

PDBCE 835

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AGENCY FOR INTERNATIONAL DEVELOPMENT  
PROJECT DATA SHEET

1. TRANSACTION CODE  
 A = Add  
C = Change  
D = Delete

Amendment Number

DOCUMENT CODE  
3

2. COUNTRY/ENTITY  
AFRICA REGIONAL

3. PROJECT NUMBER  
698-0456

4. BUREAU/OFFICE  
AFRICA/RA 06

5. PROJECT TITLE (maximum 40 characters)  
EAST AFRICA REGIONAL REMOTE SENSING II

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)  
MM DD YY  
01 31 91

7. ESTIMATED DATE OF OBLIGATION  
(Under "B." below, enter 1, 2, 3, or 4)  
A. Initial FY 86 B. Quarter  C. Final FY 90

8. COSTS / \$000 OR EQUIVALENT \$1 =

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AD Appropriated Total	420	68	488	2,158	342	2,500
(Grant)	( 420 )	( 68 )	( 488 )	( 2,158 )	( 342 )	( 2,500 )
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
U.S. 2.						
Host Institution		620			3,705	3,705
Other Donors	780			7,840		7,840
TOTALS	1,200	688	1,888	9,998	4,047	14,045

9. SCHEDULE OF AID FUNDING (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE	D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
			1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) FN	754R	876			2,500		2,500	
(2)								
(3)								
(4)								
TOTALS					2,500		2,500	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)  
877 878 874

11. SECONDARY PURPOSE CODE  
771

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)  
A. Code BR TECH TNG  
B. Amount

13. PROJECT PURPOSE (maximum 480 characters)  
To strengthen the Regional Remote Sensing Facility, one of the key departments of the Regional Centre for Services in Surveying, Mapping and Remote Sensing (RCSSMRS), an African institution, in order to make remote sensing technology widely and economically available to, and demanded and used by, East and Southern African governments for a wide range of developmental activities.

14. SCHEDULED EVALUATIONS  
Interim MM YY MM YY Final MM YY  
1 2 9 0

15. SOURCE/ORIGIN OF GOODS AND SERVICES  
 000  M1  Local  Other (Specify) 935

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a \_\_\_\_\_ page PP Amendment)

17. APPROVED BY  
Signature: [Signature]  
Title: DIRECTOR, REDSO/ESA  
Date Signed: MM DD YY  
01 1 86

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION  
MM DD YY

APR 1986

## ACTION MEMORANDUM FOR THE DIRECTOR, REDSO/ESA

FROM : David E. McCloud, PDO

SUBJECT : East Africa Regional Remote Sensing II Project  
(698-0456)

Problem

To approve \$2,500,000 in grant funding from the ARDN account for the East Africa Regional Remote Sensing II Project for five years beginning in FY-86. Of this amount, \$750,000 will be obligated in FY 1986.

Discussion

The purpose of this Project is to strengthen the Regional Remote Sensing Facility (RRSF), one the key departments of the Regional Center for Services in Surveying, Mapping and Remote Sensing (RCSSMRS), in order to make remote sensing technology widely and economically available to, and demanded and used by, East and Southern African governments for a wide range of developmental activities. The long-term goal of the Project is to improve the management and exploitation of East and Southern Africa's natural resources, including agricultural resources, through the application of remote sensing technology. This technology will assist government planners in decisions on land and water development which ultimately benefits residents of both rural and urban areas

A critical constraint to development in Africa is the unreliability of the data base for assessing natural resource, demographic, and other problems. The proposed Project will provide a significant source of data with broad applications in such areas as agriculture, forestry, hydrology, transportation, and urban development. In addition, the Project takes into consideration Africa Bureau concerns regarding coordination with NOAA on Early Warning Systems for African drought conditions. Facility training capabilities and physical facilities will be utilized to reinforce and support current efforts on drought/early warning climatic impact assessments.

The Grant to RCSSMRS will fund the following: 1) long-term technical assistance; 2) long-term training in the U.S. for one staff member and short-term training activities in the U.S. and in the region; 3) a portion of RRSF operating expenses directly related to the project's goal; 4) a portion of the cost of the Twentieth International Symposium on Remote Sensing of the Environment organized by the Environmental Research Institute of Michigan (ERIM); 5) a portion of expenses related

to project support activities; and 6) certain commodities. In addition, the Grant Agreement with RCSSMRS will provide that Grant funds may be used to finance the costs of goods and services for the Project incurred over a period of about 16 weeks prior to the execution of the Agreement. The subject Project is the second phase of the previous project, and due to the time gap between one project ending and the other beginning this provision is necessary.

By the end of the Project, the Facility will be producing a wide array of maps for development planning and project implementation purposes, conducting photo interpretation training courses, and involving itself in the conception, management, and implementation of project support activities which apply remote sensing technology to various development problems. In addition, the Facility will be one of the main participants in the above-mentioned ERIM Symposium to be held in Nairobi during December 1986, and will provide much of the technical support. Project support activities, i.e. studies and analyses performed using remote sensing techniques, are part of a much larger outreach capability funded by other donors, and will stimulate demand for the use of remote sensing techniques.

The parent organization, RCSSMRS, is a regional African institution with the following signatory member states: Comoros, Kenya, Lesotho, Malawi, Somalia, Swaziland, Tanzania, Uganda and Zambia, and is encouraging other countries, such as Sudan, to join. The recipient of project funds is the Regional Remote Sensing Facility, a department of RCSSMRS. This Project is part of a broader, long-term work plan for the Facility which will be supported not only by USAID and RCSSMRS, but also by France, Canada, EEC, Netherlands and Sweden.

Total AID costs for the Project are \$2.5 mil., broken down as follows:

\$US 000	
Technical Assistance	1,003
Training	276
RRSF Operating Expenses	343
Project Support Activities	160
ERIM Conference	39
Commodities	151
Evaluation	<u>40</u>
Subtotal	2,012
Contingency (13%)	256
Inflation (5%)	<u>232</u>
Grand Total	2,500 =====

The Life of Project is five years. Of the total Project costs, \$750,000 will be obligated in FY 1986, but only up to \$500,000 will be disbursed during the first Project year and during each year thereafter. The balance will be disbursed in annual increments dependent on the availability of funds and on progress of Project implementation.

Total host institution support costs for the Project are about \$3.7 mil., broken down as follows:

	\$US 000
Staff	2,560
Operating Expenses	625
Commodities	220
Staff Travel	<u>300</u>
Grand Total	3,705 =====

Anticipated other donor contributions to RRSF during the project time period are as follows:

	\$US 000					Total
	France	Canada	EEC	Netherlands	Sweden	
Technical Assistance	1,000	240	-	900	500	2,640
Training	500	200	400	3,250	250	4,600
Commodities	<u>100</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>500</u>	<u>600</u>
Grand Total	1,600 =====	440 ===	400 ===	4,150 =====	1,250 =====	7,840

The Project Agreement will contain a condition precedent which requires, prior to disbursement of funds for the second and each subsequent year, the provision to AID of evidence of substantial participation of other donors in the funding of the Facility's activities. The Agreement also will contain several special covenants to ensure that: 1) a project evaluation program is established; 2) a separate account is maintained for Project funds; 3) a separate account is maintained for the Facility's sales revenues, and annual statements are provided to AID; 4) the Director or his designee will be one of the required, authorized signatories on all accounts controlling Facility funds; 5) a portion of the Facility's surplus revenue may only be provided to the Centre based on an audited overhead rate; 6) Project support activities will be developed by the Facility's Director to help generate revenue and to encourage use of the Facility; 7) there will be renewed efforts to recruit an African photoscientist; and 8) women will be encouraged to attend training courses.

Included in the text of the Project Authorization, the Amplified Project Description, and the Project Paper are clarifications of the association between the Facility and the Centre. Specific responsibilities of the Facility's Director are described. The intent is to more clearly define the relationship between the Facility and the Centre in terms of management of the Facility. Originally these points were covered in proposed covenants. Following final Grant negotiations, AID and the Centre agreed to delete them as covenants from the Grant Agreement, but to include them in Annex 1, which is a part of the Grant Agreement. Due to the importance to the Project of the management issues which were covered in these covenants, their substance has also been included in the Project Authorization in such a way that they may not be changed without amendment to the Project Authorization.

The first ECPR meeting on the PID was held on April 10, 1985. Various issues were raised at that time which required revision of the PID. At a second ECPR meeting, held on July 15, 1985, additional issues were raised which required clarification by a cable response. The PID was approved at a third ECPR meeting held on September 6, 1985. The Africa Bureau Environmental Advisor confirmed concurrence for categorical exclusion of the Project from IEE requirements.

The PP was reviewed by REDSO/ESA on March 6, 1986 and found to be technically, administratively, environmentally and socially sound. Discussion centered on the administrative relationships within the Centre and the Facility as described above. Also discussed was the possibility of developing a relationship between the Centre and EOSAT to ensure the long-run economic viability of the Remote Sensing Facility, in view of the prices presently charged for new imagery, with the result being a visit by Centre personnel to EOSAT headquarters in the U.S. to commence negotiations with that company. Subsequently, REDSO and the Centre further negotiated certain management points included in the draft Grant Agreement and resolved them to the satisfaction of both parties. In summary, the review recommended that AID proceed with the project activity as described in the PP as being the best available means of currently applying resources in remote sensing to development in East and Southern Africa.

The responsible AID officer in the field will be Linda Bernstein, REDSO/ESA Project Development Officer, and the AID/W backstop officer will be Tom Luche, AFR/RA.

The Project data appear in CP FY 1986 (Annex 1, Africa). The Congressional Notification waiting period expired without objection on 12 March 1986.

Recommendation: That you approve this Project by your signature on this memorandum and on the attached Project Authorization.

Approved

*J. W. Kehring*

Disapproved

\_\_\_\_\_

Date

16 APR 1986

Attachments:

1. Project Authorization
2. Project Paper

Drafted: DEMcCloud; April 9, 1986

Clearances: KD Hansen \_\_\_\_\_ (DRAFT) *JW*

JAGraham \_\_\_\_\_ (DRAFT)

JGGaudet \_\_\_\_\_ (DRAFT)

CBarnes \_\_\_\_\_ (DRAFT)

RFMC L. MARTIN (DRAFT)

LMcGhee \_\_\_\_\_ (DRAFT)

CSCallison \_\_\_\_\_ (DRAFT)

AMFell \_\_\_\_\_ (AF)

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PROJECT AUTHORIZATION

Official File Copy

Name of Entity: Regional Centre for Services in  
Surveying, Mapping and Remote Sensing  
(RCSSMRS)

Name of Project: East Africa Regional Remote Sensing II  
Project

Number of Project: 698-0456

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the East Africa Regional Remote Sensing II Project (the "Project") involving planned obligations in an amount not to exceed \$2,500,000 in grant funds to be obligated over a four year period from date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project. The planned life of Project is five years from the date of initial obligation.

2. The Project is to strengthen the Regional Remote Sensing Facility, one of the key departments of the Regional Center for Services in Surveying, Mapping and Remote Sensing (RCSSMRS), an African institution, in order to make remote sensing technology widely and economically available to, and demanded and used by, East and Southern African governments for a wide range of developmental activities. To carry out the objectives of the Project, A.I.D. will provide funding for technical assistance, training, operating expenses, commodities, and project support activities.

3. The Grant Agreement, which may be negotiated and executed by the officers to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following terms and conditions as A.I.D. may deem appropriate.

4. a. Source and Origin of Goods and Services.

Goods and services, except for ocean shipping, financed by A.I.D. under the Project shall have their source and origin in the United States or Kenya, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

b. Availability of Grant Financing

The Grant Agreement will provide that Grant funds may be used to finance the costs of goods and services for the Project incurred prior to execution of the Grant Agreement, but not prior to December 1, 1985

c. Conditions

The Grant Agreement will provide in substance as follows:

Prior to disbursement of funds for the second year of the Project, and each subsequent year, Grantee will submit to A.I.D., in form and substance satisfactory to A.I.D., evidence of substantial participation of other donors in the funding of the Regional Remote Sensing Facility's activities.

d. Covenants

The Grant Agreement shall contain in substance the following covenants:

(1) Funds provided under the Grant shall be placed in a separate account.

(2) A separate account will be maintained for revenues earned by the Facility from sales of imagery products and those revenues will be available to pay the costs of materials and services needed by the Facility. A portion of any surplus revenue generated by the Facility may, however, be provided to the Centre to cover overhead expenses incurred by the Centre on behalf of the Facility, based on audited overhead rates established at the end of the first year of the Project. The Centre shall provide an annual statement to A.I.D. detailing (1) income received from sales of imagery products; (2) payments to the Centre for overhead; and (3) payments made for supplies or other uses; with beginning and ending balances shown.

(3) An accounting system will be maintained that shows funds generated by Facility Project support activities and operating expenses of the Facility.

(4) The Director of the Facility or his designee shall be one of the required, authorized signators on any accounts controlling Facility funds, such as separate donor accounts.

(5) The Director of the Facility shall, in consultation with the Director-General of the Centre, develop and generate Project support activities and negotiate terms of contracts for such activities, subject to any contracts being signed by the Director-General pursuant to provisions of the Tender Committee.

(6) The Centre will renew its efforts to recruit an African photoscientist to work with the Technical Advisor Photoscientist during the Project, recognizing that this is a key position essential for long-term technical viability of the Facility.

(7) The Centre will actively encourage women to attend its training courses and will keep course attendance records indicating the sex of participants.

(8) The Centre will provide A.I.D. quarterly reports on the Facility, showing the plan of work for the upcoming quarter, and actual achievements based on the plan for the quarter just ended, to include: (1) activities and actions; (2) dates begun/completed; (3) staff involved; and (4) comments.

e. Annex 1, Amplified Project Description

The Amplified Project Description, Annex 1 to the Grant Agreement, shall contain the following provisions, which shall not be subject to revision without amendment of this Authorization:

(1) The Director of the Facility will have responsibility for preparation and implementation of the Work Programs and Budgets for the Facility, including activity plans, staffing, and training schedules.

(2) The Director of the Facility will have responsibility to determine the Facility's staff requirements, including preparation of job descriptions, and for supervision of Facility staff, including initiating actions related to promotions, disciplinary actions, and awards; allocation of travel and other perquisites; and allocation of staff time and effort.

(3) The Director of the Facility is responsible for the use and disposition of Facility equipment and materials, including maintenance of inventory and log books and supervision of the Facility's supply room; and goods or materials provided for the Facility under the Grant shall be used exclusively for the activities of the Facility.

16 APR 1986

Date

*JW Koehring*

John W. Koehring  
Director, REDSO/ESA

EAST AFRICA REGIONAL REMOTE SENSING II  
(698-0456)  
Project Paper

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April 1986

## ACRONYMS

ARSC	African Remote Sensing Council
ACCS	Ambroziak Color Coordinate System
The Centre	Abbreviated name for the RCSSMRS; includes the Regional Remote Sensing Facility as a department of the Centre
CIDA	Canadian International Development Agency
CSIRO	Commonwealth Scientific & Industrial Research Organization (Australia)
ECA	Economic Commission for Africa (Short name for UNECA)
EEC	European Economic Commission
ERIM	Earth Resources Institute of Michigan
ESA	East and Southern Africa
ETMA	AID Environment Training and Management Assistance Project (698-0427)
The Facility	Abbreviated name for the Regional Remote Sensing Facility (RRSF), one of the departments of RCSSMRS
FAO	Food and Agricultural Organization of the United Nations
IDRC	International Development Research Council (Canada)
IQC	Indefinite Quantity Contract
LANDSAT	Land Satellite photos, referring to images sent by satellite to earth stations
NASA	U.S. National Aeronautical Space Administration
NOAA	U.S. National Oceanography and Atmospheric Administration
PACD	Project Assistance Completion Date
PASA	Participating Agencies Service Agreement
PDO	Project Development Officer
PIL	Project Implementation Letter
PSC	Personal Services Contractor

RCSSMRS	Regional Centre for Services in Surveying, Mapping and Remote Sensing
REDSO/ESA	AID Regional Economic Development Services Office for East and Southern Africa
RFMC	AID Regional Financial Management Center - Nairobi
RRSF	Regional Remote Sensing Facility ('the Facility")
SPOT	Systeme Probatoire pour l'Observation de Terre (second generation French Landsat-type system)
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa, headquartered in Addis Ababa, Ethiopia
UNESCO	United Nations Economic and Social Council
UNEP	U.N. Environmental Program
USG	United States Government
USGS	US Geological Survey

SUMMARY

A. Grantee: Regional Centre for Services in Surveying, Mapping and Remote Sensing (RCSSMRS)

B. Implementing Agency: Regional Remote Sensing Facility (RRSF)

C. Financial Plan and Terms of Project:

Total AID costs for the Project are \$2.5 mil., broken down as follows:

	\$US 000
Technical Assistance	1,003
Training	276
RRSF Operating Expenses	343
Project Support Activities	160
ERIM Conference	39
Commodities	151
Evaluation	<u>40</u>
Subtotal	2,012
Contingency (13%)	256
Inflation (5%)	<u>232</u>
Grand Total	2,500
	=====

These costs will be financed over a five-year Life of Project released in \$1/2 million tranches.

Total host institution support costs for the Project are about \$3.7 mil., broken down as follows:

	\$US 000
Staff	2,560
Operating Expenses	625
Commodities	220
Staff Travel	<u>300</u>
Grand Total	3,705
	=====

These costs will also be financed over a five-year Life of Project.

**D. Purpose of Project:**

The purpose of the Project is to strengthen the Regional Remote Sensing Facility, one of the key departments of the Regional Centre for Services in Surveying, Mapping and Remote Sensing (RCSSMRS), an African institution, in order to make remote sensing technology widely and economically available to, and demanded and used by, East and Southern African governments for a wide range of developmental activities.

**E. Background of Project:**

AID began its support for the Regional Remote Sensing Facility in 1977 as a result of both an AID-sponsored National Academy of Science study and its own previous experience with remote sensing projects. Despite progress made in various areas a critical constraint to development in Africa remains the unreliability of the data base for assessing natural resource, demographic, and other problems. In addition, recent experience with drought in Africa underscores the need for improved early warning systems. The importance of remote sensing technology for developing countries has been formally recognized by the Economic Summit states, and plans are underway for active U.S. involvement in a specialized conference on that subject to be convened in the Federal Republic of Germany in late 1986.

The proposed Project will provide a significant source of data with broad applications in such areas as agriculture, forestry, hydrology, transportation, and urban development. In addition, the Project takes into consideration coordination with NOAA on Early Warning Systems for African drought conditions.

**F. Description of Project:**

The Project will fund the following: 1) long-term technical assistance; 2) long-term training in the U.S. for one staff member and short-term training activities in the U.S. and in the region; 3) a portion of RRSF operating expenses directly related to the project's goal; and 4) certain commodities. By the end of the Project, the Facility will be producing a wide array of maps for development planning and project implementation purposes, conducting photo interpretation

This Project is part of a broader, long-term work plan for the Facility which will be supported not only by AID and RCSSMRS, but also by France, Canada, EEC, Netherlands and Sweden.

**G. Summary Findings:**

Technical - There is a need for an inventory and monitoring system for natural resources throughout the East and Southern African region. The Facility has already established a library of satellite imagery which is proving valuable in the resolution of the area's natural resource management problems.

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This Project will strengthen the Facility's capability for conducting a range of mapping and resource analysis projects.

**Economic** - The ability of the region to sustain its population is declining as ever increasing requirements for fuelwood, grazing, and land contribute to desertification and erosion of the agricultural resource base. The strong demand for the training and services offered by the Facility, and the high costs associated with its abandonment, all argue strongly for a continuation of U.S. support. The Facility is broadening its revenue-generating capacity through increased project support activities and increased sales of its products. However, at the same time it is expanding its operations which require increased investment funds.

**Social Soundness** - Improved management of natural resources and better crop forecasting are prerequisites for addressing major problems in the region. Improvements to management and crop forecasting can be enhanced and accelerated through utilization of remote sensing technology. Implementation of project services and utilization of the products from remote sensing is expected to ultimately benefit millions of people in the region.

**Institutional and Management** - The main focus centers on the adequacy of the management arrangements and practices to permit efficient and effective implementation of the remote sensing program. Specific responsibilities of the Director of the Facility are discussed. It is highlighted that the realm of authority of the Facility's Director, within the Centre management, must be clarified to permit efficient operation of the remote sensing program. Unless this is done and put into practice, the program will operate inefficiently and, hence, underserve its member states and other potential clients.

#### H. Project Issues:

Two issues are raised:

1. Much experience suggests that establishing and organizing effective international or regional institutions takes at least as much time as is required to move from a proven scientific idea to a workable technological system. Various organizational and administrative issues have arisen during AID's relationship with the Facility and the Centre. These are not uncommon in the development of institutions, but they nonetheless require attention so as to avoid major stumbling blocks in the future. Both AID and the host institution are aware that organizational issues may arise and are prepared to deal with them as necessary.

2. As a result of the Land Remote Sensing Commercialization Act (1984 PL 98-365), ownership of much of Landsat operations was transferred to a private firm. In turn, the cost to the Facility of obtaining imagery has increased substantially. The potential result could be a severe

restriction in the activities of the Facility. AID is currently negotiating with the private firm (Earth Observation Satellite Company), focusing on an arrangement whereby AID, on behalf of Nairobi, Ouagadougou and Ife Ife Centres, can obtain imagery at cost/discount.

I. No waivers are required.

J. Major Conditions Precedent and Covenants:

The Project Agreement will contain a condition precedent which requires, prior to disbursement of funds for the second and each subsequent year, the provision to AID of evidence of substantial participation of other donors in the funding of the Facility's activities. The Agreement also will contain several special covenants to ensure that: 1) a project evaluation program is established; 2) a separate account is maintained for Project funds; 3) a separate account is maintained for the Facility's sales revenues, and annual statements are provided to AID; 4) the Director or his designee will be one of the required, authorized signatories on all accounts controlling Facility funds; 5) a portion of the Facility's surplus revenue can be provided to the Centre based on an audited overhead rate; 6) Project support activities will be developed by the Facility's Director to help generate revenue and to encourage use of the Facility; 7) there will be renewed efforts to recruit an African photoscientist; and 8) women will be encouraged to attend training courses.

K. Project Paper Design Team Members:

Linda A. Bernstein, Team Leader, REDSO/ESA

John Gaudet, Environmentalist, REDSO/ESA

Carolyn Barnes, Sociologist, REDSO/ESA

David P.S. Wasawo, Advisor, Government of Kenya, Ministry of Energy and Planning

Hassan M. Hassan, Director, RRSF

Allan Falconer, RRSF Program Manager

training courses, and involving itself in the conception, management, and implementation of project support activities which apply remote sensing technology to various development problems.

## I. PROJECT RATIONALE

### A. Statement of the Problem

The basic problem that this project will address is the lack of reliable data in East and Southern African Countries on their respective natural resource endowments. The lack of this information severely constrains rational planning, utilization, and conservation of natural resources for economic development purposes. An analogous situation in the U.S. would be trying to develop a meaningful water rights policy for western states without current information on topography, positions of wet and dry riverbeds, run-off patterns, soil types, or land use.

### Resource Information in Developing Countries

The primary base for the economic development of most developing nations lies in their natural resources. Yet these nations, on the whole, do not have thorough knowledge about the nature, quantity, and location of their resources to harness them effectively for the welfare and progress of their people.

Much of the developing world is still inadequately mapped. Many countries have yet to determine the extent and condition of their arable land, forests, rangeland, and water resources and to identify promising areas for mineral exploration. Vitally important, at a time of world food and energy shortages and of spreading environmental deterioration, is the need to monitor the changing condition of their natural domain -- to forecast crop yields, to detect erosion of land and pollution of water, to recognize alterations in land use, to give early warning and assess damage of natural disasters, and to observe many other aspects of environmental change.

The nature, scope, volume and detail of the resource information required will vary from one country to another. A nation's information needs will be determined, among other factors, by its size, its development objectives, and the information already accumulated. Two factors set practical limits to the amount of resource information a nation can acquire: the costs of data acquisition; and the capacity of a country to assimilate the information and to utilize it productively.

Traditionally in all countries resource information has been acquired from different sources, gathered by a variety of means, and often maintained in separate agencies. For these and other reasons, national planners have rarely incorporated current and accurate resource information and environmental factors in their planning processes. Beyond the data required for national purposes is a growing demand for resource and environmental data required on a transnational scale to meet regional or global objectives such as crop yield forecasting, environmental monitoring, and river basin development.

For all these purposes the need exists for more comprehensive ways of looking at a nation's or region's resource base and for improved means, both technical and managerial, of taking such information into consideration in development planning and resource management.

Remote sensing technology has proved to be a highly useful tool for undertaking natural resource assessments, particularly for large inaccessible areas where limited skilled manpower would not be available for laborious surveys on the ground.

Applications include:

agricultural production-estimating crop acreage and yield, surveying soils;

the management of rangeland, forest and water resources;

geologic survey and mineral resource management;

map making and population estimating;

land use planning;

health and environmental protection;

monitoring of marine resources; and

disaster warning and relief.

### Background

The importance and need for remote sensing technology by developing countries was fully documented in the 1977 report of the AID-sponsored National Academy of Science (NAS) study entitled Resource Sensing from Space: Prospects for Developing Countries. This report was the result of a comprehensive analysis on remote sensing technology with respect to developing country needs, applications and capabilities. It include chapters on the need for resource information in developing countries, experience with remote sensing technology, and recommendations for further technical assistance in remote sensing.

Partly in response to the recommendations of the NAS panel and partly as a result of previous experience with remote sensing projects, AID foresaw the need to institutionalize the transfer of this technology through the development of training and user assistance centers, and has supported the development of a number of centers in Africa, including the Nairobi-based Regional Remote Sensing Facility (RRSF) of the Regional Centre for Services in Surveying, Mapping and Remote Sensing which it has funded since 1977.

More recently, the importance of remote sensing technology for developing countries has been formally recognized by the

Economic Summit states, and plans are underway for active U.S. involvement in a specialized conference on that subject to be convened in the Federal Republic of Germany in late 1986.

Interest in remote sensing from space was greatly heightened by the launching in July 1972 of the first Earth Resources Technology Satellite (ERTS I renamed LANDSAT I), and the ensuing diversity of assessments about the utility of LANDSAT data for various earth applications. LANDSAT-5 was launched in 1985.

