DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

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PD-AAF-428-B1

NEAR EAST ADVISORY COMMITTEE MEETING

DATE: June 7, 1979
TIME: See Agenda
PLACE: 6439 NS

SUBJECT: SYRIA: National Remote Sensing Center (PP)

The Near East Advisory Committee will meet as scheduled above to discuss the attached Issues Paper and PP for subject project.

Please refer all questions to the Chairperson.

Attachments:
PP
Issues Paper

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UNITED STATES GOVERNMENT

memorandum

DATE: June 1, 1979

REPLY TO ATTN OF:

Project Review Committee Chairperson

SUBJECT: Issues Paper: USAID/Syria's PP for National Remote Sensing Center (NRSC) Project

TO: Near East Advisory Committee

THRU: NE/TECH, Mr. William F. Gelabert

Background: The PP was received in AID/W on May 18 and reviewed by the Project Committee on May 24, 1979. The proposed project has evolved largely out of the Land Classification and Soil Survey Project (Syria), which was originally approved by NEAC 4/27/78 but subsequently underwent modification during Grant Agreement negotiations and was scaled-down and re-approved in its accepted form 9/7/78. (Grant Agreement was signed 9/28/78). This modification and thus the evolution of the present Remote Sensing project proposal centered on the Syrian Arab Republic Government's (SARG's) decision to not locate the remote sensing unit within the Directorate of Soils (Ministry of Agriculture and Agrarian Reform), as called for under (original) Land Classification and Soil Survey Project; but, rather, to create a National Remote Sensing Center (NRSC), which would organize and coordinate all remote sensing activities within the country, including those related to agriculture upon which the former would have exclusively focused.

While AID/W and USAID/Damascus fully supported this proposed modification, they did not agree to the Syrian's preference for including AID assistance to establish this Center as part of the Land Classification/Soil Survey project; as it would have considerably broadened its scope and focus. AID's proposal was for a two-project approach, wherein the Land Classification project would be scaled-down, deleting those activities and outputs related to the establishment of a remote sensing unit, and to develop a separate project to assist with the creation of a National Remote Sensing Center. SARG reluctantly agreed to this approach, but only after it had received repeated assurance that the Agency would help them develop such a proposal and would give serious consideration to its funding within the framework of AID-established project review/approval procedures and the availability of funds.

In early 1978 the SARG asked U.S. assistance on their remote sensing program and particularly in establishing the NRSC. AID sent a team of experts in July 1978 to study this possibility, and this proposed project is based on their recommendations.

The Project: The project's purpose is to develop a capacity to manage and utilize natural resources through the establishment of a national remote sensing center. AID proposes to assist the SARG in establishing the NRSC by: (a) providing training for Syrian personnel who will operate the NRSC; (b) financing the services of technical experts in various specialities who will work with Syrian officials in Syria to set up the NRSC; and (c) financing the necessary equipment to produce the technical output of the NRSC.

Issues: The committee reviewed the issues raised in the PID review; a need to pinpoint SARG responsibility for management of the project, as well as host country commitment of qualified personnel; identification of end users for Landsat data; and a request for clarification of several problems connected with implementation. By and large, the committee felt that these issues had been effectively dealt with in the PP. However, the committee did raise a number of issues, largely concerning the relationship of training plans to the implementation schedule. Clarification of the following issues has been solicited from the Mission by cable:

1. The implementation schedule may err on the side of optimistic expectations. It now depends on at least seven English speaking participants being identified, trained and returned to Syria by the summer of 1980. (These participants include two in applications analysis and user services, two training officers, one manager of instrument engineering, one photo technician and one data acquisition specialist.)

2. The committee felt that splitting responsibility for training between OIT and an outside contractor might be impractical and cause delays.

3. Again, in terms of realistic implementation scheduling, the field has been queried as to whether the President of Syria has in fact signed the decree setting up the Center, and whether the budget which permits payment of special incentive salaries to Center personnel has in fact been approved and will be available in time.

4. We have requested USAID/Damascus to forward a log-frame for the PP.

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE)

PP

2. DOCUMENT CODE: 3

3. COUNTRY ENTITY: Syria

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): 276-0041

6. BUREAU/OFFICE: A. SYMBOL: NE; B. CODE: 03

7. PROJECT TITLE (Maximum 40 characters): National Remote Sensing Center (NRSC)

8. ESTIMATED FY OF PROJECT COMPLETION: FY 85

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 79; B. QUARTER 4; C. FINAL FY 79 (Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L/C	FIRST FY D. TOTAL	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L/C	LIFE OF PROJECT G. TOTAL
AID APPROPRIATED TOTAL						
GRANT	3,500		3,500	3,500		3,500
LOAN						
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY		3,438	3,438		3,438	3,438
OTHER DONOR(S)						
TOTALS	3,500	3,438	6,938	3,500	3,438	6,938

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 79 F. GRANT	E. 1ST FY 79 G. LOAN	H. 2ND FY — I. GRANT	H. 2ND FY — J. LOAN	K. 3RD FY — L. GRANT	K. 3RD FY — M. LOAN
(1) ESF	750	874		3,500					
(2)									
(3)									
(4)									
TOTALS				3,500					

A. APPROPRIATION	N. 4TH FY — O. GRANT	N. 4TH FY — P. LOAN	Q. 5TH FY — R. GRANT	Q. 5TH FY — S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1) ESF					3,500	
(2)						
(3)						
(4)						
TOTALS					3,500	

12. IN-DEPTH EVALUATION SCHEDULED: MM / YY

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 21? IF YES, ATTACH CHANGED PID FACESHEET.

[ ] 1 = NO
2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE

TITLE

DATE SIGNED: MM / DD / YY

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM 05 / DD 14 / YY 79

AID 1330-4 (3-76)

NATIONAL REMOTE SENSING CENTER (NSRC)

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I. SUMMARY

The Syrian Arab Republic (SARG) Government does not have sufficient knowledge of Syria's natural resources, e.g., mineral deposits, petroleum, water resources, soil types, etc., to enable Syria to make full and efficient use of these resources in its economic development. The SARG authorities realize this deficiency, and have taken action to remedy it.

Since the resumption of relations between Syria and the U.S. in 1974, the SARG authorities at the highest level have consistently expressed their desire to obtain high technology in order to spur economic development. With this intention, SARG organized the National Remote Sensing Committee in 1978. The Committee's members represented the ministries and SARG organizations that would collect and utilize resource information available to Syria from remote sensing by the U.S. Landsat satellites, from aerial photography and from ground-truth investigations. The Committee proposed that SARG organize a National Remote Sensing Center (NRSC) to collect, analyze and distribute this information on natural resources. The Committee's proposal is now under consideration in the office of the President who is expected to authorize shortly the establishment of the NRSC as an independent government agency responsible directly to the Prime Minister's office.

In early 1978 the SARG asked U.S. assistance on their remote sensing program and particularly in establishing the NRSC. AID sent a team of experts in July, 1978 to study this possibility, and this proposed project is based on their recommendations.

The project goal is to manage and utilize more effectively Syria's natural resources in planning for and implementing economic and social development. The project's purpose is to develop a capacity to manage and utilize natural resources through the establishment of a national remote sensing center. AID proposes to assist the SARG in establishing the NRSC by: (a) providing training for Syrian personnel who will operate the NRSC; (b) financing the services of technical experts in various specialties who will work with Syrian officials in Syria to set up the NRSC; and (c) financing the necessary equipment to produce the technical output of the NRSC. The assistance will be supplied through a U.S. contractor who will arrange training, provide a resident manager and technical experts as needed, and assist in procurement of equipment and commodities. AID's assistance will be on a grant basis. The execution period is expected to be five years. By the end of this time SARG personnel should have the training and experience to operate the NRSC without technical assistance. The SARG will then assume complete responsibility for the financing and operation of the NRSC.

The output of the project will be a natural resource atlas for Syria, which will be compiled by the NRSC and distributed to all SARG agencies who need and use such information. The resource atlas will be continually revised as more data become available. The NRSC will also conduct continuing training for the personnel fo the user agencies who will thereby be able to use the resource information in formulating and making decisions on Syria's economic development plans.

Recommendation:

That AID approve a grant of $3.5 million for the establishment of the NRSC, subject to such covenants and conditions precedent to be met by SARG as are required for successful execution of the project. These are set forth in Section IV D below.

NATIONAL REMOTE SENSING CENTER (NRSC)

II. PROJECT BACKGROUND

A. Background

1. Problem to be addressed: Syria is a nation with significant economic potential, but whose development is greatly handicapped by a lack of full utilization of the country's sizeable natural resources. Therefore, the Syrian Arab Republic Government (SARG), in planning its economic development to take maximum advantage of its natural resources, needs more thorough knowledge of its soils, water, minerals, petroleum and other natural resources.

Unfortunately, natural resources in Syria have not received, until recently, the level of attention that is needed to support an expanding economy. Although Syria has already found some oil, there is a strong possibility that additional petroleum resources exist, which Syria is currently exploring. Some phosphate is now being mined, but other minerals, for example, those that could support a building supply industry, are thought to exist. Additional sources of potable water are needed both in Syria's major cities and provincial centers, as their growing populations strain existing resources. Vast areas of the country are thought to have soils which would support excellent crops if adequate water supplies for irrigation could be found. The distribution of these soils, however, is not known. Only through a massive effort in soil mapping can soils be delimited. In order to find the water to irrigate these soils, a concentrated effort in examining dam sites and finding and developing ground-water sources will be needed by the Syrian geologic and hydrologic surveys. In addition, sources of material to build the dams must be found, and the engineering problems associated with the building of dams and irrigation ditches must be examined. This example of the interplay of disciplines necessary to develop an agricultural capacity is just a small indication of the complexity of the situation in developing an adequate basic knowledge of the natural resources of a country.

At present, however, the SARG has neither an adequate knowledge base regarding its natural resources nor full capacity to establish one. Past efforts to obtain resource

data, although adequate for limited study areas, have been too fragmented or cover too small an area to be of use nationally.

While there is more than one approach to establishing this needed knowledge base, highest priority for Syria should be the production of basic resource maps showing resource availability and distribution, as well as the capabilities of the land to support various types of development. Without these maps the SARG does not have an adequate basis of information for making proper resource allocation/utilization decisions, including estimation of the costs of a given development and the various development alternatives open to the planner.

Specific information needed includes: identification and location of resources by various categories and classifications; an estimate of the total resource present; type of earth materials that underlie the area in which the resource is located, including the soils and rock types; and the presence or absence of surface and ground water. Such studies must be done on a national scale; be in a form that would allow integration of the material with other relevant data, such as climatic, social, economic and environmental information; and be in an easily retrievable form. The end result would be the availability of adequate information to the planner and the decision-maker to determine which areas should be intensively developed and which areas should be avoided because of their being too costly to develop or technically not feasible. As a result, the SARG will be able to make more informed decisions about the allocation and rate of utilization of the available resources, both renewable and non-renewable.

2. Response to the Problem: Fortunately, the SARG recognizes this deficiency in resources information and has committed itself to using the latest technology, including remote sensing, to find, inventory and develop these resources. Beginning in 1976 the SARG took action to expand its knowledge of its natural resources, and investigated the use of remote sensing, e.g., the collection and analysis of data obtained through aerial photography and satellite imagery.

To develop Syria's capacity to utilize data obtained through remote sensing, the SARG established the National Remote Sensing Committee in 1978. This committee is charged with formulating a program for utilization of remote sensing data and analytical techniques in Syria. The chairman is the Minister of Electricity, H.E. Dr. A.O. Youssef, and its members

include: Dr. Chafiq Safadi, Assistant Minister of Public Works who studied remote sensing in the U.S. in 1975; the Director of the National Research Center; the Director of Research in the Ministry of Industry; the Director of the Surveying Department in the Ministry of Defense; the Director General of Meteorology; the Directors of Irrigation and Soils in the Ministry of Agriculture and Agrarian Reform; and representatives of the Geophysics section of the Ministry of Petroleum and Metal Resources; the Directorate of Telecommunications; and the Prime Minister's office.

Since the resumption of relations between the U.S. and Syria in 1974, Syria at the highest levels has consistently expressed its desire to obtain high technology in order to spur the nation's economic development. Several SARG officials received training in the U.S. in fields related to remote sensing, including the use of satellite technology.

Under the auspices of the United Nations Outer Space Affairs Division, an expert in remote sensing, Dr. Farouz Shahroki, visited Syria in January 1978 and prepared a prospectus for the establishment of a national remote sensing facility.

At the same time the Syrian Government and USAID had been preparing a project for land classification and soils survey, the purpose of which was to strengthen the operational capability of the Directorate of Soils in the Ministry of Agriculture and Agrarian Reform to undertake and maintain a current land soil resource inventory, including the assessment of present land utilization patterns and their potential and suitability for alternative uses. This project was to use modern analytical and interpretive techniques to derive detailed and comprehensive knowledge regarding present land utilization patterns, soil suitability and its capability for various alternative uses, and the utilization of this knowledge in making policy decisions regarding land resource allocation and use. The project included a multispectral data analysis center (located within the Directorate of Soils) for interpreting and analyzing land/soil resource data generated by the use of remote sensing techniques. AID was to assist in training, equipping, and providing technical assistance to establish this center. Its outputs would include: (1) land/soil resource classification maps, including a general soil map of the entire country, at a 1:500,000 scale,

showing general land-use maps of Syria at 1:500,000 and 1:250,000; (2) generalized maps at 1:100,000 of Zone 1 (350mm or above of rainfall annually) in Aleppo, Raqqa and Hasakah muhafazats, showing physiographic classes, surface drainage systems, major soil groups and the relative areas within each, as well as present land-use patterns, including the various crops and relative areas of each; and (3) semi-detailed (1:25,000 scale) soil maps of all arable lands in Zone 1, showing their land-use suitability and potential for selected alternate uses. The project was also to establish a systematic procedure for the accumulation of relevant data and a functioning data bank for not only land/soil resource information and statistics but production parameters and other factors pertaining to existing and feasible utilization patterns and crop intensification levels.

When finally formulated in July 1978 this project was referred by the Syrian Government to the National Remote Sensing Committee. The Committee had by that time decided to proceed with establishment of a national remote sensing center and the SARG had separately asked U.S. assistance in developing a remote sensing project. Consequently, the SARG wanted to change the proposed Land Classification/Soil Survey Project into a national remote sensing center project. Since the need for the Land Classification Project was immediate, and its revision into a national remote sensing project would have taken some months for further technical analysis, the SARG and AID decided to proceed immediately with a scaled-down land classification project with financing from FY 78 funds. This was done under Technical Assistance Grant No. 276-001 and the project agreement was signed on September 28, 1978. At the same time AID and SARG began to prepare a project for a national remote sensing center for possible AID financing in FY 1979.

