

## QUARTERLY REPORT FOR THE PERIOD APRIL - JUNE 1997

### Overview

Much of the quarter was spent on preparation and presentation of the second annual workplan for approval. The workplan was presented in May and approval was given by the end of the quarter.

Indicators and achievement of results to form the monitoring of this workplan are included at the end of each component section.

### Program I: Expand Environmental Monitoring Technologies

#### Component One: Catchment Monitoring

If using the GoM workplan or the *End of Mission Report for Watershed*, activities this quarter should have centred on analysis and reporting of the results from the recently concluded data collection activities for the 1996/97 monitoring season. However, efforts have focused on completing sectoral analysis and reporting by agency from the 1995/96 growing season. Discussion of problems relating to such delays normally were discussed at the quarterly or bi-monthly meetings for the agency desk officers. These meetings are no longer scheduled, possibly due to the difficulties in getting the five to six agencies together at the same time or a change in MEMP supervisory responsibilities within EAD.

The Core Committee, chaired by the Environmental Science Advisor was to review the sectoral reports which were supposed to have been prepared in time for the February meeting in Salima. As this did not happen the sectoral review was postponed until this quarter. The Science Advisor prepared an evaluation form from which all reports could be evaluated using the similar criteria. A meeting was held at Sheila's Lodge in which all reports were reviewed except the water quality report. This report was prepared by EAD staff as the officer has moved from the Central Water Laboratory to EAD. As a result of this review process and the need to prepare a cross sectoral report, a proposal was put forth that the Core Committee members would be commissioned as a two week consultancy to write the cross-sectoral report. It was agreed that two reports should be written. One technical synthesis report suitable for review by researchers and another summary report suitable for decision makers with limited time to review lengthy documents. These requests were submitted to the Director of EAD for approval. No further activities were completed by the Core Committee during the quarter.

Considerable time was spent in meeting with the Ministry of Finance in negotiations for the new financial year's non project assistance (NPA) funding. Requests were made to reduce the budget and a new budget of approximately six million kwacha was submitted. The reductions were made by removing funding for completed activities or activities which could be supported with money from the Environmental Support Programme. By the end of the quarter, no money had been received from Treasury, thus mirroring similar problems from the last three years of attempts to support catchment monitoring with non project assistance.

#### Indicators and achievement of results

*Develop a monitoring strategy for MEMP catchments* It was anticipated that the results from the Core Committee review and the preparation of the cross sectoral analysis could be used to guide the development of a monitoring strategy for the upcoming monitoring season. As the Core

Committee did not complete the cross sectoral report during the quarter, this was deferred until the next quarter.

*Develop a synthesis reporting format for integration of sectoral data and reports* Two outlines were prepared for the technical and summary reports. These were presented in a generic form which may be suitable for use in State of the Environment reporting or for the Situation Analysis Report for the Shire River catchment.

## Component Two: Develop Prototype Environmental Information System

### *Formation of Shire River Sub-committee of Technical Committee for the Environment (TCE)*

The first meeting of the TCE was held on 11 June, 1997 in the MoREA conference room. As the Chief Documentation Officer was out of the country, the MEMP Technical Advisor presented a brief on the EIS activity for the Shire River and proposed the formation of a sub-committee for addressing issues in the Shire River. As the Assistant Director for EAD's Monitoring and Management was out of the country, it was not possible to present the current status on developing mitigation activities in the selected catchments. This activity is coordinated through MoREA by the Assistant Director for EAD's Monitoring and Management, but the Director of Land Resources & Conservation Branch is chairing the group identifying mitigation actions.

After the brief presentation, the newly elected TCE Chairman expressed concern that already too many committees were being formed. It was proposed that the Shire River task force would be guided by the Southern Region sub-committee of the TCE comprising members from Blantyre/Zomba. This committee is chaired by John Wilson of the Wildlife Society. As some members with natural resource management background are not on this committee due to their being based in Lilongwe, it was proposed that the Southern Region sub-committee could call on their expertise on an as needed basis.

### *Approval of EIS Strategy document*

The EIS Strategy document proposes endorsement by the National Council on the Environment. The next meeting of this committee is in September. A follow-up presentation of the EIS strategy will be made in Blantyre on the 24<sup>th</sup> of June for discussion at the next TCE meeting scheduled in advance of the upcoming NCE. The endorsement of the EIS strategy will be proposed as an agenda item for this meeting.

### *PIP Funding*

Pickford Sibale indicated that PIP funds should be available from the end of June. Robert Clement-Jones arrived in Lilongwe on the 18<sup>th</sup> of June to follow-up the status of the preparation of the PIP document.

### *Formation of EIS Task Force*

The Chief Documentation Officer and MEMP Technical Advisor had informal and formal discussions with senior management of the Dept. of Forestry, Dept. of Surveys, Dept. of Meteorology and Land Resources & Conservation Branch over the manner to form the Task Force. A meeting was held where all options were presented and discussed. The results of this meeting were presented to the World Bank where it was recommended that 'costed workplans' are developed for 'institutional sub-contracts' for each participating agency. The EIS Environmental Officer from the Monitoring and Management Unit is preparing the costed workplans in collaboration with the Technical Advisors from Clark and Arizona.

When PIP funds are available, advertisements will be placed for the Principal Investigator of the EIS Task Force.

#### *Past Activities*

During the preparation of the second annual workplan for Clark and Arizona, it was agreed that technical assistance would be provided to the EIS Task Force for the areas covering the Machinga and Blantyre ADDs. In addition, the technical advisors working on the PLUS presentation will prepare a follow-on training in using the PLUS 'digital atlas' to analyze and present 'themes' on the Shire River. The Environmental Policy Advisor will assist in evaluating the PLUS 'framework for decision making' as a means for presenting information on the causes of sedimentation in the Shire to decision makers.

The MEMP Technical Advisor prepared and presented a discussion on Remote Sensing in Malawi for the NRM Donor Coordination group. The concept of integrating data from existing information systems at FEWS and the forthcoming PLUS study in the Shire River EIS was presented. Discussions at this meeting focused not only on how does information get to senior decision makers as proposed through the TCE and NCE, but on how it gets to 'end users' or individual land users in the catchments. Additional discussion highlighted the possibility of preparing a 'digital' LREP with funding from the EU and technical support from the UA/CU cooperative agreement. Clark University proposed to provide a digitizing training in July which will provide support to this activity.

Discussions were held with the FEWS Country Representative and the UA Short term Technical Advisor on using Vulnerability Assessment Mapping clusters or the VAM database as a source of socio-economic data aggregated to the EPA level for use in the Shire River EIS.