The present technology consists of two satellites, Landsats 4 and 5, orbiting the earth on a sixteen day repeat cycle. Both these satellites carry a sensor called the Thematic Mapper (TM) which records seven channels of energy reflected and emitted by the earth. It records this energy with a spatial resolution of approximately 30 meters. The satellites also carry a sensor known as a multispectral scanner (MSS). This sensor records only reflected energy in four channels with an 80 meter resolution. In all cases the satellites view a ground swath 180km. wide and the data, when put into a square format, provide views of the earth's surface 180x180kms. The whole of the globe, between 82 degrees North latitude and 82 degrees South latitude, passes beneath the satellite every 16 days and, subject to cloud cover and the appropriate operation of the satellite, about 22 images of equatorial areas can be gathered each year. In regions towards the poles proportionately more images can be gathered of each place as the orbits converge at higher latitudes giving greater sidelap between images.

All the data gathered by the satellite are telemetered to earth where they are recorded on magnetic tape. These tapes can be copied and purchased for direct use on a computer system or played back to create images directly onto photographic film. Such images are comprehensive and versatile. Each covers an area of some 34,000 sq. kms. and each of the channels of energy recorded may be viewed separately in monochrome or any three channels may be composited together in a color image. Various manipulations of the data are possible to give better views of such items as geological features, vegetation, soils or water.

The available images from the whole Landsat system are of considerable value to the planning agencies of developing countries. The data from the earliest satellites in the series, Landsats 1, 2 and 3, form a valuable resource for the compilation of maps, and assessments of natural resources. These data all have a resolution of 80 meters. Direct comparison with more recent data is possible using the MSS data from the current satellites. These satellites also produce TM data with much finer resolution so more detailed work can be done. The use of the present satellites and the existing data archive provide for the detection of change since Landsat 1 was launched in 1972, and for the continuing reassessment and monitoring of land use pressures, desertification, and some aspects of agricultural activity and crop yield prediction.

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The availability of the Landsat system presents every developing country with data about its natural resources. Such data can be combined with other information from aircraft and ground observation, but utilizing this new and powerful technology can be costly and leads to increasing interdependence with the technology and training provided by the satellite operating nations.

The development of institutions to contain, channel, and control new technologies is an extremely demanding task. Much experience suggests that establishing and organizing effective international or regional institutions takes at least as much time as is required to move from a proven scientific idea to a workable technological system. It was precisely this institution-building task that A.I.D. set out to do in 1977 with its first grant for the RRSF. The proposed project is a continuation of that effort.

In the case of remote sensing technology, we are dealing not with a single complex system but with a new and rapidly expanding capability to contribute new and widely varied kinds of information to the whole of the development process.

B. Linkage to objectives of the UNECA African Remote Sensing Council

The African Remote Sensing Council, established under the auspices of the United Nations Economic Commission for Africa (UNECA), is headquartered in Mali, and aims to coordinate remote sensing activities on the continent in order to better exploit and develop natural resources, monitor environmental effects, and cooperate in dissemination, training, processing, and utilization of remote sensing technology. The proposed project is consistent with the objectives of the ARSC Constitution. The Nairobi Remote Sensing activity is one of five remote sensing centers coordinated under the African Remote Sensing Council. The others are in Cairo, Ouagadougou, and Kinshasa (which have received AID support) and Ile Ife (Nigeria).

The proposed project is also consistent with the 1980 Lagos Plan of Action, adopted by African governments, to expand information on large unexplored natural resource areas, and undertake natural resource assessments as a basis for economic development projects. The Lagos Plan is invoked in the second Five-Year Plan (1986-87-1990/91) of the Regional Centre for Services in Surveying, Mapping, and Remote Sensing (RCSSMRS).

C. Linkage to Africa Bureau Strategy

The Africa Bureau Strategic Plan highlights as a critical constraint to development the unreliability of the Africa data base for assessing natural resource, demographic, and other problems. The proposed remote sensing project will provide a significant source of data with broad applications in such

areas as agriculture, forestry, hydrology, transportation, and urban development.

The Strategic Plan's priorities on human resource development, agriculture, and institution building are directly related to the proposed project, which will train large numbers of participants in the practical use of a highly sophisticated technology; provide a major tool for forecasting and monitoring crop production; within the context of strengthening an African regional institution. The Plan's sectoral strategy on natural resource management to address problems of fuelwood, oil import costs, and alternate energy sources is also directly relevant to the proposed project.

The proposed project's prerequisite of other donor participation is consistent with the Strategic Plan's emphasis on donor coordination.

A worldwide cable (85 State 45804 dated February 14, 1985) from the Administrator on Policy Dialogue Checklist, identified various high priority issues. One of the issues was natural resource management: "Policy dialogue should encourage LDC's to manage their natural resources to take into account short and long-term impacts on land use, agriculture, forests, water resources, and biological diversity." The proposed project relates to this objective by providing a natural resource management tool to East and Southern African countries.

The FY 1986 Africa Regional Annual Budget Submission project narrative for East African Regional Remote Sensing II stresses the need to maintain technical capacity and enhance the viability of the institution which has been assisted under Phase I. The ABS allocates \$700,000 in FY 1985, with a five year LOP of \$5 million. The proposed project falls well within that, proposing a \$500,000 FY 1986 obligation with an LOP of \$2.5 million, and is consistent with levels given in the Congressional Presentation.

The proposed project also takes into consideration Africa Bureau concerns regarding coordination with NOAA on Early Warning Systems for African drought conditions (Annex F). RRSF training capabilities and physical facilities will be utilized to reinforce and support current efforts on drought/early warning and climatic impact assessments, as well as initiatives arising from the early warning concerns of the 1984 Bonn Economic Summit.

#### D. Relationship to Other Donor Activities

The USAID contribution of \$2.5 million toward this project represents only a portion of the total planned contribution of approximately \$14 million from various donors. To the extent that other donors come in, RRSF will be able to expand as envisaged in its ten year plan. However, the USAID

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contribution will permit RRSF to continue its present level of activity at a critical minimum.

The following other donors are planning major contributions to the operations of the Facility\*. The initiative for soliciting these contributions shall rest with the Facility.

1. FRANCE

One long-term technical advisor from SPOT [Mr. Muller] is already collaborating at the Facility. When his tour of duty is completed, he will be replaced by another individual. In addition, a second long-term French technical advisor is also planned. France is expected to sponsor two to three courses per year during the LOP at the Centre\* on SPOT. Each would run three weeks and have about 25 participants from the ESA region. France is also considering funding computer facilities at RRSF.

2. CANADA

IDRC's Photomap Project at the Centre concluded on September 30, 1985. It had placed a long-term cartographic advisor (Mr. Godwin Adika, a Ghanaian national) at the Centre. IDRC is planning to reactivate this project during Years 2 through 5 of the LOP of the AID project. Under their project, topographic maps of various areas of Kenya, Swaziland, and Uganda have been prepared based on satellite imagery. This very cost effective method of map revision has been pioneered by the Centre in collaboration with Canada.

IDRC is expected to resume support for Dr. Adika's salary and benefits during a time period that will coincide with Years 2 through 5 of the AID project. (In the interim year the Centre has continued his services at its own expense).

Under the Canadian project, a training manual and allied training courses on photomap preparation techniques will be implemented. Such courses are expected to be held yearly (20 participants, 6 weeks).

3. EEC

Implemented primarily through the European Space Agency, the EEC plans to sponsor two courses per year on SPOT, Earth Resources Satellite - 1 (ERS-1), and/or SpaceLab, with 25 participants studying three to four weeks each.

\* "Facility" in this PP refers to the Regional Remote Sensing Facility; the 'Centre' refers to the Regional Centre for Services in Surveying, Mapping and Remote Sensing. The Facility is one of the departments of the Centre.

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#### 4. NETHERLANDS

Dutch technical assistance is expected to finance two long term advisors in hydrology and soil science during four and one-half years of the five year LOP of the AID project. Also, the Dutch will sponsor a course on water resource development for hydrologists from Sudan, Yemen, and Kenya (25 people, 4 weeks), scheduled for March 1986 which will be based on Dutch technical assistance projects in those countries.

Still in negotiation with Dutch technical assistance (DGIS) and the International Training Center (ITC) in Enschede, Holland, is a five or ten year specialized program in cooperation with the RCSSMRS on natural resource surveys to meet the special needs of drought-vulnerable countries in the 20-country ESA region. It is envisaged that this program would train 40 persons per year from the ESA region to the diploma level via nine months of full time study at ITC followed by six months of supervised field work in their home countries. The field work would be supervised by technical advisors from the RRSF; students would return to the Facility for submission of their projects and completion of final requirements for the diploma. Where possible, the field projects would be attached to on-going Dutch technical assistance projects in the region. Estimated costs of the diploma program are:

\$15,000 per student per year  
x 40 students per year  
x 5 years ;  
plus \$2,000 per student for supplies, in-country travel during field work; plus \$500 per student to bring RRSF advisors out for field supervision.

#### 5. SWEDEN

As a part owner of SPOT, the Swedish Government, through its Swedish Space Agency, has expressed an interest in seeing that subsidized SPOT data is available to developing countries. Discussions have been held with the RRSF regarding placing one long-term computer advisor at the Facility; providing a computer; provision of SPOT data; and conducting a training course emphasizing forestry applications (25 participants, 4 weeks), possibly jointly sponsored by France or the EEC. The forestry course, to be given annually, would focus on Swedish foreign assistance forestry projects on-going in the region.

Table 1  
 Estimated Other Donor Support for RRSF during LOP  
 of AID Project

	YEAR 1	YEAR 2 US \$ 000	YEAR 3	YEAR 4	YEAR 5	LOP
<u>FRANCE</u>						
2 Technical Advisors	200	200	200	200	200	1,000
<u>Training</u>						
2-3 SPOT cours/yr 3wks x 25 participants	100	100	100	100	100	500
<u>Commodities</u>						
Computer	-0-	100	-0-	-0-	-0-	100
Subtotal	300	400	300	300	300	1,600
<u>CANADA</u>						
TA Cartographic Advisor	-0-	60	60	60	60	240
<u>Training</u>						
1 photomap course/year 6 wks x 20 participants	-0-	50	50	50	50	200
Commodities	-0-	-0-	-0-	-0-	-0-	-0-
Subtotal	-0-	110	110	110	110	440
<u>EEC</u>						
TA	-0-	-0-	-0-	-0-	-0-	-0-
<u>Training</u>						
2 courses/year on SPOT/ERS-II SPACE LAB 3-4 wks x 25 participants	80	80	80	80	80	400
Subtotal	80	80	80	80	80	400

Table 2  
 Estimated Other Donor Support for RRSF during LOP  
 of AID Project

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	YEAR 1	YEAR 2 US \$ 000	YEAR 3	YEAR 4	YEAR 5	LOP
<u>NETHERLANDS</u>						
TA	100	200	200	200	200	900
hydrologist	50	100	100	100	100	450
soil scientist	50	100	100	100	100	450
<u>Training</u>	50	800	800	800	800	3,250
1 water resources course						
4 wks x 25 participants	50	-0-	-0-	-0-	-0-	50
Diploma course 40 participants/ year 15 month program)	-0-	800	800	800	800	3,200
Subtotal	150	1,000	1,000	1,000	1,000	4,150
<u>SWEDEN</u>						
TA						
computer advisor	100	100	100	100	100	500
<u>Training</u>						
SPOT/Forestry course						
4 wks x 25 participants	50	50	50	50	50	250
<u>Commodities</u>						
SPOT Data	100	100	100	100	100	500
Subtotal	250	250	250	250	250	1,250
<u>GRAND TOTAL</u>	<u>780</u>	<u>1,840</u>	<u>1,740</u>	<u>1,740</u>	<u>1,740</u>	<u>7,840</u>

## II. Project Description

### A. Goal

The long-term goal of this project is to improve the management and exploitation of East & Southern Africa's natural resources, including agricultural resources, through the application of remote sensing technology. This technology will assist government planners in decisions on land and water development programs which ultimately benefit both the rural and urban people.

### B. Purpose

The purpose of the project is to strengthen the Regional Remote Sensing Facility, one of the key departments of the RCSSMRS, which is an interregional organization based in Nairobi. The Facility, which AID has supported since 1977, will, therefore, be able to continue to make remote sensing technology available to governments and organizations in East and Southern Africa. Because a fundamental condition for continued AID support is broad-based and substantial participation of other donors, the AID contributions will be provided on an annual basis.

### C. Strategy

The project will continue long term technical assistance by funding: (a) the program manager, who will serve as an advisor to the African Director of the Facility; and (b) the Photo Scientist, who has also played a key role during Phase I in supervising the processing and analysis of satellite imagery photo products.

The project will send one staff member from the Facility for long-term training to the U.S. in advanced remote sensing applications as well as fund various short-term training activities both in the U.S. and in the region.

The project will also reimburse a portion of Facility operating expenses which directly contribute to the goal of the project. Examples include staff travel within the ESA region to conduct in-country remote sensing applications courses; supplies and repairs for the photolab; and items such as petrol and training materials.

Finally, commodities funded include replacement project vehicles and satellite imagery materials.

It should be pointed out that the AID contribution represents only a portion of the Facility's overall operating expenses and payroll. All local staff salaries and some operating expenses are funded through dues paid by ESA member states and through revenues generated by services performed by RCSSMRS. Other long-term expatriate advisors may be funded by donors such as France, the Netherlands, Canada, Sweden and the EEC.

Through careful monitoring of a management plan and quarterly work plan, reporting requirements will address concerns which arose during Phase I regarding internal management problems in the RCSSMRS, as related to viable operation of its Remote Sensing Department.

D. End of Project Status

Successful implementation of the project is expected to strengthen an institution-building environment such that:

1. The RRSF is producing a wide array of maps, compiled from satellite imagery, which are ordered by ESA countries for planning area development projects, assessing road networks, crop forecasting, soil, forestry, hydrological surveys, etc.
2. The RRSF is conducting photo interpretation training courses attended by participants from ESA countries.
3. Photolab, image library, interpretation equipment, and training facilities are maintained.
4. RRSF has become increasingly involved in the conception, management, and implementation of project support activities which apply remote sensing technology to development problems.

III. Financial Plan and Project Budget

The operations of the RCSSMRS are funded by: (a) contributions from signatory member states in ESA (Comoros, Kenya, Lesotho, Malawi, Somalia, Swaziland, Tanzania Uganda, and Zambia); (b) bilateral and multilateral donors; and (c) revenue from sales of goods and services provided by the Centre.

Member states' assessments are allocated annually by the Governing Council, and totalled \$1,646,950 for 1984/85. (See following Tables 3 and 4.) Actual contributions run about half of assessments, adverse due largely to economic conditions prevailing in the nine signatory member countries. It is significant to note, however, that over a decade, the member states have contributed some \$5.8 million to the RCSSMRS as of February 1985, with the larger shares coming from Kenya, Tanzania, and Uganda.

Of the resources flowing to the Centre, approximately 40 percent are allocated to the RRSF, covering such items as local staff salaries, administration and common services. While the subject project is a grant to the Centre, its specific purpose is to support the RRSF, recognizing that all departments of the Centre function interdependently.

Three budgets are presented below as Tables 5, 6 and 7. Table 5 is the budget for AID's contribution to RRSF. The AID LOP

contribution is \$2.5 million, of which the largest portion, or about forty percent, is allocated to the long-term technical advisors, the Program Manager and the Photo Scientist, and some short-term technical assistance. The Program Manager and Photo Scientist are continuations of positions which have been funded under the Phase I project. About fifteen percent of the AID contribution is allocated to supporting a portion of the Facility's operating expenses.

Table 6 presents the budget for the host regional organization's (RCSSMRS) contribution to RRSF. The LOP contribution of RCSSMRS, is \$3.7 million, primarily for local staff salaries.

A summary budget showing expected contributions from other donors appears as Table 7. Other donors are expected to contribute about \$7.8 million to RRSF during the LOP. The primary expenditure category is training, and a major secondary category is technical assistance.

It is important to note that the Facility will be involved in revenue-generating activities. Current sales of satellite imagery by the Facility are generating an income which averages about Kshs 40,000/- per month (approximately \$2,500). This is sufficient to cover the costs of materials and utilities for the photo-lab and to create a small surplus. The surplus generated should be applied to project activity, or support additional work which is of an experimental nature, or work that is considered valuable to the Facility for demonstration purposes. In addition, as explained in a covenant which appears in Section VIII below and which discusses disposition of Facility-generated revenues, a portion of surplus revenues may be provided to the Centre to cover Facility-related overhead costs. In the general area of cost-recovery the photo laboratory should be able to purchase all necessary expendables from the present income at the current work level. However, because an expanded workload is anticipated which may incur up-front costs not immediately recoverable, a line item in the subject project budget (Table 5, Element III) has been included to provide for photolab supplies.

For the most part, project support activities should provide sufficient revenue to cover all direct and indirect costs. Project support activities refer to studies and analyses performed using remote sensing techniques to conduct natural resource and other large area assessments such as forest mapping, soil surveys, preparations of photo maps, etc. It is the intent that the Facility will be continually expanding the number of activities it undertakes, and this expansion will require seed money, as in the case of the photolab, to cover investment costs not immediately recoverable. Thus, a line item in the subject project budget (Table 5, Element IV) has been included to provide for expenditures on these activities.

The question of management of the Facility by the Center relates to the above issues. Management of the Facility will be critical in determining the allocation of funds and other resources into the areas of project support and user services. The overall fiscal control of monies generated through sale of data and from contract agreements will determine the extent to which it is possible to realize the goals of project support activities in a timely and effective manner. Thus, management of the Facility will be of the greatest significance if technical objectives are to be achieved. In this regard, it will be in the Centre and Facility's interest to perform a job costing exercise to determine appropriate levels of charges for the various services they will perform, e.g. the photolab and project support activity services.

TABLE 5: BUDGET FOR RRSF  
AID CONTRIBUTION

Element	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	LOP
	-- U.S. DOLLARS --					
<b>I. TECHNICAL ASSISTANCE</b>						
<u>Program Manager</u>						
Base Salary	51,050	54,100	56,800	59,700	62,700	284,350
Pension benefit (300/mo)	3,600	3,600	3,600	3,600	3,600	18,000
Housing (1050/mo)	12,600	12,600	12,600	12,600	12,600	63,000
Education allowance	9,200	9,200	6,000	3,000	3,000	30,400
Air Freight	3,000	-0-	6,000	-0-	3,000	12,000
Insurance @ (\$125/mo)	1,500	1,500	1,500	1,500	1,500	7,500
Repatriation	5,000	-0-	10,000	-0-	30,000	45,000
Miscellaneous	2,000	2,000	2,000	2,000	2,000	10,000
<b>SUB-TOTAL</b>	<b>87,950</b>	<b>83,000</b>	<b>108,500</b>	<b>82,400</b>	<b>118,400</b>	<b>470,250</b>
<u>PhotoScientist</u>						
Base Salary	43,900	45,200	47,500	49,900	52,400	238,900
FICA (USG contribution)	3,000	3,200	3,300	3,400	3,500	16,400
Housing Allow. (1050/mo)	12,600	12,600	12,600	12,600	12,600	63,000
Education Allowance	10,000	6,000	6,000	6,000	6,000	34,000
Storage of HHE in US (\$100/mo)	1,200	1,200	1,200	1,200	1,200	6,000
Air Freight	3,000	-0-	6,000	-0-	3,000	12,000
Insurance @ \$125/mo	1,500	1,500	1,500	1,500	1,500	7,500
Repatriation	5,000	-0-	10,000	-0-	30,000	45,000
Miscellaneous	2,000	2,000	2,000	2,000	2,000	10,000
<b>SUB-TOTAL</b>	<b>82,200</b>	<b>71,700</b>	<b>90,100</b>	<b>76,600</b>	<b>112,200</b>	<b>432,800</b>
<u>Short-term Consultants</u>						
3 Consultants from US for 2 weeks ea. per year	20,000	20,000	20,000	20,000	20,000	100,000
<b>TOTAL TECHNICAL ASSISTANCE</b>	<b>190,150</b>	<b>174,700</b>	<b>208,600</b>	<b>179,000</b>	<b>250,600</b>	<b>1,003,050</b>
<b>II. TRAINING</b>						
<u>Long-Term</u>						
1 person, 2 years long-term training (\$2000/mo)	-0-	25,500	25,500	-0-	-0-	51,000
Travel to US (1 RT)	-0-	1,500	1,500	-0-	-0-	3,000
<u>Short-Term</u>	15,000	15,000	15,000	15,000	15,000	75,000
1 person to short-term training (2 mos) each year of project training	12,000	12,000	12,000	12,000	12,000	60,000
Travel	3,000	3,000	3,000	3,000	3,000	15,000
<u>Courses conducted by RRSF</u>	30,000	30,000	30,000	30,000	30,000	150,000
<b>TOTAL TRAINING</b>	<b>45,000</b>	<b>70,500</b>	<b>70,500</b>	<b>45,000</b>	<b>45,000</b>	<b>276,000</b>

Element	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	LOP
	-- U.S. DOLLARS --					
<b>III. RRSF OPERATING EXPENSES</b>						
Office Expenses	14,000	14,000	14,000	14,000	14,000	70,000
Telephone, telex, telegram	1,600	1,600	1,600	1,600	1,600	8,000
Xerox	5,800	5,800	5,800	5,800	5,800	29,000
Office Stationery	900	900	900	900	900	4,500
Postage & Bank charges	3,800	3,800	3,800	3,800	3,800	19,000
Shipping & receiving	1,900	1,900	1,900	1,900	1,900	9,500
Vehicle	6,500	6,500	6,500	6,500	6,500	32,500
Petrol/oil	5,000	5,000	5,000	5,000	5,000	25,000
Service	800	800	800	800	800	4,000
Major repairs	700	700	700	700	700	3,500
Training Materials & Equipt.	30,000	30,000	30,000	30,000	30,000	150,000
User Services Data Acquisition						
Mp. Books & ref. materials	12,000	12,000	12,000	12,000	12,000	60,000
Photolab Supplies <sup>1/</sup>	6,000	6,000	6,000	6,000	6,000	30,000
<b>TOTAL OPERATING EXPENSES</b>	<b>68,500</b>	<b>68,500</b>	<b>68,500</b>	<b>68,500</b>	<b>68,500</b>	<b>342,500</b>
<b>IV. PROJECT SUPPORT ACTIVITIES</b>						
Project Input Costs	30,000	30,000	30,000	30,000	30,000	150,000
Audit	10,000	-0-	-0-	-0-	-0-	10,000
<b>V. ERIM CONFERENCE<sup>3/</sup></b>						
	39,000	-0-	-0-	-0-	-0-	39,000
<b>VI. COMMODITIES</b>						
Project Vehicles	26,000	-0-	-0-	-0-	-0-	26,000
Imagery/Tapes	25,000	25,000	25,000	25,000	25,000	125,000
<b>VII. EVALUATION</b>						
	-0-	25,000	5,000	5,000	5,000	40,000
<b>SUB-TOTAL ELEMENTS I-VIII</b>	<b>433,650</b>	<b>388,700</b>	<b>402,600</b>	<b>347,500</b>	<b>439,100</b>	<b>2,011,550</b>
<b>VIII. Contingency (13%)</b>						
	55,000	49,500	53,700	44,700	53,300	256,200
<b>IX. Inflation (5%)<sup>2/</sup></b>						
	-	21,700	48,500	61,300	101,200	232,700
<b>GRAND TOTAL</b>	<b>488,200</b>	<b>459,900</b>	<b>524,800</b>	<b>453,500</b>	<b>573,600</b>	<b>2,500,000</b>

1/ To cover a portion of the Photolab expenditures.

2/ Inflation factors: Year 2 - 1.05; Year 3 - 1.1025; Year 4 - 1.157625; Year 5 - 1.215506

3/ To be provided directly to ERIM by AID.

BUDGET FOR RRSF<sup>1/</sup>  
Contribution of (RCSSMRS)

Element	Year 1	Year 2	Year 3	Year 4	Year 5	LOP
	U.S. DOLLARS					
I. STAFF	390,800	439,300	542,966	593,466	593,466	2,559,998
Director, RRSF	62,600	62,600	62,600	62,600	62,600	313,000
Deputy Director	-	-	53,333	53,333	53,333	160,000
Agri. Appl. Specialist	47,200	47,200	47,200	47,200	47,200	236,000
Range Ecol. Spec.	47,600	47,600	47,600	47,600	47,600	238,000
Forestry Appl. Spec.	-	-	50,333	50,333	50,333	151,000
Hydrology Appl. Spec.	-	-	-	50,500	50,500	101,000
User Services Spec.	46,200	46,200	46,200	46,200	46,200	231,000
Computer Specialist	-	48,500	48,500	48,500	48,500	194,000
Photo Sci. Counterpart	46,200	46,200	46,200	46,200	46,200	231,800
Admin. Officer	32,000	32,000	32,000	32,000	32,000	160,000
Support Staff	89,400	89,400	89,400	89,400	89,400	447,000
Misc. S-term Consultants	19,600	19,600	19,600	19,600	19,600	98,000
II. TRAINING	-	-	-	-	-	-
III. ADMINISTRATION AND COMMON SERVICES	125,000	125,000	125,000	125,000	125,000	625,000
IV. COMMODITIES						
Printing and Photographic Materials	44,000	44,000	44,000	44,000	44,000	220,000
V. STAFF TRAVEL	60,000	60,000	60,000	60,000	60,000	300,000
TOTAL	619,800	668,300	771,966	822,466	837,466	3,704,998

<sup>1/</sup> This budget is reproduced here as it has been received from RCSSMRS  
<sup>2/</sup> Includes operating expenses and maintenance of equipment.