An AID-sponsored team visited Syria for 3 weeks in July 1978 to study and make recommendations for a Syrian National Remote Sensing Center. The members of the team were: Mr. Charles F. Withington of DS/ST, AID/W, Dr. Farouz Shahroki of the University of Tennessee, and Mr. J. O. Morgan of the U.S. Geological Survey (USGS). Their report and recommendations have provided the basis for this project.

3. The SARG's Proposed National Remote Sensing Program:

a. Responsibilities of the National Remote Sensing Committee

The National Remote Sensing Committee is responsible for preparation of the national remote sensing program, of which the National Remote Sensing Center (NRSC) will be the principal implementing organization, its work complemented by the SARG agencies using the data obtained through remote sensing. The Committee has drafted the authorization for establishment of the NRSC, and this draft is now (May, 1979) under review in the office of the President. The Committee expects that the President will authorize the establishment of the Center in the near future.

In the interim, the Committee is responsible for remote sensing activities. For example, participants in remote sensing training are for the present being nominated by the Ministry of Electricity. The Director of Meteorology, Mr. A. W. Kabakibo, is directly in charge of planning the NRSC and is the SARG liaison with AID for the project.

b. Role of the NRSC and its relation to other SARG Agencies

The NRSC will be the SARG agency responsible for collecting, analyzing, and distributing remote sensing and related resources information to other SARG agencies. It will provide space where such information can be catalogued and stored as well as computer facilities for digital processing of Landsat imagery. The NRSC staff will prepare land use, resource and land use, and resource and land capability maps. This information will provide the basis for SARG decisions on natural resource development and utilization. These outputs of the NRSC will eventually be available to all SARG agencies.

The NRSC will be an independent agency responsible directly to the Prime Minister's office. It will have its own annual budget allocated directly from the Prime Minister. It also is expected to earn some income from sales of its information to private firms, and at least in the initial stages benefit from foreign assistance, namely, the proposed AID and possible U.N. grants.

Coordination on the general policy level between the NRSC and interested SARG agencies will be through an advisory committee representing all sectors concerned with remote sensing data. Coordination on the operational level with users of remote sensing data and ground-truth sources will be through the technical staff of the NRSC. The National

Remote Sensing Committee is concerned that the NRSC serve effectively the user agencies. To facilitate this, the Technical Section chiefs will be recruited from the staffs of the user agencies. They will thus be completely familiar with the agencies' needs and key operational personnel. To strengthen further the personnel links between the NRSC and the user agencies, the Committee plans for the NRSC to conduct training on a continuing basis for personnel of the user agencies who will be using or providing data for the NRSC.

c. The NRSC Approach to Increasing Resource Knowledge

(1) Source of Resource Data

The NRSC expects to buy Landsat remote sensing data from Italy, which has a receiving station in operation that covers the area of Syria. Iran has plans to open a remote sensing receiving station, although the Syrian facility can function effectively without access to the Iranian Center's data. Syria will need to make purchase agreements with Italy and/or Iran. The cost of the data will be about $10,000 per year. Its initial purchase will be included in the project, but subsequent purchases will be financed by Syria itself.

Ground truth data will be obtained partially from the NRSC's own investigations, partly from other SARC agencies. Aerial photographs are now made by the Syrian Air Force, which has the capacity to fly planes with RC-8 and RC-10 mapping cameras. The Air Force has continuing responsibility for flying the missions needed by the NRSC and supplying aerial photos as needed to it.

Over-all there will be a two-way exchange of information between the NRSC and the information supplying and user agencies. The NRSC will receive data from them, analyze and relate it to remote sensing and other information it receives, and then make available all its information to the other agencies. When the NRSC begins operations, formal arrangements will need to be made with the resource agencies to fix responsibility for supplying necessary resource data.

(2) Preparation of Natural Resources Atlas

The major output of Syria's remote

sensing program will be a natural resources atlas. In preparing this, the NRSC will make black and white mosiacs at the 1:1,000,000 scale of the area of Syria, using remote sensing data obtained from the red and near-infrared bands of the magnetic spectrum. About 13 photo images will be needed to cover Syria. Each image will be worked on separately, at a scale of 1:500,000 and be annotated with Syria's major geographic features. Overlays or separate maps should be made which include the geographic, geologic, and hydrologic features, including drainage pattern maps, soils and soil assemblages, vegetation, including types of agriculture, and pasture land, etc. A final product would have each of the 13 images as a folio consisting of a satellite image and the resources associated with it. These folios would be preliminary, for changes will continually take place as new information becomes available.

When all image folios are completed at a scale at 1:500,000, a combined image map should be made at 1:1,000,000. This would be a published product, the atlas of the resources of the whole country. This, of course, would not be a final product either, for refinements would be made as new information became available.

Production of the initial resources atlas should take less than 2 years, and its completion should show where there are gaps in the data and where further work should be done. Remote sensing would aid this further work.

(3) Responsibility for Compilation of Resource Atlas

Primary responsibility for compilation of the atlas would be with the NRSC staff. The discipline-oriented SARG agency personnel trained by the NRSC would assist in providing information for annotated atlas sheets.

d. Proposed Organizational Framework of the NRSC

The draft presidential authorization for the establishment of the NRSC provides the organizational framework which is set forth in Figure 1. The senior officer will be the Director General who will have the authority of a Minister. During NRSC's start-up period he will be responsible for obtaining quarters for the NRSC, hiring personnel, recommending

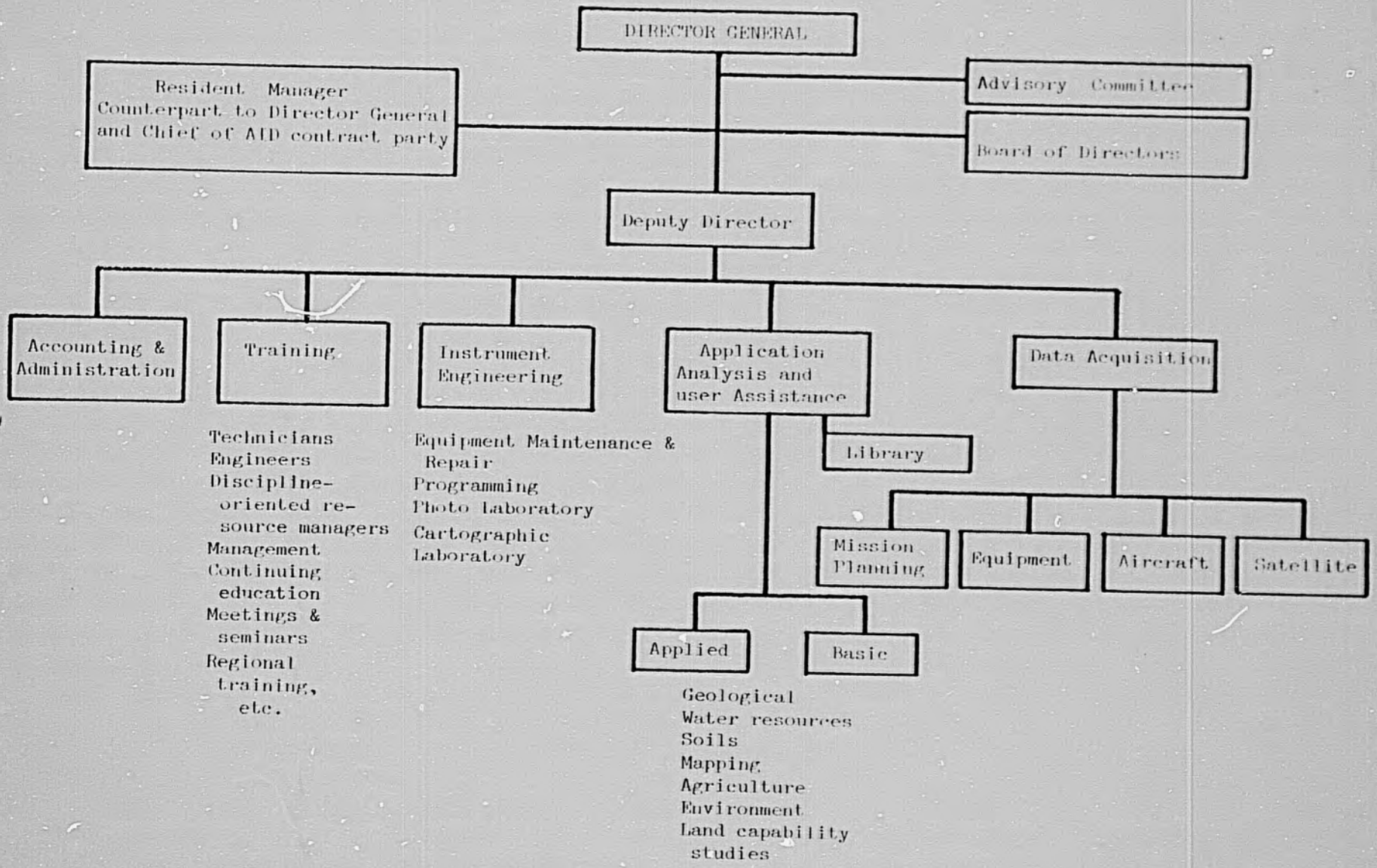

Figure 1. Proposed Organization Chart of the National Remote Sensing Center of Syria

qualified candidates for training, and supervising the ordering and installation of equipment. After the NRSC begins operations, he will be responsible for directing the inflow of data from Landsat, aerial photography, and ground-truth investigations, as well as analysis of data in the NRSC and its dissemination to users. The Director General should have a PhD in some resource or scientific discipline.

In the operation of the NRSC, the Director General will be assisted by the Deputy Director General and the chiefs of the five technical sections whose functions are described in Annex 1. These sections are: the Data Acquisition Section; Applications and Analysis, and User Assistance Section; Instrument Engineering Section; Training Section; and Accounting and Administration Section. (See Annex 1 for a description of their functions.) Each will be headed by a chief, the technical section chiefs having PhD degrees and the qualifications of university professors, e.g. 6 years' experience in applied or basic science fields. Each technical chief will have a research assistant.

In managing the operations of the NRSC, the General Director will be assisted by the Board of Directors made up of the section chiefs. The Board will also include three highly qualified technical advisors who will not be from the NRSC staff, but who will be appointed to the Board by the Prime Minister. The Board's decisions will be subject to review by the Prime Minister.

In addition, the Director General will be assisted by an advisory committee, whose members will be from outside the NRSC. They will be highly experienced individuals representing the following sectors: soils, plants, water, meteorology, cartography, geology, mineral resources, environment, agricultural research, and electricity. These people will be from various SARG agencies and the universities and will know the needs and plans of their sectors.

The Director General will also be assisted by a Research Committee made up of the technical directors and research specialists.

Qualified technical personnel for the NRSC will be obtained through contacts with other organizations and advertising, or in special cases directly appointed. It is proposed that the NRSC will be exempted from the limitations of various decrees governing ministries, including those on the

levels of government salaries. Thus the NRSC should be in a position to pay special monetary allowances, which will make possible salaries above the normal government salary scale. These special financial incentives are given to encourage recruitment of qualified personnel for the NRSC and their continuation on their jobs there.

e. SARG Plans for a Regional Remote Sensing Center

As the staff of the Syrian NRSC acquires experience and successfully completes the preliminary resource atlas for Syria, it will be in a position to assist other countries in developing their own remote sensing capability. The SARG envisions that the NRSC will eventually become a regional remote sensing center, supplying data to cooperating countries and training their personnel in the techniques of gathering, analysis, and use of remote sensing data, thus enabling these countries also to acquire better knowledge of their natural resources.

Syria's first regional remote sensing activity will be to host a United Nations symposium, which will be held in Damascus December 1-13, 1979. SARG has asked AID to finance about $100,000 of equipment for use during this symposium. AID has agreed to provide this equipment through commodity import financing.

B. Description of the AID Project

1. Project Goal and Purpose: The project goal is to manage and utilize more effectively Syria's natural resources in planning for and implementing economic and social development. The project purpose is to develop a capacity to manage and utilize natural resources through the establishment of a national remote sensing center. These are in accord with one of the SARG's prime objectives--to determine as quickly and efficiently as possible the natural resources of Syria. To assist in accomplishing this, the Syrian authorities propose to establish the NRSC described in II.A.3.

2. Project Components: AID proposes to assist the SARG in establishing the NRSC by: (a) providing training for Syrian personnel who will operate the NRSC; (b) financing the services of technical experts in various specialties who will work with Syrian officials in Syria to set up the center; and (c) financing the necessary equipment to produce the technical

TABLE I

PROJECT SUMMARY

AID Contribution		
1. Contract with U.S. firm for 5 years (including overhead)		
A. Training for Syrians in the U.S.	$ 375,950	
B. Technical Services	1,487,775	
C. Commodities	983,488	
Sub-Total	$2,847,213	
2. Inflation (15%)	427,101	
3. Contingencies (8%)	225,686	
Total AID Contribution		$3,500,000
SARG Contribution		
1. NRSC Quarters and Furnishings	$ 730,000	
2. NRSC Operating Budget (Staff salaries, operating supplies, etc. for 5 years)	1,975,000	
3. Inflation and Contingencies (27%)	733,325	
Total SARG Contribution (U.S. Equivalent)		3,438,325
TOTAL PROJECT SUMMARY		$6,938,325

output of the NRSC. AID's assistance will be on a grant basis. The execution period of the project is expected to be 5 years. By the end of this time SARG personnel should have the training and experience to operate the NRSC without foreign technical assistance. The SARG will then take over complete responsibility for financing the operation and maintenance of the NRSC. The details of the three components of the AID project are described below. Table 1 summarizes the costs of the components.

a. Training

Since the NRSC will be a new organization responsible for a new and specialized scientific, technical function, most of its personnel will need to have special training. At the outset, much of the training will have to be in the U.S. When the first participants return and have had operating experience, they will take over training of new recruits to the NRSC as well as training of personnel of other agencies dealing with data related to remote sensing.

Some general educational qualifications are required from all prospective remote sensing participants. Technical and research personnel should have previous training in a discipline that deals with the earth's features, i.e., geology, hydrology, soils, agriculture, etc. Inasmuch as English is the language of remote sensing, all candidates must be able to meet the AID requirements on the ALIGU Test. Undoubtedly a number of the candidates will require English language training. Thus it is essential that the SARG begin as soon as possible to select well-qualified training candidates who can begin their English language training.