A meeting was held with MEMP and National Documentation Staff to discuss the current state of the database application to track projects in the NRM field. It was agreed to identify what was required to finish off the application as it exists. Identify what information is available for project tracking from the donors. To update the project lists using a search on the donors or specific agencies.

#### *Current Activities*

Clark University had two technical advisors in-country through July to begin working on developing data layers for the Shire River area. Clark and Arizona intend to support two individuals from the agencies participating in the EIS to attend the AFRICAGIS'97 conference in Gaborone. The MEMP Technical Advisor attended this conference as well.

The Environmental Science Advisor is proposing to conduct research to model a large watershed in the Nkasi catchment which drains away from the MEMP Kamundi catchment into the Shire River. This is one of the more problematic catchments in the Shire. The work will be done in conjunction with the Water Resource Department and Meteorology Dept. This is the same catchment that the MAFE project proposes to target fallow fields for tree planting activities.

#### *Development of Digital Map Data Standards*

Since development of the prototype EIS can require the extensive collection and use of geographic data, Dr. Ron Eastman and Mathilde Snel of Clark University met with members of the Department of Surveys in Blantyre from June 5-9, 1997 to discuss the development of digital mapping standards. Recommendations for digital mapping standards were made and include geo-reference (e.g. geodetic, projection, entity, representation, attribute, relationship, geometrical, and topological), map accuracy, and meta-data/documentation standards. Discussions were held on creating a digital map data storage and distribution format and medium. The digital mapping standards as recommended in the draft report (June 1997) will be used as provisional standards

throughout the compilation of digital geographic data in the prototype EIS. It was agreed that the provisional digital mapping standards will be reviewed by the Department of Surveys and refined in October when members of Clark University meet with the Department of Surveys again to finalize the digital mapping standards.

To avoid any ambiguities in the development of the prototype EIS, the Clark University team was involved with MoREA to review and refine the purpose and methodology of the prototype EIS. As stated in the *Second Annual Workplan* it was emphasized that the main goal of the prototype EIS is to build capacity in Malawi on environmental analysis, monitoring, and reporting. It was discussed that the investigation of the prototype EIS will analyze sedimentation in the Shire with respect to land cover change and soil erosion potential and answer the following questions: 1) where are significant land cover changes occurring in the Shire river valley?; 2) what is the geographic distribution of soil erosion hazard in the Shire?; 3) does landcover/use contribute to soil erosion?; 4) what are the underlying causes of landuse/cover change and soil erosion?; and 5) what are possible intervention strategies and their anticipated impacts?. It was clarified that the issue of sedimentation will be analyzed not only due to concerns of an instable energy supply, but additionally due to concerns of livelihoods of farmers and irregular water flow at SUCOMA. Furthermore it was emphasized that as indicated in the *Second Annual Workplan* the study area will cover the entire Shire watershed although will place a particular emphasis on the mid-Shire covering the Blantyre and Machinga ADDs - areas considered of political importance.

In refining the purpose and methodology of the investigation of the Shire, acknowledgment was made that there is a need for social analysis to help identify the underlying causes of land cover change and soil erosion and to provide policy recommendations that may help mitigate environmental degradation. Nicholas Haan proposed to provide guidance to a group of Malawian social scientists in situating such a social analysis for the Shire river valley. It was proposed to include a third task (under the section Assessment of Causes of Sedimentation) on "Situating a social analysis into the Shire river valley investigation" designated to incorporate a social, economic, and political analysis of environmental degradation in the Shire. By adding this component, the methodology of the prototype EIS will focus more extensively on integrating the use of both geographic technologies and community based analysis to provide a more holistic investigation on the biophysical and socioeconomic causes of land cover change and soil erosion in the Shire river valley. Furthermore, the methodology will emphasize that the investigation of environmental degradation requires analysis between and among varying geographic and temporal scales from the small scale (e.g. analyzing environmental changes in the entire watershed) to the large scale (e.g. analyzing the underlying socioeconomic causes of environmental degradation at the community level). Mr. Haan met with the Technical Advisor and the Director of Environmental Affairs where it was given verbal approval.

Since funding for the Task Force Analysis Team has not been secured yet, Clark University is working jointly with MoREA to help facilitate the process. A time line has been proposed for tasks to be completed within the GOM line agencies themselves (Department of Forestry, Department of Surveys, MET/MEMP, and Land Conservation Research Branch/Land Husbandry Training Center) and discussions will be pursued with GOM agencies to get a better understanding of the level of commitment of government staff to the Shire investigation. There is concern that with the present delay in forming the Task Force, the Shire valley products may not be provided as scheduled in the *Second Annual Workplan*. For now, Mathilde Snel will be working with a number of GOM agencies to start the analysis of landcover/use change and soil erosion potential in the Blantyre ADD.

#### Indicators and achievement of results

*Provide technical support for data collection and archiving provided to the Task Force Analysis Team. Process satellite imagery according to map standards began with the Departments of Forestry and Surveys.*

*Provide technical input to improve institutional and technical infrastructures and analytical capacities.* Not completed as the EIS Task Force has not been put into place.

*Develop prototype digital map data geo-referencing standard* Prototype geodetic datum parameters to be used for all data recording in an unified national level geo-referencing system produced.

*Develop prototype digital map data production and distribution formats* To be completed with the return of the technical advisor in October.

*Develop a digital map data distribution medium and capability* To be completed with the return of the technical advisor in October.

*Develop a preliminary situation analysis report based on existing data* Not completed as the EIS Task Force has not been put into place.

*Produce environmental assessment report for Shire River Catchment* Not completed as the EIS Task Force has not been put into place.

## Component Three: Public Lands Utilization Study (PLUS)

### **Summary**

PLUS completed fieldwork in April 1997 and began the transition from data collection to model production. Socio-economic data were cleaned and quality assurance/quality control (Qa/Qc) procedures were conducted on all spatial information. For the five Level 2 sites, final models were developed for income, resource utilization, suitability (agriculture capability and erosion hazard), population pressure, access, and land cover change from 1984 to 1994. Discussions initiated between the University of Arizona (UofA), the Ministry of Lands and Valuation (MoLV), and USAID concerning data limitations<sup>1</sup> led to a review of all PLUS objectives (national level issues), agreement on a strategy going forward, and the integration of PLUS efforts with other activities within the Malawi Environmental Monitoring Programme (MEMP) 1997 Workplan. Developments from this review and an evaluation of progress in the first phase of data analysis resulted in a tentative schedule for the PLUS closing seminar as early as September 1997, though by the end of the quarter it appeared that November would be more realistic.

### **Malawi Environmental Monitoring Program Work Plan**

MoLV and MoREA met with the University of Arizona and USAID to discuss the role of PLUS within the Malawi Environmental Monitoring Program (MEMP). It became clear that a number of objectives within MEMP were parallel to those of PLUS and that the two activities could mutually benefit if collaboration was improved. The clear linkages to the prototype Environmental Information System (EIS), Nature policy efforts, and training were then written into the 1997 Workplan.