TABLE 7: Budget for RRSF<sup>1/</sup>  
Indicative Other Donor Contributions

Element	Year 1	Year 2	Year 3	Year 4	Year 5	LOP
	U.S. DOLLARS					
<b>I. TECHNICAL ASSISTANCE</b>	400,000	560,000	560,000	560,000	560,000	2,640,000
France	200,000	200,000	200,000	200,000	200,000	1,000,000
Canada	-	60,000	60,000	60,000	60,000	240,000
EEC	-	-	-	-	-	-
Netherlands	100,000	200,000	200,000	200,000	200,000	900,000
Sweden	100,000	100,000	100,000	100,000	100,000	500,000
-----						
<b>II. TRAINING</b>	280,000	1,080,000	1,080,000	1,080,000	1,080,000	4,600,000
France	100,000	100,000	100,000	100,000	100,000	500,000
Canada	-	50,000	50,000	50,000	50,000	200,000
EEC	80,000	80,000	80,000	80,000	80,000	400,000
Netherlands	50,000	800,000	800,000	800,000	800,000	3,250,000
Sweden	50,000	50,000	50,000	50,000	50,000	250,000
-----						
<b>III. COMMODITIES</b>	100,000	200,000	100,000	100,000	100,000	600,000
France	-	100,000	-	-	-	100,000
Canada	-	-	-	-	-	-
EEC	-	-	-	-	-	-
Netherlands	-	-	-	-	-	-
Sweden	100,000	100,000	100,000	100,000	100,000	500,000
-----						
France <sup>2/</sup>	300,000	400,000	300,000	300,000	300,000	1,600,000
Canada <sup>4/</sup>	-	110,000	110,000	110,000	110,000	440,000
EEC <sup>2/</sup>	80,000	80,000	80,000	80,000	80,000	400,000
Netherlands <sup>4/</sup>	150,000	1,000,000	1,000,000	1,000,000	1,000,000	4,150,000
Sweden <sup>3/</sup>	250,000	250,000	250,000	250,000	250,000	1,250,000
<b>TOTAL CONTRIBUTION</b>	<b>780,000</b>	<b>1,840,000</b>	<b>1,740,000</b>	<b>1,740,000</b>	<b>1,740,000</b>	<b>7,840,000</b>

- 1/ This budget is reproduced here as it has been received by USAID  
2/ Relatively firm commitment.  
3/ Under active discussion but not yet finalized.  
4/ Still at initial proposal stage.

#### IV. IMPLEMENTATION PLAN

As this project is Phase II of an existing project, those implementation procedures which have previously been found useful will be continued in this project. Implementation activities in the project include contracting for technical assistance, procurement of specific commodities, arranging for long-term and in-country training and provision of local cost support.

##### A. Implementation Agents:

RCSSMRS/RRSF - Section VI. D provides a detailed description of the institutional relationships of the RCSSMRS as the implementing agency. Within the context of those relationships the RRSF will be responsible for normal day-to-day activities involved in project support activities, training programs, maintenance of the browse file, etc. The implementation mechanisms currently in place for these activities will be maintained with adjustments as might become necessary in the future.

AID - REDSO/ESA serves as the AID office responsible for project implementation. Within REDSO, the project officer who is designated as project manager, will coordinate with appropriate legal, contracting, procurement and financial expertise as is required. The REDSO project manager will also serve as liaison with AFR/TR/RA in AID/W to assure necessary AID/W support for the project. With regard to disbursement of funds to PSC's, i.e. salaries and related payments, AID will disburse these funds directly to the PSC's.

B. Technical Assistance - AID will contract with two individuals on a PSC basis in accordance with AID procedures to provide the long-term services required in this project. Contracting will be done by REDSO/ESA in consultation with the Centre. Contracting will be done for 2 years with an option to renew for additional time. Short-term consultancies with non-USG personnel are more efficiently handled by RRSF which then claims reimbursement (as happens currently). Short-term consultancies with USG personnel will necessarily be handled by PASA agreements.

##### C. Commodities

The Authorized Source/Origin for Commodities and Commodity related services for the project is AID Geographic Code 000 and Kenya. Commodities to be purchased with AID funds will be limited to the following: a) two motor vehicles for use by RRSF staff in carrying out project activities; b) approximately one hundred twenty five thousand dollars worth of imagery tapes; and c) expendable office supplies valued at approximately thirty five thousand dollars for the life of project. Procurement of all the above items will be undertaken by the RRSF on a cost reimbursable basis with technical

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assistance as needed provided by the REDSO/ESA/RCMO. Because all purchases will fall well within AID's small value procurement limits, RRSF will be required to contact a reasonable number of suppliers and obtain competitive offers before purchasing the needed items. No formal competition is required. The two vehicles, one a sedan and the other a utility vehicle, are both right-hand drive and will be purchased under the blanket source/origin waiver issued in State 086441 dated 20 March 1986.

D. Training - Long-term training will follow AID's normal PIO/P system. In-country training has been very effectively organized by RRSF throughout Phase I and it should continue to make the necessary arrangements on a reimbursable basis.

E. Local cost support: RRSF relies upon the project to cover assorted operational costs described in Section III. These costs are reimbursed by AID, and this procedure should continue. Appropriate Project Implementation Letters (PIL) will be issued as necessary.

F. Implementation Schedule

<u>Month</u>	<u>Activity</u>	<u>Agent</u>
0	Sign Grant Agreement	AID/RCSSMRS
1	Issue PIO/T	AID
1	Procure vehicles (initiate imagery procurement)	RRSF/RCSSMRS
2	Contract with long-term TA	AID
2	1st Training Course	RRSF/RCSSMRS
?	1st participant to U.S.	AID/RRSF
?	Training courses repeated periodically during LOP	RRSF/RCSSMRS
24	Evaluation	AID/RRSF/RCSSMRS
60	Final Evaluation	AID/RRSF/RCSSMRS

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V. EVALUATION PLAN

The budget provides for \$40,000 during the LOP for evaluations.

An evaluation of the project should be carried out in about 24 months after signing the Grant Agreement. The team should be composed of an evaluation officer, a specialist in remote sensing application to natural resource management, and an institutional and financial analyst. The remote sensing specialist will be obtained on a short-term contract, while the other evaluators are expected to be drawn from AID.

Prior to this evaluation, the Facility will be expected to have carried out a follow-up evaluation of all course participants (see Social Soundness Analysis). The follow-up would take the form of a questionnaire mailed to all former trainees. The evaluation should obtain information on (a) use of the skills and knowledge obtained in the course attended; (b) the indirect impact of the training (e.g. use of maps devised from remote sensing data); and (c) views in regard to constraints to use of remote sensing data and ways these might be overcome, including services which the Facility might offer. The purpose of the follow-up on trainees would be to (a) document the results and impact of the training (b) identify constraints to use of remote sensing techniques and (c) suggest future emphases of the Facility.

In addition, the Facility is expected to modify its course evaluation form to obtain information on knowledge and skills learned, and the perceived intended use of remote sensing techniques.

Thus, for the project evaluation the Director of the Facility will be expected to provide the team with the following information:

- (a) a report analysing the results of the trainee follow-up evaluation
- (b) Course evaluations and course reports including a summary of the evaluations by the trainees
- (c) records on user services and project activities
- (d) financial reports on Facility income and expenditure
- (e) other information as required.

The evaluation will include an assessment of the management arrangements and practices between the Centre and Facility, and an assessment of the financial situation of the Facility in regard to other donor support, contributions of member states through the Centre, and charges for services.

A final evaluation is planned for just before the completion of the Project. Prior to this the Facility is expected to have carried out a mail survey on the results and impact of its project services.

## VI. SUMMARIES OF PROJECT ANALYSES

### A. Technical Analysis Summary

#### 1. General

Overall there is agreement that the future of East and Southern Africa will reflect the extent to which the area can deal with its natural resources. There is evidence of the lack of recent data on natural resources, and moreover, it is only recently that there has begun to be concern to improve the situation. In particular, surveys are needed in critical resource sectors such as forestry, water, soil, vegetation, rangeland and arable land. Without such surveys it is difficult to develop adequate programs to ensure continued supplies of firewood, water and food. There is a need therefore, for an inventory and monitoring system for natural resources throughout this whole region.

The Facility has established a library of satellite imagery which is frequently consulted by natural resource scientists in an attempt to up-date the information relative to the region. Courses and training programs have been offered in the major natural resource disciplines, and it is apparent that the natural resource agencies and other governmental and non-governmental entities in ESA are benefiting from the effective low-cost approach which has been adopted here. This unique transfer of the benefit of sophisticated space technology for earth resources remote sensing is proving valuable and, if continued, will assist in the resolution of the overall problems of management of the area's natural resources. Effective application of this technology will vary from country to country depending on particular needs and the existing state of natural resource assessment and management. The proposed project will provide continued funding for a highly sophisticated development tool - remote sensing technology -- a technology that can also play a significant role in providing sources of data on the most recent African drought and severe food shortages -- one of the most overwhelming problems facing African policy-makers. The RRSF has already made significant progress in the provision of valuable services to organizations (including USAID Missions) and government ministries. To date, these have included Uganda, Kenya, Sudan, Zambia, Rwanda, Comoros, Zimbabwe, Djibouti, Tanzania, Ethiopia, international organizations such as UNEP, UNESCO, IDRC, UNDP, CSIRO, and REDSO/ESA; over twenty African and overseas universities; private voluntary organizations; and private firms. Moreover, demand for advice and involvement of the RRSF staff is still rapidly increasing.

## 2. Activities to be Undertaken by the Project

This project will fund the continued activity of the Facility in the area of natural resources. To achieve this some resources will be directed into the area of training; this training will be of the extended training course format, which includes the preparation and completion of in-country exercises by course participants. A large share of resources will be directed into technical assistance, and the balance of project funds will be expended on Facility operating expenses (such as maintenance of the image library) and project support activities. Examples of project support activities already implemented by the RRSF appear at Annex I. Project support activities funded by AID are expected to form a portion of a much larger outreach capability funded by other donors. This outreach capability has been developed by the Facility following the Project Amendment of 1982. It provides exposure and creates additional demand for the use of remote sensing techniques, in order to help tackle development problems in member countries. In addition to available qualified personnel, the combined physical resources of the Center will be available for major project support.

With this capability, the RRSF now has a service/project orientation specifically tailored to the solution of natural resource, energy and environmental issues. Such a project oriented format is closely tied to national programs, and this close tie will be continued in the present project.

It is now evident that the outreach capability of the Facility has been enhanced by directly involving staff and country trainees in project activities. There is ample evidence that the most effective way to disseminate this information is by specific example. Thus the training and demonstration materials currently being produced at the Facility will continue to focus on and link with project or country team reports. Abstracts of these reports will be used as a basis for "Applications Brochures" for teaching and demonstration purposes. This whole process will magnify and reinforce the concept that training, information exchange and project activities are all inter-related and must be dealt with in an integrated fashion.

In short, the Facility has the capability for conducting a wide range of mapping and resource analysis projects. Staff may need to be supplemented with outside consultants, but the overall technical capability at the Facility is probably as good as can be found anywhere in Africa.

### 3) Coordination of Activities - NASA/NOAA

The Facility has maintained links with major NASA experimental programs as well as with the European Space-Lab experiments, and with France in development of the SPOT system.

The Facility is collaborating with NASA/NOAA in experiments in the use of weather satellite data for continent-wide monitoring of vegetation and extreme conditions such as drought, desertification and floods.

The NOAA crop yield assessment program is of particular interest to the Facility, which has given courses in the use of remote sensing in agricultural statistical programs and crop yield assessments. Effective implementation of such a program requires that the scientists in the relevant ministries of the countries participate in the work; thus, they use their own staff to support it. This creates an effective network. The Facility will, therefore, with the support of this project, continue liaison with NOAA and the presentation of appropriate courses at regular intervals taught by NOAA staff. (See Annex E-1, Section D)

#### B. SOCIAL SOUNDNESS SUMMARY

Approximately 188 million people live in the 22 countries covered by the Remote Sensing Facility. Fourteen of these countries have a GNP per capita of less than \$500. The vast majority of the people depend primarily on farming and animal husbandry for their livelihood. The service area is characterized by low incomes, insecurity of wood supply, particularly for cooking and construction, and fluctuating levels of food production due to climatic conditions which often lead to localized drought and periodically to widespread drought conditions.

Improved management of natural resources and better crop forecasting are pre-requisites for addressing these major problems. Planning for this can be enhanced and accelerated through utilization of remote sensing technology.

The project proposes to support the increased use of remote sensing technology through institutional development and technology transfer. The focal institution is the RCSSMRS and its Regional Remote Sensing Facility. Institutional development will be effected by improved management and training of Facility staff. One staff member will be sent for degree training in the U.S. Approximately four people, including those in positions slated to be filled and created, will attend short-term specialized courses in the U.S. All the staff are expected to improve their work performance as a result of on-the-job training provided by the long and short term technical assistants.

Training provided at the Facility and through project services will result in an increase in awareness of the applications and benefits to be derived from utilization of remote sensing technologies and in enhancement of skills. Approximately 200 people, of which an increasing percentage should be women, are expected to be reached by training solely or partially financed

by AID. Over 400 other individuals will receive training which involves the input of the AID financed long term technical assistants.

Project services covered with AID funds will benefit all the East and Southern African nations. These services will result in maps and accompanying analysis to be used in crop forecasting and planning area development projects, road networks, mineral exploration, agricultural and forestry development projects. The utilization of the products from remote sensing is expected to ultimately benefit millions of people in the region.

C. ECONOMIC ANALYSIS SUMMARY

Sub-Saharan Africa's economic and social conditions began to deteriorate in the 1970's and continue to do so. Gross domestic product grew at an average of 3.6 percent a year between 1970 and 1980, but has fallen every year since then. With population rising at over 3 percent a year, income per capita in 1983 was estimated to be about 4 percent below the 1970 level. Even more significantly, agricultural output per capita has continued to decline, so food imports have increased, now accounting for about a fifth of the region's cereal requirements. Clearly the ability of the region to sustain its population is declining as ever increasing requirements for fuelwood, grazing, and land contribute to desertification and erosion of the agricultural resource base. Unless trends of the recent past can be first halted and then reversed, Africa faces a social and economic crisis of vast proportions.

The Remote Sensing Facility proposal for continued support herein can play a critical role in reversing these adverse trends in East and Southern Africa by providing planners and decision makers with better information as to the nature and conditions of the resource base. At one extreme the benefits of improved information could be quite tangible with the Facility possibly assisting in the discovery of water and other mineral resources. In other cases the benefits may be intangible, but, nonetheless, highly important as the Facility assists with food and export crop forecasting, environmental health problems, deforestation, range management, map making and project design. Though it is impossible to quantify all of the benefits which will accrue from the continued operation of the Facility, the fact that they are considerable and highly valued is clearly demonstrated by the high level of demand for the training and services offered by the Facility. Failure to provide continued support to the Facility would result in an extreme curtailment of its services, an event that would involve very large opportunity costs. Planners and decision makers in East and Southern Africa would be cut off from a source of information that could only be obtained elsewhere at much greater, even prohibitive cost. Satellite imagery, for example, could be obtained from the U.S. or France, but at a

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ANNEX C

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only: B.1.

higher cost and without the access to the technical expertise now resident at the Facility. Air and ground surveys could be utilized as an alternative means of data collection, but only at very great cost -- indeed, one of the major benefits flowing from satellite imagery is that it allows one to economize to a considerable degree on such costly activities.

In addition, curtailment would involve the wastage of the considerable resources currently at the Facility. The browse file data alone have a replacement value of \$1 million. Films on loan from NASA and other image products have a replacement value of \$30 million. Termination of the current project could require the return of the files to NASA and the wastage of the browse file images through lack of upkeep, reproduction capacity and technical interpretive skills.

The strong demand for the training and services offered by the Facility, and the high costs associated with its abandonment, all argue strongly for a continuation of U.S. support. Such support is not only critical in terms of the continued operation of the Facility, but also to its ability to attract other donor support -- and, thus, ultimately to a reduced U.S. financing role. Other donors clearly look to the U.S. for leadership as they consider their role in assisting the Facility.

It should be noted that some source of external support for the Facility seems certain to be required well into the indefinite future. While the Facility generates revenue from sales of satellite imagery and related services, with 1986 revenues expected to be about the equivalent of one to two months operating expenses, revenue is far from sufficient to cover total costs. Problems in this regard are further compounded by the economic situations of the nations which comprise the membership of the RCSSMRS. Indeed, the member nations which most require the services of the Facility are those which are least able to pay. Accordingly, while the Facility should seek to recover costs to the maximum possible degree -- a process that will be facilitated as users become more aware of the benefits of remote sensing -- it should also seek to diversify its sources of external support. It should be noted in this regard that no remote sensing facility anywhere in the world fully covers its costs. All require subvention to one degree or another -- subsidies which are justified by the intangible benefits and externalities associated with the operation of such centers.

#### The impact of the Land Remote Sensing Commercialization Act

The Land Remote Sensing Commercialization Act, enacted as PL 98-365 on July 17, 1984, transferred ownership of much of Landsat operations and products from the public domain to a private firm, the Earth Observation on Satellite Company (EOSAT) of Arlington, Virginia. As a result of the new Commercialization Act, the cost to the Regional Remote Sensing

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Facility of obtaining imagery has increased from about \$250 in 1980 to \$1800 per scene today. Such cost increases could severely restrict present and potential activities of the RRSF, except for training functions using old training materials. Perhaps even more serious than the cost considerations is the proprietary nature of landsat data now "owned" by EOSAT. EOSAT now regards landsat data as proprietary, i.e. a trade secret. Copyright restrictions ("Reproduction" vs. "Enhancement") will complicate the handling of landsat imagery. Prior to the Commercialization Act, when landsat data were in the public domain, no copyright regulations applied.

The Landsat 5 satellite orbits the earth every 16 days, making 22 passes over East and Southern Africa each year. A complete set of scenes (which provides maximum coverage) for one year from EOSAT would now cost \$26.4 million (22 passes X 480 scenes X \$2500). One fly-over per year (1 pass X 480 scenes X 2500) would cost \$1.2 million (minimum coverage). One fly-over per year for the entire African continent would be about \$5 million. The RRSF has a collection of scenes purchased under the Phase I project and taken from 1972-80. Also, it has the NASA collection, 1972-77, on loan. New data set(s) are needed for the future viable functioning of RRSF.

The cost of purchase from EOSAT is prohibitive for the RRSF.

Even if the money could be made available for these levels of data purchase, -- and only a small portion is provided for under the proposed Phase II project -- EOSAT proposes to restrict the use of the data to the original purchaser and to require the return of the data after use. This is a major inhibition to data use in the region and will change the nature of the Remote Sensing Facility program. Instead of looking to the Facility to provide up-to-date and most recent data products, users will have to exploit the existing data collection and produce the best possible product from the available information. Up-dating may then be done by light aircraft survey, ground survey or the purchase of products from EOSAT at the prices quoted. In the medium to long term (5-10 years) it may have considerable impact on any project activity requiring the acquisition of new data. Public Law 98-365 provides for the copyright restrictions to apply only to data less than ten years old. As a substantial portion of the Facility's existing collection is already more than 10 years old, and the law is not retroactive, the full effect of this restriction will begin to be felt in the next five years as the present collection ages and more monitoring projects requiring current data are proposed.

The proposed Phase II project basically provides technical assistance and operating expense support to the RRSF. It is recommended that such AID support go forward, while at the same time, recognizing the changed economic circumstances posed by the creation of EOSAT. Any accommodation, or negotiations,

with EOSAT will take place only over a period of time, and will necessarily involve the other remote sensing centers in Africa.

There are at least several options for dealing with these concerns regarding the Commercialization Act:

- o AID, on behalf of Nairobi, Ouagadougou and Ile Ife Centers, negotiates with EOSAT to obtain imagery at cost/discount. The rationale is that EOSAT presently has no market of sufficient size for its products in Africa. The three Centers are training EOSAT's future users. It is in EOSAT's long-term commercial self-interest to support development of the Centers now. One suggestion is that RRSF approach EOSAT directly to discuss the possibility of EOSAT providing free or low-cost "educational materials" in exchange for RRSF market development (e.g. training) functions.
- o AID and other donors simply accept EOSAT's price list, and AID, inter alia, finances costs of imagery, on a case-by-case basis, with funding from other projects.
- o AID raises broader principles - economic/social well being of Africa, implications for world and U.S. political stability, need for drought monitoring. The bottom line is these are USG foreign policy concerns of the Department of State. The Secretary of State has certain limited prerogatives under the Commercialization Act.

AID is negotiating with EOSAT on this matter, and it is anticipated that the first option discussed above will be selected.

#### D. INSTITUTIONAL AND MANAGEMENT ANALYSIS SUMMARY

Annex E-4 provides a description and analysis of the RCSSMRS. The main focus centers on the adequacy of the management arrangements and practices to permit efficient and effective implementation of the remote sensing program. The conclusions are summarized herein.

Planning, programming and budgeting are part of the responsibility of the Director of the Facility, as stipulated in his job description. However, his authority in these areas is not clearly specified. The authority for development of the annual work plan and budget for the Facility ought to be the responsibility of the Director, who would liaise with other department heads when their involvement is required and consult with the Director General of the Centre. The budget needs to reflect not only the required revenue from various sources, i.e. donors and member states, but also the anticipated income from sale of services. Funds generated from user services

should be programmed against costs of materials for the Facility.

The annual work plan and budget for the Facility should be submitted to the Technical Committee through the Director General and, thereafter, be forwarded to the Governing Council. The remote sensing annual plan and budget will be only one part of the overall Centre plan reviewed by the Technical Committee and Governing Council. Once approval has been obtained from the Governing Council, implementation of the plan and administration of the budget should be the responsibility of the Director of the Facility.

The Director of the Facility is responsible for the use and disposition of Facility equipment and materials, including maintenance of inventory and log books and supervision of the Facility's supply room. Goods or materials provided for the Facility under the Grant shall be used exclusively for the activities of the Facility unless the Facility and AID agree otherwise in writing.

The Centre must have an accounting mechanism which will permit tracking of all income generated by the Facility and its use. At the end of each year a summary of the department's income and expenditure should be submitted to the Governing Council as well as relevant donor agencies. Such records will permit the Governing Council and donors to monitor the extent to which the Facility can generate income and, hence, be at least partially self-financing.

The Centre has the authority to enter into contracts, with the Director-General having the power to conclude contracts in consultation with the chairman of the Governing Council. If the Facility is to carry out its potential role in the region, its base of financial support must be broadened. To do this, the Director of the Facility, because of his technical competency in remote sensing, needs to have the authority to generate funds and negotiate the terms of the contracts.

All staff of the Facility should be directly responsible to the Director. Their work assignments should be set by the Director based on internal departmental consultations.

The Director should have the authority to write job descriptions for new staff positions and have a role in selection of the person. The Director should also have a staff development plan and the authority to determine who will receive overseas training.

The Director should report to the Director General at monthly meetings and informally. Quarterly reports showing the plan of work for the forthcoming quarter and actual achievements based on the forward plan for the quarter completed will allow the Director-General to monitor progress of the Facility and serve

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as an internal management mechanism for the Facility. Such quarterly work plans ought to be instituted as soon as possible.

The realm of authority of the director of the Facility within Center management must be clarified to permit efficient operation of the remote sensing program. Unless this is done and put into practice, the remote sensing program will continue to operate inefficiently and, hence, underserve its member states and other potential clients, to the long-term detriment of millions of potential, indirect beneficiaries in the region.

E. ENVIRONMENTAL ANALYSIS SUMMARY

The Project meets the criteria for a Categorical Exclusion in accordance with Section 216.2 (C)(2)(i). A Categorical Exclusion was approved by the Bureau Environmental Officer per State 381050 dated December 14, 1985 (Annex G).

VII. CONDITION PRECEDENT TO ADDITIONAL DISBURSEMENT

Prior to the disbursement of funds for the second year of the Project and each subsequent year, under the Grant, or to the issuance by AID of documentation pursuant to which disbursement will be made, the Grantee will, except as the Parties may otherwise agree in writing, furnish to AID in form and substance satisfactory to AID evidence of substantial participation of other donors in the funding of the RRSF's activities.

VIII. SPECIAL COVENANTS

A. Project Evaluation. The Parties agree to establish an evaluation program as part of the Project. Except as the Parties otherwise agree in writing, the program will include, during the implementation of the Project and at one or more points thereafter:

1. evaluation of progress toward attainment of the objectives of the project;
2. identification and evaluation of problem areas of constraints which may inhibit such attainment;
3. assessment of how such information may be used to help overcome such problems; and
4. evaluation, to the degree feasible, of the overall development impact of the Project.

B. Separate Account. The Parties agree that funds provided under the Agreement will be placed in a separate account, except as the Parties otherwise agree in writing.

C. Program and Budget. The Parties agree that unless otherwise agreed in writing, the Director of the Facility will have responsibility for preparation and implementation of the work programs and budgets for the Facility, including activity plans, staffing, and training schedules.

C. Facility Staff Management. The Parties agree that the Director of the Facility will have responsibility to determine the Facility's staff requirements, including preparation of job descriptions, and for supervision of Facility staff, including initiating actions related to promotion, disciplinary actions, and awards, allocation of travel and other perquisites; and allocation of staff time and effort, except as the Parties otherwise agree in writing.

E. Equipment and Materials. The Parties agree that the Director of the Facility is responsible for the use and disposition of Facility equipment and materials, including maintenance of inventory and log books and supervision of the Facility's supply room; and that goods or materials provided for the Facility under the Grant shall be used exclusively for the activities of the Facility, except as the Parties otherwise agree in writing.

F. Facility Sales Revenue. A separate account will be maintained for revenues earned by the Facility from sales of imagery products and those revenues will be available to pay the costs of materials and services needed by the Facility, except as the Parties otherwise agree in writing. A portion of any surplus revenue generated by the Facility may, however be provided to the Centre to cover overhead expenses incurred by the Centre on behalf of the Facility, based on audited overhead rates established at the end of the first year of the Project. The Centre shall provide an annual statement to A.I.D. detailing (1) income received from sales of imagery products; (2) payments to the Centre for overhead; and (3) payments made for supplies or other uses; with beginning and ending balances shown.

G. Accounting. An accounting system will be maintained that separately shows funds generated by Facility Project support activities and imagery sales of the Facility.

H. Accounting Signators. The Director of the Facility or his designee shall be one of the required, authorized signators on any accounts controlling Facility funds, such as separate donor accounts.

I. Project Support Activities. The Director of the Facility shall, in consultation with the Director-General of the Centre, develop and generate Project support activities and negotiate terms of contracts for such activities, subject to any contracts being signed by the Director-General pursuant to provisions of the Tender Committee.