Syrians with the necessary technical and language qualifications for remote sensing training and eventual jobs in the NRSC are not numerous. It is expected that most trainees will be drawn from experienced personnel in the existing resource agencies, i.e., the Ministries of Petroleum, Agriculture, Communications, Universities, etc. While loss of experienced personnel will inevitably cause some inconvenience to other agencies, the SARG has placed high priority on the development of its capability in remote sensing, as evidenced by special pay and bonus incentives to be given to NRSC employees. The U.S. has recognized Syria's priority by agreeing to prepare this project. Thus, while there will be some cost to other SARG agencies in loss of experienced personnel, the actual numbers will not be large and the other

TABLE 2

Training Requirements and Estimated Costs

		Cost in U.S. $
1.	**Training - Professional**	
	A. Applications Analysis and User Services Two participants for 6 months each	36,900
	B. Librarians Two participants for 6 months each	36,900
	C. Training Officers Five participants for 6 months each	92,250
	D. Instrument Engineering Section: (1) Manager One participant for 6 months	18,450
	(2) Computer programmers Three participants for 6 months	55,350
	(3) Computer equipment maintenance Specialist One participant for 6 months	18,450
	E. Photo Technicians Four participants for 6 months each	77,800
	F. Meteorologist One participant for 3 months	9,300
	G. Architect of NRSC Building One participant for 1 month	3,750
	Total Training-Professional	349,150
2.	**Training - Technicians**	
	A. Data acquisition personnel Two participants for 2 months each	13,400
	B. Equipment specialist One participant for 2 months	6,700
	C. Aircraft mission planning One participant for 2 months	6,700
	Total Training - Technicians	26,800
	TOTAL TRAINING	375,950

agencies can train replacements.

Most of the specialized remote sensing training will be in learning photo interpretation using satellite imagery and aircraft photos. The students should study areas that they know and are working on already. This familiarity will assist them in using ground truth information to verify conclusions drawn from remote sensing data.

All training should be done with a multi-discipline group, so that upon return to Syria the participants will be prepared to begin work immediately on resource studies of their country.

The types of training to be provided under this are shown in Table 2 and described in detail in Annex 2.

In addition to the training included in this project, there will be two types of training related to remote sensing conducted to be financed under the existing General Participant Training Project (0004). These are:

(1) Training for Members of Remote Sensing Committee

A limited number of National Remote Sensing Committee members (present Committee or proposed NRSC Advisory Committee) should spend 1 to 2 weeks visiting remote sensing facilities in the U.S. As some of these may not speak English, it may be necessary to have an interpreter accompany them. This group should visit Goddard Space Flight Center, Greenbelt, Md.; EROS Data Center (EDC), Sioux Falls, S.D.; Moffat Field, Mountain View, Calif.; Vandenberg Air Force Base, Calif.; Johnson Manned Space Flight Center (JMSFC), Tex., and Cape Canaveral, Fla. It is expected that the Committee will send six participants for 2 weeks each.

(2) Academic Training which includes Remote Sensing

It is proposed that 10 participants be sent to the U.S. for 2 years each for Master of Science degrees. Their training will be in their disciplines, with some courses in remote sensing. These positions are not directly related to the NRSC so are not vital to its functioning. However, the training these people receive will be valuable to the collection of data for the NRSC and their experience with

remote sensing will be useful in their future work in scientific and technical fields.

Arranging for all project training will be the responsibility of the U.S. consultant. Candidates will be proposed by the NRSC or other agencies to the State Planning Commission. They will then be tested in English and, if they achieve high enough levels, sent for training in the U.S. If their English capability is inadequate, they will be trained at the English Language Training Center in Damascus, with any additional training required done in the U.S. AID, in consultation with the contractor, will assure that participants receive the type of training needed to fill their future jobs at the NRSC.

b. Technical Advisory Services

U.S. experts will be needed to assist SARG in setting up the NRSC. They will be recruited on a contract basis, with one contractor providing all the necessary experts and back-up assistance for them. The contractor will be responsible to the Director General and assist him in setting up the project and in establishing its operating procedures. The contractor will also be responsible for arranging the training of NRSC personnel in the U.S. and will assist the Director General in seeing that training is properly accomplished and returned participants satisfactorily functioning in their new positions. The contractor will also assist the Director General in procuring equipment, e.g., in making final decisions on equipment to be ordered, preparing procurement documents, assuring that equipment is delivered on a timely basis, etc. In summary, the contractor is to assure that the transfer of technology is accomplished in satisfactory order.

Technical advisory services of the type needed can be obtained from either a private company, such as the Environmental Resource Institute of Michigan, or a university, for example, the Center for Remote Sensing at South Dakota State University. It is anticipated that this will be a host contract, negotiated either with the NRSC or the Ministry of Electricity representing the National Remote Sensing Committee. SARG is anxious to be party to the contract and this would conform with AID policy. However, the agency designated to represent SARG may not have sufficient experience and depth of technical and legal expertise to negotiate and administer the contract. In such a case, AID may have to negotiate and manage the contract.

TABLE 3

Technical Advisory Services - U.S. Experts	Cost in U.S. $
1. Resident Manager 5 years in Syria	750,000
2. Instrument Engineer One expert for 3 months	37,775
3. Computer Maintenance Expert One expert for 1 year in Syria	150,000
4. Computer Analyzers and Programmers Two experts for 6 months each	150,000
5. Photographic Laboratory Technicians: Two experts for 6 months each One expert for 1 year	150,000 150,000
6. General Consultants on Training 12-man months TDY over the 5-year period	100,000
TOTAL Technical Advisory Services	1,487,775

The type and number of U.S. experts needed are described below and summarized in Table 3.

(1) Resident Manager

The resident manager will act as science advisor to the Director General of the NRSC and chief of the U.S. contract team. He should have a Ph.D. degree and at least 5 years' experience in a resource discipline and be experienced in all phases of remote sensing. He must be a capable manager and be able to work with the Director General and the Board of Directors. He must have sufficient technical background to advise on ordering and setting up of equipment. He must be familiar with training in remote sensing and related resource disciplines as well as in the user services to be provided by a national remote sensing center.

The manager will supervise the AID finance inputs in the project and be the chief U.S. assistant to the Director General in the establishment and operation of the NRSC. Working with appropriate Syrian officials, he will be responsible for ordering, receiving, and setting up the equipment; supervising the selection of participants for training in the United States, ensuring that those U.S. technicians needed to give further on-the-spot training in Syria are available at the proper time. He will train the Director General, who will assume complete responsibility for management of the NRSC when the AID project is completed.

One expert for 5 years $750,000

(2) Instrument Engineer

This expert will work with the suppliers' engineers in setting up the instruments when they arrive. He will ensure that all instruments are in good working order and make certain that the Syrian technicians are trained in their operation and maintenance.

One expert for 3 months $37,775

(3) Computer Installation and Maintenance Technician

This U.S. technician will be needed to help set up the computer, also working with suppliers' engineers, and ensure that the Syrian technicians have the know-how to operate

and maintain it. The computer chosen may be of a type for which there is already maintenance available in Syria. If so, local facilities could be drawn on for long-range maintenance along with NRSC technicians trained in the U.S.

One expert for 1 year	$150,000

(4) Computer Analyzers and Programmers

These specialists should arrive after the computer is set up and the NRSC participants have returned to Syria from their U.S. training. They must be capable of programming the computer to gather resource data in the field from Landsat, digitizing the Landsat imagery on the computer, and programming for digitizing maps.

Two experts for 6 months, each	$150,000

(5) Photographic Laboratory Technicians

These experts will help set up the laboratory and ensure that Syrian technicians trained in laboratory work are capable of operating it. One expert will remain for 1 year to ensure proper operation of the laboratory.

Two experts for 6 months, each	$150,000
One expert for 1 year	$150,000

(6) General Consultants on Training

When the Syrian training officers return to Syria and begin the NRSC's training program for new NRSC personnel and staff from the user agencies, some of their U.S. teachers should return with them to ensure that the training will go smoothly. Subsequently they should be on call to assist training workshops in Syria. These consultants will stay for about 3 to 4 weeks per visit.

Twelve months of TDY	$100,000
Total Technology Transfer	$1,487,775

c. Commodities

An illustrative list of equipment, materials, and vehicles required for the project is in Annex 3. When the NRSC

has been established and the contract team is on the job, this list will be finalized and procurement documentation prepared. The contractor will handle the procurement. The commodity list has been divided into three parts: remote sensing analytical equipment, photographic laboratory equipment, and vehicles.

(1) Remote Sensing Analytical Equipment

This equipment includes items needed to analyze Landsat and aerial photos. Much of it will also be used by the students in the NRSC for field investigations. Additional items for field work may be needed and added when final equipment lists are prepared. Suppliers' contracts will include normal installation services where appropriate.

Sub-Total	$762,257

(2) Photographic Laboratory Equipment

The photo laboratory equipment listed is expected to meet all needs of this laboratory during the project's duration. As in (1) above, normal installation services will be included in contracts with suppliers.

Sub-Total	$156,231

(3) Vehicles

Transportation for students and resource managers on official business to the field for ground-truth studies will be needed. For this purpose the following vehicles will be procured for the project.

One microbus (about 20-passenger capacity	$25,000
Five 4-wheel drive field vehicles @ $10,000	40,000
Sub-Total	65,000
Total Commodities	$ 983,488

C. SARG Contributions to the Project

The SARG will finance all local costs. Its contribution will amount to the equivalent of almost $3.4 million and will include:

1. Salaries of NRSC personnel

a. Director General

The Director General's salary will be about $15,000 per year, totalling $75,000 for five years.

b. Professional

It is anticipated that about 30 professionals will be needed to operate the center. They will have average annual salaries of about $8,000. Their total salaries for the five-year life of the project will amount to $1,000,000. This estimate allows for the likelihood that it will take some time fo the staff to reach its full force.

c. Subprofessional Staff

About 40 subprofessionals will be needed at the NRSC, including secretaries, typists, maintenance personnel cleaners, drivers, etc. It is estimated that their salaries will average about $4,000 a year with a total for five years of $800,000.

2. Housing for the NRSC

The NRSC will be housed temporarily in quarters provided rent-free by the Ministry of Electricity. These are valued at about $30,000 per year, or $90,000 for the three years the NRSC expects to occupy them. The NRSC's permanent building will be on the grounds of the Polytechnical Institute in Douma, about 17 km. from downtown Damascus. Therefore, no money will be needed for land, water and sewer connections, streets and other services. It is anticipated that the building will be about 1,200 square meters in area and contain enough large rooms to house a photo lab, library, lecture hall, computer and workshop space, as well as rooms for the remote sensing equipment, reception, kitchen and offices. Some room should be left for expansion, in case new equipment is needed later, such as a computer for image enhancement. It is planned that the building be constructed of reinforced concrete with terrazzo floors. Its estimated cost is about $500 per square meter, for a total cost of about $600,000. Total housing cost-$690,000.

3. Furnishing

The cost of furnishings is estimated at $40,000.

4. Miscellaneous Expenses

Operating supplies, building maintenance, transportation for staff and trainees, training of user agency personnel, etc., for five years is estimated at $100,000.

5. Inflation and Contingencies

Thirty percent of the total of Items 1-4 has been included for inflation and contingencies. This will amount to about $733,325 for the 5-year period.

The total SARG contribution is about $3,438,325.

III. PROJECT ANALYSIS

A. Technical Feasibility

A remote sensing project such as this one is technically feasible in Syria, based on the following considerations:

1. The approach chosen for establishment of a remote sensing capacity in SARG has already been successfully used by AID in Upper Volta and Kenya, and it is now being used in centers planned for Thailand and Latin America. Basic conditions for the success of this type of project are at least as favorable in Syria as in these other countries.

2. Syria is in the fortunate position of being within range of two receiving stations; that in Italy and one hopefully to be opened in Iran. Thus, data can be received that are taken over a given spot every nine days by Landsat 2 and 3 Satellites. In addition, there should be no difficulty in receiving the Return Beam Vidicon (RBV) imagery now being transmitted from Landsat 3 and possibly other Satellites.

3. SARG has already conducted successful resource surveys in meteorology and geology, and is beginning studies on soils, land types, and agriculture. Thus, the Syrian officials responsible are familiar with the end product they should achieve, complete resource inventories and maps, which will be revised on a continuing basis as new data become available.

4. The technical feasibility of the project approach is supported by SARG's recognition that it must have much more complete knowledge of its natural resources; by the existing cooperation of all the resource agencies in the National Remote Sensing Committee; by SARG's readiness to provide its share of the project's cost; and by the support for the project from the highest levels of the SARG.

B. Economic and Financial Analysis

Calculation of precise economic and financial returns on this project is not possible. For example, the cost of establishing the NRSC is minimal compared to the increased agricultural production which could result from better knowledge of soil types or new petroleum production from new oil deposits discovered by using remote sensing techniques. Consequently, no attempt is made in this paper to calculate in the usual way economic and financial rates of return.

However, investments in remote sensing centers are proving themselves to be generally cost effective. Remote sensing techniques have been used to find underground water resources, to detect mineral occurrences which have led to mineral development and to help in site location for engineering structures such as dams and roads. They are now used by every major oil company to help in its search for oil. Since remote sensing techniques were developed in the U.S., most of the successes have been in the United States or were demonstration projects carried out by U.S. technicians in the Third World countries; these same techniques can be applied successfully there.

Furthermore, remote sensing techniques are cheaper than traditional exploration methods in important ways. Traditionally, land resource surveys have been done by personnel actually on the ground. Aerial photography has aided these field surveys and is still the most valuable tool in surveying small areas. When dealing with a whole country, however, satellite imagery is by far the cheapest method of survey. As an example, it has been estimated that aerial photography, including interpretation, costs about 30 times more than a survey of compatible areas done by satellite techniques. It is also much more accurate.

C. Cost Estimate

Table 4 summarizes the cost estimate. A project grant of approximately $3.5 million will be needed to finance AID's contribution for the financing of U.S. foreign exchange costs. The contribution of the SARG is estimated at equivalent of about $3.4 million.