### **Level 1. Physical Characterization of Public Lands (spatial analysis)**

#### *Enhancing the National-level Spatial Data Set: Summary Data Extraction and Modeling*

The UofA, USAID and MoLV began this quarter with an evaluation of PLUS objectives relative to the resolution of data input layers needed to meet those objectives. These issues had been discussed in the Land Steering Committee meetings of the previous quarter, with the conclusion

---

<sup>1</sup> For details on discussions over the availability of critical national data layers in digital form as well as over all spatial resolution questions, please see Land Steering Committee minute for January through April 1997 as well as the last quarterly report.

that intensive analysis of the five Level 2 protected areas would be possible if the missing data layers (LREP soils & physiography and higher resolution elevation data) could be digitized by the Arizona Remote Sensing Center (ARSC) at the UofA. This digitizing was subsequently completed, however all parties felt that more analysis Malawi's protected areas at the national level would greatly enhance the final product.

In this regard, ARSC performed additional data searches and obtained a digital FAO soils map. If this map proves to have adequate information about soils it will be combined with the national DEM 1 km resolution, agro-climate data and the 1991 land cover map to permit coarse resolution agriculture suitability and erosion hazard mapping for Malawi's protected areas. The addition of the 1973 land cover map will also permit a change analysis for those same areas between 1973 and 1991. In June, a model for population pressure exploiting 1987 census data compiled by FEWS for all of Malawi's EPAs was designed. While the resolution and detailed attributes of the land cover, soils and elevation layers do not compare with what has been captured for the five Level II sites, PLUS intends to use the data available to conduct coarse-resolution modeling on all of Malawi's protected areas. For details on progress, see Table 1.

*Spatial Data Capture and Base Mapping*

**Table 1. National-level data for protected areas:** data preparation complete on layers with a “√”.

All layers are currently undergoing final Qa/Qc which should be complete in August 1997.

Data Layer	Complete
<i>Administration</i>	
Country boundary	√
Boundaries of Forest Reserves, National Parks, Wildlife Reserves	√
Boundaries of Agricultural Schemes (only 75% of maps available to date)	√
Agriculture Development Division boundaries (ADDs)	√
Extension Planning Area boundaries (EPAs) (includes population density)	√
Region and District Boundaries (for Districts, includes population density)	√
<i>Infrastructure</i>	
Major Cities	√
Transportation Network	√
<i>Environment</i>	
Stream Drainage Network	√
Major Lakes	√
1973 Land Cover Map	√
1991 Land Cover Map	√
Soils (from FAO)	√
Agro-climate Zones (from LREP)	√
Temperature at the End of Growing Period	√
Average Temperature During Growing Period	√
Average Minimum Temperature	√
Average Annual Temperature	√
Average Annual Precipitation	√
Precipitation/Potential Evaporation	√
Number of Dry Months per Year	√

*GIS Analysis for Malawi's Protected Areas*

Land Cover Change Model (from 1973 to 1991)

Digital Elevation Model

√

Shaded Relief Map

√

Population Pressure on Protected Areas (based on EPA density figures)

50% complete

Population Pressure Model (model under design)

Suitability/Hazard Model (coarse model using the above data layers now)

*Quality Assurance/Quality Control (Qa/Qc)*

As part of the aforementioned integration with the EIS, the PLUS data set will contribute directly to the prototype EIS being developed by MoREA. ARSC has drawn up Qa/Qc guidelines for the capture, integration, and analysis of digital data layers. It has also adopted the metadata standards developed by the Department of Surveys in order to properly document each data input and output layer. Implementing a more stringent and standardized controls on database development and presentation will enhance its potential to contribute to analysis of other environmental questions once PLUS is completed.

*Summary Data Extraction: Level 2 Spatial Modeling*

Capture of all data layers for Level 2 (Table 2) other than Land Cover maps was completed. Table 3 details progress on the image processing behind development of the Land Cover maps which should be complete by August 1997. Models for these data layers were designed and test and final product maps should be completed by mid-September.

**Table 2. Level 2 sites:** digitizing and attributing has been completed on data layers with a “√”. Qa/Qc will be completed by August 1997

Source & Resulting Data Layer	Mulanje	Zomba	Liwonde	Dzalan yama	Vwaza
<i>1:50,000 Survey Sheets</i>					
Reserve Border	√	√	√	√	√
Streams	√	√	√	√	√
Villages	√	√	√	√	√
Roads	√	√	√	√	√
250 ft Contours	√	√	√	√	√
<i>LREP</i>					
Soils	√	√	√	√	√
Agro-climate zones	√	√	√	√	√
<i>Satellite Imagery</i>					
Land Cover 1984	75%	90%	30%	40%	40%
Land Cover 1994	75%	90%	30%	60%	40%
<i>GIS Analysis and Modeling</i>					
Digital Elevation Model	√	√	√	√	√
Slope Map	√	√	√	√	√
Aspect Map	√	√	√	√	√
Shaded Relief Map	√	√	√	√	√
*Agricultural Capability (LREP)					

*Erosion Hazard (SLEMSA)					
*Population Pressure Model					
*Access Model					
*Land Cover Change 1984 -					
*Suitability Model					
<i>Fieldwork</i>					
Participatory Maps Scanned	√	√	√	√	√

\*Final models have been designed and tested. Actual maps will not be created until Qa/Qc is complete on all data layers.

Other than the missing maps for approximately 25% of the Agricultural Schemes, digital data collection is complete (MoALD is still making efforts to complete at least the tabular data set on Ag. Schemes). The boundary for Liwonde National Forest is incorrect on the 1:250,000 map (per DNPW) and has been re-digitized accordingly.

*Classification and Change Detection.*

**Table 3. Image processing activities:** if complete for both 1984 and 1994 images, “√”.

Image Processing Step	Mulanje	Zomba	Liwonde	Dzala nyam a	Vwaza
Atmospheric /Radiometric	√	√	√	√	√
Geometric Rectification	√	√	√	√	√
Unsupervised Classification	√	√			
Modified Soil Adjusted Veg Index	√	√	√	√	√
Tasseled-Cap Transformation	√	√	√	√	√
Ground Verification	√	√	√	√	√
Elevation Criteria Introduced	√	√			
Final Classification					
Accuracy Assessment					
Land Cover Maps Produced					

*Creation Rationale.* The information provided for Malawi’s protected areas was summarized and joined to the maps of forest reserves, national parks, and wildlife reserves. Key attributes include the date each protected area was gazetted and the rationale for gazettelement. Maps will be produced depicting this information in a spatial manner.