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J. Photoscientist. The Centre will renew its efforts to recruit an African photoscientist to work with the Technical Advisor Photoscientist during the Project, recognizing that this is a key position essential for long-term technical viability of the Facility.

K. Training Attendees. The Centre will actively encourage women to attend its training courses and will keep course attendance records indicating the sex of participants.

L. Quarterly Reports. The Centre will provide A.I.D. quarterly reports on the Facility, showing the plan of work for the upcoming quarter, and actual achievements based on the plan for the quarter just ended, to include: (1) activities and actions; (2) dates begun/completed; (3) staff involved; and (4) comments.

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SUBJECT: PID REVIEW - EAST AFRICA REMOTE SENSING II,  
698-2456

REF: (A) NAIROBI 27911, (B) NAIROBI 27937

1. ECPR OF SUBJECT PID WAS HELD ON SEPTEMBER 6, 1985. ECPR APPROVED THE PID AND CONFIRMED THAT REDSO/ESA SHOULD PREPARE AND AUTHORIZE PP. IN REVIEWING THE FINDINGS OF THE ECPR, DAA/AFR DETERMINED THAT A FIVE YEAR AUTHORIZATION WAS APPROPRIATE. AFR, LIKE REDSO/ESA, IS CONCERNED ABOUT INSTITUTIONAL IMPROVEMENT IN RRSEY AND ABOUT OTHER DONOR SUPPORT. PP DESIGN AND AUTHORIZATION SHOULD PROVIDE FOR APPROPRIATE CP'S WHICH WILL ENCOURAGE MAXIMUM PERFORMANCE BY RRSEY AND ALLOW A.I.B. TO WITHDRAW SUPPORT IN A TIMELY FASHION, PERHAPS AFTER THREE YEARS, IN THE EVENT THE PERFORMANCE PROVES INADEQUATE.

2. DESIGN OF THE PROJECT SHOULD TAKE INTO ACCOUNT THE NEED TO TAKE ADVANTAGE OF RRSEY TRAINING CAPABILITY AND PHYSICAL FACILITIES TO REINFORCE AND SUPPORT CURRENT EFFORTS ON DROUGHT EARLY WARNING AND CLIMATIC IMPACT ASSESSMENTS AS WELL AS INITIATIVES WHICH COULD ARISE

*K other donors*

FROM THE EARLY WARNING CONCERNS OF THE BONN ECONOMIC SUMMIT. ALL OF THESE EFFORTS MIGHT RESULT IN A DEMAND FOR CARTOGRAPHY BASED ON LANDSAT SATELLITE SYSTEMS AS WELL AS A HEAVY TRAINING REQUIREMENT.

3. SECTION 603 OF THE LAND REMOTE-SENSING COMMERCIALIZATION ACT OF 1984, PUB. L. 98-365 (98 STAT. 451), PROVIDES: QUOTE UNENHANCED DATA DISTRIBUTED BY ANY SYSTEM OPERATOR UNDER THE PROVISIONS OF THIS ACT MAY BE SOLD ON THE CONDITION THAT SUCH DATA WILL NOT BE REPRODUCED OR DISSEMINATED BY THE PURCHASERS. UNQUOTE. AS NOW INTERPRETED AND PLANNED TO BE IMPLEMENTED BY ECOSAT, THE FUTURE SYSTEM OPERATOR, THIS PROVISION MAY BE AS A MAJOR IMPEDIMENT TO THE VIABILITY OF RRSEY AND DESIGN OR EVEN THE UTILITY OF EARS II. WE ARE PLANNING FURTHER DISCUSSIONS WITH ECOSAT AND WILL KEEP REDSO ADVISED. ZALLIS  
BT

Vertical stamp: OCT 24 1985

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PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

Life of Project  
From FY 86 to FY 90  
Total US Funding: \$2,500,000  
Date Prepared: November 15, 1985

Project title & Number: EAST AFRICA REGIONAL REMOTE SENSING II (698-0456)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p><b>Goal</b> Improve agricultural and natural resource management and exploitation in East and Southern African through utilization of remote sensing technology, to assist government planners and decision makers in promoting land and water development for the rural and urban people.</p>	<p>The lives of the rural and urban people are improved by development of their country's natural resources</p>	<p>Surveys</p>	<p>Improved data will improve accuracy of resource assessment and make more efficient the management of agricultural and natural resources. RRSF products will be distributed throughout participating countries.</p>
<p><b>PURPOSE</b> Strengthen the Regional Remote Sensing Facility (RRSF), a key department of RRSMS, in order to make RS technology available to, and demanded and used by, ESA country governments for a wide range of development activities.</p>	<p><b>END OF PROJECT SIMILIS</b></p> <ol style="list-style-type: none"> <li>1. The RRSF is producing a wide array of maps, compiled from satellite imagery, which are ordered by ESA countries for planning area development projects, assessing road networks, crop forecasting, soil, forestry, and hydrological surveys.</li> <li>2. The RRSF is conducting photo interpretation training courses attended by participants from ESA natural resource ministries.</li> <li>3. RS photolab, image library interpretation equipment and training facilities are maintained.</li> <li>4. RRSF has become increasingly involved in the conception, management, and implementation of project support activities which apply remote sensing technology to development problems.</li> </ol>	<p>AID and Facility records</p>	<ul style="list-style-type: none"> <li>- ESA countries undertake development projects which lend themselves to analysis/preparation via RS techniques.</li> <li>- Member countries continue and hopefully expand their financial contributions to the Center.</li> </ul>

<u>OBJECTIVES</u>	<u>MAGNITUDE OF OBJECTIVES</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
1. Operational Regional Remote Sensing Facility within context of RCSSMS	1. Ag. Applications specialist or one computer specialist, or one other member of RRSF professional staff receives 1-term training in the U.S.	Facility Records On site visits	Appropriate candidates are identified and are available, training is successful; participants return to their positions at RRSF; other ESA participants return to their respective ministries.
2. Trained Africans in key Facility positions			
3. Natural resource assessments conducted; other project support activities undertaken	3. Approximately 10 project support activities undertaken; Facility revenue-generating contracts with such entities as UNDP, reach approximately \$7,000 per month.		
4. Satellite imagery, maps produced, Photo lab is operating on cost effective basis.	4. Sales of Satellite imagery reach approximately \$5,000 per month.		Viable arrangement under Commercialization Act is worked out.
5. ESA participants trained by RRSF.	5. Approximately 20 courses conducted, of which 5 funded by AID. Approximately 600 ESA individuals trained.		
<u>INPUTS</u>	<u>EXPENDITURE FOR EACH ACTIVITY</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
1. <u>AID</u>			
a) Long and short term technical assistance	Long term 1 Program Manager - 60 p.m. 1 Photoscientist - 60 p.m. Various short-term consultants - 30 person weeks	Contract personnel on site; reports/presentations by short-term consultants	Contract hire personnel can be identified and remain during LOP or activity.
b) Appropriate U.S. training of Facility personnel Long-term Short-term	2 years full time, 1 person 10 person months	AID and Facility records, training certificates	Personnel are available for training, appropriate U.S. vendors can be identified

ATTACHMENT B-3

INEUIS (continued)	EXPENDITURE FOR EACH ACTIVITY	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
c) Commodities	Satellite imagery materials from NOAA		Continued receipt of imagery from satellite and data centers
d) RRSF Operating Expenses associated with technical assistance and training	Covers a portion of Facility expenses such as: postage, telex, staff travel, petrol, vehicle maintenance, supplies, photocopying, spares & repairs for photolab equipment & rental, shipping & receiving training materials & image interpretation materials.		AID funds available throughout LCP
2.			
a) Technical Assistance	Local staff salaries (60 p.m. each) for Facility Director and Deputy, and counterpart specialists in: Agriculture; Forestry; Range Biology; User Services; Hydrology; Photocientist; Computers; Administrative Assistant; Support Staff	AID and Facility records	The African Director remains in place; Specialists and other staff are promptly recruited and brought on board; certain current staff continue in their positions. Viable working relationship between the Facility and the Center
b) Commodities	Printing and photographic supplies		
c) Operating budget support	Office space; overhead; proportion of Center's staff budget involved in technical coordination, cartography, engineering, and other other operating expenses.		RCSSMS continues to provide facilities and staff
3. <u>Other donors</u> <u>FRANCE</u>			
a) Technical Assistance	2 long-term IS advisors (120 p.m.)	Facility Records and reports  Site visits  Multidonor conferences	Other donor interest and support is forthcoming on a timely basis

INRUIS (continued)	EXPENDITURE FOR EACH ACTIVITY	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
b) Training	2-3 three-week courses on SPOF/year with 25 participants each (750-1,125 person weeks)	Facility records and reports	
c) Commodities	Computer		
<u>NETHERLANDS</u>			
Technical Assistant	1 long-term hydrology advisor (54 p.m.) 1 long-term soil science advisor (54 p.m.)	Facility records; Reports from ESA; USAIDs; Multidonor conferences	
Training	1 4-week course on water resources, 25 participants (100 p.w.) Long-term five-year Diploma program in natural resources drought management, 40 participants per year, 15 mos. each (3,000 p.m.)		
Commodities	Training materials		
<u>EEC</u>			
Technical Assistant	—		
Training:	2 three to four-week courses/year on SPOF, ERS-1, or SpaceLab, 25 participants each (150 - 200 p.w.).		
Commodities	—		
<u>CANADA</u>			
Technical Assistant	1 long-term map advisor (48 p.m.)		
Training	1 six-week course/year on photomap techniques, with 20 participants, in years 2-5 (480 p.w.)		
Commodities	Satellite imagery/photographic materials		

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<u>INRUIS (continued)</u>	<u>EXPENDITURE FOR EACH ACTIVITY</u>	<u>MEANS OF VERIFICATION</u>	<u>IMPORTANT ASSUMPTIONS</u>
<u>SWEDEN</u> Technical Assistance	1 long-term computer special-   list (48 p.m.)		
Training	Cooperate with France & EEC   on one 4-week SIOT course/year   on Forestry applications, 25   participants, year 2-5   (400 p.w.).		

ANNEX C

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A. includes criteria applicable to all projects. Part B. applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance loans, and B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS Yes.  
STANDARD ITEM CHECKLIST BEEN REVIEWED FOR  
THIS PROJECT? Yes.

A. GENERAL CRITERIA FOR PROJECT

1. FY 1985 Continuing Resolution  
Sec. 524; FAA Sec. 634A;

Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project.

Funding is provided under the AFR/RA Regional Organizations appropriation. Congress was notified in the FY 1986 Congressional Presentation p. 584, and in a CN submitted 2/25/86 which expired without objection on 3/12/86.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$500,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

Yes. See Project Paper.

Yes. See illustrative budget in Project Paper, Sec. II-B.

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

4. FAA Sec. 611(b); FY 1986  
Continuing Resolution Sec. 501.  
If for water or water-related land resource construction, has project met the principles and standards and procedures established pursuant to the Water Resources Planning Act (42 U.S.C. 1962, et seq.)?(See AID Handbook 3 for new guidelines.)

N/A.

operation will be an important task. It is critical to the success of this project that an appropriate balance between these activities is continued from Phase I, because the project budget and overall staffing levels of the Facility only provide for a small staff. Consequently, this limits the total amount

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project? N/A.
6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. Yes. This is a regional project. The RCSSMRS has 9 contracting member states within East and Southern Africa, and provides services throughout the region as well, promoting resource assessment.
7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. Improvement in the management and exploitation of East and Southern Africa's natural resources will assist government planners in decisions on land and water development programs. This will directly benefit "e", and indirectly benefit "a". B, C, D, and F appear not to be affected by this project.
8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). The project will have minimal impact on encouragement of US private trade and investment abroad, as it is primarily an institution building project. However, the RCSSMRS will work closely with the U.S. EOSAT, recently privatized from services provided by NASA.
9. FAA Sec. 612(b), 636(h); FY 1986 Continuing Resolution Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars. The host regional organization, the RCSSMRS, will contribute costs of local staff salaries, and administrative and common services costs to the project.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? No.
11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? Yes.
12. FY 1986 Continuing Resolution Sec. 522. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? N/A. This project is not directed toward the production of any commodities.
13. FAA 118(c) and (d). Does the project comply with the environmental procedures set forth in AID Regulation 16?. Does the project or program take into consideration the problem of the destruction of tropical forests? a) Yes.  
b) The Project will promote assessments of deforestation which can be used by government planners to address this problem.
14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)? N/A.
15. FY 1985 Continuing Resolution Sec. 533. Is disbursement of the assistance conditioned solely on the basis of the policies of any multilateral institution? No.
16. ISDCA of 1986 Sec. 310. For development assistance projects, how much of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black Long-term technical assistance contracts will be advertised and competed in accordance with Agency regulations.

colleges and universities, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)?

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance  
Project Criteria

- a. FAA Sec. 102(a), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (v) utilize and encourage regional cooperation by developing countries?

- (a) Wide area resource assessments made through use of remote sensing, under this project, will address such problems as deforestation, watershed, and erosion, conditions which directly affect the livelihood of poor peoples.  
(b) & (c) Appear not to be affected by the project.  
(d) Greater participation of women will be encouraged under the training component of the project.  
(e) As this is a regional project, it will bring together resource managers and technical people from various countries, and regional cooperation will be promoted.

- g. FAA Sec. 281(b).  
Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in government processes essential to self-government.

The project utilizes regional scientific talent both in working in, and training at, the RCSSMRS.

2. Development Assistance Project Criteria (Loans only)

- a. FAA Sec. 122(b).  
Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.
- b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

Not a DA loan funded project.

N/A.

3. Economic Support Fund Project Criteria

- a. FAA Sec. 531(a). Will this assistance promote economic and political stability? To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of part I of the FAA?
- b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary

N/A. Not funded through ESF funds.

N/A

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- b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used? Yes
- c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)? No. but it has been determined that use of remote sensing for wide area resource assessments is a cost effective tool.
- d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)? The 25% requirement is not applicable because this is a regional project. However, approximately 26% of project costs will be covered by the host regional organization contribution.
- e. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth? Yes.
- f. FAA Sec. 128(b). If the activity attempts to increase the institutional capabilities or the government of the country, or if it attempts to stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority? Yes. The Project will lead to more rationale use of water, wood fuel, and agricultural resorces which will ultimately benefit the poor majority.

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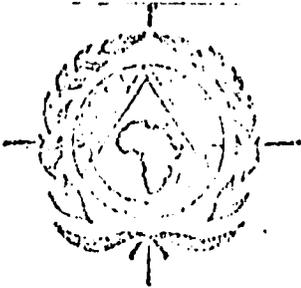
c. FAA Sec. 534. Will ESF funds be used to finance the construction of, or the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such country is a party to the Treaty on the Non-Proliferation of Nuclear Weapons or the Treaty for the Prohibition of Nuclear Weapons in Latin America (the "Treaty of Tlatelolco"), cooperates fully with the IAEA, and pursues nonproliferation policies consistent with those of the United States?

N/A

d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

N/A.

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REGIONAL CENTRE FOR SERVICES IN

SURVEYING AND MAPPING, ANNEX D

AND REMOTE SENSING

P. O. BOX 18116,  
TELEPHONE 803327  
TELEGRAMS: REGSURVEYS  
NAIROBI, KENYA

ENTERPRISE HOUSE,  
ENTERPRISE ROAD.

Date.....12th November, 1985

Our Reference.....CSSM/1/3/A

*Keohring*  
*Graham Bernstein*

Your Reference .....

REDSO ACTION COPY

Action taken.....

No action necessary.....

Initials

Date

Mr. J.W. Keohring,  
Director,  
REDSO/ESA  
USAID,  
P.O. Box 30261,  
NAIROBI.

Dear Mr. Keohring,

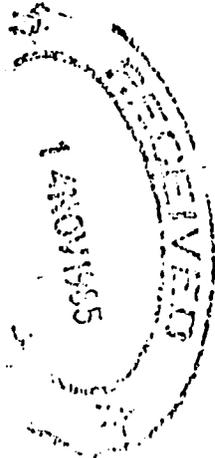
USAID ASSISTANCE WITH THE CENTRE'S 2ND  
FIVE YEAR PLAN

During the course of various discussions held with representatives of USAID/REDSO (ESA), advice was given to the effect that the Governing Council of the Centre considered the 10-Year Plan and agreed that generally it could be used as a broad planning document for the department of remote sensing at the Centre. The Governing Council, therefore, directed that relevant portions of the 10-Year Plan be used to formulate the Centre's 2nd Five-Year Plan which takes effect from 1.7.86.

In compliance with the Governing Council's directive, a draft of the 2nd Five Year Plan has been prepared. This draft has been circulated to all member States in order to enable them to comment on it before its final formulation.

You have been advised that the PID you submitted to USAID Washington has been approved, and that consequent upon that approval, both USAID and the Regional Centre for Services in Surveying, Mapping and Remote Sensing should jointly draft a Project Paper (PP). To this end I have appointed Dr. H.M. Hassan, Director, Remote Sensing Department to go on the drafting committee for the P.P.

Dr. Hassan will explain to you that the Centre sees any further assistance from USAID/REDSO (ESA) as being to the Regional Centre for Services in Surveying, Mapping and Remote Sensing (RCSSMPS).



BEST AVAILABLE DOCUMENT

12... (43)

In the present context, the beneficiary of any USAID assistance will be the Remote Sensing Department of the Centre.

As you know, the government of France has been active in supporting our programme through joint training courses. Preliminary discussions with French authorities have been initiated for continual support. Discussions are under way with the Swedish and the Dutch authorities for similar support. We are also optimistic that International organisation such as UNDP, FAO, UNESCO, and UNEP, which in the past have contributed to our training courses and projects will continue their support.

Because of the special relationship which exists between the Centre and USAID/REDSO (ESA), I attach herewith a copy of the draft Five-Year Plan. It is the Centre's intention to seek technical assistance from many sources for the implimentation of the projects identified in the draft plan.

The purpose of this letter is two-fold, namely;

- (i) To request USAID/REDSO (ESA) to sympathetically consider continuing its technical assistance to the RCSSMRS so that the remote sensing core activities identified in the 2nd Five-Year Plan can continue; and
- (ii) To forward to you the draft Five-Year Plan which outlines the activities planned for all the departments of the Centre, so that you can see how the plan emphasizes the need for the departments to develop complementarily and as integral components of the Centre.

Yours sincerely,



B.A. SIKILO  
DIRECTOR GENERAL

Enclos.

BEST AVAILABLE COPY

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## I. TECHNICAL ANALYSIS

### A. Problem Statement:

The future of East and Southern African will reflect the extent to which the area can deal with its natural resources. There is evidence of the lack of recent data on natural resources. Moreover, it is only recently that there has begun to be a concern to improve the situation. The economic climate of the early 1980's has put great pressure on East and Southern African countries to become more self-sufficient in food and energy because of the high costs of importing such commodities.

Indeed, these problems are continent-wide, as recognized by the assembly of African heads of state in Lagos in 1980. The "Lagos Plan of Action for the Implementation of the Monrovia Strategy for the Economic Development of Africa" deals with the development of natural resources in Africa. The heads of state recognized that "The major problems confronting Africa in the field of natural resource development include: lack of information on natural resource endowment of large and unexplored areas...." and suggested that during the 80s the strategy for the developing countries of Africa should be "undertaking the assessment of their natural resource distribution and availability for national and African multinational socio-economic development projects intended to produce goods and services to meet the needs of member States.."

In East and Southern Africa the rapid population increase and the resultant increase in pressure on natural resources are both very obvious. A majority of countries in the region have not undertaken comprehensive surveys of their resources in the last two decades. In particular, surveys are needed in critical resource sectors such as forestry, water, soil, vegetation, rangeland and arable land. Without such surveys it is difficult to develop adequate programs to ensure continued supplies of firewood, water and food. There is a need therefore, for an inventory and monitoring system for natural resources throughout this whole region. Evidence of this can be seen in the many requests received by the Regional Remote Sensing Facility in Nairobi.

The Facility has established a library of satellite imagery which is frequently consulted by natural resource scientists in an attempt to up-date the information relative to the region. Courses and training programs have been offered in the major natural resource disciplines, and it is apparent that the natural resources agencies are benefiting from the effective low-cost approach which has been adopted here. This unique transfer of the benefit of sophisticated space technology for earth resource remote sensing is proving valuable and, if continued, could assist in the resolution of the problems

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described above. Effective application of this technology will vary from country to country depending on particular needs and the existing state of natural resource assessment and management. The proposed project will provide continued funding for a highly sophisticated development tool - remote sensing technology a technology that can also play a significant role in providing sources of data on the 1984 African drought and famine--one of the most overwhelming problems facing African policy makers. The RRSF has already made significant progress in the provision of valuable services to organizations and government ministries. To date, these have included Uganda, Kenya, Zambia, Rwanda, Zimbabwe, Comoros, Djibouti, Tanzania, Ethiopia, international organizations such as UNEP, UNESCO, IDRC, UNDP, CSIRO, REDSO/ESA and USAID/Somalia; over twenty African and overseas universities; private voluntary organizations; and private firms. However, demand for advice and involvement of RRSF staff is fast increasing. Sudan, Somalia, Zambia, Madagascar, Tanzania, Swaziland and Lesotho have recently requested assistance. While the Facility has more than doubled the provision of products, user services, and natural resource surveys since 1980, and the competency to produce and to serve has been demonstrated clearly, the Facility cannot at present meet all the demands made by member states due to shortage of personnel, space, certain additional equipment, and operating funds.

Continuing financial assistance for the Remote Sensing Facility is needed. As the exhaustive March 1984 AID evaluation concluded (p.25); "The RRSF has now become an operational reality. It needs a stable period to consolidate effectiveness in the fields already achieved, so that the services it has rendered and can render to ESA may be appreciated and applied. Any destabilization of the present capabilities for effective service is likely to prove detrimental to the confidence of users, the potential use of resources, and the national populace, whose welfare the project was intended to improve."

B. Present Operation and Future Direction of Remote Sensing Facility:

The present operation of the facility is geared to the needs of the natural resources agencies in the region. It provides training and project support activities which are designed to strengthen these organizations, and to assist them in the achievement of their tasks. The Facility does not replace these agencies but works alongside existing staff using existing structures to implement projects as rapidly as possible. Many natural resources projects or project proposals require information which must be gathered by some form of survey, usually in a very short time. Conventional survey methods are time consuming, very expensive, and do not lend themselves to rapid regional application. If satellite remote sensing data are used, a rapid and effective assessment of, for example, the area of standing forest, can be made. Such rapid surveys provide data which can be used to schedule the

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existing survey staff and ground crews more effectively. The results from the ground surveys can then be used to refine the satellite image interpretation, thus improving the resource information base. Such an operation, although effective, creates the need to train resource managers and other data users as well as the need to supply the satellite data in a suitable form. These needs have been addressed in the first phase of the project during which AID funded the establishment of a data library, a photo reproduction service, and a program of training.

The training program has now had more than 700 participants from the region who have been encouraged to use the services of RRSF. There is, therefore, a need to ensure that these support services continue to enable those trained to apply the knowledge they have gained.

#### Future Direction

The RRSF has developed a ten year plan, the first five years of which were merged with the five year plan of the Centre. For the first five years the plan calls for a strong orientation towards the support of projects in natural resources assessment and management. The plan calls for considerable donor support, but has a major component financed by the contracting countries of RCSSMRS. It also envisages continued training both in the region and overseas, as well as support from several donors to strengthen the training program and greatly increase project activity within the region.

- (a) Overseas training: It has proved very difficult to find staff from the region who are both suitably trained and/or have the necessary experience. Therefore, there is a need for a program of overseas training so that people from the region can effectively staff the Facility.
- (b) Other donors: Many users of the RRSF are staff from development projects funded by external donors. For this reason, the 10 year development plan calls for multi-lateral funding so that there is a link between the donor projects in natural resources and the regional data base. Satellite data systems currently planned include those operated by the USA, France, Japan, India and the European Space Agency. With such a multinational background to these data systems it is now expected that other nations will cooperate in the operation of the Facility and in program funding.
- (c) Continuation of existing services: While these developments are taking place, there is a need to continue the core program of the Facility at present levels to prevent severe damage to its credibility. This includes the photo-laboratory operation, and the training and advisory programs. The core program must

be maintained if the natural resources activity is to be built on it.

C. Activities to be Undertaken by the Project:

This project will fund the continued activity of the Facility in the area of natural resources. To achieve this some resources must be directed into the area of training; this training will be of the extended training course format, which includes the preparation and completion of in-country exercises by course participants. A major share of project resources will be directed into technical assistance and the balance of project funds will be expended on Facility operating expenses such as the maintenance of the image library, and project support activity. This project support activity funded by AID is expected to form a portion of a much larger outreach capability funded by other donors. This outreach capability has been developed by the Facility following the amendment of 1982. It provides exposure and creates additional demand for the use of remote sensing techniques, in order to help tackle development problems in member countries. In addition to available qualified personnel, the combined physical resources of the Center are suitable for major project support.

Given this capability, the RRSF now has a service/project orientation specifically tailored to the solution of natural resource, energy and environmental issues. Such a project oriented format is closely tied to national programs, thus, certain countries, e.g., Kenya and Malawi have training programs in-country which involve national agencies in the use of remote sensing to address major problems.

Other examples, can be found in the study of the hydrology of major areas such as the Lake Victoria basin in Kenya. This has attracted a contract for the RCSSMRS to produce a regional report and a natural resource atlas partly using remote sensing. In this project similar activities would utilize Nairobi facilities and specialist consultants where required, drawing on expertise in the region as much as possible.

Excellent examples of this kind of interaction between the Facility's capability, and the perceived needs in natural resources of the region are also provided in the case of the soil survey in Zambia, forest mapping in Tanzania, and in water resources assessment in Kenya.

In the Zambia case, a World Bank agricultural development project was scheduled for western Zambia. However, before this five million dollar project could be implemented, a soils map of the area was required. The Soil Survey of Zambia estimates suggested that at least four years would be required to complete this task. The RRSF together with Soil Survey of Zambia staff designed a project using remote sensing imagery, and the support of the RRSF staff, along with one consultant. This team effort completed the task in 18 months. The total

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cost of this work was approximately \$80,000 of which some \$20,000 was provided from the RRSF budget.