D. Social Analysis

The direct social impact of establishing the NRSC will be that Syria, for the first time, will have a tool which can be used to help gather data on the nation's natural resources and also help it to understand the nature and extent of those resources. For example, some of the villages and towns in the mountainous area between Damascus and Homs are short of water, due to population growth and depletion of existing supplies. The rapid rate of population

TABLE 4

SUMMARY OF ESTIMATED COST OF NATIONAL REMOTE SENSING PROJECT
FOR 5-YEAR LIFE OF PROJECT

Activity	Training	Technical Assistance	Commodities	Total
AID Contribution:				
1. Training Syrian training in U.S.	$375,950			$ 375,950.
2. Technology Transfer U.S. experts to Syria		$1,487,775		1,487,775
3. Facilities Development (Commodities):				
Remote Sensing Center			$ 762,257	
Vehicles			65,000	
Photographic Lab.			156,231	983,488
Sub-Total				$2,847,213
4. Inflation (15%)				427,101
5. Contingencies (8%)				225,686
TOTAL AID				$3,500,000
SARG Contribution:				
1. Salaries of NRSC personnel				$1,800,000
2. NRSC Building and Temporary Quarters				690,000
3. Furnishings				40,000
4. Miscellaneous (building maintenance, training of personnel, transportation, etc., per year)				100,000
5. Director General				75,000
Sub-Total				$2,705,000
6. Inflation and contingencies (27%)				733,325
TOTAL SARG (U.S. Equivalent)				$3,438,325

growth in Damascus itself may outrun the existing source of water by the year 2000. Another factor that concerns Syrian planners is the advance of the deserts. In agriculture too there is a need to know where the arable soils are and whether they can be irrigated. There is also the need to develop ground-water supplies.

Land use and land capability studies, which can be more effectively done using remote sensing techniques, can do much toward showing the ways in which the average farmer can be more productive and have a higher standard of living. This alone will go far toward increasing average agricultural income. Likewise, gathering of data on other resources previously unknown will open new sources of production and income for all members of Syrian society.

E. Role of Women

While women's traditional role in the Middle East has been confined to home and family, women in Syria today have more access to professional jobs than previously and more in Syria than in many other countries in the area. There are women qualified for positions in the NRSC, and SARG officials have informed USAID that they are actively seeking women for training for the NRSC. Probably at least one woman will be in the first group of trainees, since a likely candidate for equipment specialist is a woman. In addition to direct participation in the remote sensing project, women, of course, also share in the general indirect benefits discussed in the social analysis above.

IV. IMPLEMENTATION

A. Implementation Plan

Table 5 summarizes the implementation plan.

1. Actions prior to SARG Ratification of Project Agreement: The project agreement is expected to be signed early in August, 1979. The rate of progress immediately after that depends on the time required for the SARG to ratify the project agreement. In the past this has, at best, taken 4-5 months, so the timetable allows nearly 4 months, with ratification by November 15, 1979. Prior to ratification, several actions can be taken, however. The Director General should be appointed immediately after signing of the project agreement, if not before. He should begin to assemble to NRSC staff and arrange for their training in the U.S.; English language testing of nominees should begin immediately. Those who are sufficiently fluent in English could begin training in the U.S. as soon as their programs are arranged. Since the AID contractor would not yet be on the job, the AID Training Office in Washington would have to be responsible for making programs for these early participants. Their costs could be financed under the General Training Grant, and the Remote Sensing project funding could be adjusted accordingly later.

TABLE 5
TIMETABLE OF EVENTS
FOR ESTABLISHMENT
OF NRSC

DATE	EVENT
1979	
May 7	Project paper to Washington, D.C. from AID/Damascus
June 30	Project paper approval, Washington, D.C
August 2	Agreement signed, SARG - USAID
August 6	Director General of NRSC appointed by SARG
August 20	English language testing and study begins for NRSC technicians going to U.S. for training.
August 31	AID/W and USAID draft RFP for consultant contract
September 30	Director General NRSC approves RFP
November 15	Ratification of Project Agreement by SARG
November 22	NRSC moves into temporary quarters, receives equipment for UN symposium
December 3	RFP issued by NRSC
1980	
January 15	RFP responses received in AID/W. Representatives of NRSC and USAID/Damascus go to Washington for evaluation of proposals
January-February	NRSC technicians begin training in U.S.
February 15	Top-ranked firm invited to Damascus for negotiations
March 31	Contract negotiations successfully completed and contract signed.

DATE	EVENT
1980	
May 15	Consultant's contract approved by High Economic Committee.
May 31	Consultant mobilizes, Resident Manager arrives in Damascus
June	Architect for NRSC building goes to U.S.
July	Architect returns and begins to design
August-October	Equipment orders placed
November	Design of NRSC building completed
1981	
January	Equipment begins to arrive and is set up in temporary quarters
January	Consultant's instrument engineer arrives
January	Trainees in professional fields begin to return
February	Construction of NRSC building begins
December	Last of trainees sent to U.S. (except computer specialists).
May	NRSC begins resource studies
May	All equipment on hand (except computer)
April	All trainees have re turned (except computer specialist)
April	Consultant's photo laboratory technician arrives to set up a temporary photo lab.
June	First Syrian-run remote sensing symposium held with help of AID project consultant.
July	Training of Syrian resource managers from user agencies begins at NRSC
July	Computer trainees sent to U.S.
August	First draft of part of part of resource atlas produced.

DATE	EVENT
1981	
September	First project evaluation
1982	
January	Computer trainees return
March	Computer ordered (NRSC management and AID consult with computer trainees on type needed before placing order)
April	Computer maintenance specialist to U.S. for training
April	Training courses throughout year. U.S. training specialists arrive on TDY as needed.
September	Resource maps begin to be released
November	Second project evaluation
1983	
April	New building finished
May	Equipment moved from temporary quarters to NRSC building
May	Computer and computer experts arrive
June	Photo lab technicians arrive to set up labs in new building
December	Third Project evaluation
1984	
March	Consultant's computer expert and photo expert leave
1985	
February	Consultant's final project evaluation
May	Resident Manager leaves. Syrian staff assumes complete responsibility for operation of NRSC

the sooner the participants can begin training, the more rapidly will project execution progress.

During this pre-ratification period, the RFP for the consultant's services can also be drafted. USAID/SARG should do this but will need technical help from AID/W. Since the RFP will ask for proposals to which firms will be bonded, it cannot be published until the project agreement has been ratified by SARG, but should be as soon thereafter as possible.

Whatever the ratification schedule, the NRSC should be installed in its temporary quarters by November, 1979, in order to prepare for the U.N. Symposium scheduled for December 1-13, 1979.

2. Negotiation of Contract with Consultant: The pre-qualification step for contractors has been ommitted, since there are relatively few organizations qualified to bid on the type of services demanded and the replies are not expected to be too numerous for review.

The SARG wishes to negotiate the contract itself, but is likely to need considerable back-up help from AID. Allowing for all contracting steps, including final approval of the contract by the High Economic Committee, it is not expected that the contractor will be mobilized before the end of May, 1980. If SARG ratifies the project agreement and approves the contract earlier than scheduled, the implementation schedule can be moved forward.

3. Mobilization of Consultant: As soon as possible following SARG approval of the contract, the resident contract manager should come to Damascus. Working closely with the Director General, the manager will expedite selection of participants. Much should already have been done on this, but the contractor's U.S. office will have to work quickly to arrange the appropriate training in the U.S. which they will take over from the AID Training Office. Since the Minister of Electricity has already contacted the member agencies of the National Committee to find suitable personnel for training, there should, by summer 1980, be an adequate supply of technically qualified, English-speaking candidates. All participants should have been sent for training (except the computer specialists) by the end of 1980.

A priority task for the contract resident manager is to begin ordering equipment (except for the computer). This step should be completed by the end of October, 1980. The equipment should begin to arrive in the first half of 1981, and should be set up in the temporary quarters of the NRSC so that the NRSC can begin to function. In fact, natural resource studies are scheduled to start in May, 1981.

4. Temporary Quarters for the NRSC: So that the project will not be delayed by lack of a permanent building, the Minister of Electricity has arranged for temporary quarters for the NRSC. These will be in a new structure belonging to the Ministry of Electricity in downtown Damascus. As stated above, it ishoped that these quarters will be useable in time for the U.N. Symposium in December, 1980, but they must be available for the project no later than spring, 1980. While the photo laboratory will be in cramped quarters in the temporary housing and undoubtedly cannot be brought to full production until moved into the permanent quarters, it is possible that in the interim some of the photographic services can be contracted out. The library will not be fully functional in the temporary quarters either, and may have to be housed elsewhere until the new building is available.

5. Timing of Installation of Computer: At present it is not planned to set up the computer until the new building is completed, which would not be until spring, 1983. However, the SARG authorities are most concerned at this delay, since the NRSC can only be partially operative before the computer is installed and in operation, which would not be until summer, 1983 according to present plan. The SARG authorities are anxious that the NRSC begin to function as soon as possible and that it has a sufficient period of functioning under the AID technical services contract to assure satisfactory operation when the consultants leave. Accordingly, the National Remote Sensing Committee has stressed that one of the first tasks of the contract resident manager will be to determine whether the time by which the NRSC reaches full operation can be moved forward.

Training by the NRSC staff for personnel from the Syrian user agencies should begin in summer, 1981. By this time all NRSC trainees should have returned from the U.S. and all equipment (except computer) be on hand and installed in the temporary quarters. The NRSC staff will have had several months experience working on resource studies.

6. NRSC Transfer to Permanent Quarters: Under the present plan, the new NRSC building will be completed in April, 1983. All parts of the NRSC and their equipment should be installed in the new NRSC building by the following summer. The computer should be delivered by May, 1983. The rest of 1983 and 1984 will be devoted to getting all equipment including computer and photography laboratory set up, assuring that the NRSC Syrian staff knows how to operate and maintain all equipment, and continued training of user agency personnel. This phase should be completed by the end of 1984. The staff will continue working on the resource maps which will be released as they are completed.

7. Completion of Project: The resident manager should complete turnover of all aspects of the NRSC's operation to its Director General and leave by May, 1985. The end of the project

status will be reached when the Syrian counterparts are able to conduct resource studies and training in a fully equipped facility. Many of the natural resources maps should have been made and others be in process, with revision being made on a continuing basis.

B. Evaluation Arrangements

It is proposed that four project evaluations be made during the life of the project. These evaluations, conducted by the AID/W project manager, a representative of the Syrian Remote Sensing Advisory Committee, a U.S. specialist in remote sensing and a representative of USAID/Damascus, will look not only to the functioning of the project in relation to the project design, but will also anticipate problems before they arise. The timing of these visits should be established as needed but should be on a yearly basis.

C. Negotiating Status and Conditions Precedent

The design of this project has been worked out in close cooperation with the SARG National Remote Sensing Committee. The proposals on the three components of the project: training, technical advisory services, and commodities, have been discussed with them and their ideas incorporated in the project planning.

The following undertakings and actions by the SARG will be included in the covenants or conditions precedent in the project agreement:

1. Ratification of the project agreement and preparation of legal opinion by SARG.

2. Designation of SARG's legal representatives for the project

3. Approval of the presidential authorization establishing the NRSC.

4. Appointment of Director General and nomination of candidates for key positions.

5. Provision of adequate quarters for the NRSC.

6. Arrangements with Italy and/or Iran to obtain Landsat data from their receiving stations.

Annex 1

FUNCTIONS OF THE NRSC TECHNICAL DEVISIONS

1. Data Acquisition Section:

This section will be responsible for gathering the remote sensing data which will be needed for resource analysis. It will include units for satellite and aircraft data acquisition, a unit for equipment procurement and maintenance, and a mission planning unit responsible for the aircraft missions that will obtain aerial photos.

2. Applications and Analysis, and User Assistance Section:

This will be the main resource analysis section. Its staff will work closely with other SARG agency personnel in analyzing the remote sensing data and helping the users to interpret it. Its members will be interchangeable with the training section staff since they will be called upon to analyze data and work with users. The library will be under this section.

3. Instrument Engineering Section:

This section will be responsible for the maintenance and operation of the computer, and also progremming the computer to digitize Landsat imagery and to store resource data. The photo laboratory, part of this section, will reproduce Landsat imagery and to store resource data. The photo laboratory, part of this section, will reproduce Landsat images, copy maps, print overlaps to maps, etc. Highly trained technicians will be needed to operate this section.

A cartographic capability is needed for the NRSC and will be incorporated in this section. It is, however, assumed that any base map drafting, printing and reproduction is already being done in existing SARG facilities, and therefore cartographic personnel are available.

4. Training Section:

This section will be responsible for instigating training courses, seminars, workshops, etc., to teach remote sensing to resource managers in the SARG user agencies and new recruits to the NRSC itself. The staff should be experienced resource managers of varying disciplines and with at least 5 years' field experience.

5. Accounting and Administration Section:

The Accounting and Administration Section will operate according to usual SARG requirements and practices in these areas.

ANNEX 2

DESCRIPTION OF TRAINING

UNDER NRSC PROJECT

Described below are the various types of training proposed for the staff of the NRSC, as well as the type of educational background and experience needed for participants to qualify for that training.

1. Training for the Professional Staff

a. Applications Analysis and User Services Staff

These specialists should be resource discipline-oriented and have been resource managers, i.e., geologists, hydrologists, range managers, etc., for at least 5 years. Their background should include photo interpretation, although if the participants do not have this experience they can learn it in training. These people should be interchangeable with the training officers (see 1.c. below), since they may assist the Applications Analysis and User Services Staff, their time is fully absorbed by training of personnel of the user agencies. The training will be similar for both these categories of specialists. Participants will be sent to a university or equal facility that has general courses in remote sensing and photo interpretation, i.e., the Remote Sensing Institute of the University of South Dakota at Brookings, S.D., the EDC or Environmental Resources Institute of Michigan. Advanced degrees would be preferred, and teaching experience would be desirable.

Two participants for 6 months each $36,900

b. Librarians

The NRSC library should be staffed with librarians trained in the operation of a technical library. They will be responsible for gathering and cataloging the resource data that are already available, and also for absorbing newly acquired data into the collection. These participants need to spend from 3 to 6 months in the U.S. at the libraries of USGS, the Department of Agriculture and the EDC. They should have a short (4-5 day) course in remote sensing, perhaps at EDC. In their stay at these locations they would learn cataloging

techniques for books and maps. Personnel chosen for this should be trained librarians.

Two participants for 6 months $36,900

c. Training Officers

As noted above, these participants will be interchangeable with the Applications Analysis and User Services Section personnel, and their training and background will be similar. Their training, as well as that of Applications Analyzers, can be staggered so that not too many people will be away from the NRSC in training at one time. Training at different institutions may be desirable. One of these trainees, preferably the one with the most discipline-oriented background, should be designated as the head of section.