## **Level 2. Land-use Characterization of Public Lands (socio-economic analysis)**

*Rapid Appraisal and Key Respondent Interviews* Fieldwork is complete and the Bureau of Applied Research Anthropology (BARA) has completed coding and qualitative analysis.

*Participatory Mapping* Fieldwork is complete and the maps (all 120 of them) have been scanned to add to the spatial data set. BARA will use these in the qualitative analysis.

*Formal Survey* Fieldwork, data entry and data cleaning are complete. Models for income and resource utilization were developed and tested. Syntax files in SPSS were developed to test hypotheses on the relationship of public land resource utilization. Results should be available in August 1997.

*Species Consolidation* Approximately 1000 local names for species used in the five Level 2 protected areas were reviewed by experts in FRIM, Parks and Wildlife, and Forestry, with assistance from members of other agencies, including the National Herbarium. The Department of Forestry has had the biggest share of work in this regard and has requested more time to finalize their list.

*Resource Assessment* Fieldwork for Vwaza and Liwonde was completed in April 1997. Data were entered and cleaning has begun. Final analysis should be complete in August 1997.

**Integration of Level 1 and Level 2** September 1997.

**Writing the Final Draft and Producing the Final Draft Digital Atlas** September 1997.

**Presentation of Results Format and venue under discussion.** September 1997?

**Final Report and Digital Atlas Issued** December 1997?

### **Framework for Decision Making**

In May 1996, USAID requested that PLUS provide a means of making its final products more accessible to decision makers. Initially, this was conceived as a sort of matrix which would guide decision makers to consider the multiplicity of factors which all play a role in tenure and management decisions where protected areas are concerned. Increasingly, however, it is becoming clear that it is not only necessary to organize the data by such factors, but also to enhance the possibility that experts or stakeholders familiar with those factors be mobilized when such decisions are being made. These are only initial thoughts, though it is clear that the broad, consultative base of expertise provided by the Lands Steering Committee may be useful in such a framework. In addition, it has been suggested to explore the strategies recommended by the International Model Forest Network (IMFN) which supports an integrative, consultative management of natural resources at the landscape level, a local and yet multi-sectoral approach which involves communities as well as ministries, often with a protected area as a point of focus.

### **Overall Progress Summarized**

<b>Activity</b>	<b>Progress</b>	<b>Expected Completion</b>
Spatial Data Collection	<i>national FAO soils added in June 1997</i>	<i>completed December 1996</i>
Base Digital Mapping (Level 2 sites)	65% complete	<i>completed May 1997</i>
Base Digital Mapping (PL boundaries)	80% complete (missing some)	<i>completed May 1997</i>
Land Cover Classification (Level 2)	60% complete	August 1997
Change Detection (Level 2 sites)	testing	August 1997
Summary Data Extraction (Level 2)	model design complete	August 1997
Building the "digital atlas"		September 1997
Creation Rationale	MoALD still chasing Ag. Schemes.	<i>completed June 1997</i>
Secondary Data Collection		<i>completed May 1997</i>
Rapid Appraisal		<i>completed December 1996</i>
Participatory Mapping		<i>completed January 1997</i>
Key Respondent Interviews		<i>completed February 1997</i>
Formal Household Survey		<i>completed February 1997</i>

Resource Assessment		<i>completed April 1997</i>
Res. Assess. Data Entry		<i>completed June 1997</i>
Res. Assess. Analysis		<i>August 1997</i>
Socio-economic Data Entry		<i>completed March 1997</i>
Socio-economic Data Cleaning		<i>completed April 1997</i>
Socio-economic Analysis	60% complete	<i>August 1997</i>
Linking Level 2 and Level 1 results	design in progress	<i>September 1997</i>
Framework for Decision Making	conceptual design in progress	<i>September 1997</i>
Final Draft Report & Presentation		<i>September 1997?</i>
Final Report		<i>December 1997?</i>

## Component Four: NDVI Time Series Analysis and Interpretation

To facilitate future environmental monitoring in Malawi, the Clark team has been involved in analyzing the value of easily accessible coarse AVHRR data (at resolutions of 11km, 7.6km, 3km and 1km). The Meteorological Department and Department of Forestry are presently obtaining data from Harare at a 11km resolution. The Forestry department has already conducted long time series analysis on a number of forest reserves and districts. For larger forest reserves the time series analysis has proven to be useful, however, due to the coarse 11 km resolution of the data, the data has not been useful for analyzing vegetation changes in smaller forest reserves. During the advanced GIS training held at Bunda college, the value of using 7.6 km NDVI imagery was assessed. A time series was conducted over 14 years (1982 - 1996) on the watershed that contributes to sedimentation of the Nkulu and Tedzani falls hydroelectric dam. Results pointed to two particularly interesting trends: a 8-10 year climatic cycle and landcover change. Land cover changes were indicated in especially the Mwanza and Neno areas. A similar long time series analysis with the 7.6 NDVI data will be conducted with the Department of Forestry over the entire Shire watershed to contribute towards the investigation of landcover changes in the entire Shire river valley.

The Clark team have also been analyzing the use of different resolution data for environmental monitoring. Dr. Ron Eastman and Mathilde Snel looked into the feasibility of using 1km NDVI data - being downloaded at the Department of Fisheries station in Salima - to map landcover/use and to detect fire. Subsequently, Nicholas Haan conducted a special session with the Department of Forestry to analyze the use of different resolution NDVI data - the 1km resolution AVHRR data, the 7.6 km resolution NDVI data, and a 20 meter resolution SPOT image - for monitoring vegetation changes.

The possibility of obtaining 3km NDVI data from the Meteorological Department is also being pursued. The Meteorological Department in Chileka sent a letter requesting the data from the Meteorological department in Harare.

### Indicators and achievement of results

No activities were scheduled to be completed during this period.

## Component Five: Area Sample Frame in Machinga ADD

Two meetings were held with World Bank to discuss the evolution of the area sampling frame coverage for the country. The World Bank is willing to support construction of the frame for other ADDs. They have requested the Ministry of Agriculture and Livestock Development take a lead in calling a meeting to get input from all interested agencies who would benefit from survey data collected using the area sample frame methodology. Data could be collected through three types of surveys; crop production statistics, program impacts and, environmental data. As at one time it appeared the same consultant may be used for both the World Bank activities and those to be completed under the Arizona/Clark cooperative agreement, USAID suggested that an effort be

made to share costs where possible. At this time, it is not clear who will complete the World Bank activities. The officer responsible for taking the lead on organizing the meeting to discuss data collection requirements, has left the country for three months.