In the Tanzania case, a member of the Tanzania Department of Forestry attended a short course in Nairobi on remote sensing for natural resource assessment and monitoring. Subsequently, he requested a course for his department specifically on the topic of remote sensing for forest inventory and management. This course was held in Arusha in February 1984. The forester, upon his return to his department in Tanzania, designed a project to map Tanzania's forest resources. This was approved by the Ministry and a draft map was prepared using satellite imagery and laboratory support from the RRSF. The map was field checked by the Tanzanian forester and a staff member of RRSF, and it was then compiled, edited, printed and published by the RRSF in conjunction with the Cartography Department of RCSSMRS. The final product is the first national map of vegetation cover for Tanzania produced in 28 years. Discussions are now in progress which would allow Tanzania to train other teams to prepare more detailed analyses of this basic map at the 1:250,000 scale using the same techniques in consultation with RRSF.

In the Kenyan case, the Ministry of Water Development requested a training course for a team of geo-hydrologists who were preparing a map of water resources in the Baringo district. The RRSF provided a course for 20 people, and had the data for the study areas from 1st July 1984 processed for use in the course. These data were obtained from the thematic mapper (TM) on Landsat 5 and provided detailed information for a water resources assessment team.

It is now evident that the outreach capability of the Facility has been enhanced by directly involving staff and country trainees in project activities. We have ample evidence now that the most effective way to disseminate this information is by specific example. Thus the training and demonstration materials currently being produced at the Facility are focused and linked with project or country team reports. Abstracts of these reports are then used as a basis for "Applications Brochures" for teaching and demonstration purposes. This whole process magnifies and reinforces the concept that training, information exchange and project activities are all inter-related and must be dealt with in an integrated fashion.

In summary, the Centre has the capability for conducting a wide range of mapping and resource analysis projects. Staff may need to be supplemented with outside consultants, but the overall technical capability at the Center is probably as good as can be found anywhere in Africa.

#### E. Coordination of Activities

Within this project the co-ordination of project support, user services, training, data archiving and photo-laboratory

operation will be an important task. It is critical to the success of this project that an appropriate balance between these activities is continued from Phase I, because the project budget and overall staffing levels of the Facility only provide for a small staff. Consequently, this limits the total amount of activity possible.

The Facility has maintained links with major NASA experimental programs, the Shuttle radar activity, the European experiments from Space-Lab, and the development of the French SPOT system. In addition, the Facility is collaborating with NASA/NOAA in experiments in the use of weather satellite data for continent-wide monitoring of vegetation and extreme conditions such as: drought, desertification and floods.

The NOAA crop yield assessment program is of particular interest to the Facility which has given courses in the use of remote sensing in agricultural statistical programs and crop yield assessments. Effective implementation of such a program requires that the scientists in the relevant ministries of the countries participate in the work; thus, they use their own staff to support it. This creates an effective network. The Facility therefore envisages a continued liaison with NOAA and the presentation of appropriate courses at regular intervals, taught by NOAA staff.

Initially a major course will be offered by NOAA staff at the Facility describing the overall application of the NOAA crop yield prediction system. This would include the concept of training for field staff from each country and the use of the RRSF to disseminate satellite data. The initial course would be followed by courses for junior staff from the region so that, after a period of a year, the system could work as follows. NOAA data analyses and satellite imagery products would be transmitted to the RRSF for dissemination. The RRSF would copy satellite data and forward this to the cognizant scientist in each country. He or she would, in turn, enquire of field officers as to the current results of their field surveys and relate this to satellite data. This would also allow for verification of any ancillary data provided by NOAA. The RRSF would receive copies of these assessments and archive them, taking note of any major trends which would be reported back to NOAA.

The estimates of crop development and crop yield would be improved by field officers working on the preparation of agricultural maps including soil maps, crop type and farming practices maps, agro-ecological zone maps, crop suitability and crop productivity maps, etc. These would be compiled in liaison with RRSF and using the existing Landsat database, plus any available supporting data from the countries concerned. Crop behavior in these zones would be determined from existing statistical data or from data gathered for the purpose of the project.

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On-going monitoring by NOAA would be improved by the creation of such a database, but, more importantly the NOAA data should be supplied to the individual countries whose own nationals would make their own assessment of the situation. The result would be an effective network including NOAA staff with an anchor point at RRSF, Nairobi. The network of scientists in the region linked to NOAA staff, would also be able to utilize the facilities at RRSF, and this would lead to a closer link with the individual sovereign states who are uniquely positioned to take action in matters of food security. It also leads to a growing confidence in a structure which will transfer technology and utilize and strengthen indigenous system of data gathering and crop monitoring. Such internal growth will lead to more effective data gathering and so to a better management of agricultural and natural resources. This offers a sounder basis for operation than an externally operated system which provides answers without reference to local knowledge.

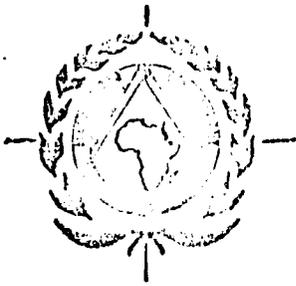
FINANCIAL ANALYSIS

BACKGROUND: The present operation of the Facility finances dates from the early days of the project when all remote sensing expenditure was from the Facility account. This account is a separate external bank account and at present the majority of the Facility expenses are met from this. Input to the account is a monthly reimbursement from USAID plus other donor contribution.

Currently revenue from photo-sales etc is held in a separate account which is maintained in a credit balance up to Kshs.100,000/- amounts in excess of this are transferred to a deposit account currently standing at Kshs600,000/- or more. This situation is not ideal for multi-donor operations nor is it well suited to increased revenue earning activity unless some re-organization is done.

Other projects funded externally at the RCSSMRS including IDRC and UNDP activity work on a split-funds basis. The donors maintain accounts for the project from which capital purchases are made in foreign funds. Local costs, approved by the donors, are paid by the centre which accounts for these on a monthly and quarterly basis so that the donor reimburses such costs directly to the Centre's bank account. The Centre has, apparently, received Central Bank approval to deposit receipts from its engineering activities in its external account. It is possible that such an arrangement could be made for the Facility also. However, it should be noted that much of the Facility revenue is in small amounts and some is paid in cash. The papermark may be incompatible with the present staffing levels.

# REGIONAL CENTRE FOR SERVICES SURVEYING AND MAPPING



ENTERPRISE HOUSE,  
ENTERPRISE ROAD.

P. O. BOX 18118.  
TELEPHONE 556400  
TELEGRAMS: REGSURVEYS  
NAIROBI, KENYA

Date...26th November, 1985.

Our Reference.....

Your Reference .....

Mrs. Linda A. Bernstein,  
Project Officer,  
REDSO/E.A.  
Nairobi.

Dear Linda,

As per your request I am enclosing detailed  
by monthly and yearly report of the actual expenditures  
for the year October, 1984 through September, 1985.

Yours Sincerely,

B. Bekele,  
for Director General.

Linda Bernstein  
RCSO

REMOTE SENSING.

SUMMARY OF ONE YEAR ACTUAL EXPENDITURE OCTOBER 1984  
THROUGH SEPTEMBER, 1985.

	K.SHS.
1. Administrative an	937,463.54
2. Training	1,659,991.06
3. User Services	198,266.60
4. Photo-Lab	94,561.65
5. Projects	416,346.50
Total actual expenditure	<u><u>3,306,629.35</u></u>

REMOTE SENSING

DETAILED FINANCIAL REPORT OCTOBER, 1984 THRU SEPT. 1985.

CODE	ADMINISTRATION	OCT. 84	NOV. 84	DEC. 84	JAN. 85	FEB. 85	MARCH 85	APRIL 85	MAY. 85	JUNE. 85	JULY. 85	AUG. 85	SEPT. 85	TOTAL FOR 1 YEAR.
1.1	OPERATING EXPENSE													
1.11	TELEPHONE, TELEX, TELEGRAM	1034.10	951 90	952 40	11,337 35	465 00	6723 95	906		1962 50	886 50			23,219 75
1.12	XEROX	605	8047	3645 50	3632	9190 45	-	-	-	29815 65	1200	24882 85	11817	92,835 45
1.13	OFFICE STATIONERY	576	-	-	5178 80	2113 -	5708 50					522		14,098 30
1.14	OFFICE EQUIPMENT													
1.15	RENOVATION (SPACE) REPAIRS													
1.16	POSTAGE & POST CHARGES	6355.40	5476 55	5898 35	7396 45	4939 60	4595 60	474 9 85	8115 20	3274 90	5628 40	2394 95	1129 60	59,955 25
1.17	SHIPPING & RECEIVING	415	3872	13487 20	333	5341	1850	340	3510				1168	30,316 20
1.2	VEHICLE													
1.21	FUEL/OIL	6696.75	6919		12429 75	5609 25	5985 25	5464 75		17893 75	11504.25	4786 75	3357	80,646 50
1.22	SERVICE	2614.10	3600		1199		3672			1346				12431 10
1.23	MAJOR REPAIRS			4167 10	2974 50				150		4050.00			11,341 60
1.24	INSURANCE													
1.25	CAPITAL PURCHASE	-	2040 60		1140		2112 40							5293
1.3	CONTRACT SUPPORT	51706.45	8455	44439 30			131439 80		100240 45		56532 15			392,815 15
1.31	HOUSE RENT													
1.32	UTILITIES													
1.33	GUARD SERV. OF ALARM SUPP.													
1.34	REPAIR & IMPROVEMENT													
1.35	FURNISHING													
1.36	LESS (AS REQUIRED BY GRANT)													
1.4	ALLOWANCES													
1.41	PER DIEM & ACCOM (ADMIN TRAVEL)	28769	1180		99152 39			400		2026 85				131,528 24
1.42	UNIFORMS											1340		1,340 00
1.5	FURNISHINGS & FABRIC													
1.51	REPAIR & MAINTENANCE OF FURNITURE			250		950	950 00			16540	45983	13270	1700	79,643
	TOTAL	98774.20	40542 05	72839 85	144773 24	28608 30	163037 50	11660 60	112015 65	72859 45	125784 35	47196 55	19171 60	937,463 54

REMOTE SENSING

DETAILED FINANCIAL REPORT OCTOBER, 1984 THRU SEPTEMBER 9, 1985.

CODE	TRAVEL INC	OCT.84	NOV.84	DEC.84	JAN.85	FEB.85	MARCH85	APRIL.85	MAY.85	JUNE.85	JULY.85	AUG.85	SEPT.85	TOTAL FOR ONE YEAR.
2.1	SHORT COURSES IN NAIROBI													
2.11	ACCOMMODATION (Nairobi)		51763 70	78907 50					620					329192 63
2.12	PERDIEH								79462 50			197901 43		79462 50
2.13	OFFICIAL FUNCTIONS	15254		25360 55					20152 00		33845			94612 35
2.14	TRANSPORT IN NAIROBI			25206				1160	16800		11632 40			54798 40
2.15	FIELD ACCOMMODATION	49745								35006 80	62327			147078 80
2.16	Stationery and Supplies			2400						340				2740
2.17	PHOTOGRAPHY AND PRINTS		44100	2000		1535	101853 10	16353	7739		7017			180597 10
2.18	BOOKS								1500					1500 00
2.19	GRAPHICS SUPPORT AND PRINTING								3000					3000
2.2	ON THE JOB TRAINING													
2.21	TRAVEL													
2.22	ACCOMMODATION			29352	30560			37050		336				336
2.23	PERDIEH	3600	4800		11400					3690				100652
2.24	SUPPLIES			7200			6480		15225			3000		22800
2.3	COSTS IN THE REGION													28905
2.31	STAFF TRAVEL				20716		31439							52155
2.32	ACCOMMODATION													
2.33	PERDIEH (STAFF)				140793 26				27962 90					168756 16
2.34	SUPPLIES					162								162
2.35	INCIDENTAL COSTS IN FIELD (EQUIPMENT HIRE)					225								225
2.3	CONSULTANTS WITH IN REGION													
2.41	CONSULTING FEE					4000	70989 85							
2.42	TRAVEL		2250				35036				84,534 25		850	160374 10
2.43	ACCOMMODATION												40393 50	77679 50
2.44	ALL/HAZEL EXPENSES						6750							6750
		68599.00	102813 70	170426 05	203459 26	5922	252347 95	54563	172462 20	39372 80	199355 65	200901 45	41243 50	1511776 56

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REMOTE SENSING

DETAILED FINANCIAL REPORT OCTOBER, 1984 THRU SEPTEMBER 9185.

CODE 2	TRAINING	OCT.84	NOV. 84	DEC.84	JAN.85	FEB.85	MARCH 85	APRIL 85	MAY.85	JUNE.85	JULY.85	AUG.85	SEPT.85	TOTAL FOR ONE YEAR.
2.5	TRAINING MATERIALS	68599.09	(102913.70)	(170426.05)	(203469.26)	(5922)	(252547.95)	(54563)	(172462.20)	(39372.80)	(199335.65)	(200901.45)	(41243.50)	1511776.56
2.51	BOOK AND MANUALS													
2.52	PREPARATION OF AUDIO-VISUAL MATERIALS													
2.53	PRINTING OF LEAFLETS & BROCHURES													
2.54	PREPARATION OF PAPERS & DIAGRAMS	1650			14000		18000	29000	25630				38222.50	110852.50
2.55	HOUSING													3050.00
2.56	OTHER SUPPLIES FROM PHOTOLAB													
2.57	STATIONERY AND MATERIALS													
2.6	TRUCK EQUIPMENT													
2.61	TRUCKS													
2.67	REPAIRS SERVICE & MAINTENANCE								10000					10000
2.7	TRIP/PT AND THE OVERSEAS						24312							24312
2.8	RENOVATION													
2.81	REPAIRS & MAINTENANCE													
2.82	RENOVATION													
2.83	CURTAINS													
2.84	FURNITURE													
		79249.09	102913.70	170426.05	203469.26	5922	294859.95	83563	208092.20	39372.80	199335.65	200901.45	79466	1650991.06

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REMOTE SENSING  
DETAILED FINANCIAL REPORT OCTOBER, 1984

USER SERVICES	OCT. 84	NOV. 84	DEC. 84	JAN. 85	FEB. 85	MARCH 85	APRIL 85	MAY 85	JUNE 85	JULY 85	AUG. 85	SEPT. 85	TOTAL FOR A YEAR.					
<b>3.0 USER SERVICES</b>																		
<b>3.1 DATA ACQUISITION</b>																		
3.11 PHOTO																		
3.11 OTHER																		
3.12 CATALOGUES		2500											2500					
3.14 MAPS		6384	85	94577	80			37300					138262 65					
3.15 BOOKS AND REFERENCE	6401.95				4028	85		597	50	2675	00	37686	90	51380 20				
<b>3.2 MARKINGS</b>																		
3.21 MAP STORAGE					4000								4000 00					
3.22 FILES																		
3.23 FURNITURE & SHELVING							1633	75					1633 75					
<b>3.3 EQUIPMENT AND FABRIC</b>																		
3.31 INFORMATION, PERMITS AND MAINTENANCE																		
3.32 DISPLAY MATERIALS																		
3.33 DRAFTING MATERIALS																		
<b>3.4 USER SUPPORT</b>																		
3.41 STATIONERY																		
3.42 DESIGN & MOUNTING MATERIALS																		
3.43 OTHER																		
3.44 PRODUCTION COSTS AND MATERIALS												490	490 00					
	6401.95	8884	85	95067	80	-	8018	85	163375	37987	50	-	2675	37686	90	-	198266	60

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REMOTE SENSING  
DETAILED FINANCIAL REPORT OCTOBER, 1984 THRU SEPTEMBER 1985.

CODE	PHOTOLAB	OCT.84	NOV.84	DEC.84	JAN 85	FEB 85	MARCH.85	APRIL.85	MAY.85	JUNE.85	JULY.85	AUG.85	SEPT.85	TOTAL FOR ONE YEAR.
4.1	SUPPLIES													
4.11	PHOTOCOP PAPERS & MATER				9062 40		3777 -	3213 85	3779 40	3904 15	6973 15			30709 95
4.12	CHEMISTRY	42485.65		3250	1565				275					47575 65
4.13	PLYWOOD & M.MATERIALS			2818			1860	860		1000		1050		7588
4.14	OTHER STATIONARY & S.	2698.05				3650			2190					8638 05
		45,183.70		6068	10,627 40	3650	5637	4073 85	6244 40	4904 15	6973 15	1050	150	94561 65
<b>CODE 5 PROJECTS</b>														
5.1	AIR PHOTOGRAPHY													
5.11	AIRCRAFT HIRE				23149 10	46640								69789 10
5.17	MATERIAL & SUPPLIES			10900 80		5000								15900 80
5.2	FIELD WAGE													
5.21	STAFF TRAVEL			7160 50										7160 50
5.22	STAFF ACCOMODATION			3635 95										3635 95
5.23	STAFF FERRIEM	750			6995									7745 00
5.24	OTHER FIELD COSTS	5500												5500
5.25	CONSULTANT HIRE				2000									12000
5.26	FIELD EQUIP. PURCHASE/RENTAL											10000		13000
5.27	LABORATORY SUPPORT				13000									6512
5.31	PHOTOLAB COSTS				6512									281 25
5.32	STATIONARY & SUPPLIES						281 25							2100 00
5.33	OTHER LAB COSTS							2100						
5.34	ANALYSIS													
5.9	SPECIAL PROJECTS	4150	4950	1155 80	1600		119210	1800	18460	7445 50	90040 90	23769 70		272721 90
		4150	11100	22853 05	53456 10	51921 25	121350	1800	18460	7445 50	90040 90	33769 70		416346 50

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# REGIONAL REMOTE SENSING FACILITY

P O Box 18332  
Nairobi Kenya

Tel: Nairobi 556400  
Cable Landsat Nairobi



## MEMORANDUM

To : Linda Bernstein  
From : Allan Falconer *Allan Falconer*  
Subject: Financial Analysis/Reporting  
Date : 14/8/1985

Following our discussions, I enclose a set of blank monthly financial reporting sheets. There are the two USAID internal forms and a summary sheet which shows the estimated and actual expenditure for the reporting month plus the proposed expenditure for the next two months. The summary sheet is a collation of totals from the succeeding five sheets which detail expenditure into five major categories namely, Administration, Training, User Services, Photo-lab and Projects. Each category is broken down into a series of detailed sub-headings.

The budget forecast for the current project activity was compiled on a cumulative basis to September 30th and I enclose a copy of this cumulative budget together with actual expenditures written in alongside the estimates. Overall we were about K.Shs.800,000 underspent at the end of May. The monthly accounting for June and July is being prepared.

DRAFT BUDGET (KSHS) CUMULATIVE

JULY 1984 - SEPTEMBER 1985.

TABLE 3

	<u>Administration</u>	<u>Training (Nbi + Region)</u>	<u>User Services</u>	<u>Photolab</u>	<u>Projects</u>	<u>Cumulative:</u>	
July	78,560	-	6,332	-	1,800	86,692	56,644
Aug	133,916	-	14,320	2,187	45,926	196,349	146,349
Sept	373,485	183,575	53,829	71,824	122,611	805,324	805,324
Oct	463,485 <u>472,259</u>	233,575 <u>253,825</u>	56,829 <u>60,231</u>	116,824 <u>117,008</u>	124,611 <u>126,761</u>	995,324	<u>1,030,084</u>
Nov	623,485 <u>512,801</u>	335,575 <u>356,738</u>	246,829 <u>69,116</u>	126,824 <u>117,008</u>	164,611 <u>137,861</u>	1,495,324	<u>1,193,525</u>
Dec	723,485 <u>585,640</u>	453,575 <u>527,164</u>	291,829 <u>164,183</u>	136,824 <u>123,076</u>	194,611 <u>169,714</u>	1,800,324	<u>1,560,779</u>
Jan	918,485 <u>730,413</u>	613,575 <u>732,033</u>	301,829 <u>164,183</u>	146,824 <u>133,703</u>	224,611 <u>214,170</u>	2,205,324	<u>1,974,505</u>
Feb	1,028,485 <u>759,021</u>	733,575 <u>739,497</u>	326,829 <u>173,011</u>	161,824 <u>133,353</u>	274,611 <u>266,091</u>	2,525,324	<u>2,073,436</u>
Mar	1,208,485 <u>921,458</u>	983,575 <u>1,034,357</u>	436,829 <u>173,011</u>	176,824 <u>142,940</u>	304,611 <u>387,441</u>	3,110,324	<u>2,657,720</u>
Apr	1,401,485 <u>940,032</u>	1,043,575 <u>1,117,920</u>	506,829 <u>174,644<sup>75</sup></u>	191,824 <u>147,064</u>	334,611 <u>381,241</u>	3,480,324	<u>2,767,365</u>
May	1,491,485 <u>1,053,048</u>	1,223,575 <u>1,326,012</u>	516,829 <u>212,533</u>	216,824 <u>153,309</u>	369,611 <u>407,701</u>	3,870,324	<u>3,050,065</u>
June	1,581,485	1,273,575	526,829	281,824	404,611	4,070,324	
July	1,671,485		536,829	346,824	464,611	4,295,324	
Aug	1,761,485		546,829	361,824	504,611	4,450,324	
Sept	1,851,485		556,829	376,824	544,611	4,605,324	

Project Officer Administrative  
Approval of Payment Vouchers

Project No. \_\_\_\_\_ Title \_\_\_\_\_  
ASI No. \_\_\_\_\_ Payee \_\_\_\_\_  
Project Officer \_\_\_\_\_ Office \_\_\_\_\_

Pursuant to Handbook 19, Chapter 3E, I have administratively approved  
payment voucher for \_\_\_\_\_

\_\_\_\_\_ dated \_\_\_\_\_ in the amount of  
\_\_\_\_\_. My signature has been affixed immediately  
following the appropriate statement No. \_\_\_\_\_. Any  
exceptions made to the amount claimed is explained by an accompanying  
statement.

1. AID Direct Contracts and Grants

"I have reviewed the voucher, the related invoice(s) and  
supporting documentation attached thereto. Based on this  
documentation and my personal knowledge of the project, I  
see no reason to withhold payment. Therefore, the voucher  
is administratively approved for payment subject to the  
financial review and certification by the paying office."

Signed \_\_\_\_\_ Date \_\_\_\_\_

2. Reimbursements to B/G for Costs Incurred in the Project for  
Services Performed and/or Goods Delivered

"I have reviewed the voucher, the request for reimbursement  
and supporting documentation attached thereto. Based on  
this documentation and my personal knowledge of the project,  
I see no reason to withhold payment. Therefore, the voucher  
is administratively approved for payment subject to the  
financial review and certification by the paying office."

Signed \_\_\_\_\_ Date \_\_\_\_\_

Standard Form 1031 Revised January 1980 Department of the Treasury FORM 4-2000 1034-111	PUBLIC VOUCHER FOR PURCHASES AND SERVICES OTHER THAN PERSONAL				VOUCHER NO.	
U.S. DEPARTMENT, BUREAU, OR ESTABLISHMENT AND LOCATION	DATE VOUCHER PREPARED			SCHEDULE NO.		
	CONTRACT NUMBER AND DATE			PAID BY		
	REQUISITION NUMBER AND DATE					
PAYEE'S NAME AND ADDRESS:				DATE INVOICE RECEIVED		
				DISCOUNT TERMS		
				PAYEE'S ACCOUNT NUMBER		
				GOVERNMENT B/L NUMBER		
SHIPPED FROM		TO	WEIGHT			
NUMBER AND DATE OF ORDER	DATE OF DELIVERY OR SERVICE	ARTICLES OR SERVICES <i>(Enter description, item number of contract of Federal supply schedule, and other information deemed necessary)</i>	QUAN- TITY	UNIT PRICE		AMOUNT
				COST	PER	
TOTAL						
(Use continuation sheet(s) if necessary) (Payee must NOT use the space below)						
PAYMENT: <input type="checkbox"/> PROVISIONAL <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL <input type="checkbox"/> PROGRESS <input type="checkbox"/> ADVANCE		APPROVED FOR <div style="text-align: right;">= \$</div>	EXCHANGE RATE <div style="text-align: right;">= \$1.00</div>	DIFFERENCES		
		BY 2				
		TITLE	Amount verified; correct for <i>(Signature or initials)</i>			
Pursuant to authority vested in me, I certify that this voucher is correct and proper for payment.						
_____ <i>(Date)</i>		_____ <i>(Authorized Certifying Officer)</i>		_____ <i>(Title)</i>		
ACCOUNTING CLASSIFICATION						
PAID BY	CHECK NUMBER		ON ACCOUNT OF U.S. TREASURY		CHECK NUMBER	ON (Name of bank)
	CASH		DATE		PAYEE 3	
	\$					
1 When stated in foreign currency, insert name of currency. 2 If the ability to certify and authority to approve are combined in one person, one signature only is necessary; otherwise the approving officer will sign in the space provided, over his official title. 3 When a voucher is received in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary" or "Treasurer", as the case may be.					PER  TITLE	

GSA FPMR (41 CFR) 101-11.6

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Previous edition usable

PRIVACY ACT STATEMENT

The information requested on this form is required under the provisions of 31 U.S.C. 82b and 82c, for the purpose of disbursing Federal money. The information requested is to identify the particular creditor and the amounts to be paid. Failure to furnish this information will hinder discharge of the payment obligation.