Five participants for 6 months $92,250

d. Instrument Engineering Section Staff

This section will be responsible for the more advanced equipment, such as the computers and some of the photo laboratory equipment. It will include five specialists: a manager, a maintenance engineer and three programmers.

(1) Manager

The manager should have background in administration, knowledge of computer operations and photography, and some training in statistics, with a base in physics or civil engineering. If possible, the manager's training should be at facilities where computers are in use for compiling and storing resource information, as well as digitizing maps and Landsat data, i.e., such institutions as the USGS or Purdue University. His training will depend upon the choice of the equipment to be installed.

Manager - one participant for 6 months $18,450

(2) Computer Programmers

These participants should already have had some training in computer programming. It is possible that there are already people in Syria trained for these jobs, so

extensive training in the U.S. may not be necessary.

Three participants for 6 months, each $55,350

(3) Computer Equipment Maintenance Specialist

As there are a number of computers already in Syria, which may include the type selected for the NRSC, it is possible that this position may not be needed and all maintenance can be done on contract.

One participant for 6 months $18,450

e. Photo Technicians

One of the most important tasks of the NRSC will be to reproduce satellite imagery in color, including reproduction of color photos from black and white images and developing the images so as to bring out the subtle shades in the photo. Another task will be to reproduce maps by photography. There are personnel in Syria already trained in photography and the participants should be chosen from these. All four photo technicians planned may not be needed at the start of the project, but when the NRSC is in full operation, they will be. Training can be done at the EDC. Experience in photographic reproduction and chemistry is desirable.

Four participants for 6 months $77,800

f. One Meteorologist

Meteorology satellites do not normally provide data to remote sensing centers, but these weather satellites are becoming more numerous and are now in general use. The data they collect are normally used for weather forecasting, and little use has been made of them for looking at the earth. It would be desirable to have a SARG meteorologist familiar with these systems and their capabilities. Syria has a satellite receiver, but others are needed because of the great strides that are being made in this field. In addition, the meteorological satellites can be used to transmit data from Data Collection Platforms (DCP's) to a central point. This may be attractive to SARG for collection of data on weather or stream flow from remote areas. There should be some local knowledge of the weather satellite and DCPs capabilities in Syria. The

participant chosen should spend from 1 to 3 months at the U.S. Weather Satellite facilities in Suitland, Md. working with the data and learning of the capabilities. The length of training will depend on the participant's background and desires.

One participant for 3 months $9,300

g. Architect of NRSC Building

The architect who is to design the NRSC building should spend a month in the U.S. examining buildings which house remote sensing centers in order to be able to see exactly what is needed. This trip should begin as soon as possible, for although the NRSC will be in temporary quarters until its building is finished, the NRSC cannot function fully until it occupies its own building.

One participant for 1 month $3,750

h. Map Draftsmen

The drafting section, which is responsible for drafting maps, will probably be able to obtain trained personnel from the Cartographic Unit of the Defense Ministry. If this is not possible, some cartographers will need to be trained. The training should be at the U.S. Geological Survey.

2. Training for NRSC Technicians

a. Data Acquisition Personnel

To obtain, handle, store and utilize aircraft photos and satellite imagery, two people will need training in the U.S. They will spend 1 month studying remote sensing in general and 1 month on such specialized subjects as the various cameras and films currently used for remote sensing, their types and storage, as well as the capabilities of the future satellites.

Training in remote sensing should be at EDC and in aircraft planning at the Johnson Manned Space Flight Center (JMSFC) with a visit to the U-2 operation at Moffat Field. Qualifications for candidates are: degrees in photography, electrical engineering or physics.

Cost for two participants for 2 months each $13,-00

b. Equipment Specialist

Although much of the equipment that will be used in the NRSC is simple to operate and maintain, some is complex. Therefore, it will be necessary to have personnel trained in the operation and maintenance of the standard remote sensing instruments at the NRSC. Training in the U.S. will be at a variety of places such as: EDC, U.S. Geological Survey (USGS), Flagstaff, Arizona, JMSFC and Moffat Field. This person should have background in photogrammetry or electrical or mechanical engineering.

One participant for 2 months $6,700

c. Aircraft Mission Planner

In planning aircraft flights to obtain photo coverage, it is necessary to arrange flight patterns so that the cameras will take overlapping stereoscopic photos of the entire area under study. Undoubtedly, there are people in the Syrian Air Force who are already familiar with this type of planning who might be transferred to the NRSC. In any case, a person familiar with aircraft operations, map reading, basic mathematics and some knowledge of cameras should be sent for 2 months training to Moffat Field and JMSFC. This training will be similar to that in (a) above, although this person will deal with actual mission planning rather than with film acquisition and storage.

One participant for 2 months $6,700

Grand Total for Training $375,950

ANNEX 3

COMMODITY PROCUREMENT

1. Obligations of Contractor for Commodity Procurement

These arrangements assume there will be a host country contract. The contractor will be responsible for advising the Director General of the NRSC on all imported commodities and equipment procured under the AID project. It will prepare procurement documents, assist in evaluation of offers, follow-up on shipment and proper installation of equipment.

The items to be procured are those on the attached list, or any substitutions authorized by the Resident Manager and Director General.

Prior to placing orders for the equipment listed, the contractor will have appropriate members of his technical staff review the technical adequacy of the items listed and inform the Resident Manager of any recommended substitution. Upon receiving his written concurrence on any substitution. Upon receiving his written concurrence on any substitution, the contractor will proceed with the procurement in accordance with AID policies and regulations. The contractor will determine origin of items not of U.S. manufacturers and advise USAID/ Damascus if a source/origin waiver is required.

In addition to the list below, the contractor will provide various contrast-enhanced photographic reproductions of Landsat imagery as requested by the Resident Manager. This will involve reprocessing positive and negative transparencies (70mm) obtained from the Fucino, Italy Remote Sensing facility to produce transparencies with optimized contrast. These transparencies will be combined in a multispectral viewer or precision color enlarging system to produce various color products including 35mm slides, negative and positive transparencies up to 9" x 9" and color prints up to 30" x 30". All processing services shall be requested in writing by the Resident Manager. It is estimated that the total value of these services will be $35,000 during a 2-year period.

2. List of Commodities

The following names of manufacturers are illustrate.

A. Remote Sensing Equipment

Item No.	Item Name	Mfg./Vendor	Specifications	(US $) Est. Unit Cost	Qty.	(US $) Est. Cost
1a	Mirror Stereoscopes	Forestry Supplies	Serial No. 51100, Type F-71 w/case (SN 51110)	270.00	5	1350.00
2a	Binocular Attachments	Forestry Supplies	Serial No. 51120,4x W/inter-pupillary adjustment, individual ocular focusing (fits F-71)	195.00	5	975.00
3a	Parallax Bars for Stereoscopes	Forestry Supplies	Serial No. 51130, Type 122-GE (fits F-71)	175.00	2	350.00
4a	Pocket Stereoscope	Forestry Supplies	Serial No. 51030, Abram CR-8	15.50	20	310.00
5a	Pocket Stereoscope Height Finder	Forestry Supplies	Stock No. 51020, Type HF-2	86.00	5	430.00
5b	Map Tube Rack	Forestry Supplies	36 tube capacity, 33 5/8"W x 15 3/4"D x 32"L	64.00	2	128.00
5c	Counting Machine	Forestry Supplies	Serial No. 53112, 4 counting units	46.50	4	186.00
5d	Light Tables	VWR/ Treck	Model BB42T Nuarc 30" x 40" Economy Table Top	260.00	4	1040.00
6a	Abneys	Forestry Supplies	Stock No. 43929, Leitz Topographic-two graduated ares w/percent degrees, and topographic calibrations	103.00	2	206.00
7a	Brunton Pocket Transits	Forestry Supplies	Stock No. 37215, Induction damped 0-360 degrees graduation	83.00	10	830.00
8a	Altimeters	Forestry Supplies	Stock No. 43316, Thommen Model 3011, Barometric Pressure and Meters	88.00	2	176.00
9a	Altimeters	Forestry Supplies	Stock No. 43355, Thommen Model 3016 Barometric Pressure and Feet	88.00	2	176.00

Item No.	Item Name	Mfg./Vendor	Specifications	Est. Unit Cost	Qty.	Est. Cost
10a	Diazo Printer Developer	Blue Ray or Arkwright-Interlaken	Model 814-14" capacity	400.00	5	2000.00
11a	Diazo Supplies	K & E	Ammonia, developer, Bulbs, ... cutters, paper and developer, dispensers, etc.	300.00	1	300.00
12a	Diazo Film	K & E or Arkwright	Tinted base, 8' x 10" sheets, 500 sheets ea. of pink, yellow, and blue	100.00	3	300.00
13a	Diazo	K & E or Arkwright	Clear base, 8" x 10" sheets, 2000 sheets ea. of black, red, blue, yellow, orange, green, cyan, magenta, sepia	200.00	9	1800.00
14a	Pocket Magnifiers	Ben Meadows	Bausch and Lomb—one 10 power and one 14 power	50.00	1	50.00
15a	Rulers	Ben Meadows	Stock No. 030318, Metric 12" bevelled ruler with inches in tenths and millimeters, clear	.60	35	21.00
16a	Rulers	Ben Meadows	Stock No. 030026-50, cm long w/mm and cm graduations, clear	2.00	19	38.00
17a	Scales	Forestry Supplies	Stock No. 47206, set of 23 scales in fan which read to various map and image scales	9.00	10	90.00
18a	Engineers	Ben Meadows	Stock Number 030006, 18" triangular, boxwood	35.00	1	35.00
19a	Metric	Ben Meadows	Stock Number 030054, 30 cm triangular plastic	4.00	4	16.00
20a	Field Clipboards	Forestry Supplies	Book Type Loose Sheet holders 9 1/2" x 11" w/storage	19.30	15	289.50
21a	Dot Counter	Forestry Supplies	Stock No. 45023, 3 digit tally, pressure but no mark	32.45	10	324.50
22a	Dot Counter	Ben Meadows	Stock No. 090244.3 digit tally w/ preset, pressure w/pin prick	75.00	2	150.00
23a	Dot Counter	Ben Meadows	Stock no. 090190.3, digit tally, no preset but ink marking, w/10 refills for each pen	94.85	10	948.50

Item No.	Item Name	Mfg./Vendor	Specifications	Est. Unit Cost	Qty	Est. Cost
24a	Acreage/ Dot Grids	Forestry Supplies square	Stock No. 45025, 9 11" sheet w/8" square grid, 64 dot/factor in^2, acreage factor tables	3.25	50	162.00
25a	Dot Grids	Ben Meadows	Three grids Stock Nos. 102380, 102381, 102382, ea. 12" x 12" of dot densities of 16, 25, and 36 per sq. inch	11.85	50	592.00
26a	Area Scale	Ben Meadows	For quick acreage estimation w/ circle, rectangle, & linear scales	1.00	50	50.00
27a	Sketch-masters	Forestry Supplies	Verticle, Type, 260E, Model 11, with leg extensions	507.50	2	1015.00
28a	Sketch-masters	Forestry Supplies	Carl Zeiss LUZ w/0.5 to 2.8 scale ratio range	1700.00	1	1700.00
29a	Areal Form Line Grids	Ben Meadows	For sketching contours on oriented stereopairs	3.95	50	197.50
30a	Leroy Lettering Sets	Ben Meadows	Stock No. 063006-6, templates w/ pens, scriber, holders and case	130.50	10	1305.00
31a	Portable Drafting Station	Forestry Supplies	Stock No. 49193, folder containing pad, drafting machine, protractor, scales	22.90	25	572.00
32a	Acetate Pads	Ben Meadows	Stock No. 010728, Frosted 8 1/2" x 12", .005 thick, pkg. of 25	3.59	120	430.80
33a	Acetate Pads	Ben Meadows	Stock No. 010808, clear 9" x 12", .005 thick, pkg. of 25	3.25	120	390.00
34a	Color Additive Viewer	International Imagery System	Four channel projection machine for registration and variable color filtering of multiple images obtained from Landsat multispectacle scanner and aircraft remote sensing systems formation of 1:1 million and 1:500,000 scale images from 1:3.369 million scale transparencies. Provision for tracing and for production of hard copy imagery.	14575.00	1	
			1:1.5 model 6040, 3.3 x magnification			
			PT-70 tracing attachment	5390.00	1	
			Exposure Control 6004-01 color color printing	2805.00	1	
			package 40 Cp	2145.00	1	
			Additional supplies, K.T CP-1	304.00	1	

Item No.	Item Name	Mfg./Vendor	Specifications	Est. Unit Cost	Qty	Est. Cost
34a cont.			Note: 240V, 60Hz must be specified on order. Spare parts: Lamps 0808(4), 2 sets @ $66	132.00	4	
			Chip holders 0870(4)	39.00	4	
			Total Color Additive Viewer			25,903.00
35a	Opaque Projector	Typical Acceptable model made by Minnesota and Minning and Manufactoring Co.(3M)	Horizontal projection producing enlarged image from black and white and multicolor opaque copy. Copy holder must accommodate both single sheets and opened both of 10" x 12" format and 2" minimum thickness. Must operate on 220V, 60 hz. power	440.00	1	440.00
36a	Projection Screen	Dalite versatol 70" x 70"	Tripod mounted foldup, screen rolls up	64.00	2	128.00
37a	Slide Projector	Kodak 850 H-K	35 mm projection, with automatic focusing, zoom lens to 5" or 6" maximum focal length. Must handle all 35mm and 2" x 2" superslides in paper, plastic or metal mounts. Must operate on 220V, 60 hz. power. Remote Control should be able to take circular slike tray of 80 slides.	214.00	2	428.00
38a	Computer	Digital PDP-11/70	Computer: High-speed TTL (Schottley) logic yields a basic execution of just under 300 nanseconds input-output architecture designed for 32-bit parallel data transfers. High-speed, CPU-integral mass storage controllers. Such features as these mark the DIGITAL PDP-11/70 as the most profitable, most reliable computers for use in the remote sensing facility. Speed is achieved with high-speed logic circuitry, power with high-speed, broad-band data transfer circuitry, and reliability with extensive parity checking and other internal data-checking modes.			