After considerable discussions with USAID and the subcontractor for the ASF, agreement was reached on modifying the questionnaire to include more questions on environmental change and reduce the amount of measurement and quantification of soil and water conservation activities in the field. The modified questionnaire was reproduced and presented to a short training course held at the Zomba RTC. The questionnaire received favourable responses from the enumerators who thought that the previous format would have been difficult to complete in a timely manner.

With the arrival of NPA funds some six months later than anticipated, what was to be a planting survey was barely conducted in time to be a harvest survey. Following the training, the survey was conducted from mid-May to early June. The number of questionnaires administered nearly doubled numbering now approximately 2,250. Due to the increase in this number, field activities consumed much of the NPA budget for data entry. It was decided to utilize the data entry facilities at APRU instead of completing data entry at Machinga ADD.

Originally the consultant planned to come to Malawi to install the data entry programs and oversee the data collection activities. As the technician at APRU was familiar with this type of software and the survey would be nearly completed by the time the consultant could arrive, it was decided to save on the cost this trip, postponing the next visit until after the data has been entered.

#### Indicators and achievement of results

No activities were scheduled to be completed during this period.

## Program Two: Strengthen Environmental Training and Research

As the current workplan was prepared in April, this section of the report covers both on-going activities and activities introduced as part of the current annual workplan. The ongoing activities include curriculum development and small grants research while the activities that were introduced as part of the current workplan are mainly related to training and research.

### Develop an Environmental Science Curriculum (UNIMA)

#### **Chancellor College**

On April 7, the MEMP Technical Advisor and the Environmental Science Advisor visited Chancellor College to discuss issues related to curriculum development. The meeting at Chancellor College was held with heads of departments of the Faculty of Sciences. The agenda of the meeting was to develop environmental science curriculum for Chancellor College. The Faculty of Science consists of the following departments: Biology, Physics, Chemistry, and Geography, etc. During the meeting, we were told that the Faculty of Sciences has established a Center for Environmental Sciences. The center's responsibilities include curriculum development for environmental sciences. Participants in the meeting informed us that a curriculum for graduate degree programs in environmental sciences has been developed by the center but no curriculum was developed for undergraduate degree programs. It was agreed to collaborate with the Center for Environmental Sciences in the development of environmental science curriculum for undergraduate degree programs. However, to effectively develop a suitable environmental science curriculum, it was suggested that the curriculum currently taught by all the departments in the Faculty of Sciences be reviewed before developing a new curriculum. The Chairman of the meeting, Dr. E. Sambo, has agreed to collect the existing syllabi from all departments and to submit it to me as soon as it becomes available. As of the end of this quarter, a list of the existing curriculum from the Faculty of Sciences departments were not received. The environmental science advisor in collaboration with the Center for Environmental Sciences will develop a tentative environmental science curriculum for Chancellor College.

#### **Polytechnic**

As part of the same trip, MEMP Technical Advisor and the Science Advisor visited the Polytechnic College on April 8, 1997 where they met with the Principal and the Head of the Department of the Environmental Health to discuss development of an environmental science curriculum. They were informed by the Head of the Environmental Health of the existence of an environmental science curriculum developed by the Faculty of Applied Sciences which consists of the Department of Applied Sciences and the Department of Environmental Health. The Civil Engineering department of the Faculty of Engineering also teaches some courses with some aspects of environmental education. Instead of developing a new curriculum for environmental sciences for the Polytechnic, the Head of the Department of Environmental Health expressed the need for reviewing and strengthening the existing environmental curriculum already developed by the Faculty of Applied Sciences.

In addition to curriculum strengthening activities, the head of the Environmental Health Department expressed the need to train junior faculty members on specific topics such as statistical analysis of environmental data and the use of mathematical models for environment and natural resources management. The purpose of this training would be to assist junior faculty members particularly assistant and associate lecturers in developing skills needed for conducting environmental research. To address this issue, specialized training on key environmental issues was incorporated into the current workplan as a new activity that is aimed at addressing the needs identified by the Head of the Department of Environmental Health.

## **Bunda College**

On April 16, the Curriculum and Syllabi Committee of Bunda College held a meeting to discuss how an environmental science curriculum can be incorporated into the existing curriculum. At Bunda College, to graduate from an undergraduate program, students in each department are required to take a fixed number of courses. It is therefore difficult to introduce new courses into the system without actually replacing some of the existing courses. To introduce new environmental science courses within the current setting may cause inconveniences particularly to faculty members whose courses are replaced. Any decision to address these issues requires careful evaluation as well as approval of the faculty and head of departments. Based on these discussions, one of the alternatives is to develop an environmental science option where students can take courses that lead into a Bachelor of Science Degree in Agriculture with an Environmental Science option. However, as of now the option has neither designated faculty members nor department that can initially host the option before it eventually evolves into department. During the last Curriculum and Syllabi Committee meeting, the need to attach the environmental science option to one of the existing departments has been discussed but no agreement was reached as to which department should host the environmental science option.

One of the major constraints to environmental science curriculum development for Bunda College is not the curriculum development activity but to agree on how the curriculum will be incorporated into the existing degree programs. To expedite the curriculum development activity, the Science Advisor is working toward the development of an environmental science curriculum to be in place when these issues are resolved. In the mean time, the Dean of Bunda College, the Curriculum and Syllabi Committee, and the Environmental Science Advisor will continue their effort in addressing these issues.

## **Identify External Training Courses**

The following summarizes the activities completed or proposed to date in identifying training to support capacity building for the activities in the Government of Malawi's Workplan for the Malawi Environmental Monitoring Programme. As in many components of the MEMP, the training proposed reflects collaborative efforts between programmes and donor activities. Training programmes or components identified for external and in-country training are listed by agency. In most cases training needs have been discussed with technicians or their supervisors. No individuals have been selected to attend specific courses.

## **External training**

*Department of Water* The Environmental Science Advisor suggest two short courses conducted in by the U.S.G.S. in field sampling methodologies, one with a specific focus for international participants. These were proposed to the Deputy Controller for Water Affairs and endorsed as he had attended one of the courses. The USGS indicated that neither of the courses had been scheduled for 1997.

*Departments of Surveys and Land Resources Conservation Branch* As part of the PLUS study a digital land resources evaluation project (LREP) has been developed for the five level 2 study sites. Interest as been expressed from many sectors in expanding the coverage to produce a national level *digital LREP*. The European Union is particularly interested in supporting this activity and could make local currency funds available to cover in-country costs in producing the digital map sheets to be linked to the LREP database if UA/CU could provide technical assistance.

Clark University provided training to fifteen participants in digitizing using the Data Automation Kit (DAK) software. LREP map sheets were used during the training. In addition, Clark provided technical assistance in developing prototype meta databases and digital map standards to be used by the Department of Surveys.