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CURRENT EXPENDITURE & BUDGET FORECAST  
Reported in Kenya Shillings  
Summary

DATE: \_\_\_\_\_

Code:	Description	Estimated	Actual	Estimate	Estimate
1.	Administration				
2.	Training				
3.	User Services				
4.	Photolab				
5.	Projects				
	Grand total				

CURRENT EXPENDITURE STATEMENT & BUDGET ESTIMATES  
Reported in Kenya Shillings

DATE: \_\_\_\_\_

Code I: ADMINISTRATION	Estimates	Actual	Estimates	Estimates
<u>I.1 OPERATING EXPENSES</u>				
I.11 Telephone, telex, telegram				
I.12 Xerox				
I.13 Office Stationery				
I.14 Office Equipment				
I.15 Renovations (space) & repairs				
I.16 Petty Cash & postage & Bank charges				
I.17 Shipping & receiving				
<u>I.2 VEHICLE</u>				
I.21 Petrol/oil				
I.22 Service				
I.23 Major repairs				
I.24 Insurance				
I.25 Capital purchase				
<u>I.3 CONTRACT SUPPORT</u>				
I.31 House rent				
I.32 Utilities				
I.33 Guard service and alarm support				
I.34 Repairs & Improvement				
I.35 Furnishings				
I.36 Decoration (as required by lease)				
<u>I.4 ALLOWANCES</u>				
I.41 Perdiem & accommodation (admin. travel)				
I.42 Uniforms				
<u>I.5 FURNISHINGS AND FABRIC</u>				
I.51 Repair & maintenance of furniture				
Sub total				



DATE \_\_\_\_\_

CODE 2: TRAINING

Estimates

Actual

Estimates

Estimates

Sub total c/f

2.5 TRAINING MATERIALS

- 2.51 Book and manuals
- 2.52 Preparation of audio-visual materials
- 2.53 Printing of leaflets & brochures
- 2.54 Preparation of papers & diagrams
- 2.55 Mosaics
- 2.56 Other supplies from photo lab
- 2.57 Stationery and materials

2.6 SUPPORT EQUIPMENT

- 2.61 Purchase
- 2.62 Repairs, service and maintenance

2.7 PIC/P AND OTHER OVERSEAS TRAINING2.8 RENOVATION

- 2.81 Repairs & maintenance
- 2.82 Renovation
- 2.83 Curtains
- 2.84 Furniture

A

US

DATE: \_\_\_\_\_

Code 3 USER SERVICES	Estimates	Actual	Estimates	Estimates
<u>3.0 USER SERVICES</u>				
<u>3.1 DATA ACQUISITION</u>				
3.11 PIO/C				
3.12 Other				
3.13 Catalogues				
3.14 Maps				
3.15 Books, and reference material.				
<u>3.2 FURNISHINGS</u>				
3.21 Map storage				
3.22 Files				
3.23 Furniture & Shelving				
<u>3.3 EQUIPMENT AND FABRIC</u>				
3.31 Renovation, repairs and maintenance				
3.32 Display materials				
3.33 Drafting materials				
<u>3.4 USER SUPPORT</u>				
3.41 Stationery				
3.42 Design & mounting materials				
3.43 Other				
3.44 Reproduction costs and materials				
Sub total				

DATE: \_\_\_\_\_

Page 4: PHOTOLAB		Estimates	Actual	Estimates	Estimates
<u>1.1. SUPPLIES</u>					
1.11	Photographic papers & materials				
1.12	Chemistry				
1.13	Plywood & mounting materials				
1.14	Other Stationery & similar supplies				
Sub total					
<u>Page 5: PROJECTS</u>					
<u>1. AIR PHOTO WORK</u>					
1.11	Aircraft hire				
1.12	Material & supplies				
<u>2. FIELD WORK</u>					
2.21	Staff travel				
2.22	Staff accommodation				
2.23	Staff per diem				
2.24	Other field costs				
2.25	Vehicle hire				
2.26	Field equipment purchase/rental				
<u>3. LABORATORY SUPPORT</u>					
3.1	Photolaboratory costs				
3.2	Stationery & Supplies				
3.3	Other laboratory costs				
3.4	Analysis				
<u>4. SPECIAL PROJECTS</u>					
Sub total					

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SOCIAL SOUNDNESS ANALYSISSocial Cultural Setting

The service area of the Remote Sensing Facility covers 22 countries. Eleven of these countries are classified by the U.N. as "Least Developed Countries". The population within the service area in 1983 totaled about 188 million people. While seven countries contain less than a million people in each, three countries each have a population of over 20 million. The Gross National Product per capita varies from \$120 to \$2,400; in only six countries does the GNP per capita reach more than \$500. Three of the countries are particularly prone to drought conditions.

In all of the countries the majority of the people are dependent on farming and animal husbandry for their livelihood. In seventeen out of eighteen countries (for which data are available) over fifty percent of the labor force is engaged in agriculture, and in eleven cases at least seventy-five percent of the labor force is in agriculture. In most of the countries three-fourths of the population reside in rural areas. Low incomes, insecurity of food and energy supply, and inadequate access to basic services such as health, education and potable water affect the majority of people in every country. Moreover, dependency on agriculture as the mainstay of the majority of the population is unlikely to change within this century but future livelihood is threatened by environmental degradation. The latter occurs because households at the margin of existence are forced into damaging use of the biomass to meet their immediate needs for food, fuel, animal fodder, and construction materials. As important, environmental degradation is caused by wealthier individuals and commercial organizations through indiscriminate exploitation of natural resources and by highly skewed ownership of arable land resulting in pressure on the remaining arable land to meet the subsistence needs of its inhabitants.

Pressure on agricultural land is reflected in an increase in the number of people forced to exploit marginal lands. Also in the last decade food production per capita has been declining partially as a result of an increase in population, an increase in cash crops, and a decrease in soil fertility. There is also pressure on water resources. Sedimentation rates are increasing in the watersheds of high and medium potential areas. Especially in the marginal and arid areas, installation of wells has attracted people and livestock, increasing stress on vegetation. Moreover, in almost every country most of the households rely on wood for fuel for cooking and heating but wood demand is increasingly exceeding supply from sustainable stock. The pressure on land and water resources is exacerbated by population growth.

TABLE OF BASIC INDICATORS

	Population (in Millions) mid-1983)	Area ( '000 Km <sup>2</sup> )	GNP per capita (US \$ 1983)	Number enrolled in secondary school % of age group	of labor force in Agriculture (1981)	Urban pop. (1983) % of total
Angola	8.2	1,247	--	--	59	23
Botswana	.9	600	920	--	83-	16*
Burundi	4.5	28	240	3	84	2
Comoros	.3	2	340+	--	--	4*
Djibouti	.3	22	--	--	--	74*
Kenya	18.9	583	340	20	78	17
Ethiopia	40.9	1,222	120	12	80	15
Lesotho	1.5	30	460	20	60	13
Madagascar	9.5	587	310	14	87	20
Malawi	6.6	118	210	4	86	11
Mauritius	.9	2	1,160	--	30-	43*
Mozambique	13.1	802	--	6	66	17
Reunion	.5 <sup>++</sup>	2	4,010 <sup>+</sup>	--	--	41*
Rwanda	5.7	26	270	2	91	5
Seychelles	.6	( )	2,400	--	--	37*
Somalia	5.1	638	250	--	82	33
Sudan	20.8	2,506	400	18	78	20
Swaziland	.7	17	807	--	52-	15
Tanzania	20.8	945	240	3	83	14
Uganda	13.9	236	220	8	83	7
Zambia	6.3	753	580	16	67	47
Zimbabwe	7.9	391	740	23	60	24

Sources: World Development Report 1985, and 1984 World Population Data Sheet  
 - = 1980; + = 1982; ++ = mid-1984; \* = estimates for some point in the 1970's or  
 early 1980's.

Governments within the region are increasingly concerned about adequate management of natural resources and the plight of the rural and urban poor.

The past few years have especially pointed to the need to better predict drought conditions and hence food scarcity on a large scale. An early warning system enables the affected government and donors to plan for food imports to reduce the potential of starvation.

### Sociocultural Feasibility

Remote sensing is a tool which can provide timely and cost-effective data to be used in planning and monitoring for the benefit of the rural and urban poor. Toward this goal the project provides support for training and project services. The training to be held within the region has two complementary objectives: to increase awareness of the application of remote sensing techniques to development and to develop skills in the use of remote sensing techniques. Training to increase awareness is necessary for technical people and decision-makers. Special seminars for the latter are important since these people have the authority to institute use of remote sensing within their sphere of operation.

Courses for professionals consist of both short (usually 3 weeks) and extended courses. Each course is usually discipline specific. The normal training course contains participants from various ethnic groups and different nationalities. At times even different races are present, although the trainees are predominantly Africans. The heterogenous characteristics of the course participants have not caused problems. Rather, the common professional bond has added to the value of the training experience.

"Other than the course content itself it was a most valuable experience to be exposed to differing and similar ideas exchanged with other course participants originating from different parts of Africa... The diverse experiences of participants in their careers was an interesting subject of discussion."

(Trainee, course evaluation, Remote Sensing in Geological Interpretation, September 27 - October 15, 1982)

"I've learned so much during the 3 weeks. The interaction with participants was a blessing. I've learned so much about geology, soils etc from them .. [which is] not documented in geological textbooks."

(Trainee, course evaluation, Teaching with Remote Sensing Data, July 25 - August 12, 1983)

Most course attendance records do not permit identification of the sex of the trainee. The records which do indicate the sex

show a very low proportion of women trainees , such as 2 out of 30 except for the course on Teaching with Remote Sensing Data in which 7 of the 30 trainees were women. The project will require that the Facility actively encourage women to attend and that the course attendance records indicate the sex of the participant.

Recruitment for courses is done through the Facility sending notices to individuals, departments and heads of organizations. Usually there are more applicants than number of places in a course (courses are normally limited to 30 people) so the Facility selects the participants from the list of applications. For some donor-sponsored courses, the donor representative takes responsibility for recruitment and selection. Particularly in the former case, the Facility can actively encourage women as participants by so stating in their brochures, by sending course notices to individual women, and in the selection of participants.

Training courses are given by Facility staff, technical assistants at the Facility, and short-term consultants. While the assessments of the courses by participants generally point to the high calibre of the trainers, at times they reveal weaknesses which should be addressed. The Facility should not only rely on the general summary report of the course by the individual in charge, but should periodically review the original questionnaires in order to look for improvements in organization, teaching, and technical skills. Enhancement of the Facility staff's technical skills is expected to continue under the AID project both through the provision of long and short-term technical assistants for team teaching and the provision of overseas training.

### Project Services

The Facility offers project services, which include services for training in a particular country. The services primarily center on mapping and resource analysis requested by a particular agency or ministry. In the discussions between the Facility and requesting organization, the task is clarified. This procedure appears to have worked well, although there have been difficulties in some cases due to management problems. The latter are expected to be overcome through adoption of measures recommended in the Institutional Analyses Section of the PP.

### Beneficiaries

The direct beneficiaries of the AID project will be (a) Centre and Facility staff, (b) course participants, and (c) those receiving project services. Among the Facility professional staff, one is expected to be sent for a master's degree and approximately four others will attend short-term courses in the U.S. These men (there are currently no women on the professional staff) are expected to increase their knowledge

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and skills in specialized fields of remote sensing. The training should increase their levels of confidence and be reflected in better training and other services performed.

Approximately 200 people will attend courses which are sponsored solely or partially by AID. An additional 400 people will participate in courses and seminars sponsored by other donors but involving the input of the AID long term technical assistants. As many as possible of the trainees should be women. The trainees are expected to benefit from an increased level of awareness of and skills in remote sensing technology. Approximately two-thirds of the trainees are expected to use the skills and knowledge at least occasionally when they return to their jobs. One-third are anticipated to use the skills and knowledge often in execution of their jobs. A multiplier effect will occur on a small scale, especially through the training of university teachers.

Examples from previous course evaluations serve to reveal the anticipated use of the training and training materials received.

#### Awareness

"The knowledge about the role of remote sensing as a fast tool for geological interpretation and exploration can play was indeed an eye-opener." (Trainee, Remote Sensing in Geological Interpretation course, September 27 - October 15, 1982).

"I have found the courses on remote sensing, energy studies, and assessments of forestry and fuelwood inventory extremely valuable as this is what the Wood Energy Project at home is aimed at." (Malawi participant, Forestry, Energy and Natural Resource Assessment course, April 14-May 22, 1983)

#### Development Activities

"The course will help me coordinate the current hydrocarbon exploration promotion programme more effectively" (Participant, Remote Sensing in Geological Interpretation, September 27 - October 15, 1982)

"The knowledge gained will go a long way in assisting me in my work of Rangeland monitoring and fuelwood inventory." (Forestry, Energy and Natural Resource Assessment Course, April 14 - May 22, 1983).

#### Teaching

"I thank the Facility for allowing us to obtain and produce teaching materials. These go a long way in furthering our teaching aid collection." (Kenyan participant, Teaching with Remote Sensing Data, July 25-August 12, 1983)

" I have material now which will enable me to continue from where I stopped last time. The material I had last time deals only with the introduction to Landsat data but this time it deals with the application in the field of water resource cartography and geology, and this will not be for me only but for the Institute. (Sudanese participant, Teaching with Remote Sensing Data, July 25 - August 12, 1983)

The course evaluation form which is used by the Facility should be modified to facilitate acquisition of personal testimonies on the benefits derived. The ones cited above were additional comments in response to other questions.

Furthermore, perceived and actual use of the training received may vary greatly because of intervening factors. Therefore, the Facility should undertake a follow-up assessment of the trainees to identify their application of remote sensing techniques and the use of the final product. In this way, the indirect benefits and beneficiaries can be identified. In response to a follow-up in 1982 of 179 former trainees through a mailed questionnaire to which 21 percent of the former course participants responded, 54 percent reported having used Landsat data since attending a training course. Typical uses included: 1) revision of small scale maps, 2) location of seasonal river course changes where flood protection is necessary to develop irrigation sites, 3) vegetation mapping, 4) rangeland fire monitoring, 5) soil mapping, 6) landuse change detection, 7) flood extent mapping, 8) mineral exploration, and 9) landcover type mapping.

The project activities often provide on-the-job training and sometimes course training within a country. They usually result in an end-product. Use of these end-products for planning has the potential of indirectly benefiting millions of people in East and Southern Africa. The nature of these benefits should primarily result in an improved management of natural resources and prediction of drought conditions. Prior to the completion of the project, the Facility should conduct an evaluation through a mailed questionnaire to determine the actual use of the products which result from project services.

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4/1

TRAINING THROUGH NAIROBI REGIONAL REMOTE SENSING FACILITY  
NUMBER OF AFRICAN\* PARTICIPANTS BY DISCIPLINE AND COUNTRY OF ORIGIN  
MARCH 1979- JUNE 1985

Country	Agric./ Land Use	Agronomy (French)	Forestry/ Range	Geology	Hydrology	Carto./ Geodesy	Transport Engineering	Teaching Methodology Utilizing R.S. Data	Total
-- number of persons --									
Botswana	23	-	3	1	-	3	-	2	32
Burundi	8	7	-	7	-	1	-	-	23
Comoros	1	2	-	-	-	2	-	-	5
Djibouti	-	1	-	-	-	-	-	-	1
Ethiopia	5	-	-	-	4	6	5	-	20
Ghana	1	-	-	1	-	-	-	-	2
Kenya	53	15	11	19	42	33	12	26	211
Lesotho	2	-	-	3	-	-	4	-	9
Liberia	-	-	-	3	1	-	2	-	6
Madagascar	2	5	-	3	1	2	-	-	13
Malawi	31	-	3	1	1	-	3	-	39
Mauritius	-	1	-	-	-	-	-	-	1
Mozambique	3	-	-	4	-	2	-	-	9
Nigeria	-	-	-	-	2	1	-	-	3
Rwanda	8	8	3	1	2	-	-	-	22
Senegal	1	-	-	-	-	-	-	-	1
Sierra Leone	1	-	-	-	-	-	-	-	1
Somalia	1	-	2	1	1	-	1	2	8
Sudan	10	-	5	5	8	13	3	3	47
Swaziland	1	-	6	1	2	11	-	-	21
Tanzania	30	-	28	8	10	24	20	27	147
Uganda	9	-	7	5	6	13	11	14	65
Zambia	3	-	5	9	3	12	-	-	32
Zimbabwe	12	-	2	3	4	5	2	2	30
	205	39	75	77	86	127	63	76	748

\* In addition, 12 Near East participants have been trained in agriculture and geology.

## D. INSTITUTIONAL AND MANAGEMENT ANALYSIS

### Introduction

This section examines the institutional relationships within the Regional Center for Services in Surveying Mapping and Remote Sensing (RCSSMRS) and in particular the relationship between the management of the Centre and the management of the Regional Remote Sensing Facility (RRSF) as a department of the Centre. The main concern centers on the adequacy of the management arrangements and practices. Are the perimeters of authority at each level delineated to facilitate the efficient and effective implementation of the remote sensing program? How can management arrangements and practices be improved to help ensure that the Centre's responsibilities in remote sensing can be carried out in a timely manner?

### Background

The Regional Center for Services in Surveying and Mapping was established in 1975. The RRSF began as a semi-autonomous entity, financed by AID and co-located with the Centre. The original project agreement for the establishment of the RRSF, was signed in 1977. In 1982, an amendment to the Agreement Concerning the Establishment of a Regional Center for Services in Surveying and Mapping was adopted by the Governing Council of the Centre. The amendment not only changed the name of the Centre to the Regional Centre for Service in Surveying, Mapping and Remote Sensing (RCSSMRS) but stipulated other changes relevant to the institutional relationships within the Centre, and between the Centre and Facility, as discussed below. Since 1982 the RRSF has been a department within the Centre. The management relationship between the Centre and Facility has been strained and troublesome for all involved. The recent appointment of a highly competent Director of the Remote Sensing Facility offers the opportunity for a better working relationship between the Department and the Centre management.

### RCSSMRS Structure and Responsibilities

#### Governing Council

The highest authority rests with the Governing Council which is composed of no more than two members representing cartographic and remote sensing activities from each contracting party (this term is used to refer to the member states). The meetings of the Governing Council are chaired by the Executive Secretary of the UN Economic Commission for Africa. The Governing Council is to meet at least once a year and may hold extraordinary meetings on the request of its Chairman or at least two thirds of its members.

The Council's responsibilities are:

- to define the principles governing the Centre's general policy
- to provide overall supervision of the Centre
- to submit to each contract member state, ECA and the African Remote Sensing Council, an annual report of the work of the Centre
- to apportion among the contract member state, in accordance with a scale of assessment to be agreed by it, the costs of operation of the Centre
- to approve the work programme and budget of the Centre

Technical Committee

The Technical Committee, established in 1982 by the Governing Council is to consist of:-

- (a) an expert designated by each contracting party;
- (b) one representative each of the U.N Economic Commission for Africa and the Organization of African Unity;
- (c) one representative of each of the states and organizations with which the Centre maintains active cooperation;
- (d) the Director-General and the directors of the substantive departments of the Centre; and
- (e) such experts in the fields of surveying, mapping and remote sensing as the Committee may invite to assist in its deliberations.

The Technical Committee has the following authority and responsibilities:

- (a) to examine and formulate recommendations as appropriate, on any matter relating to the objectives of the Centre that may be referred to it by the Governing Council or the Director General of the Centre or proposed by any Contracting Party;
- (b) to consider the scientific and technical aspects of the draft programme of activities of the Centre and their financing and submit its views and recommendations thereon to the Governing Council through the Director-General of the Centre; and

- (c) to meet at least once every year and at the beginning of each meeting, elect a Chairman from amongst its members.

The provision for the Committee permits an open scientific review of the Centre's program. Its meetings are usually held immediately prior to the convening of the Governing Council.

#### Tender Committee

This Committee was also established by the Governing Council in 1982. It is composed of (i) one representative each of three Contracting Parties as may from time to time be selected by the Governing Council (ii) the Director-General of the Centre (iii) the Accountant of the Centre and (iv) any person or persons invited upon the advice of the Director-General, by the Chairman to attend any of the meetings of the Committee. Anyone invited to attend any meeting of the Committee shall neither form part of the quorum of nor vote at the meeting. The Administrative Officer of the Centre is the Secretary of the Committee.

As to its functions, the Council stipulated that the committee shall authorize all purchases or hire of equipment, supplies or services worth over US\$5,000, but not exceeding US\$50,000; and that for all purchases or hire of equipment worth more than US\$50,000 the Committee shall make its recommendations to the Governing Council. The Committee is to submit a report on all its activities to the Governing Council.

In respect of purchases or hire of equipment, supplies or services below US\$5,000 the Director-General of the Centre has the authority to conclude contracts for the purchase or hire of such equipment, supplies or services. In exercising these powers, the Director-General is to ensure that goods and services are obtained from the cheapest supplier without foregoing quality. It is also stipulated that the Director-General shall be advised by a Committee established by him, and shall submit a report on actions taken by him to the Governing Council. The Director-General informs us that he has set-up such a Committee, and it comprises the Director-General himself, the Director of Technical Co-ordination, heads of Departments, and the Finance and Administration Officer.

#### Appointments and Promotions Committee

At the last meeting of the Governing Council held in June 1985 provisions were made for an Appointments and Promotions Committee. In the case of Professional and Technical Staff the membership is to comprise: (i) a member of the Council designated by the Chairman of the Council as Chairman; (ii) another member of the Council designated by the Council (iii) the Director-General who shall also be Secretary to the Committee (iv) heads of Technical Departments that can assist the Committee in the discharge of its functions and (v) one

external assessor nominated by the Director-General in consultation with the Chairman of the Council.

In the case of General Service Staff the membership is to comprise (i) the Director-General as Chairman (ii) the Director of Technical Co-ordinations (iii) all Heads of Departments concerned and (iv) the Administrative and Finance Officer who shall also be the Secretary to the Committee.

The Committee for Professional and Technical Staff may set up an interview panel. Its recommendations are to be submitted to the Governing Council for approval. While the Committee for Professional and Technical staff is to interview candidates for the posts of the Director-General, the Director of Technical Co-ordination and Heads of Technical Departments, the Governing Council may seek additional approvals from Governments of member States for the recruitment to the three categories of posts at the Centre. The Committee for the General Service Staff, on the other hand, shall make its recommendations to the Director-General who has the authority to make appointments, although he is to inform the Governing Council about them. In the past the heads of departments made recommendations on renewal of contracts and promotion of professional staff for the review of the Director General. Then, he submitted his recommendations to the Council for approval. Under the new provisions the Committee is to interview candidates. The exact process is not clearly specified; for example, it is unclear if the Director General has a review function prior to submission to the Committee.

#### RCSSMRS

The RCSSMRS is organized into five departments viz: (a) Administration and Common Services (b) Engineering (c) Geodesy (d) Mapping and (e) Remote Sensing. To appreciate their relative weights, the details are as follows:

##### (a) Administration and Common Services

This comprises (i) the Office of the Director-General, with the Director-General and one personal Secretary. (ii) the office of the Director of Technical Co-ordination with the Director of Technical Co-ordination and a personal Secretary, (iii) library office, with the Chief Librarian, two Secretaries a library assistant and library clerk. It also includes the Office of the Finance and Administration with: Administrative and Finance Officer; two Secretaries, one security protocol officer, one store-keeper, three accounts clerks, one telephone operator, one driver, one registry clerk, one typist, two messengers, six watchmen, four cleaners, one temporary assistant. All these posts are filled.

##### (b) Engineering Department

The functions of the department are:

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- Maintenance, calibration and repair of all geodetic instruments, calculators, mini computers, microprocessors, communication radios, photogrammetric instruments and cameras.
- Installation and commissioning of photogrammetric instruments, enlargers and printers.
- Advisory services in regard to purchase of survey instruments and equipment.
- Training of technicians from member countries in the care, calibration and repair of survey instruments.

The position of Senior Engineer is provided for but is vacant. The other positions are: two electronic engineers, one optical engineer, one optical technician, two junior optical technicians (one of which is vacant), one junior electronic technician, one driver and one office attendant. All these positions are filled, except one.

(c) Geodesy Department

The department has the following functions:

- Network analysis, evaluation and strengthening .
- Execution of the African Doppler (ADOS) project and post processing of ADOS results. Archival and distribution of ADOS data.
- Provision of Doppler Survey for various uses such as geodetic control, engineering, cadastral and oil exploration.
- Establishment of EDM calibration baselines and of hydrographical survey services.
- Carrying out aerial photography, processing of aerial photography, and so forth.
- Consultancy in various surveying and mapping fields.

The position of Senior Surveyor is provided for but is vacant. The other positions in the department are two surveyors, one navigator/camera operator, two field assistants, two technicians, one computer assistant, and four drivers Only three of the latter positions are vacant.

(d) Cartography Department

The following functions are allocated to the cartography Department:

- Thematic mapping of various natural resources.
- Topographic mapping from low altitude aerial survey.
- Application of satellite imagery to develop inexpensive techniques for topographic mapping.

The position of Senior Cartographer is provided for but is vacant. In addition, there is one cartographer, one draughtsman, one assistant lithographer (which is vacant), and one lithographic Assistant. There is also a Map Advisor

financed by IDRC. It is not known whether IDRC will continue financing this position, failing which there are proposals to absorb the incumbent into the establishment.

(e) Regional Remote Sensing Facility

A new Director assumed his duties in October 1985. The position of Deputy Director has been provided for, but is vacant. Owing to the need to mobilize finances for putting up Block C building, Deputy Director post has been put temporarily in abeyance. A Programme Manager, the Photo Scientist, and the Image Analyst Specialist are financed by USAID. There is one French expert financed by the French government. Since 1980 the RCSSMRS has provided for the services of an Image Analyst Specialist who is in charge of the Browse File. An expert on range management joined in March 1981 as an Applications Specialist and is in charge of User Assistance. An agriculturalist was recruited in June 1982 and assists with training.

Apart from the senior staff members enumerated above, the RCSSMRS has also provided supporting staff. There is an Administrative Assistant (who works only part-time for the Facility because of the Centre coopting her time); one Personal Secretary; one Accounts Clerk/Typist (the position is vacant because the person has been transferred to Administration and Common Services Department); three Laboratory Assistants; one Browse Clerk; and one driver.

Management of the Center

The Director General

The overall management of the Centre is vested in the Director General. He has the responsibility to submit the work program and budget of the Centre to the Technical Committee for consideration. Then he submits its recommendation and the draft program and budget to the Governing Council for approval. Thereafter he is "carry out the work program in accordance with the decisions of the Governing Council."

Also, he is to "conclude, at the request of the member states of the Economic Commission for Africa and in consultation with the Chairman of the Governing Council, arrangements for the provision by the Centre of technical services in the field of services in surveying, mapping and remote sensing." He also has the authority to "approve applications for practical training at the Center." He is charged with coordination of the work of the Centre with that of the Economic Commission for Africa, the African Remote Sensing Council and other organizations interested in the subject of such services.

The Director-General is the link between the Center and the Governing Council as an ex-officio member of the later. He is

answerable only to the Council. To the extent that the Centre is successful the Director-General is reflected in a positive light. To the extent that the Centre is not successful, he is equally reflected in a negative light. Thus, he has the basic responsibility to see the the programs approved by the Governing Council are carried out competently and in a timely manner.