Item No.	Item Name Mfg./Vendor Specifications	Est. Unit Cost	Qty	Est. Cost
38a cont.	A. Instruction Speed: The basic execution time is less than 300 nanoseconds: thus, adding two integers with just one instruction may be performed in that time span. Internal buffering allows the fetch of the next program instruction. B. Integral Cache Memory: A high-speed bipolar memory, its capacity is 2048 bytes with a cycle time of only 240 nanoseconds. This buffer-like memory unit, located between the CPU registers and main core memory, this unit often eliminates the need for a core memory read operation, and in other ways, speeds internal data flow to match the core to the CPU processing speed. C. Memory Management: A memory management unit for complete management and protection without any time overhead. It is designed to access all of physical memory in the multi-user, multi-programming environment. <u>Mass Data Storage</u> A. Disc System: The digital RP05 Disc Drives and controller each story 100 megabytes, with peak transfer rates of 806,000 bytes per second. Reliability measures include a phase-locked-loop clock system and modified frequency modulation recording, the latest in reliable reading/recording techniques. Removable disc packs allow unlimited off-line storage. B. Magnetic Tape System: A highly-reliable 9-track tape storage system with 800 of 1600 bit-per-inch density. There are ten built-in features to ensure accuracy of data transfers. C. Floppy-Disc Subsystem: A low-cost mass storage subsystem allowing the configuring auxiliary disc-based computing systems with small PDR-11 series processors. These units facilitate data interchange and software distribution, and are designed for high reliability			

Item No.	Item Name	Mfg./Vendor	Specifications	Est. Unit Cost	Qty	Est. Cost
38a cont.			D. Input-Output Media: These include the Decwriter II terminal, the Decscope video terminal, and electrostatic printer-plotter and a 300 line per minute line printer.			
			E. Software: Ideally matched to the hardware for tasks to be performed in the remote sensing environment, RSX-11M system control software and Fortran IV-plus programming software offer the maximum in computer system utilization. (This cost is exclusive of maintenance.)	65000.00	1	65000.00
39a	Zoom transfer scope	Bauch and Lomb	Model recommended 2T4 wide base wired for 220V, 60 hz. catalog No. 53-05-04-03; Accessories: 1 ea. map lens Cat. No. 53-05-12, Spare parts: 2 ea. replacement bulbs for each lamp cost with accessory lens and spares	5600.00	1	5600.00
40a	Overhead Projection	Minnesota Minning and Manufacturing Co.	Horizontal projection producing enlarged image from black and white and color transparency copy. Must operate on 220V, 60 hz.	75.00	2	150.00
41a	Mini-computer		To be placed in the Department of Agriculture soils Laboratory for data reduction computer, terminal disc and tape			
42a	Image Analyzer	Dicomid		45000.00	1	45000.00
43a	Map to map information transfer	Bausch and Lomb	5 x Enlargement superimpose information from 2 maps or map satellite image of different scales. Camera mount.	10000.00	1	10000.00
44a	Light table 10"x28" microscope mount in which zoom stereoscope can be mounted	Bausch and Lomb	Light table capable of holding 2 Landsat transparencies or roll aircraft film-stereo magnifier zoom capability which scans the entire area.			

Item No.	Item Name	Mfg./Vendor	Specifications	Est. Unit Cost	Qty	Est. Cost
45a	Light Table	Richard Model 030	10" x 10" light table portable for viewing Landsat Transparencies Day light fluorescent bulbs must be wired for 220V, 60 hz.	30.00	20	600.00
46a	Viewing Loupe 6x10 power	Multiple	Viewing Loupe for looking at Landsat imagery	3.50	30	75.00
47a	Microfisch	Minnesota Mining & Manufacturing Co.	Capable of reading microfish and film, and reproducing copy photographically, 220V, 60 hz.	5000.00	1	5000.00

B. Photographic Laboratory Equipment

The following list is a suggested inventory of items needed for the photo lab. All electrical equipment is to be adapted to 60 Hz, 220 volt current (the cycle requirement mandatory, the voltage requirement preferred). Specific models, manufacturers or vendors are suggestions only. Any equipment of equal specification would be acceptable. A list of manufacturers and vendors is found at the end of the procurement list.

Item No.	Item Name	Manuf./ Vendor	Specifications	(US $) Est. Unit Cost	Qty.	(US $) Est. Total Cost
1	Microfilm Splicer	Fuller & D'Albert	16mm (Dupage)	150.00	1	150.00
2	Mounting Press	Industrial Photo	Electric, 52"	525.00	1	525.00
3	Map Hanger Stands	Forrestry Supplies	Serial No. 49125 Holds 36" x 52" sheet, 12 doz.	300.85	2	601.70
4	Slide Sorter/ Viewer	Industrial Photo	35mm 80-slide capacity	16.00	2	32.00
5	Color	VWR/ Treck	Durst DC 184/CLS-301 EST taking up to 8" x 10" film, tilt rectifying, w/vacuum board registration holder, and voltage regulation, including negative carriers, lens boards, lens holder, pump & two lamps	8500.00	1	8500.00

Item No.	Item Name	Manuf./ Vendor	Specifications	(US $) Est Unit Cost	Qty	(US $) Est Total Cost
6	Enlarger	VWR/ Treck	Super Chromega D5 XL Dichoric II-color lamphouse, calibrated light distribution, takes up to 4"x 5" film w/ chromega-trol power supply @ 220 V/60 Hz, and incl. negative carriers, lens boards, lens holder, and two lamps	1500.00	1	1500.00
7	Enlarging Lens	VWR/ Treck	Companion-S in Barrell: 50, 80, 135, 150, 180, 240,300, and 360 mm sizes	3727.00	1	3727.00
8	Color Print Processor	Kodak	Model 11 8 x 10 to 11 x 14 paper	420.00	1	420.00
9	Color Print Processor	Kodak	Model 30A Up to 30 x 40 paper, w/ extra 3040A and 2024A tubesm timing disks for EKTACOLOR 37 RC paper at 50 & 60 Hz, and a transformer Kit.	4803.00	1	4803.00
10	Timing Disk	Kodak	Model BW 30 B+W/RC Paper	19.50	1	19.50
11	Timing Disk	Kodak	Model 30A For R-500 EKtaprint 60 Hz	19.50	1	19.50

Item No.	Item Name	Manuf./ Vendor	Specifications	(US $) Est Unit Cost	Qty	(US $) Est Total Cost
12	Film Processor	VWR/ Treck	Serial No. AY81-8-E6 Arkay E.6 Color Film Processor, 2gl. w/processing baskets	1953.00	1	1953.00
13	Timer	VWR/ Treck	Serial No. LKT2519-40 Lektra TM-8 @ 220V, 60 Hz range of 1 to 111 sec in 1/10 sec	149.00	2	298.00
14	Chemical Recovery Cartridge	Kodak	Model 1-P For B+W films/paper, color prints	32.50	4	130.00
15	Chemical Recovery Cartridge	Kodak	Model 2-P For color films	32.50	2	65.00
16	Circulatory Unit	Kodak	Model P Connects chem. recovery cartridges to existing plumbing	24.95	3	74.85
17	Water Chiller	VWR/ Treck	Serial No. 19422-153 Parr 1551 delivers 50°F water @ 6g/hr. rewired to 240V/60 Hz	490.00	2	980.00
18	Water Control	VWR/ Treck	Model 1WS Water Control Center with Water Saver controls, fluctuations in temperature and pressure of hot & cold water inlets rewired to 240 V/60Hz	632.00	2	1264.00

Item No.	Item Name	Manuf./ Vendor	Specifications	(US $) Est Unit Cost	Qty	(US $) Est Total Cost
19	Blue/ White Printer	Blue Ray	Model 842 Combination printer/ developer	1200.00	1	1200.00
20	Copy Stand	VWR/ Treck	Serial No.B01870 + B01871 Technal TC-1,20"wx27"Dx43"H, adjustable centering arm, w/copy light assembly	259.00	1	259.00
21	Densitometer	VWR/ Treck	Stock No. MA1300 5240 Macbeth TR-523, transmission/ reflection	2550.00	1	2550.00
22	Color Analyzer	VWR/ Treck	Stock No. LK72518-15 Lektra PTM66, reads three colors simultaneously	1890.00	1	1890.00
23	Exposure Meter	Gossen	Labo Six enlarging meter	150.00	1	150.00
24	Rotary Cutter	VWR/ Treck	Model Be3810 Rotatrim 42"	250.00	1	250.00
25	Register Boards	Kodak	Stock No.1474667 + 1474675 Both small (5x7 to 10x12) & large (11x14 to 16x20)	744.00	1	744.00
26	Register Punch	Kodak	Stock No.1476969 For use w/Kodak Register Boards	201.00	1	201.00
27	Registration System	VWR/ Treck	Model S-26 Brown-Hulen Manual Punch, 23"x 26"	595.00	1	595.00

Item No.	Item Name	Manuf./ Vendor	Specifications	(US $) Est. Unit Cost	Qty	(US $) Est. Total Cost
28	70mm Transparency Register System	Spectral Data	Including accuratized film holder registration vacuum easel, and matched overlay punch	150.00	1	150.00
29	Film Dryer Cabinet	VWR/ Treck	Simplex Jet Air Dryer, w/JA-2 and JA-3 racks, hangers and weighed clips for 6 rolls of both 20 and 36 exposures (120 or 35mm)	1390.00	1	1390.00
30	Tripod	VWR/ Treck	Model A Davis and Sanford DS75576-20	147.00	1	147.00
31	Thermometer	Kodak	Process Type Three	40.00	1	40.00
32	Thermometer	Kodak	Tank and Tray Model	5.50	1	5.50
33	Thermometer	VWR/ Treck	AccuDial	11.65	3	34.95
34	Air Filter	VWR/ Treck	Stock No. IC75660-40 Ionics Dustroyer 275 ft3/min	230.00	3	690.00
35	Canned Air	VWR/ Treck	Treck Dust Chasers: 2 dozen cans, 2 nozzeles, 3 dozen can refills	139.80	1	139.80
36	Dust Removal Kit	Kodak	Frame, brushes, including blower and hose assembly	265.00	2	530.00
37	Vacuum Easel	VWR/ Treck	Stock No.BX75339-60 Open-faced w/pump, Bychrome 20 x24	180.00	1	180.00

Item No	Item Name	Manuf./ Vendor	Specifications	(US $) Est Unit Cost	Qty	(US $) Est Total Cost
38	Vacuum Pumps	VWR/ Treck	Stock No.54907-059 Gast rotary, 2.5cfm, 20 psi rewired to 240 W, 60Hz.	172.23	3	516.69
39	Filter Kit	Kodak	Model A Polycontrast	38.00	1	38.00
40	Point Source	VWR/ Treck	Stock No. KM72451-00K+M Tri-level, built in filter holder	99.50	1	99.50
41	Filter-matic Light Unit	VWR/ Treck	Stock No.KM72452-00 K+M Tri-level w/ filter wheel	264.00	1	264.00
42	Ascorlume Lights	VWR/ Treck	Stock No.BT1201-06 Berkley Technical six-lamp Quartz iodine system with three sets of replacement lamps	1213.00	1	1213.00
43	Rubber Tanks	Kodak	4 x 5 tanks w/lids	12.70	4	50.80
44	Film Developing	Kodak	Sheet hanger No.6 (pkg of 12)	5.25	1	5.25
45	Sheet Developing Hangers	Kodak	Plate hanger No.4A (pkg of 6)	8.50	2	17.00
46	Trays	Kodak	Duraflex 16x20 (pkg of 3)	21.00	3	63.00
47	Deep Tray	Kodak	Duraflex 20x24 (6" deep)	61.00	1	61.00

Item No	Item Name	Manuf./ Vendor	Specifications	(US $) Est Unit Cost	Qty	(US $) Est Total Cost
48	Dump Tank	VWR/ Treck	Model 81-140T Arkay 5 gallon (steel)	72.35	1	72.35
49	Mixing Valves	Kodak	Model PX-5 Thermostatic	300.00	2	600.00
50	Chemical Mixers	VWR/ Treck	Model PM5 Kreonite Porta-Mix 5 gal.	290.00	1	290.00
51	Chemical Storage Tanks	VWR/ Treck	Model AYPRT-2 Arkay 2 gal. w/floating lid	21.50	12	258.00
52	pH Meter	VWR/ Treck	Stock No.34100-006 VWR pH Master	120.00	1	120.00
53	Ventilators	VWR/ Treck	Stock No.KAV-102 Lite-Tite .200 cfm, wired to 240 v, 60Hz	55.95	3	167.85
54	Water Filter Housings	VWR/ Treck	Stock No.TR70296-50 Up to 150 psi w/vents,drains	61.35	4	245.40
55	Water Filters	VWR/ Treck	Stock No.TR70254-50 10 inch, 5u (case of 30)	69.25	1	69.25
56	Water Filters	VWR/ Treck	Stock No.TR70255-50 10 inch, 20 u (case of 30)	51.95	1	51.95
57	Filter Brackets	VWR/ Treck	Stock No.TR70295-95	2.50	4	10.00
58	Brushes	VWR/ Treck	Staticmaster 3 inch w/2 replacement cartridges each	34.85	6	209.10

Item No	Item Name	Manuf./ Vendor	Specifications	(US $) Est Unit Cost	Qty	(US $) Est Total Cost
59	Ultrasonic Cleaner	VWR/ Treck	Model 12 Bransonic (1 qt)	95.00	1	95.00
50	Paper Safes	VWR/ Treck	Arkay 8½x11,16x 20, and 20x24	107.40	1	107.40
51	Vacuum Cleaner	VWR/ Treck	Stock No. 21925-000 Rewired for 240 v, 60 Hz	35.00	1	35.00
52	Safelights	VWR/ Treck	Stock No.KK141-2212 Adjustable, Kodak Model B	32.50	4	130.00
53	Safelights	VWR/ Treck	Stock No. kk152-1178 Basic Kodak Dark-room Lamp	15.00	4	60.00
54	Safelights	VWR/ Treck	Stock No. KK141-2261 Utility Safelight Lamp, Kodak Model S	48.00	3 3	144.00
55	Safelight Filters	VWR/ Treck	Kodak 5½" Types OA and OC	9.00	3	27.00
56	Safelight Filters	VWR/ Treck	Kodak 5½" Types 00, 1A, and 10	9.00	2	18.00
57	Safelight Filters	VWR/ Treck	Kodak 5½" Type 13	8.25	3	24.75
58	Safelight Filters	VWR/ Treck	Kodak 10 x 12" Types OA and Oc	21.45	3	64.35
59	Safelight Filters	VWR/ Treck	Kodak 10 x 12" Types 00, 1A & 10	21.45	3	64.35
60	Safelight Filters	VWR/ Treck	Kodak 10 x 12" Type 13	19.50	3	58.50
61	Changing Bags	VWR/ Treck	Stock No.BJ19-016-005 34" squqre	49.50	1	49.50