The University of Arizona will provide a two week training in Arc View, the software used for the digital LREP in October. It is proposed that an individual would be identified from LR&CB that would specialize in land evaluation analysis using the digital LREP. This individual would receive external training at the Arizona Remote Sensing Centre (ARSC) in use and development of applications with the LREP database. An individual from the Department of Surveys who has completed or been responsible for the completion of the digitizing of the LREP sheets would also travel to ARSC to complete the linking of the polygons to their attributes in the LREP databases.

*Ministry of Research and Environmental Affairs* The Monitoring and Management Unit has three professional officers who could be eligible to go for external training. The focus areas for the Monitoring and Management Unit include state of the environment reporting and cross sectoral data analysis and interpretation. World Resources Institute in Washington D.C. has background in both of these areas. No firm plans have been finalized but discussions have begun in providing funds to support training in State of the Environmental reporting. It was envisioned that an individual would receive support to go to Washington D.C. to work with the World Resources Institute.

*Department of Forestry and Department of Meteorology* No external training programmes have been identified or discussed with these two agencies.

## Internal training

*Ministry of Land Valuation, Departments of Wildlife and Forestry, Ministry of Research and Environmental Affairs, Land Resources and Conservation Branch and the EIS Task Force* Training in desktop mapping and data analysis with Arc View using the Public Lands Utilization Study *Digital Atlas*. ARSC will provide two graduate student trainers to present a two week training in using Arc View sometime from mid-October.

*Ministry of Research and Environmental Affairs* World Bank funds will be used to provide training for two to four people from MoREA in the use of Microsoft Access. This training is to support the use of an Access application to track programmes and activities relating to natural resource management in the Shire River for the EIS.

*MEMP agencies and University Students* The Environmental Science Advisor will conduct a training in data analysis, interpretation and reporting tentatively scheduled for February of 1998. In addition, short courses will be prepared for MEMP personnel or individuals participating in the small grants research programme as requested from November of this year.

*UNIMA Colleges* Clark University will conduct a training of trainers course in late October for University of Malawi instructors. Initial discussions with the trainers indicates that 70-80% of the introductory course material will be presented by Malawians with Clark University providing technical backstopping.

## Strengthen GIS technical capacity

A critical part of strengthening GIS technical capacity has been Clark's continual involvement in conducting a series of geographic technologies trainings. An advanced course in GIS was conducted at Bunda college from June 17 to June 21, 1997. Seventeen participants attended from the GOM and UNIMA (Department of Surveys, Department of Forestry, LRCB Shire valley ADD, Land Husbandry Training Center, UNIMA Bunda, UNIMA Polytechnic, and UNIMA Chancellor). The course covered sessions on time series analysis for the detection of land cover change, decision making techniques for environmental analysis, and modeling of soil erosion potential using additive and multiplicative models (e.g. SLEMSA). As with the intermediate training held in January 1997, sessions in the advanced training focused on the analyzing landcover/use change and soil erosion in parts of the Shire river valley.

Discussions were facilitated with UNIMA staff on the training of additional UNIMA staff in the next sequence of geographic technology training to start in October 1997 and in establishing a GIS curriculum. Furthermore, discussions were held and tasks allocated to UNIMA trainees of the 1996-1997 geographic technologies course to train in the next sequence of geographic technologies courses to start in October 1997.

## UNIMA Small Grants Research Program

The Small Grants Research program has encountered funding problems that are linked to the lack of Non-project Assistance Funds (NPA). After discussions on the importance of environmental research as a tool for capacity building, the University of Arizona has agreed to provide funds for the Small Grants Research Program

Mr. C. Geoffrion, the Vice President for Research of the University of Arizona visited Malawi to discuss with UNIMA officials on a collaborative research program. Mr. Geoffrion, the MEMP Technical Advisor, and the Environmental Science Advisor met with the University of Malawi Vice Chancellor and the Registrar, to discuss signing of a memorandum of understanding (MOU) between the two universities. The Vice-Chancellor of the University of Malawi recommended that the MOU will be signed after being reviewed by the University Council.

Mr. Geoffrion, MEMP Technical Advisor, and the Environmental Science Advisor also met with the Principal of Bunda College of Agriculture to inform him about the availability of funds from the University of Arizona for the Small Grants Research Program. We discussed with the Principal how the Small Grants Research program could be administered and implemented to complete research within the specified time frame.

On June 20, a request for proposals for the small grants has been sent to the three participating colleges of the UNIMA system. The proposals will be evaluated by the Research and Publications Committee (RPC) of each college and grants will be awarded to successful applicants by September 30, 1997.

## Strengthen MEMP Small Watershed Research Component

### **Sectoral reports**

On April 17, the Core Committee consisting of five members from MEMP participating agencies and the Environmental Science Advisor, as the Chairman, met at Sheila's lodge. The purpose of the meeting was to review and evaluate the sectoral reports prepared by MEMP participating agencies and to make recommendations for improving the quality of the reports. The members of the Core Committee reviewed the sectoral reports from the following departments: Agriculture, Water resources (hydrology report), and Meteorology. Reports from the Forestry. The Water quality lab were not available for review. After careful review and evaluation, the Core Committee made recommendations for improving the quality of the sectoral reports. Furthermore, they recommended that a synthesis report be prepared from the sectoral reports. They also suggested that the authors of the sectoral reports should revise the reports by incorporating the comments made by the Core Committee.

### **Review and Analysis of Data From Small Catchments**

To assess the suitability of the data collected under the MEMP small catchment program for research, data collected during 1995/96 were examined. The data may have limitations that may restrict its use for research and consequently for decision-making purposes. At the moment, all the data collected from the catchments are not available and therefore no assessment about the suitability of the data for research can be made. However, as more data become available, data will be analyzed and used for environmental research and training purposes when appropriate.

## Specialized Training on Key Environmental Issues

The Environmental Science Advisor met with Dr. Simango, the Head of the Department of Agricultural Engineering at Bunda College, to discuss the possibility of identifying two students who might be interested to work on soil erosion modeling as their undergraduate research projects.

Dr. Simango welcomed the opportunity and advised Mr. Mlava, Lecturer in the Department of Agricultural Engineering, who is also in charge of student projects, to identify students who may want to work on soil erosion modeling. Two students were identified to work on soil erosion modeling as their undergraduate research projects and will conduct similar research using data from control plots at two different MEMP catchments during 1997/98 rainy season. The data will be used for calibrating and validating the soil erosion models namely the Soil Erosion Model in Southern Africa (SLEMSA) and Universal Soil Loss Equation (USLE).