In carrying out these functions the Director General is dependent upon the heads of departments, to whom authority is delegated formally through their job descriptions and informally by the Director General. However, there is a crucial factor which has to be taken into account in the extent to which the delegation of powers is to be effected and the oversight required from the Director General. As indicated above, the technical departments of engineering, geodesy and cartography have professional staff of only P2/1 level. Engineering has three P2 and one P1, and there is a vacant post of Senior Engineer at P3 level. Geodesy has three P2 staff and the P3 position of Senior Surveyor is vacant. Mapping has one P2 staff member, an advisor financed by the International Development Research Council, and a P1 post vacant.

In contrast to the other departments, the Regional Remote Sensing Facility has the post of Director at P4, a vacant P3 post for a deputy director and three posts established at P2. In addition, there are three senior professionals financed by AID and one senior professionals financed by the French. Furthermore, the Facility has over seven years of experience of managing its affairs independently and successfully. Therefore, while one would expect the Director-General to more closely supervise the day to day operations of the engineering, geodesy and mapping departments, until they have more senior and more experienced directors, it would not be productive if the same surveillance were applied to a mature department like the Remote Sensing Facility. In fact, it would be a poor allocation of time because of the other more demanding tasks of the Director-General.

This has been tacitly recognized by the Governing Council in its decision on the level of qualifications, emoluments and responsibilities of the Director of the RRSF.

#### Job Description of the Director of the Facility

In advertising the post of Director of the RRSF, the following were the requirements, which were approved by the Governing Council:

##### i) Qualifications and Experience

- A post graduate degree equivalent to a Ph.D. or M. Sc. in land surveying, photogrammetry, cartography, geology or a closely related scientific field from a recognized university;

- Specialized training in remote-sensing either as part of or an undergraduate or post graduate course;
- A minimum of 10 years post qualification experience which should include the application of remote sensing technology to resource projects, 2-4 years teaching experience at university level and a proven record of strong leadership and good administrative ability.

ii) Duties and Responsibilities

- Supervision of expatriate and local staff assigned to the Remote Sensing Facility and ensure its smooth day to day running; Initiate and supervise the planning, design and implementation of training courses, seminars and workshops conducted both at the Centre and in countries of member states;
- Maintain close contact with remote sensing users in the centre's catchment area to ensure that information is disseminated and that remote sensing data are made readily available as needed;
- Organize and oversee demonstration projects at the request of member states;
- Ensure proper utilization of all equipment assigned to the Remote Sensing Department including maintaining an up to date inventory, vehicle log books and proper maintenance, insurance and securing of all equipment;
- Liaise regularly with international and bilateral development assistance organizations operating in the region to ensure collaboration on projects and training as appropriate;
- Exercise good financial management in accordance with approved regulations;
- Prepare programmes of activities which will ensure the rapid adoption of remote sensing techniques as essential tools for planning, utilization and development of natural resources.

The qualifications and duties as enumerated in the job description indicates the confidence placed in the holder.

Programming and Budgetting

Planning, programing and budgeting are part of the responsibilities of the Director of the Facility as stipulated in his job description. However, his authority vis a vis others is not clearly delineated.

Planning for the Facility, and the Centre in general, involves different life-lines. In 1984 the RRSF presented a Ten Year Development Plan to the Governing Council. The Governing Council noted the Plan, and although considering it a good basis for planning, directed that it be recast into a five year plan and incorporated into the Centre's Five Year Plan for the period beginning July 1986. This plan will be presented to the Governing Council for approval. The approved plan would then be submitted for adoption by a Conference of Plenipotentiaries during the first half of 1986. The latter conference is important since at such conferences the member states pledge themselves and commit their governments to the plan. Afterwards the annual work programs will be developed along the lines set forth of the Five Year Plan. In particular the Five Year Plan is plans expected to specify general program directions, requirements for additional staff and funds required to support the centre.

The Centre's annual work plan is anticipated to provide a outline of the work to be carried out by each department during the year and to stipulate the budget required by each department. Ideally, prior to devising each annual plan the RRSF would have secured outside funds for special training and projects. If not, then the plan should be flexible to allow modifications in allotment of staff time and in expected revenues from parties other than member states.

The responsibility for preparation of the annual work program in remote sensing, including a plan for projects, training schedules, staffing and the budget, ought to rest with the Director of the Facility. However, the plan should be done following the policies established by the Governing Council, taking into the account the Five Year Plan (once it has been approved), and in direct consultation with the Director General and other department heads when their involvement is required.

The budget needs to reflect not only the required revenue from various sources, i. e. donors and member states, but also anticipated income from sale of services. For example, the budget ought to reflect the sales of satellite imagery products against costs of materials needed for the photo laboratory. Funds generated from user services must initially be used to equip the remote sensing computer room and classroom. Therefore, it ought to cover other expenditures of the Facility. All recurrent and developmental expenditures ought to be projected.

The annual work plan and budget for the Facility then should be submitted to the Technical Committee through the Director General. Once the remote sensing annual plan, which will be one part of the overall Center plan, has been approved by the Governing Council, implementation of it and administration of the budget should be the responsibility of the Director of the Facility.

The Center must have an accounting mechanism which will permit an easily accessible record of all income generated by the RSSF and its use. The Director of the Facility should be responsible for overseeing that requisite records are kept on income and use of donor contributions, services and the Center. It is through such records that the Governing Council will be able to monitor the extent to which the Facility can serve to generate income and hence be at least partially self-financing. Such a mechanism is in keeping with the Governing Council's discussions on charges for services at its June 1985 meeting.

#### Contracts for Projects and Training Courses

The Centre has the authority to enter into contracts. The Director General has the power to "conclude, at the request of Governments of States members of the Economic Commission for Africa and in consultation with the Chairman of the Governing Council, arrangements for the provision by the Centre of technical services in the field of surveying, mapping and remote sensing." The job description of the Director of the Facility stipulates that he "liaise regularly with international and bilateral development assistance organizations operating in the region to ensure collaboration on projects" and to "prepare programmes of activities". The exact authority to initiate and negotiate contracts is unclear.

If the Centre's Remote Sensing Facility is to carry out its stated role in the region the base of financial support must be broadened. To do this, the Director of the Facility because of his technical competency in remote sensing, should be free to generate funds for training courses and projects through his professional contacts. These activities ought to be in keeping with the policy of the Center and build upon the general direction as set forth in the Five Year Plan and not require additional recurrent expenditures which have not already been budgetted. He should be able, in consultation with the Director-General, to negotiate the terms of contracts keeping in mind that it is the prerogative of the Director General to "conclude" arrangements. Designation of this authority to the Director of Facility would not remove the power of the Director General to conclude arrangements. Rather it places this time consuming duty as a major responsibility of the Director.

#### Procurement for the Facility

Procurement of commodities must follow the guidelines laid down by the Tenders Committee. Until recently procurement for the Facility was done by the AID contractor. Since then, the Facility has been procuring items such as photo lab materials through the Centre and then billing USAID for repayment. There has been a distinction between those commodities funded by donors and those obtained through the Centre's recurrent budget.

The job description of the Director of the Facility only specifies that he be responsible for proper utilization of equipment. Expendibles such as office supplies and photo laboratory supplies should also be under his direct management.

Small consumable office supplies, as well as appropriate non-consumable commodities should be kept in a supply room or store within the Facility. The maintenance of an inventory and a log book for each vehicle is the direct responsibility of the Director, as stipulated in his job description. Having such responsibility for supplies and equipment, should enable the Director to make realistic annual budgets for the Facility requirements.

#### Staff Selection, Promotions and Work Assignments

As stated above the Governing Council has recently established an Appointments and Promotions Committee. Nevertheless, the decision on the allocation of new positions has not been clarified. It should be the responsibility of the director of each department to prioritize his new staff requirements during the process of setting out the annual work plan. This is expected to occur in the Five Year Plan for the Center. Also, the responsibility for writing the job description has not be specified. Given that the department head is most familiar with the work to be done, it should be the head of the department who submits the job description, in consultation with the Director General and through his office, to the technical committee for approval.

No provisions have been made for short-listing of job candidates. Consideration should be given to instituting an in-house ad-hoc committee which in the case of professional staff should consist of the Director-General, the Director of Technical Cooperation, the Director of the Department and an independent expert from local sources invited by the Director-General on the advice of the Director of the Department. When the position to be filled is the director of a department then the Appointments and Promotions Committee should do the short-listing.

It is also considered advisable that there be instituted in each case, an ad-hoc in-house short-listing committee for General Service staff. The core membership would be the director of the department, the Administrative and Finance Officer and other members designated in accordance with the area of specialty.

The ad hoc committees should then submit a report stipulating the criteria used in selection of the short-list of candidates and the results of their deliberations to the appropriate Appointments and Promotions Committee.

Once staff have been appointed to the Facility, they ought to be under the direct supervision of the Director, as in his job

description. This supervision should include assignment of tasks, following a quarterly work plan drawn up in consultation with staff members, as explained below.

Communication

The Director-General holds a monthly meeting of the heads of Center. He also normally has informal meetings with individual head of departments at least three times a week. The monthly meetings serve not only to inform the Director General of actions in each department, but also to allow the heads to know about the work in other departments. It is also a useful mechanism for assuring coordination among departments, when required.

If the monthly meetings were complemented by quarterly reports, the reports could be a useful tool for monitoring by the Director-General and lessen the need for each frequent informal weekly meetings with each head of department.

To permit the Director General to oversee the work of the Facility, the Director ought to submit quarterly reports showing the plan of work for the forthcoming quarter and actual achievements based on the forward plan for the quarter just ended. The forward plan ought to stipulate for each major activity the main actions to be carried out, the dates each should begin and be completed, and the staff to be involved. In reporting on the quarter just ended, the format similar to the forward plan ought to be used, stating actual date each main action was begun, completed, and current status. It should also state the actual staff involved, and explain any reasons for deviation from that planned.

Consultant Report  
by  
David P.S. Wasawo

I. Introduction

1. The purpose of the paper is to examine the institutional relationships within the RCSSMRS and in particular the relationship between the management of the Centre and the management of the RRSF of the Centre.
2. AID's concern that this analysis be carried out was probably precipitated by the resignation of the Director of the Facility, which AID thought was due to a deficient management relationship between the Director-General of the Centre and the Director of the Facility.
3. On the other hand the management of the Centre sees the problem as that of fully integrating a department into the Centre which is constitutionally led by the Director-General.
4. It is suggested that events leading to that resignation were perhaps broader in origin and that the resignation per se not be pursued.

II. BACKGROUND

1. As a result of requests for assistance from developing countries, in the wake of AIDSAT Demonstration, USAID decided in early nineteen seventies to set up regional training centres in remote sensing. An agreement was subsequently reached to co-locate the RRSF to serve the Eastern and Southern African countries, with the recently established RCSSM in Nairobi.
2. It was clear from the terms of the Agreement, that the RRSF was an independent entity within the RCSSM; financed entirely by USAID, with a USAID employee as the Director; answerable to USAID, but working in continuing consultation with the Director-General of the Centre, including the latter's approval of project personnel.
3. The RRSF major gains from the Centre were the provision of accommodation and the umbrella provided by the Centre, so that USAID would not have to go through the processes of negotiating a headquarters agreement with the host country as well as agreements with other member states.

4. In return, USAID would approve the Centre's capability to provide technical assistance in remote sensing training of its personnel; and would provide its photo lab with equipment and materials. Upon termination of the Agreement, USAID would leave, for the use of the Centre, field equipment (including vehicles and cameras), photolab equipment, furniture and library reference materials.

### III. DEVELOPMENTS

1. The first evaluation at the end of 1978 noted weaknesses in communication between REDSO/ESA and AFR/RA and suggested improvements. It expressed concern that due to poor administration of the Centre, member states and donors were losing confidence in the Centre and therefore not giving it the necessary support. The evaluators feared that the RRSF might suffer through "guilt by association" and suggested that if Kenya were to build the proposed remote sensing satellite receiving station then consideration be given to relocating the RRSF.
2. Four months later an "in-depth" evaluation having noted that the Centre now appeared to be a viable institution recommended that the Facility remain adjunct of the Centre. It also recommended urgent recruitment of counterpart staff particularly the Director; and suggested that the Centre should have an advisory review role over planning and budgeting for the Facility; and that consideration be given to instituting a mixed donor/user forum.
3. The second agreement between the RCSSM and USAID was signed on 10 July 1979, four months after the "in-depth" evaluation. It confirmed the independence of the RRSF from the Centre, with the former still run by USAID direct-hire employee as Director, but this time reporting to a program manager sitting in REDSO/ESA offices. It committed the Centre to provide resources (not less than the equivalent of US\$276,000 including costs borne on an "in-kind" basis) required to carry out the project effectively. It required the parties to recognize that the establishment of an African Remote Sensing Council (ARSC), and perhaps, a regional receiving station in Kenya may warrant a re-examination of the relationship. Of more significant was that "the Grantee covenants that title to all project commodities financed by AID under this or any prior agreement will be vested in AID" -- a negation of Article VI (g) of March 1977 Agreement. The second agreement did not, however,

address the problem of the Centre's advisory role in the Facility's planning and budgeting, nor the need for donor/user forum.

4. During the next four years the Centre assumed responsibility for all local staff salaries, and also recruited the Director and three counterpart staff for the Facility. However, the suggestions made by Bebout that steps be taken to integrate Facility accounts with those of the Centre; that the Centre's deliberative organs review Facility's programs; and that every effort be made to merge Facility activities and operations directly with the Centre; were not acted upon. The Governing Council, notheless, decided to change the name of the Centre to Regional Center for Services in Surveying, Mapping and Remote Sensing (RCSSMRS) thus incorporating RRSF as a department of the Center.

#### IV. CURRENT POSITION

1. Amendment No. 1 (1982) to the Agreement made a number of changes of institutional interest. One such change was that one of the objectives of the Centre would be to function as the Regional Management Committee of the ARSC with respect to remote sensing activities in Eastern and Southern Africa. Henceforth the Centre would also operate under the aegis of the of the ARSC.
2. Under the Amendment, membership of the Governing Council was strengthened to reflect remote sensing interests. The Technical Advisory Committee was remodelled into a Technical Committee with a new mandate and membership.
3. During the same year a Tender Committee was established, and more recently (June 1985) the Appointments and Promotions Committee.
4. The RCSSMRS is organized into five departments: The Administration and Common Services Department, the Engineering Department, the Geodesy Department, the Mapping Department and the Regional Remote Sensing Facility.
5. It is interesting to note that the Conference of Ministers of Economic Commission for Africa set up an Ad-Hoc Committee to evaluate the multinational institutions established under the aegis of ECA and OAU.
6. The Ad-Hoc Committee recommended and the Conference of Ministers accepted that the Cartographic

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operational institutions namely the Regional Centre for Services in Surveying, Mapping and Remote Sensing (RCSSMRS), the Regional Center for Training in Aerial Surveys (RECTAS) and the Regional Remote Sensing Centre at Uagadougou (CRTO) should be retained as individual institutions; but that the African Remote Sensing Council, and the African Association of Cartography (AAC) should be merged.

## V. ISSUES AND RECOMMENDATIONS

### 1. THE CENTER, THE FACILITY AND AID

- a) The Facility started off as an independent entity and for various reasons AID was uncertain about its future permanent location. A number of options were mentioned such as the Center itself, the Regional Management Committee of the ARSC, UNEP, etc. At the same time AID encouraged the Center to assume more and more responsibility for the Facility, culminating in the Governing Council making a decision to absorb it.
- b) Up to now however, there has been no revision of the 1979 Agreement that this be effected.
- c) The Facility is a child of AID but adopted by the Center which has its own children. It is to be hoped that AID will not abandon its child now that it has been adopted by the Center, that the Center will not prefer its own children to the newly adopted one, and that both parents, AID and the Center will actively seek uncles (in the form of donors) for the Facility, so that the latter can get the wherewithal to get married and produce children in the form of more effective training and project work.
- d) In view of the likely institutional developments in the field of remote sensing such as the building of a receiving station, and in view of the advantages that accrue from a familiar name, it is suggested that the department retain the name of the 'Regional Remote Sensing Facility, but without retaining the letter heads on note paper.

### 2. THE CENTER, THE FACILITY AND ARSC

In view of the relationship between the Centre and ARSC, and the recently approved merger of the ARSC and AAC, it is recommended that consideration be given to the RCSSMRS either being a member of the

merged body or at least being in attendance at its meetings.

3. THE MANAGEMENT OF THE FACILITY

- a) The overall management of the Center including the Facility is vested in the Director-General who carries out these functions though delegation to Heads of Departments. The Centers development, however, is such that the professional departments of Engineering, Mapping and Geodesy do not have the same professional staff endowment in terms of seniority and numbers as the Facility. Moreover, the job description of the Director of the Facility is quite explicit in certain key areas of management. It is therefore recommended that in delegating to the Director of the Facility, the Director-General take into account the relative maturity of the Facility as indicated in his job-description.
- b) It is recommended that, although the responsibility for the preparation of a Work Program for the Facility lies with its Director, he should carry out these responsibilities through extensive consultations, including those with the Director-General, the Director of Technical Co-ordination, other Departments of the Center, the Member States, organizations and individuals as well as Donors. A document prepared by the Director will then go to the Heads of Departments meeting for consideration and for the preparation of a consolidated Center's Work Program to be presented to the Technical Committee. The Technical Committee has a broad-based professional representation, including Donors and Heads of Departments. The Director of the Facility will therefore be on hand to explain his Work Program, and if need be, to defend it.
- c) It is recommended that it be the responsibility of the Director of the Facility to determine his staff requirements, that these be the subject of review by the Heads of Departments meeting before being presented to the Technical Committee for consideration, and that once accepted, it should be his responsibility to write job descriptions for advertisement. Following advertisement, an ad-hoc in-house short-listing committee should be instituted in each case and their reports made available to the Governing Councils' Appointments and

Promotions Committee. Once the staff are appointed and deployed, they should be entirely under the Director of the Facility.

- d) With regards to the procurement for the Facility, a Tender Committee now exists, and it is recommended that once requirements in materials and equipment are identified by the Department and approved by the Governing Council, their procurement be subject to the Tender rules and regulations, except in so far as these may be affected by agreements with donors. Once procured, the Facility will be responsible for their proper use, and will maintain an up-to-date inventory which should be reported quarterly to the Central Administration.
- e) As to contracts for projects carried out by the Facility, the person who will be doing the "leg-work" will be the Director of the Facility. He should therefore be free and unfettered in generating the projects, and should be enabled, in consultation with the Director-General to negotiate contracts subject to these being concluded by the Director-General through the normal tender machinery.
- f) Current communication channels within the Center comprise: monthly Heads of Department meetings with the Director-General; and the latter's informal meetings with individual Heads of Departments. It is recommended that these channels be maintained, but that they be supplemented with quarterly departmental reports. Consideration should be given to instituting "tea-breaks," workshops and seminars. The Director of the Facility should be enabled to communicate professionally with institutions, individuals and donors.
- g) The Facility itself should be strengthened by bringing forward the appointment of Deputy Director and Forest Application Specialist to 1986 and Hydrogeology Application Specialist to 1987. It is also recommended that the Center enter into discussion with AID to see how best the "Expert Team" for Resource Assessment (EXTRA) concept can be more effectively implemented and provided for.

DIRECTOR OF REMOTE SENSING

Responsible and reporting to the Director General for the discharge of the following:

1. To provide necessary leadership in co-ordinating, monitoring and controlling the activities of the Remote Sensing Department.
2. To initiate and supervise the planning, design and implementation of training courses, seminars and workshops conducted both at the Centre and in countries of the Member States.
3. To institute effective supervision of expatriates and local staff assigned to the Remote Sensing Department.
4. To have an up-to-date data on development in remote sensing techniques and technology.
5. To maintain close contact with remote sensing users in the Centre's catchment area to ensure that information is disseminated and that remote sensing data is made readily available when needed.
6. To prepare programmes of activities which will ensure the rapid adoption of remote sensing techniques as essential tools for planning, utilization and development of natural resources.
7. To ensure proper utilisation of all equipment assigned to the Remote Sensing Department including maintaining an up-to-date inventory, insurance and security of all equipment.
8. To liaise with all donors in matters relating to the Remote Sensing Department and furnish reports of all discussions. Any discussions with any Donor must be ~~pre-arranged~~ <sup>pre-arranged</sup> prior to consultation with the Director General and/or Director of Technical Co-ordination.
9. To liaise regularly with the international and bilateral development assistance organisations operating in the region to ensure collaboration on projects and training requirements of the sub-region.
10. To initiate negotiations for technical assistance with Donors (in addition to REDSO) to the Centre in support of approved programmes.
11. To exercise prudent financial management of the Remote Sensing and strive to achieve budgeted levels of revenue and expenditure.
12. To assist in achieving corporate objectives of the Centre and work towards enhancing inter-departmental coherence and cooperation by promoting community spirit.
13. To provide regular and frequent advice to the Director General and Director of Technical Co-ordination on matters relating to the functions of the Remote Sensing Department. Where

possible this should be done on a formal and informal basis twice to three times a week if not more frequently.

14. To attend meetings of the Heads of Departments.
15. To seek authorisation from the Director General for all trips outside the station within and outside Kenya and submit reports on return from such trips.
16. To make quarterly reports to the Director General on the performance and activities of Remote Sensing Department for distribution to the Centre, ECA and donors.
17. To perform such other functions as the Director General and/or Director of Technical Co-ordination may, from time to time, direct.

V A C A N C Y

The Regional Centre for Services in Surveying Mapping and Remote Sensing, which is an Inter-Governmental Organization established under the auspices of the U.N. Economic Commission for Africa, invites applications from suitably qualified persons for the following post.

Vacancy: Director, Regional Remote Sensing Facility (Department)

No. of Posts: One

Level:

P4 (US\$ 18,620 x 420 - 22,400)

Remote Sensing Department:

The Remote Sensing Facility (Department) which is a fully fledged Department of the Centre, is responsible for the promotion of the use of remote sensing technology by scientists and policy-decision makers involved in natural resources development and environmental control. The Facility, therefore, requires as its Head, a highly qualified and experienced national of East and Southern African Member States of ECA/OAU, with a strong background in mathematical and earth sciences and a good knowledge of digital computer processes.

Qualifications and Experience:

The candidate must possess the following qualifications:

- a) a post graduate degree equivalent to a Ph.D. or M.Sc. in Land Surveying, Photogrammetry, Cartography, Geology or a closely related scientific field, from a recognised University;
- b) specialised training in remote-sensing either as part of or an under-graduate or post-graduate course;
- c) a minimum of 10 years post qualification experience which should include the application of remote sensing technology to resources projects, 2 - 4 years teaching experience at University level and proven record of strong leadership and good administrative ability.

Duties and Responsibilities:

- a) Supervision of expatriate and "local" staff assigned to Remote Sensing Facility (Department) and ensure its smooth day-to-day running.
- b) Initiate and supervise the planning, design and implementation of training courses seminars and workshops conducted both at the Centre and in countries of Member States.
- c) Maintain close contact with remote sensing users in the Centre's catchment area to ensure that information is disseminated and that remote sensing data are made readily available as needed.
- d) Organise and oversee demonstration projects at the request of Member States.
- e) Ensure proper utilization of all equipment assigned to the Remote Sensing Department including maintaining an up-to-date inventory, vehicle log books and proper maintenance, insurance and security of all equipment.
- f) Liaise regularly with international and bilateral development assistance organisations operating in the region to ensure collaboration on projects and training as appropriate.
- g) Exercise good financial management in accordance with approved regulations.
- h) Prepare programmes of activities which will ensure the rapid adoption of remote sensing techniques as essential tools for planning, utilisation and development of natural resources.

Contractual period:

Two years subject to extension upon satisfactory performance.

Duty Station: The duty station for occupiers of the above post will be Nairobi.

Applications: Applications must be submitted on the application forms available from Headquarters of national survey organizations and from the Headquarters of the Regional Centre for Services in Surveying Mapping and Remote Sensing. Applicants must enclose copies of degree/diplomas and supply the names of not less than three non-consanguineous referees. In addition, applications from candidates in current employment must be routed through their employer. Applications which do not fulfil these conditions will not be considered.

All applications should be sent to: The Director General,  
Regional Centre for Services in  
Surveying Mapping & Remote Sensing,  
P. O. Box 18118 Nairobi, Kenya

CLIMATIC IMPACT ASSESSMENTS FOR SUB-SAHARAN AFRICAUSDA Activity

The U.S. Department of Agriculture, Economic Research Service, International Economics Division, Africa and Middle East Branch, is actively involved in making crop and livestock area, yield, production, and trade projections for the countries in the ESA region.

ERS/IED/AME is located at 1301 New York Ave., N.W., Room 732, Washington D.C. 20005-4788, (202) 786-1626. As of the date of this Project Paper the branch chief was Dr. Cheryl Christensen who visited the RRSF and discussed possible future cooperation with it in August 1985.

The ERS crop estimates are published periodically by USDA, and are a major world reference, in addition to FAO's, on agricultural statistics. ERS estimates for ESA are based on a variety of sources including weather information, status reports from USDA Agricultural Attaches, reports from AID Missions, host country data, etc. The following explains how remote sensing technology may be utilized to support USDA crop estimating efforts. While this is not currently a part of the present project, it is an example of a project development support activity which may be developed as a result of general support to the RRSF under this project:

The Regional Remote Sensing Facility's data and analytic capacity could be used to support better monitoring of agricultural production in two ways.

First, LANDSAT imagery can be used as a basis for improving agricultural data collection. One of the most reliable methods for collecting agricultural data relies on samples selected from an area frame. Data collected for the properly selected sample areas can be expanded to provide accurate estimates of national (or provincial) crop production. Constructing an area frame requires accurate mapping materials-often a major constraint in African countries. LANDSAT imagery can provide a basis for area frame construction - even in regions which have not been previously mapped.

Second, LANDSAT imagery can contribute to on-going efforts to improve early warning systems. Relatively low cost monitoring of vegetation patterns can be achieved using low resolution imagery (as the NOAA project does). Such monitoring can identify problem areas, which merit coverage with higher resolution, more expensive, LANDSAT imagery, as well as efforts to get better ground truth, coordination between low and high resolution imagery can provide on accurate, yet cost effective, early warning system.