Item No	Item Name	Manuf./ Vendor	Specifications	(US $) Est Unit Cost	Qty	(US $) Est Total Cost
72	Voltage Stabilizers	VWR/ Treck	Stock No.66063-001 Revco rewired for 240v, 60 Hz	320.00	3	960.00
73	Film Holders	VWR/ Treck	Stock No.KA77004-20 Fidelity 2¼" x 3¼	6.65	2	13.30
74	Film Holders	VWR/ Treck	Stock No.KA77004-50 Fidelity 4"x 5"	6.65	12	79.80
75	Film Holders	VWR/ Treck	Stock NoKA77004-50 Fidelity 5"x 7"	8.90	4	35.60
76	Film Holders	VWR/ Treck	Stock No.KA77004-60 Fidelity 8"x 10"	18.90	4	75.60
77	Visual makers	Kodak	Stock No.1006055 Ektagraphic EF w/ field case	195.00	5	975.00
78	Step Tablet	Kodak	Stock No.1523422 Calibrated 21 step	28.80	1	28.80
79	Print Viewing Filters	Kodak	Stock No.1500735 R-25 Filter Kit w/ wallet	8.00	1	8.00
30	Color Separation Guides	Kodak	Stock No.1527662 Q-14 14" long	4.50	1	4.50
31	Mounting Adhesive Spray	VWR/ Treck	Stock No. MM60944825 3M" Photomount", 16 oz. (case of 12)	45.00	2	90.00
32	Kodak Publications	Kodak	Publications E66 E75, E77, E78, E96, F5, GL,J10, J28, K12, K13, M5, M27/28H, M28, M29, M42, M61, M62, M63, M76,M81, M128, P300, P312, P315, Q1, Q2, Q3, Q4, Q67, Q7, R10, W14U, W24,Z-22-ED,Z119,Z119C, Z121, Z121C, Z126, Z205, Z207	207.35	1	207.35

Item No.	Item Name	Manuf./ Vendor	Specifications	(US $) Est Unit Cost	Qty	(US $) Est Total Cost
83	Slide Sleeves	Forestry Supplies	Stock No.49900 Hold 20 35mm slides (pkg of 25)	10.25	40	410.00
84	Electronic Calculators	Texas Instru-Ments	2 SR-40 scientific, 1 SR-51-II advanced scientific,1 SR 58 Programmable with statistics and surveying libraries,1 PC 100A printer/ plotter	1250.00	1	1250.00
85	Electronic Calculators	Hewlett Packard	2HP 21 scientific, 1 HP 46 scientific model @ 240 V 60 Hz, 1 HP65 Programmable w/math, surveying, and 2 statistical libraries	1550.00	1	1550.00
86	Camera Cases		Padded case for one Nikon or Hasselblad with three lenses	80.00	5	400.00
87	35mmSLR Camera	Olden Camera	Nikon F2A Photomatic with 50mm f/1.4 lens	871.50	1	871.50
88	Extra Lenses for 35mm cameras	Olden Camera	Al-Auto Nikkor Lenses-one 28 mm f/3.5-22, (269.50), and one 400 mm, f/5.6-32, ($1590)	1859.00	1	1859.00
89	70mm SLR Camera	Olden Camera	Hasselbad 500 EL/ 70M w/motor driven film advance and shutter release, 80mm f/2.8 lens, spare magazine for 12 exposure size 120 film, case	2300.00	1	2300.00

Item No.	Item Name	Manuf./ Vendor	Specifications	(US $) Est Unit Cost	Qty	(US $) Est Total Cost
90	Filters for 35mm and 70mm Camera	Olden Camera	For each camera type, two each filters filters of red, orange yellow, green, UV/haze, skylight, neutral density andpolarizing	400.00	1	400.00
91	70mm Ring Binder Sleeves	Ben Meadows	Stock No.090181 holds 6 2¼ x 2¼ chips set of 25	9.95	80	796.00
92	Film Viewrs	VWR/ Tréck	Serial No.GT75657-D Graphiclite Transparency Viewers 16"x 20" with 6 replacement floures-cent tubes	189.00	4	756.00
93	Film Processor	VWR/ Treck	Serial No. AY81-8-4CP/B Arkay C-41 Film Processor, 2 gl. w/aerated bleach tank and processing baskets	1551.75	1	1551.75
94	CopyCamera Vacuum Frame			20,000	1	20,000
95	Calibrated sensitometer			2,500	1	2,500
96	Print washer			500	1	500
97	Print dryer			700	1	700
98	Refrigerator and freezer (lea) wired for 220v 60 Hz		30 cu. ft.	2,000	2	4,000
99	Contact Printer overhead, w/light Source, wired for 220 v 60 Hz			700	1	700
100	Color Analyzer wired for 220 v 60 Hz			600	1	600
101	Color processor wired for 220 v 60 Hz			6,000	1	6,000

Item No.	Item Name	Manuf./ Vendor	Specifications	(US $) Est Unit Cost	Qty	(US $) Est Total Cost
102	Accessory equipment and spare parts					10,000
103	Photographic paper and film safer					1,000
104	Equipment for film cleaning and inspection white gloves magnitizers, static eliminators light sources cleaning chemicals etc...					700
105	Laminer flow filtered air slatims			500	2	1,000
106	Chemical mixing and w equipment					800
107	File for film archives					300
108	Dry minuting press 24"x 30"					300
109	Chemical storage tanks					1,000
110	Landsat imagery will be procurred from Telespatzio in Rome for a cost of about $10,000 a year for the 5 year life of the project this will amount about $50,000.					50,000

C. Vehicles

	(U.S. $)
One microbus (about 20 passenger capacity)	25,000.00
Five 4-wheel drive field vehicles @ 10,000	40,000.00

3. LIST OF SUGGESTED MANUFACTURERS AND VENDORS

For the photo Lab and Remote Sensing equipment

1. Arkwright- Interlaken Inc
Fiskeville R.I.
2. Baush and Lomb,
Science optical products Div.
Rochester N.Y. 14602
3. Bendix Corporation/Aerospace Systems Division
Marketing Manager
Earth Resources Directorate
3300 Plymouth Road,
Ann Arbor, Mich. 48107 (313)665-7766

Or

Environment Reseach Institute of Michigan
Application Division
Resources and Technology
P.O.Box 8618
Ann Arbor, Michigan 48107

4.Ben Meadows Co.
P.O.Box 80549
3589 Broad St.
Atlanta, Ga. 30366 (404)455-0907

5. Blue Ray, Inc.
c/o Keuffler and Esser Co.
1521 North Danville St.
Arlington

6. Bushnell Optical Co.
2828E. Foothills Blvd.
Pasadena, Calif. 91107

7.Du Pont Company
Photo Products Department
Printing Products Division
Wilmington, Delaware 19898

8. Forestry Suppliers, Inc
Box8397 Dpt. S-1
205 W. Rankin St.
Jackson, Miss. 39204 (601)354-3565

9. Fuller and D'Albert, Inc.
3170 Campbell Drive
Box 458
Fairfax, Virginia 22030

10. Gossen Division
Berkley Marketing Companies, Inc.
25-20 Brooklyn-Queens Expwy.Wes
Woodside, N.Y. 11377

11. Hewlett Packard
3200 Hillview Ave.,
Palo Alto, Calif. 94304

12. Industrial Photographic Products, Inc.
8618 Fenton St.
Silver Spring, Maryland 20910

13. International Imagery System
Mountain View CA.

14. Keuffel and Esser Co.
20 Whippany Rd.
Morristown, N.J. 07960.

15. Eastman Kodak Co.
Department 454, 4121-50
Rochester, N.Y. 14650

16. Minnesota Mining and Manufacturing Co.
(3m) Local Damascus Office.

17. Nikon, Inc.
Subsidiary of EPOI
623 Stewart Ave.,
Garden City, N.Y. 11530

18. Oldelft Corp. of America
2735 Dorr Avenue
Fairfax, Virginia 22030

19. Olden Camera and Lens Co.
1265 Dorr Avenue
Fairfax, Virginia 22030 (212)725-1234

20. Spectral Data Corporation
112 Parkway Drive South
Hauppauge, N.Y. 11787

21. Texas Instruments, Inc
P.O.Box 22283
Dallas, Texas 75222 (800)527-4980

22.VWR/Treck International Dept.
P.O.Box 3200
San Francisco, Calif. 94119 (415)469-0100

ANNEX 4

REMOTE SENSING AND THE

LANDSAT SATELLITE PROGRAM

Remote sensing is essentially identifying an object without actually touching it. A person's eye is a good remote sensing tool; so is a camera. Since World War I efforts have increased to improve aircraft photography. Within recent years, remote sensing, through images taken from satellites, has enormously increased knowledge of the earth's resources.

THE LANDSAT SATELLITE PROGRAM

To date there have been three Landsat Satellites launched by the U.S. The first was launched in 1972 and was designed to take an image in four bands of the electromagnetic spectrum: the green part (0.5-0.6 microns) the red part (0.6-0.7 microns) and two parts of the near infrared (above the visible) (0.7-0.8; 0.8-1.1 microns). The Polar orbit of the satellite was designed to pass over a given spot on the earth's surface (except the Polar areas) once every 18 days at exactly the same time on each image-taking orbit. These orbits are designed so that the satellite follows the sun, and will pass the equator at exactly the same local time in each of the 14 time zones around the world. (Satellite #1 passage time is 9:42 a.m.; the other two satellites are slightly earlier.)

The satellite does not "take pictures" but rather takes four "images." The data, actually shades of gray, are telemetered to earth and stored on magnetic tape. It is from these data that photographs are made: one black and white for each of the four parts of the electromagnetic spectrum being imaged. When these black and white pictures are exposed through the proper filters, a color infrared picture is produced.

Inasmuch as two of the images are taken in the near infrared, they are measuring solar reflectance--the reflectance of the sun's rays off the surface of the earth. One of the best reflectors is chlorophyll in plants and trees. Thus Landsat images are particularly good indicators of the agriculture and forests of the land.

There are two methods of obtaining pictures: one photographically, (or analogue) as just described, the other

digitally. In this method, the original magnetic tapes are used. These are placed in a computer and an image produced on a cathode ray tube (CRT). This image is "enhanced", i.e., it is a sharper picture. Although there is little difference between the data found on the analogue and digitized images, the latter is easier to examine. The major difference is cost per image. The computer image is perhaps 100 to 200 times less expensive (this is after the cost of the computer) than the photographic image. An additional advantage of a computerized "read out" is that the computer can be "trained" to look at just the reflectance under study, i.e., water, trees, or cities. Here again cost is a factor.

Landsat One failed after 5½ years. Landsat Two, launched in 1976, and Landsat Three, launched in 1978, are still operating.

Data from the satellites are received at a ground station. The reception at a ground station is generally within a radius of 1,000 miles. When the satellite is out of view of a ground station, the satellite has the ability to store the data on tape, to be read out when it nears a receiving station. There are now several stations around the world and more are planned. The United States, Canada, Brazil and Italy have operating stations. Others are planned or are near completion in Argentina, India, Iran, Sweden and Thailand, possibly Kenya and

Figure 1: Landsat Reception Stations

(Map showing the Landsat Reception Stations which are capable of receiving the Landsat Images over Syria)

Upper Volta. Soon the whole world will be covered. In addition, NASA is planning to try transmitting Landsat Satellite to communication satellite to a main ground receiving station in the U.S., thus minimizing the number of ground receiving stations that will be needed.

Syria falls under two receiving stations - Italy and Iran, thus SARG should be able to receive data once every 9 days if it is so desired.

RESOLUTIONS OF SATELLITE DATA

Resolutions of images, that is the smallest item that can be seen on the ground, is governed by the size of imaging picture-element or pixel. In Landsat, the pixel is approximately an acre in size. Thus an object 200 ft. x 200 ft. (70m x 70m) is the smallest thing visible, and this is only as a shade of gray. By and large, the smallest identifiable object on analogue determinations is something about 10 acres in size. This would be slightly smaller in a digitized picture.

OTHER FORMS OF REMOTE SENSING

Landsat Three has a second experiment that is working (a thermal scanner failed). This is the Return Beam Vidicon (RBV). It is essentially two television cameras, each taking one-half of a Landsat scene. Here resolutions are on the order of 30 meters. These are actual pictures, so no computer need be involved.

Skylab, a manned orbital laboratory, was able to view some of the earth between 50°N and 50°S. It is no longer operational. Some excellent pictures were obtained.

Soyuz satellites (Russian-manned satellites) took some good pictures of the earth with resolutions on the order of 10 meters or so. Unfortunately, there is no index available to the West, so we do not know the areas covered by these pictures.

In order that the Syrian remote sensing center be successful, it will be important that NASA continue to keep its satellite program going, which is highly likely, although plans after 1986 are not firm as yet.

AERIAL PHOTOGRAPHY AND SATELLITE IMAGES

Although cameras in aircraft can produce good photos, aircraft for picture reconnaissance can only reach levels of 70,000 feet. With these planes, NASA has taken some excellent high altitude pictures of the United States, which are available to the public. In Syria, the government has the proper cameras and is now looking for the best type of aircraft in which to fly them. These aerial photos will be available to the NRSC.

In order to cover a larger area with fewer pictures, however, satellites are important. The resolutions are not as good as aircraft photography, but one satellite image represents about 80 high-altitude air photos. Therefore, satellites are best for a nationwide survey; aircraft for local areas. In other words, in satellite imagery one sees the forests, in aircraft imagery one sees the trees.

One fact is important. Satellite imagery and aircraft imagery are most effective when the analyst knows the conditions he is looking at on the ground. This is called "ground-truth."

ANNEX 5

ENVIRONMENTAL IMPACT OF PROJECT

The project per se will have no significant detrimental impact on the environment.

The most important environmental consideration will be to ensure that the effluent from the photo laboratory in the NRSC building does not contaminate the local ground-water supplies. To meet this problem, a simple waste-treatment system for small volumes of photographic-processing waste has been included on the project commodity list.

Most of the NRSC's impact on the environment will be of a positive nature. The knowledge gained of resources by SARG resource managers will allow for controlled development from the environmentalist's point of view. Areas with environmental problems such as forest degradation, desert encroachment, and erosion can be monitored. In addition, environmentalists working on projects for undeveloped areas frequently find that the Landsat imagery is the only feasible means of obtaining current information needed for planning purposes for areas which are inaccessible because of lack of roads.