As part of a specialized training, a one-week course on the economics of soil and water resources management was taught during the first week of June as part of the M.Sc. Level course, Economics of Environment and Natural Resources Management. This course is offered by the Rural Development Department but it is often taught by senior staff at the Agricultural and Research Policy Unit (APRU). In addition to the Economics of Environment and Natural Resources Management course, some lectures were given on sustainable agricultural development policy to graduate students as part of a course on agricultural policy taught by a senior staff at APRU.

### **Small Catchment Research**

The small catchment research consists of a research and a monitoring component. The research component deals with the review, evaluation, and analysis of environmental data collected from the four MEMP small catchments during 1995/96 and 96/97 as well as environmental data collection and analysis during 1997/98 rainy season. Most of the activities of these quarter were to analyze some of the data collected during 95/96 and to make plans for the coming season. As described in the annual workplan, the monitoring and research components of the catchment monitoring has to be distinguished. Therefore, a monitoring strategy for small catchments will be developed and a draft report has been prepared during this quarter.

### **Large Catchment Research**

The large catchment monitoring research is aimed at developing a methodology for monitoring the impact of land use changes such as deforestation, over-grazing, and cultivation on water quantity (e.g., flooding and droughts) and quality (e.g., sediment loads). Unlike the MEMP small catchment research activity, the large catchment research activity mainly relies on historical data collected by the Water and Meteorology Departments. During the second quarter, study sites were selected based on their geographical location, land use, and availability of streamflow and climatic data. Because of the need for information on sedimentation of the Shire River Basin, several catchments that drain into the Shire River were proposed as study sites. The selected rivers are Nkasi, Rivi-Rivi, Lisungi, and Mwanza. Other watersheds were also selected for testing the methodology so that its suitability for different regions can be understood.

A list that consist of all the climatic stations that are located within the selcted watersheds has been compiled. To obtain climatic data for each catchment, the Meteorology Department at Chileka will be contacted.

### Indicators and achievement of results

*Establish teaching curriculum in environmental sciences at Bunda, the Polytechnic and Chancellor Colleges.*  
Meetings held with curriculum development committees or college staff from all three colleges.

*Research grant program for three colleges of UNIMA.* Discussion initiated with the University and a request for project proposals submitted.

*Specialized training on key environmental issues offered.* Completion of a one-week teaching course of economics on soil and water resources management under the Specialized Training program activity.

*Examine, analyze, interpret MEMP data and present results as research findings.* Quality control measures and initial statistical analysis of data collected from the small catchment has been done. Also, a draft report describing the revised monitoring strategy has been prepared.

## General remarks

The second quarter of 1997 saw a continuing effort towards the solution of the NATURE Program's overriding problem of GOM financing for the E/NRM policy and legislative reform program, but very little progress was made. Aside from the financing issue, the policy advisor has identified a number of NRM issues/themes requiring attention during the forthcoming and ongoing policy reforms, and plans to initiate a series of debates among concerned parties (including donors). The intention is to broaden some of the policy horizons and link NRM policy to the national economic development strategy. The first of these themes concerns protected areas and decisions related to protection as a land use option, a clear link with PLUS. Others which will be developed during the current year include:

- partnerships in wildlife management;
- policy implications for development of the commercial fisheries
- the woodfuel budget

## Substantive work program

### **Financing for the Composite Action Plan for review and reform of policies, institutional roles and legislation for E/NRM.**

On April 17<sup>th</sup> a meeting chaired by the Secretary to the Treasury and including the USAID Mission Director and colleagues, representatives of the NATURE, GABLE and ASAP Programs reached no firm conclusions on the NPA financing problem, and did not come close to solving it.

A second meeting chaired on May 9<sup>th</sup> by Mr. Z.D. Chikhosi (Deputy Secretary: Budget Section, MoF) and attended by other MoF representatives and NATURE and GABLE officials was more direct. The meeting was informed that no further funding would be available from the MoF: instead: agencies should take stock of what had already been achieved, determine what could be accomplished with funds already available, and thereafter new Letters of Intent (reflecting the lower level of activity) would be negotiated with USAID. The NATURE policy advisor cautioned that as far as NATURE was concerned there was little room for negotiation between the content of the LOI and the content of the Program Agreement, ie anything more than very minor cuts would necessitate a renegotiation of the NATURE Program itself.

NATURE agencies attended a meeting chaired by the policy advisor on May 19<sup>th</sup> in order to define a collective response to the MoF's position. Three agencies which could not attend this meeting were each met separately during the same week in order to canvas their views. It was agreed that after making all possible savings, after taking into account an increased level of support from the UNEP Environment and Law Programme and after subtracting from the original costings all actions which had already been accomplished, a bottom-line position would be reached beyond which no further cuts could be made without compromising the integrity of the reform program. It appeared, therefore, that a deadlock position had been reached.

The MoF were appraised of this position at a meeting chaired by Mrs. Kaluma (Budget Section, MoF) on May 29<sup>th</sup>. NATURE participants were asked to quantify their "bottom-line" position and revert to the MoF with this information quickly. The new budget shortfall was calculated at MK10.9 millions for the current financial year. The new budget, together with a similarly revised budget for the environmental monitoring program, was discussed within MoREA on June 4<sup>th</sup> and

presented to the MoF on June 6<sup>th</sup>. Meetings scheduled for June 11<sup>th</sup> and June 18<sup>th</sup> were both cancelled by the MoF without notice, but another round-table chaired by Mr. Chikhosi and attended by representatives of NATURE, GABLE and ASAP did take place on June 26<sup>th</sup>. At this meeting it was agreed that the environmental monitoring program, which had been included in the Development budget, would be financed at least up to its new (reduced) level, and that consideration would be given to making the difference (ie. between the approved and the revised monitoring budgets) available for policy/legal work.

In the meantime USAID began taking an increasingly serious view of a problem which affected three major NPA programs, and an initial strategy meeting held on April 28<sup>th</sup> was later succeeded by a regular series of briefings, held weekly or every second week according to the pace of events. Clearly, the pace of events was slow, and a great deal of time was spent on this dreary business.

## Fisheries Conservation and Management Bill

Following the Fisheries Department's withdrawal from Parliament of the Fisheries Conservation and Management Bill at the end of April (at MoREA's request), an intensive review of the Department's alternative draft was held in Mangochi on May 2<sup>nd</sup> and 3<sup>rd</sup>. The review was chaired by the Principal Secretary for Natural Resources, Mr David Kambauwa, and was attended by Fisheries Department senior staff, Parliamentary Draftsman Mr. Kenyatta Nyirenda, the NATURE policy advisor and MoREA's lawyer, Mr. Ernest Makawa. The result was a superior piece of legislation which addressed the crucial issues ignored by the previous draft: co-management, restricted entry and cross-sectoral coordination. UNEP support was sought and obtained in order to retain the services of the two lawyers to finalize the draft in time for submission to the next (July) sitting of Parliament.