## BACKGROUND FOR AID/REDSO

The NOAA/NESDIS Assessment and Information Services Center (AISC) is using climatic impact assessment technology to support drought/disaster early warning and technical assistance objectives of AID. This Early Warning Program for the developing world has evolved in two phases: (1) Global project activities during 1977-1985, and (2) An upgraded project for Africa beginning in 1985.

In Phase I (1977-1985), the AID Office of U.S. Foreign Disaster Assistance (OFDA) supported AISC in the development and operation of a global drought early warning and crop condition assessment program (80 developing countries) and the transfer of the technology through various levels of technical assistance involving 30 countries. In this context, daily rainfall reports from the countries and satellite cloud photographs are used by AISC to identify drought, qualitatively assess drought impact on subsistence food crops, and determine the potential for drought induced food shortages. Verification studies of AISC assessments, which are provided by priority cable to U.S. Missions, have demonstrated that severe drought impact on crops can be reliably assessed by at least 30 days before the beginning of crop harvesting -- this could represent as much as a 3-6 months early warning alert on the potential for food shortages.

Because the system has proven to be reliable and inexpensive to develop and operate, AID/OFDA has supported requests of interested developing countries for AISC technical assistance. The technology transfer component has involved policy level seminars to develop country plans (which organize, coordinate, and implement national assessment programs involving the National Meteorological Service, Ministry of Agriculture and appropriate food security management agency), professional training courses (for agro-meteorologists, ag-statisticians and agricultural economists with training within the region and in the United States), in-country visits by AISC representatives and inexpensive micro-computers to develop and use assessment models.

Beginning in May 1985, AID approved a significantly expanded and technologically upgraded NOAA/NESDIS project (May 1985 - September 1986) as one contribution towards the drought/food shortage rehabilitation and recovery process in the Sahelian countries, Sudan, Ethiopia and Somalia. This new program has as its goal the improvement in the capability of the host-countries to operationally assess the impact of weather on agriculture (food crops and rangelands) and to use these assessments for agricultural crop forecasting, agricultural policymaking and rangeland management. Under this project, AISC prepares Monthly Special Climatic Impact Assessment Reports during the crop season and provides in-country technical assistance to explain how the assessments can be used as input for decision making. During the period July-October 1985, Special Assessment reports were air-expressed to U.S. Missions and host-countries each month. Updates were provided by cable every 10 days. In addition, quantitative crop yield forecasts for millet and sorghum by administrative region in each of the

11 project countries were provided by cable during early September and October 1985. AISC representatives visited the Sahelian Countries during July 1985 and all project countries (except Mali and Ethiopia) were visited during October and early November 1985.

The new project was funded by AID/OFDA through FY 1986 and is being jointly managed by OFDA and the AID Bureau for Africa (AFR/TR, AFR/PD, AFR/SWA, and AFR/RA) in coordination with AID/ST/FNR. The 1986 assessments will be further upgraded (particularly for Sudan, Ethiopia and Somalia where consensus, baseline average crop yields must be determined) and expanded to include additional crops. Various types of professional training courses will also be conducted jointly by AISC and the Regional AGRHYMET Center/Niamey. The project also has provisions for introducing the technology to interested countries of the eastern and southern African regions by conducting a professional training course in Nairobi. (The attached State Department cables provide additional information).

Climatic impact assessment technology is an important tool for agricultural/rangeland monitoring in the semi-arid regions of Africa because rainfall variability is the single most important factor that determines year-to-year changes in crop yield and the total amount of vegetation/biomass cover. NOAA's daily meteorological satellite data are the foundation for the new project. These data permit detailed interpolation of rainfall amounts between weather stations to identify drought pockets and also permit a direct analysis of the relative amount and vigor of total biomass conditions. Satellite derived color-coded images and various types of vegetation indexes are extremely useful in detecting drought and assessing its impact on crop conditions including quantitative crop yield forecasts.

The NOAA-9 polar orbiting satellite provides daily coverage based on the Advanced Very High Resolution Radiometer (AVHRR). AISC's assessments are mostly based on 5 kilometer resolution data for all of Africa. These GAC data -- for Global Area Coverage -- are available in Washington through NOAA/NESDIS. The satellite also stores a very limited amount of Local Area Coverage data (termed LAC) which has a resolution of one kilometer. African receiving stations for the data would be of two types: APT (cloud photos) and HRPT (digitized data from a satellite tracking station). The HRPT - High Resolution Picture Taking - type of station provides one kilometer resolution data for digitized image analysis such as used by AISC. Several countries can receive APT cloud pictures but no developing countries have an HRPT station.



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL ENVIRONMENTAL SATELLITE DATA  
AND INFORMATION SERVICE

ASSESSMENT AND INFORMATION SERVICES CENTER  
CIAD/Models Branch  
Room 200 Federal Building, 601 E. Cherry  
Columbia, Missouri 65201

DATE: December 5, 1985

TO: Joan C. Hock, E/AI  
Russell A. Ambroziak, E/AI4  
Clarence M. Sakamoto, E/AI41

FROM: Lou Steyaert, E/AI41 *J. Steyaert*, E/AI41

SUBJECT: Report on Official Visits to Niamey, Niger and Nairobi, Kenya

Trip reports on my official visits to Niamey, Niger (Oct 21-24) and Nairobi, Kenya (Oct 28 - Nov 1) are attached. All major objectives required under the NOAA/AID Special Climatic Impact Assessment Project were accomplished. USAID, host-country, AGRHYMET Center/Niamey and Remote Sensing Center/Nairobi officials were briefed on our assessments and planned activities for 1986 were outlined. There is much enthusiasm for this new project.

Our Special Assessment Reports have been extremely well received by the AGRHYMET Regional Center and Regional Remote Sensing Center. Each of these organizations expressed strong support for the work and showed much interest in cooperating with us in the future. A measure of this interest and support is reflected in the attached cable from USAID Niamey and the attached letter from the Remote Sensing Center in Nairobi. I am very optimistic about the project and the potential for working through these regional centers.

As noted in the Niger trip report, AISC's September and October 1985 crop yield forecasts (millet and sorghum) compare very favorably with GON preliminary yield estimates. However, further evaluation is necessary after GON final estimates are available.

Action Items are noted at the conclusion of each trip report. These represent my recommendations for follow-up actions. I look forward to receiving your comments. In general, we must improve the delivery of our assessments to host-country officials.

As a final note, Albert van Dijk, University of Missouri-Columbia, and I spent two days in the Netherlands where we presented a seminar and held discussions at ITC. The Dutch scientists expressed strong support for our work. In fact, key staff suggested the need to incorporate our assessment technology as a separate 8 week package into their standard 12 month LDC training program. Upon my return to Washington, I met with various AID officials to brief them on the project results.

cc: Paul Krumpke, AID/OFDA; Jim Hradsky, AID/AFR/PD;  
Tom Catterson, AID/AFR/TR; Bob Friedline, AID/AFR/SMA;  
Dennis Panther, USAID/Niamey; Linda Bernstein, (USAID/REDSO/Nairobi);  
Al Smith (USAID Kenya); Allan Falconer (RMC/Nairobi);  
J. L. Domergue (AGRHYMET/Niamey); Doug LeComte (AISC/CAB);  
Ken Hodgkins (NESDIS); Sharon LeDuc (AISC/MB); Gary Johnson, (AISC/MB)



SUMMARY OF DISCUSSIONSRCSSMRS

The RCSSMRS has recently moved to a new facility located just outside of Nairobi and a second classroom building is scheduled for completion by January 1986. In addition to the administration building, there are currently two other buildings which provide space for classrooms, professional offices, image analysis, the photolab, the library and other facilities related to the four departments: Remote Sensing, Geodesy, Cartography and Engineering. The Center has trained more than 700 African professionals and a full load of courses is scheduled for 1986. A French sponsored course on SPOT was underway during my visit.

Most of my time was spent with Drs. Hassan and Falconer of the Remote Sensing Department to learn about their program, describe the NOAA/AID project for the Sahel/Horn countries and determine how we could work together in the future. As an initial step, AISC can provide regular NOAA AVHRR images using color transparency film (Polaroid G5478383P). The AISC images could be incorporated into ongoing ground-truth studies to calibrate and interpret the images. AISC's assessment reports should be sent to Dr. Hassan for inclusion in the library. We also agreed to jointly conduct a professional training course which is already funded under the current NOAA/AID PASA.

The professional training course could be conducted during May 1986 for approximately 20-25 professionals from interested countries of the eastern and southern African regions. The course would be administered by the Remote Sensing Department/RCSSMRS and would be three weeks in duration. Travel and per diem would be covered under the NOAA/AID PASA and administered by RCSSMRS. The Remote Sensing Department would help identify trainees (e.g., agro-met, ag-stat, etc.). The focus of the course would be on the use of NOAA AVHRR for crop monitoring/rangeland assessment with some emphasis on the use of landsat imagery and ground-truth studies to interpret the AVHRR imagery. Trainees would be introduced to the assessment technology and shown how it complements other crop information systems (e.g., list and area sampling frames). AISC's micro-computers which process the AVHRR imagery and the associated Geographic Information System (GIS) under development for integrated satellite/rainfall index analysis could be demonstrated. Note: As discussed below, this also relates to the GIS which is also under development by UNEP/GEMS.

The training course would represent a solid step towards more cooperative efforts between the Remote Sensing Department and AISC. They have much interest and expertise involving statistical crop sampling systems (e.g., aircraft surveys and ground-based area frames which are constructed in part with Landsat imagery). They are very supportive of the NOAA/AID project (Sahel/Horn), view the assessments as needed, and are quite interested in becoming more involved in the use of NOAA AVHRR based assessment technology. The training course represents such an opportunity as the Remote Sensing Department seeks to establish bilateral projects in the region (i.e., statistical crop forecasting) and strengthens their program under a new AID project.

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If consistent with long-term objectives of AID, AISC could work through the Remote Sensing Department to introduce climatic impact assessment technology for crop and rangeland assessment. AISC could prepare assessment reports for distribution to interested countries and work through the Remote Sensing Department to provide training and technical assistance. In the process, AISC could continue applications development (AVHRR imagery, GIS, crop forecast models, etc.) and transfer technology to the Remote Sensing Department. Until an HRPT receiving station is operational in the region (I could not determine if there are actual plans with confirmed funding for installation of a station), AISC could provide data and imagery. Note: In my opinion, the Remote Sensing Department needs to procure an IBM PC type of micro-computer which would permit optimum interaction with AISC, GEMS and others.

Drs. Hassan and Falconer will forward a letter to the Director of AISC accepting AISC's proposal for the course and to initiate the course planning process.

As a final note, I thoroughly enjoyed the long discussions with Drs. Hassan and Falconer concerning applications of various remote sensing technologies for drought early warning, crop assessment and agricultural forecasting. Dr. Falconer and I had first worked together during early 1981 (in Zimbabwe concerning design of a proposed SADC Early Warning Program) and it was a pleasure to renew our discussions.

#### UNEP/GEMS

Dr. Harvey Croze and Dr. Michael Gwyne are very interested in AISC's GIS project, the assessment technology and AISC's color-imagery. The GEMS GIS will involve the use of ELAS (developed by NASA) and the Arc-Info package (Jack Dangermond). In addition, N.L. Faust of ERDAS (404-872-7327) is developing a micro-based system which is compatible to ELAS and Arc-Info. It was explained that AISC is focusing on IBM PCXT micro-computers and the development of software for our GIS to complement AVHRR image processing software already developed for the IBM PC. Our contacts with Howard Hogg (GEMS consultant, Washington, D.C.) should be followed-up with correspondence to Nairobi.

GEMS requested to be placed on the distribution list for AISC assessments and Richard Lamprey requested AISC AVHRR images. He is coordinator for the UNEP/ILCA AVHRR calibration project.

Dr. Croze suggested that AISC could submit material for display at the UNEP meeting, "Problems in the Environment" to be held in Cairo, December 1986.

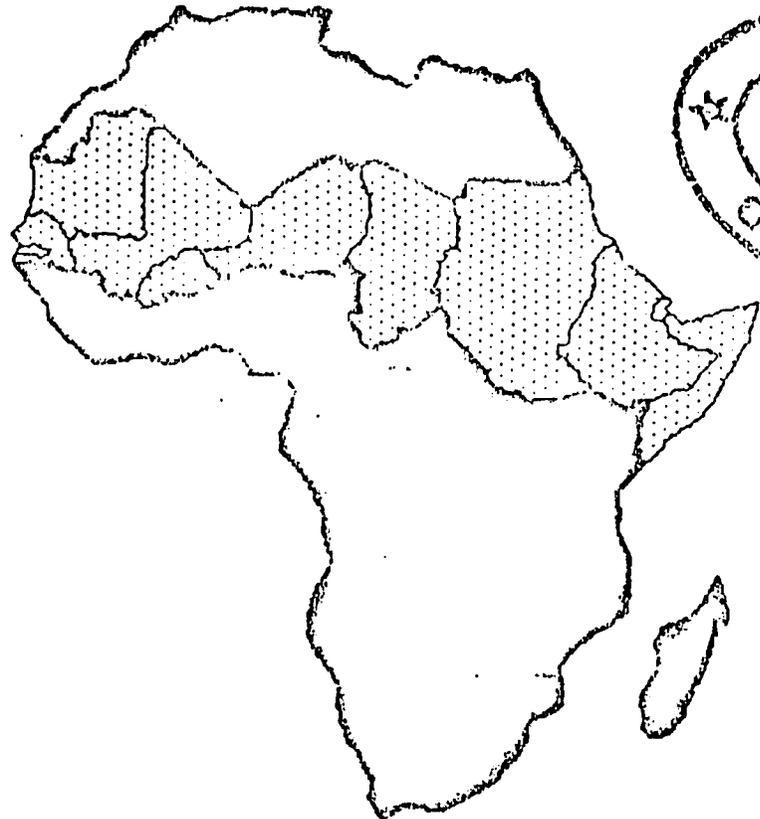
As a final comment, an exchange of information and data with GEMS would be mutually beneficial.

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Annex F

# SPECIAL CLIMATE IMPACT ASSESSMENT SUB-SAHARAN AFRICA

→ Mrs. Mitchell et al. X  
→ JWR



NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)  
NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE (NESDIS)  
ASSESSMENT AND INFORMATION SERVICES CENTER (AISC)

PREPARED IN SUPPORT OF THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

MAY - JUNE 1985

ISSUED ON JULY 15, 1985

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→ Memo File by Graham  
→ Mo Sumatra  
→ File Conf. "Economic Summit; see  
"Economic Summit"

(12)

September 27, 1985

Dear \_\_\_\_\_:

It was a pleasure meeting again in Bonn during the follow-up meetings to the Economic Summit. As you know our report focuses considerable attention on efforts for improving existing crop monitoring and early warning systems. I believe that an important primary step in implementing our proposals on this subject would be an exchange of information about our individual assistance programs presently underway. Such an exchange would help us to better see the full picture of current endeavors, identify any gaps which may exist and generally guide us in planning future steps.

This Agency's Office of Foreign Disaster Assistance currently funds work on Climatic Impact Assessments for Sub-Saharan Africa for drought early warning, carried out by the National Oceanic and Atmospheric Administration (NOAA). I am including here a set of documents on these efforts for your information. A basic overview of the NOAA activities is contained in the statement of Dr. Joan Hock to a U.S. Congressional Committee concerned with these matters.

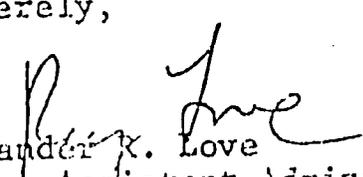
The NOAA technology employs analysis of daily weather satellite data and geographic/historical weather, crop and range land statistics through computerized models to forecast the impact of weather conditions on agricultural productivity. The current endeavor focuses on the Sahel-East/Horn of Africa sub-region. The assessments include monthly summary reports (copy of the August 17th report included) and update cables sent to the field every ten days. Earlier this month NOAA produced the first quantitative assessment based on these models of the impact of weather on yields of sorghum and millet (copies of reporting cables included here). Although accuracy levels for these assessments have yet to be established we anticipate incorporating higher resolution satellite data in the future.

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The assessments sent to U.S. Embassies and USAID Missions in the affected countries are being shared with host government officials and other interested donors. We believe they will provide early information that can assist decision makers to better determine whether and where to initiate preemptive mobilization for drought-induced famine. We see these assessments as part of the planning process fundamental to timely and effective implementation of relief efforts by donor and host governments. The Manual for Food Deficit Assessment included in this package provides comprehensive information on this planning process as we view it. We also fully recognize, however, that in order to make best use of such information, we must link it with continued support to reinforcing agro-meteorological systems, crop reporting and basic agricultural data systems at the country level. Doing so in combination with higher resolution imagery we would suggest, will also serve to provide the "ground truth" necessary to better corroborate the satellite data.

As I mentioned, the primary distribution point for these assessments is with our USAID Missions in the respective African capitals. You may wish to check with your representatives there to be sure they are cognizant of the availability of these assessments. I sincerely hope the materials and information have been useful. We would welcome your review and analysis of the program as well as information on your own programs in this area. In that light you may wish to discuss this program and similar technologies with your Government's representative to the meeting in Berlin on Oct. 15-16, where the panel on remote sensing established as a result of the Versailles Summit will discuss African early warning system needs. I am directing our representatives to focus on this theme. I look forward to your reply. Best wishes.

Sincerely,

  
Alexander K. Love  
Acting Assistant Administrator  
Bureau for Africa

*True*  
COPY

NOTE: FOR YOUR INFORMATION

THE ATTACHED LETTER WAS ADDRESSED TO THE FOLLOWING PEOPLE WITH ATTACHMENTS a/s.

1. Mr. J.L.F. Buist  
Undersecretary  
Overseas Development Administration  
Eland House  
Stag Place  
SW1E 5DH  
London, England
2. Dr. W. Preuss, Director  
Ministry of Economic Cooperation  
Karl Marx Str. 4-6  
5300 Bonn  
Federal Republic of Germany
3. Mr. David MacDonald  
Canadian Emergency Coordinator/African Famine  
Canadian International Development Agency  
200 Promenade du Portage  
Hull, Quebec  
K1A 9Z9, Canada
4. Mr. Christian Joudiou  
Directeur des Projets au Ministere des  
Relations Exterieures  
Cooperation et Developpement  
20 rue Monsieur  
Paris, France 75007
5. Mr. Francesco Corrias  
Ministry of Foreign Affairs  
La Sarnesino  
Rome, Italy
6. Mr. Hiroshi Ota  
Deputy Director-General  
Department for Economic Cooperation  
Ministry of Foreign Affairs  
221 Kasumigaseki  
Chiyoda-Ku  
Tokyo 100, Japan
7. Dr. Francois van Hoek  
Directorate-General for Development  
200 Rue de la Loi  
B-1049  
Brussels, Belgium

*file*  
*Africa Bureau*  
*Activities*

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TAGS:

SUBJECT: AFRICA REGIONAL - EAST AFRICA REMOTE SENSING II (EARS II, 698-0456) PP IEE APPROVAL

REF: A) NAIROBI 41804; B) SATE 326975; C) NAIROBI 27937; D) NAIROBI 27911

1. FR/TR/SDP ENVIRONMENTAL ADVISORS RECORDS INDICATE 3/18/85 APPROVAL OF 698-0456 PID IEE BUT THIS NOT COVERED IN PID APPROVAL CABLE (REF E).

2. AFRICA BUREAU ENVIRONMENTAL ADVISOR HERewith CONFIRMS APPROVAL CONCURRENCE FOR CATEGORY EXCLUSION OF PROJECT 698-0456 FROM IEE REQUIREMENTS AS REQUESTED IN REF A. WHITEHEAD

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NAIROBI 41804

REDSO FILE

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B.O. 12355: B/A  
SUBJECT: AFRICA REGIONAL - EAST AFRICA REGIONAL REMOTE  
SENSING II (898-0456) PF - IEE APPROVAL

REF: A) STATE 326975 D) PID SUBMITTED 6/14/85

1. FOR AFRICA REGIONAL ENVIRONMENTAL ADVISOR. REF A IS  
PID APPROVAL CASE.

2. PLEASE CONFIRM IEE CONCURRENCE PER REQUEST IN PID.  
TYPE OF IEE IS REPEATED BELOW FOR YOUR CONVENIENCE.

COPY:

CAT: CATEGORICAL EXCLUSION  
PROJECT COUNTRY: AFRICA REGIONAL  
PROJECT TITLE AND NUMBER: EAST AFRICA REGIONAL REMOTE  
SENSING II (898-0456)  
FUNDING: FY 2) 1986: DOLS 2.5 MILLION  
OR ISSUED BY: JOHN V. SOHRING, REGIONAL  
ENVIRONMENTAL OFFICER  
ENVIRONMENTAL ACTION RECOMMENDED: CATEGORICAL EXCLUSION

THIS ACTIVITY MEETS THE CRITERIA FOR CATEGORICAL  
EXCLUSION IN ACCORDANCE WITH SECTION 216.2 (C) (2) (I)  
AND IS EXCLUDED FROM FURTHER REVIEW.

ACTION REQUESTED BY: JOHN V. SOHRING, MARCH 15, 1985  
DIRECTOR, REDSO/ESA

CONCURRENCE: AFRICA ENVIRONMENTAL OFFICER  
APPROVED \_\_\_\_\_  
DISAPPROVED \_\_\_\_\_  
DATE \_\_\_\_\_

CLEARANCE: GC/AFR  
REDSO/ESA, EIA: KATHLEEN HANSEN  
END QUOTE.

3. PLEASE ADVISE. TPAIL  
BT  
#1984

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NAIROBI 41804

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## REGIONAL REMOTE SENSING FACILITY



P O Box 16,332  
Nairobi Kenya

Tel: Nairobi 556400  
Cable Landsat Nairobi

MEMORANDUM

To: Ag. Director RRSF  
From: Allan Falconer *Allan Falconer*  
Subj: Project Activity List  
Date: March 6, 1984

Reviewing Appendix F from the March 1984 evaluation report  
I can add the following comments.

Tanzania Forest Mapping

The map has now been prepared for printing and is now in the final editorial and proofing stage. This work was done by the Centre's cartography unit assisted by Mr. Okello of the Tanzanian Ministry of Tourism and Natural Resources. The preparation of printing separations has been done in liaison with the Survey of Kenya and the final publication of the map should occur in the near future. All indications are that the Forestry Department is very pleased with the product and discussions are already underway to continue with similar work at the 1:250,000 on selected forestry areas.

Kenya

- i) Further work has involved the training and project activity specifically designed to assist the Ministry of Water Development in their Water Resources Assessment Project. This activity was an extended training course oriented to the assessment of water resources in the Baringo-Laikipia area and included the preparation of satellite data for the mapping of geological and hydrological features.
- ii) The Lake Basin Development Authority (LBDA) a UNDP sponsored project has contracted for remote sensing services including training, image interpretation, and the preparation of a resource atlas. The contract is for a one year period and is valued at US\$39,000.
- iii) The continued development of photomaps by the Cartography Unit has been supported by the remote sensing activity in the preparation of mosaics for the Narok area, the Marsabit area and Mt. Elgon area at 1:250,000. 4 mosaics for use as the base for a tourist map of Kenya has also been prepared. This mosaic covers about 80% of Kenya.
- iv) In addition to the specific projects cited above there has been a continuous demand for data to support on-going research projects and activities of government departments, universities and commercial enterprises in the region.



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- 2 -

March 8, 1965

v) Enquiries about further photo mapping for project work are being followed up with a view to preparing a photo-map of the Hachakos district.

vi) Activity has been devoted to the support of the French aircraft remote sensing activity which produced data simulating the expected product from the SPOT satellite. Several test-sites were flown in Kenya and light aircraft and ground support were provided for the analysis and evaluation of these data. The data when received from France were processed into colour and printed in the remote sensing photo labs.

#### Somalia

Discussions about training and remote sensing support for activities in Somalia are in progress. We have provided data for water exploration projects and refugee resettlement projects and advice about possible applications in other natural resources fields. Activity at present consists primarily of data supply and training.

#### Uganda

i) Carvallo's work has been published in part in a book by Oxford University Press written by Dr. A. Hamilton on deforestation in Uganda.

ii) The UNESCO support of geological training in Uganda has included a grant to the department of Geology, Makerere University which has supported the purchase of suitable Landsat data and short periods of work by geology department staff here in remote sensing.

#### Sudan

i) The preparation of a soil map of the Jebel Mara area has been done, based on a Landsat image mosaic prepared during an extended course. The three soil survey staff involved produced very valuable material which is to be printed by U.S.G.S. under an extension of an existing PASA agreement.

ii) USAID Sudan have contracted for a photo map of an area from Kosti-El Obeid for a road project. This work is in progress and should result in a published photo map which will be completed and published by Sudanese trainees who are scheduled to visit Washington for this purpose.

iii) Further discussions are in progress about the possibility of a new 1:1,000,000 map of the whole of Sudan based on Landsat images and published as a full colour photo-map.

March 6, 1985

iv) Rangeland mapping of parts of Kordofan in support of FAO projects is proceeding. Staff from Khartoum have been sent to Nairobi to utilize the available data and prepare a map relating vegetation belts shown in 1970's data to the existing map for 1958 and for comparison with the data newly gathered in 1984.

#### Zambia

There have been several discussions about potential future work in forestry, soil science and geology, however, none of this has yet resulted in any defined project activity.

#### Swaziland

Working with the Swaziland Ministry of Agriculture the remote sensing staff have provided images and field support for mapping the forest areas of Swaziland. This is being done with special reference to the indigenous forest. A forest consultant was supplied for a week of activity in Swaziland in March 1984. Accompanied by a Facility staff member the consultant spent several days in the field advising on an approach to surveying and managing wattle areas, and areas of indigenous forest. Subsequently requests for new images for use in the field survey were met and the new data were despatched in August 1984. We are awaiting a report on this activity.

#### Indian Ocean

The contract to hold a course on Remote Sensing for Oceanography and Littoral environments has now been finalized and a course will be held in Reunion and Mauritius in July 1985. Support vessels and aircraft for fieldwork over the coastal coral reefs will be supplied by the governments. Response from the island countries has been good.

Madagascar will be sending a team to the Facility in April to begin work on five different pilot projects, involving natural resource assessment, forestry, geology, exploration, etc.