Landsat imagery can also be used in monitoring mining operations. For instance, when the Congo River water became unusable for drinking, Landsat imagery showed that a mine was dumping tailings into the River.

In summary, the NRSC will have many more positive environmental effects than negative ones.

The above findings justify the threshhold decision of a negative determination.

Attachment A

Initial Environmental Examination

Project Location: Damascus, Syria

Project Title: Remote Sensing

Funding: FY 1979, $3,495,000

Life of Project: 5 years

IEE Prepared by: Dennis H. Morrissey Date: 11/8/78

Environmental Action Recommended: Negative Determination

Concurrence: Dennis Chandler Date: 11/9/78

Assistant Administration's Decision: Date:

I. Examination of Nature, Scope, and Magnitude of Environmental Impact

A. Description of Project

A National Remote Sensing Center is to be established for the purpose of gathering, analyzing, storing and disseminating information obtained by remote sensing means concerning Syrian natural resources.

The Center, which might have a technical staff of 30 plus support personnel, is expected to occupy a building specially constructed for the purpose, probably in or near Damascus.

B. Identification and Evaluation of Environmental Impacts

See attached completed form.

II. Recommendation for Environmental Action

Potential direct effects on the environment from this project are insignificant or non-existent. They are limited to the incidental and temporary effects of the activity involved in probable construction of a relatively small building and to disposal of waste from a photo lab. Expert assistance will be available for designing the building in such a way as to assure that water pollution does not result from this waste, which in any case will be no more than that from any one of the many commercial photo labs already existing.

Therefore, based on the lack of any significant effect on the environment, it is recommended that a threshold decision of a negative determination be approved.

IMPACT IDENTIFICATION AND VALUATION FORM

Impact Areas and Sub-areas	Impact Identification and Evaluation
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the population	N
b. Extracting natural resources	N
c. Land Clearing	N
d. Changing soil character	N
2. Altering natural defenses	N
3. Foreclosing important uses	N
4. Jeopardizing man or his works	N
5. Other factors	
_____	
_____	
B. WATER QUALITY	
1. Physical state of water	N
2. Chemical and biological states	N
3. Ecological balance	N
4. Other factors	
_____	
_____	

1/ N - No environmental impact
1 - Little environmental impact
[illegible] - [illegible] environmental impact
[illegible] - [illegible]
[illegible] - Unknown environmental impact

IMPACT IDENTIFICATION AND EVALUATION FOR

C. ATMOSPHERIC

1. Air additives	N
2. Air pollution	N
3. Noise pollution	N
4. Other factors	
_____	_____
_____	_____

D. NATURAL RESOURCES

1. Diversion, altered use of water	N
2. Irreversible, inefficient commitments	N
3. Other factors	
_____	_____
_____	_____

E. CULTURAL

1. Altering physical symbols	N
2. Dilution of cultural traditions	N
3. Other factors	
_____	_____
_____	_____

F. SOCIOECONOMIC

1. Changes in economic/employment patterns	N
2. Changes in population	N
3. Changes in cultural patterns	N
4. Other factors	
_____	_____
_____	_____

G. HEALTH

1. Changing a natural environment N
2. Eliminating an ecosystem element N
3. Other factors

H. GENERAL

1. International impacts N
2. Controversial impacts N
3. Other factors

I. OTHER POSSIBLE IMPACTS (not listed above)

Prepared By: Dennis H. Morrison Date: 11/8/1978

Project Location: Damascus, Syria

Project Title: Remote Sensing

Photo Lab Physical Plant Considerations

Location : Ground floor or basement preferred for minimum vibration.
Minimum total floor area required: 1,000 sq. ft.

Plumbing:

1. Hot and cold running water area required: heavily mineralized water must be chemically softened. Water containing non-contamining particulate matter must be filtered.

2. Chemical drains- drains must be able to accommodate strong acid and alkali solutions. Some color chemistry contains sulpheric acid.

3. Waste water disposal-system beyond laboratory drains must be able to accommodate caustic and environmental polluting waters: liquids, solids and vapors.

Electrical: 220 volt alternating current supply at 60hz. required for most photographic equipment. Total darkroom requirements 2-4 Kw per room. Washing/drying rooms 6-10 Kw per room. Where locally supplied power exhibits 5% voltage fluctuation, stablized power supplies should be used for operation of printer, enlargers, densitometers, color analyzers, and all calibrated or precision electical equipment.

Illumination: No flourescent illumination sources in darkroom areas. Adequate safelight illumination. Entrance door warning lights and personnel safety lights and "glow in the dark" safety and guide strips.

Temperature Control : Constant temperature near 20C± 2-3 C highly desirable, especially in chemical processing rooms.

Humidity Control : Relative humidity near 50% insures dimensional stability of films and papers, helps avoid problems with static electicity, promotes reliable operation of optical and electronic equipment.

Air Quality Control and Ventilation: Clean air is required for production fo high quality photographic products. Provision should be made for filtering incoming air to remove particles larger than two microns. Critical areas should be provided with laminar flow filtered air stations. Chemical processing areas must be very well ventilated for positive removal of chemical fumes.

Darkroom access doors: Rotating pass-throughs are recommended for positive darkroom protection against outside light and for convenience. These should be of the safety push-out type.

Chemical safety measures: Rubber gloves and protective eye glasses should be provided in chemical mixing rooms.

ANNEX 7

EMBASSY OF THE
UNITED STATES OF AMERICA
AGENCY FOR INTERNATIONAL DEVELOPMENT
DAMASCUS, S.A.R.

NATIONAL REMOTE SENSING
CENTER (NRSC)

PROJECT NO. 276-0041

CERTIFICATION PURSUANT TO SECTION 611(e) OF THE
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, Miles G. Wedeman, Director of the Agency for International Development in Syria, having taken into account, among other things, the maintenance and utilization of projects in Syria previously financed or assisted by the United States, do hereby certify that in my judgement Syria has both the financial capability and the human resources capability to effectively maintain and utilize the National Remote Sensing Center (NRSC) technical assistance project.

This judgement is based upon general considerations discussed in the project paper to which this certification is attached.

Miles G. Wedeman
Director

ANNEX 8

SYRIA - National Remote Sensing Center
276-0041
5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual fund sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Economic Support Fund.

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

A. GENERAL CRITERIA FOR PROJECT

1. FY 79 App. Act Unnumbered; FAA Sec. 653(b); Sec. 634A.

(a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that figure)?

(a) Congress will be notified of the Project in accordance with Agency procedures since the Project did not appear in the FY 1979 Congressional Presentation.

(b) Yes.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of assistance?

(a) Yes.

(b) Yes

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?

No further major legislative action is necessary, however, approval of the Project Agreement by the People's Council is required as a formality. In general ratification takes 4-5 months and should not affect the project.

4. FAA Sec. 611(b); FY 79 App. Act Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973?

Not applicable.

A

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?	Not applicable.
6.	FAA Sec. 209. Is project susceptible of 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.	Project is not so susceptible at present time. When established and with several years operational experience may provide training for other countries in Middle East. Syrian government intends it to be eventually a regional center.
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; (c) encourage development and use of cooperatives, 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.	Project will ultimately improve technical efficiency of agriculture/ industry and commerce through greater knowledge of natural resources which can lead to increased production of crops and mineral-based products.
8.	FAA Sec. 601(b). Information and conclusion 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).	U.S. private sector will utilized in providing certain commodities and technical assistance for the project.
9.	FAA Sec. 612(b); Sec. 636(h). 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 to meet the cost of contractual and other services.	Syria will contribute the entire amount of the required local currency to meet the cost of construction as well as the annual operating budget of the National Remote Sensing Center (NRSC) and other services. The U.S. owns no foreign currencies which will be utilized in the project.

A

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?

The U.S. owns no excess foreign currency of Syria which may be released for this project.

11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?

The project will utilize the procurement procedures specified in AID regulations.

12. FY 79 App. Act Sec. 608. 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?

The project does not involve the Productio of any commodity for export.

B. FUNDING CRITERIA FOR PROJECT

1. Project Criteria Solely for Economic Support Fund

a. FAA Sec. 531(a). Will this assistance support promote economic or political stability? To the extent possible, does it reflect the policy directions of section 102?

(a)1. The assistance will contribute to th economic and political security of Syria b providing better knowledge of natural resources, where exploitation can lead to higher production and income for Syria's population, thereby reducing economic insecurity.
2. By the nature of the project, it does n lend itself to assist particularly any one group of people. Rather it provides a stronger base for the national economy and therefore is of benefit to all.

b. FAA Sec. 503. Will assistance under this chapter be used for military, or paramilitary activities?

(b) No assistance through this project will be used for military or paramilitary activities.

5C(1) - COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in a consistent patten of gross violations or internationally recognized human rights?

   The Department of State has not so determined.

2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?

   No such determination has been made.

3. FAA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?

   The Secretary has determined that Syria is not controlled by the international Communist movement.

4. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government?

   At present there are no claims which require that assistance be terminated pursuant to this section.

5. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?	Syria has taken such actions in the past. However, It has been determined that Syria is taking appropriate steps to discharge its obligations.
6. FAA Sec. 620(a), 620(f); FY 79 App. Act Sec. 106, 114 and 606. Is recipient country a Communist country? Will assistance be provided to the Socialist Republic of Vietnam, Cambodia, Laos, Cuba, Uganda, Mozambique, or Angola?	Syria is not a Communist country. No.
7. FAA Sec. 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?	No.
8. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?	There is no reason to believe that Syria will fail to take adequate measures to prevent the recurrence of mob action which may result in damage or destruction to U.S. property in Syria.
9. FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason?	An investment guaranty agreement for the specific risks of expropriation inconvertibility or confiscation was concluded with Syria on August 9,1976.

10. FAA Sec. 620(o); Fisherman's Protective Act of 1967, as amended, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters,

a. has any deduction required by the Fishermen's Protective Act been made?

b. has complete denial of assistance been considered by AID Administrator?

Not applicable.

11. FAA Sec. 620; FY 78 App. Act Sec. 603. (a) Is the government of the recipient country in default for more than six months on interest or principal of any AID loan to the country?

(a) No.

(b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds?

(b) No.

12. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the percentage of the country's budget which is for military expenditures, the amount of foreign exchange spent on military equipment and the amount spent for the purchase of sophisticated weapons systems? (An affirmative answer may refer to the record of the annual "Taking Into Consideration" memo: "Yes, as reported in annual report on implementation of Sec. 620(s)." This report is prepared at time of approval by the Administrator of the Operational Year Budget and can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

Yes, as reported in the FY 1977 620 report to Congress, approved on August 11, 1978. It has been determined that there has been no significant change which would affect the conclusion of that report.

13. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

Syria severed diplomatic relations with the United States in 1967. Diplomatic relations have been resumed and new bilateral assistance agreements are currently being negotiated.

14. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?

Syria has fully paid its U.N. obligations as of September 30, 1978.

15. FAA Sec. 620A, IT 79 App. Act. Sec. 607. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?

Syria has itself been the object of terrorist attacks. We know of no recent case in which Syria has granted sanctuary to individuals or groups in connection with acts of international terrorism.

16. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?

No.

17. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it detonated a nuclear device after August 3, 1977, although not a "nuclear-weapon State" under the nonproliferation treaty?

No.

No.

FUNDING CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria.

a. FAA Sec. 102(b)(4). Have criteria been established and taken into account to assess commitment progress of country in effectively involving the poor in development, on such indexes as:

a. Not applicable.

(1) increase in agricultural productivity through small-farm labor intensive agriculture,
(2) reduced infant mortality,
(3) control of population growth,
(4) equality of income distribution,
(5) reduction of unemployment, and
(6) increased literacy.

b. FAA Sec. 104(d)(1). If appropriate, is this development (including Sahel) activity designed to build motivation for smaller families through modification of economic and social conditions supportive of the desire for large families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development, and assistance to urban poor?

b. Not applicable

2. ECONOMIC SUPPORT FUND COUNTRY CRITERIA.

a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights?

a. No.

b. FAA Sec. 533(b). Will assistance under the Southern Africa program be provided to Mozambique, Angola, Tanzania, or Zambia? If so, has President determined (and reported to the Congress) that such assistance will further U.S. foreign policy interests?

b. No.

c. 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?

c. Commodities will be granted, however, no sales proceeds will accure under this project.

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d. FY 79 App. Act. Sec. 113. Will assistance be provided for the purpose of aiding directly the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?	No.
e. FAA Sec. 620B. Will security supporting assistance be furnished to Argentina after September 30, 1978?	Not applicable.

PROJECT AUTHORIZATION

AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Name of Country: Syria Name of Project: National Remote Sensing Center (NRSC)

Number of Project: 276-0041

Pursuant to Part II, Chapter 4, Section 532 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Grant to Syria (the "Cooperating Country") of not to exceed Three Million Five Hundred Thousand United States Dollars ($3,500,000) (the "Authorized Amount") to help in financing the foreign exchange costs of goods and services required for the project as described in the following paragraph.

The project consists of technology transfer (training and U.S. experts) and the furnishing of commodities to establish a National Remote Sensing Center in Damascus (hereinafter referred to as the "Project").

The entire amount of the A.I.D. financing herein authorized for the project will be obligated when the Project Agreement is executed.

I hereby authorize the initiation and negotiation of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority subject to the following terms and convenants and major conditions as A.I.D. may deem appropriate:

Source and Origin of Goods

Goods and services financed by A.I.D. under the project shall have their source and origin in the United States except as A.I.D. may otherwise agree in writing. Ocean shipping financed under the Grant shall be procured in the U.S. except as A.I.D. may otherwise agree in writing.

_____

Date

TRANSLATION

ANNEX 9

Syrian Arab Republic
Chairmanship of the Council of Ministers
State Planning Commission
Directorate of Planning for Economic,
Scientific and Technical Affairs

Letter No. 2736/F2/4207

To: USAID/Director

Dear Sir:

I refer to the latest discussion with you about the preparations for the Remote Sensing Agreement to be financed by the U.S. Economic Assistance Program for 1979.

We would like to inform you that we agree to proceed on this project and that the financing will be covered by the Grant.

In the name of the S.A.R., we are asking USAID to provide a Grant $3.5 million from the U.S. Economic Assistance Program for 1979.

We hope you will make the arrangements concerning the content, purpose and plan of the project with the Syrian Government.

Thank you for your cooperation,

Minister of State for Planning Affairs

Damascus, May 2, 1979

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