## Donor Co-ordination

The donors' E/NRM coordination group met in the USAID conference room on April 30<sup>th</sup>, when a presentation on the energy sector was made by representatives of the Ministry of Energy and Mining, UNDP and a Danish energy mission, and on June 5<sup>th</sup>, when Kent Burger presented the theme "remote sensing in Malawi".

Meetings of the donors E/NRM Protected Areas Sub-committee were held on April 16<sup>th</sup> at USAID, and May 22<sup>nd</sup> at the EC Delegation. The second meeting agreed with the proposal made by the NATURE policy advisor that the donors sub-committee should be subsumed into a new inter-agency Protected Areas Working Group (see under Land Policy).

## Sustainable financing for E/NRM programs

Following the selection of a full-time co-ordinator for the working group in March, activity ceased pending the release of funds by the Ministry of Finance (in this case to the Ministry of Finance, also). Although the coordinator's salary will be financed by UNDP, operating expenses are expected to be borne by the Bilateral Aid section of the MoF. It was therefore decided that given the short timespan of this assignment (6 months) the coordinator should not be engaged until such time as operating funds were available. The continuing problem with MoF does not auger well for the capitalization of the endowment fund using the last tranche of NATURE NPA finance. The endowment fund working group did not meet during the quarter.

## Community-Based Natural Resource Management (CBNRM)

After the successful completion of the ULG study in January and the CBNRM workshop held in Zomba in March, USAID resumed the initiative in this field by designing the CBNRM component of the NATURE Support Project. The NATURE policy advisor supported this process by attending a series of meetings with the Principal Secretary for Natural Resources, the MNR Chief

Planning Officer and the Directors of National Parks and Wildlife and Environmental Affairs. The meetings were aimed to (a) refine the project design and also (b) to determine the most appropriate lead technical ministry for the project. MoREA was eventually selected.

## Land Policy

The NATURE policy advisor attended meetings of the Land Utilization Studies Steering Committee on April 29<sup>th</sup> and May 21<sup>st</sup>. The second of these meetings was a special session to discuss the methodology to be adopted by the second phase of the Customary Land Utilization Study in resolving the considerable disparity between CLUS I's estimate of the land area under smallholder cultivation and that derived by the NSO.

On May 5<sup>th</sup> a meeting of all donors involved in supporting the activities of the Land Commission, plus Commission representatives and other interested parties, was convened in UNDP. The objective of the meeting was to update participants on the status and timetable for the Commission's work, to discuss the content of side studies which will be financed by FAO and to discuss the process of policy development by the MoLV once the findings of the Commission have been presented to Parliament.

### Protected areas

On April 29<sup>th</sup> the NATURE policy advisor chaired a meeting in MoREA attended by representatives of the MoLV, the Forestry Department, the Department of National Parks and Wildlife and the International Model Forest Network to discuss the future of protected areas as a land use issue. The meeting agreed that:

- an inter-agency working group should be created to further the interests of protected areas, to include the agencies present, the donors' protected areas sub-committee and concerned NGOs;
- the working group should submit a memorandum to the Land Commission;
- the NATURE policy advisor should draft the memorandum for consideration by the group, and
- a workshop to discuss the future of protected area management should be scheduled for later in the year.

The draft memorandum was completed and distributed by the end of June, with the first meeting of the working group scheduled for July 10<sup>th</sup>.

### Model forest

A meeting was held in the Forestry Department on May 6<sup>th</sup> between MacJones Shaba (Deputy Director of Forestry), Dr. Simon Munthali (Department of National Parks and Wildlife), Barron Orr (PLUS Coordinator), Tony Seymour and Michel LaVerdiere (CIDA) to discuss the practical development of one or more Model Forest proposals for possible CIDA financing. Five management areas were proposed, some combining protected areas in both the forest and wildlife sectors. It was agreed that both Departments would contribute background material towards an initial concept paper for consideration by CIDA. Follow-up meetings were held with Mr. Chris George, CIDA Regional Representative, on May 21<sup>st</sup>, and Mr. Goodson Sakanda, Director of Forestry, on May 22<sup>nd</sup>. At the end of June work on the concept paper was in progress but had not been completed.

## Liaison with other donor initiatives

In addition to maintaining a liaison with the donor programs listed in previous reports, new contact was established during the current quarter with:

- The Danida environmental mission: the Danish Embassy now has a resident coordinator for environmental initiatives. Contact person: Mogens Christiansen, Danish Embassy, Lilongwe.
- The Frankfurt Zoological Society project for law enforcement training in the wildlife sector. Contact person: Mike Labuschagne, Liwonde National Park.

## Indicators and achievement of results

*Assist with interpretation of National Environmental Policy and Environment Management Act* Support provided to the Fisheries Department in the finalization of a draft Fisheries Conservation and Management Bill.

*Support EAD in the monitoring of sectoral policy and legal reforms to ensure compatibility with the National Environmental Policy and Environment Management Act* Continuing liaison maintained with the EAD with regard to its intervention in the development of a Fisheries Conservation and Management Bill. Background research on land use issues relating to protected areas undertaken.

*Assist line agencies, USAID and other donors to identify and make operational a funding mechanism for the GoM action plan for policy, institutional and legal reform in the environmental/natural resource management sectors.* Continuing negotiations held with the Ministry of Finance in relation to NPA funding for the GoM action plan. Financing proposal for UNDP/UNEP for support to the review and reform of legislation in the land utilization, forestry, fisheries, wildlife, sanitation, waste management and environment management sectors prepared. Successful liaison with GTZ in relation to financial support to the development of wildlife policy.

*Assist line agencies in implementing action plans* Very little implementation achieved in the absence of NPA funding. Progress monitored but not yet reported.

*Finalize the Environmental Support Programme using the Results Framework methodology.* Tentative support from FAO and GTZ for the funding of the second of four Results Framework workshops secured. Support in principle from UNDP for the fourth, ESP overview workshop secured.

*Design and establish a monitoring and coordination mechanism within the Environmental Affairs Department.* Continuing liaison with EAD concerning the filling of a new post dedicated to donor and implementing partner coordination.

*Support line ministries and departments in formulation of E/NRM programs for consideration for PBBS support.* No action. Failure of MoF to fund the action plan for policy, institutional and legal reform, failure of MoF to operationalise the MTEF in participating Ministries and the constraints imposed by the cash budget system effectively preclude the initiation of PBBS programs at this time.

*Assist Endowment Trust Working Group to assess legal, financial, organizational dimensions of establishing a national endowment for E/NRM activities.* Contract for a full-time coordinator for the working group prepared. Failure of the MoF to finance the operations of either the working group or the coordinator has delayed action on this theme.