

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT DATA SHEET	1. TRANSACTION CODE <input type="checkbox"/> A = Add <input type="checkbox"/> C = Change <input type="checkbox"/> D = Delete 3. PROJECT NUMBER [685 - 0233]	Amendment Number _____ DOCUMENT CODE 3
2. COUNTRY/ENTITY SENEGAL	5. PROJECT TITLE (maximum 40 characters) National Plan for Land-Use & Development	
4. BUREAU/OFFICE AFR	[06]	

6. PROJECT ASSISTANCE COMPLETION DATE (PACD) MM DD YY [09 3 08 4]	7. ESTIMATED DATE OF OBLIGATION (Under "B" below, enter 1, 2, 3, or 4) A. Initial FY [81] B. Quarter <input type="checkbox"/> C. Final FY [83]
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8. COSTS (\$000 OR EQUIVALENT \$1 =)						
A. FUNDING SOURCE	FIRST FY 81			LIFE OF PROJECT		
	B. FX	C. I/C	D. Total	E. FX	F. I/C	G. Total
ADP Appropriated Total						
(Grant)	(544)	(195)	(739)	(1,400)	(600)	(2,000)
(Loan)	()	()	()	()	()	()
Other U.S.						
1.						
2.						
Host Country				2,639		2,639
Other Donor(s)						2,282
TOTALS						6,921

9. SCHEDULE OF AID FUNDING (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) SB	B 753	876		0		1,000		2,000	
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each) 973 873 963 877 852	11. SECONDARY PURPOSE CODE
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12. SPECIAL CONCERNS CODES (maximum 7 codes of 3 positions each)							
A. Code	ENV	XII	TECH	BR	RDEV	RCEN	
B. Amount							

13. PROJECT PURPOSE (maximum 480 characters)

1. To provide baseline resource maps & interpretation for development potential.
2. To transfer technology and develop an appreciation and operational capability by GOS officials for use and application of remote sensing.
3. To initiate a pilot institution-building effort to identify and assess longer-term institutional needs of Senegal for remote sensing.

14. SCHEDULED EVALUATIONS Interim MM YY MM YY Final MM YY [0 8 8 2] [0 8 8 3] [0 9 8 4]	15. SOURCE/ORIGIN OF GOODS AND SERVICES <input checked="" type="checkbox"/> 000 <input type="checkbox"/> 941 <input checked="" type="checkbox"/> Local <input type="checkbox"/> Other (Specify) _____
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16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment.)

17. APPROVED BY	Signature: <i>David Shear</i> Title: Director USAID/Senegal	18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION MM DD YY [5 1 8 8 1]
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ABBREVIATIONS

CIAT	Conseil Inter-ministériel d'Aménagement du Territoire (Interministerial Council for Land-Use Planning)
CNAT	Commission Nationale d'Aménagement du Territoire (National Land-Use Planning Commission)
CRA	Commissions Régionales d'Aménagement (Regional Land-Use Commissions)
CRD	Comité Régional de Développement Regional Development Committee
CRTO	Centre Régional de Télédétection de Ouagadougou Regional Remote Sensing Center at Ouagadougou
DAT	Direction de l'Aménagement du Territoire (Directorate of Land-Use Planning)
GEDTEL	Droupe d'Etudes pour le Développement de la Télédétection (Study Group for the Development of Remote Sensing)
GOS	Gouvernement du Sénégal Government of Senegal
IEE	Initial Environmental Examination.
NRSC	National Remote Sensing Center
PID	Project Identification Document
PNAT	Plan National d'Aménagement du Territoire (National Plan for Land-Use and Development)
RDA	Regional Development Agency
RSI	Remote Sensing Institute at South Dakota State University
SAED	Société d'Aménagement et d'Exploitation des Terres du Delta (RDA for the Senegal River Basin)
SERST	Secrétariat d'Etat à la Recherche Scientifique et Technique (Secretariat of State for Scientific and Technical Research)
SDSU	South Dakota State University
SODESP	Société pour le Développement de l'Élevage dans la zone Sylvopastorale (Sylvo-pastoral Livestock Authority)
SODEVA	Société de Développement et de Vulgarisation Agricole (RDA for the Groundnut Basin)
SODEFITEX	Société pour le Développement des Fibres Textiles (RDA for Eastern Senegal)
SOMIVAC	Société de Mise en Valeur Agricole de la Casamance (RDA for the Casamance)
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFPA	United Nations Fund for Population Activity
UNHHSF	United Nations Housing and Human Settlement Foundation
USAID	United States Agency for International Development.

III. Project Description

A. Summary and Recommendations

- A. Country: Senegal
B. Project: National Plan for Land-Use and Development
C. Funding: \$2.0 million
D. Life of Project: 3 years
E. Waivers: (1) Code 935 procurement of airplane charter, aerial photography, and soil testing not to exceed \$60,000
(2) Code 941 procurement of 2 vehicles not to exceed \$15,000
F. Conditions: (1) Appointment of GOS Project Director
(2) Establishment of Service Agreement between the Direction d'Aménagement du Territoire and the National Remote Sensing Center.

This project paper (PP) is for a grant of \$2.0 million from the Sahel Development Program appropriation (SH) to Senegal for the National Plan for Land-Use and Development Project (685-0233).

The project supports a multi-donor financed program of the Government of Senegal (GOS) to prepare a national plan for the management and optimal utilization of Senegal's natural and human resources. The development of the Plan (Le Plan National d'Aménagement du Territoire--PNAT) requires resource maps, technology exchange and institution building. The GOS agency responsible for PNAT and for national land-use planning is "La Direction de l'Aménagement du Territoire" (DAT) in the Ministry of Urban Affairs, Housing and Environment.

The project will use multi-stage integrated survey techniques including satellite remote sensing, ground survey and air photo interpretation to provide the baseline maps needed by PNAT. The project will also strengthen GOS institutions and give GOS personnel training in appropriate techniques so that they can continue effective resource monitoring and assessment.^{1/} The purposes of the project are:

- (1) to provide the baseline resource maps and interpretations for development potential that are required by the GOS to prepare a coherent and balanced development plan for optimal utilization of available resources;
- (2) to transfer technology and develop an appreciation and operational capability by GOS resource scientists and managers for the use and application of remote sensing as a tool for resource assessment and management; and,

^{1/} While all project references are to Senegal and the GOS, the baseline resource maps will also cover the Gambia so that the technology transfer and training activities could also involve Gambian resource scientists. This is a bilateral project and does not provide funding for Gambian participation. However, Gambian participation is possible within the structure and program elaborated by this project and could be arranged through participant training funded by another project. To assist this participation USAID/Senegal would encourage limited consultations by the technical assistance contractor with AID/Banjul and officials of the Government of the Gambia.

(3) To initiate a pilot institution-building effort to identify and assess long-term institutional needs of Senegal for remote sensing and photo interpretation capabilities.

The project fully supports the AID development strategy for Senegal by providing information with which the GOS and USAID can assess programs to promote and diversify agricultural production. Project outputs will provide guidance for the development of more effective agronomic practices, the increase of cultivated land area, the improved management of soil and water resources, and the avoidance of environmental degradation.

Although the immediate impact of this project is upon planning and institution-building, the long-term beneficiaries will be the entire Senegalese population who will benefit from a further knowledge of agricultural land suitability and a more balanced geographic development. The project will define where logical resettlement could occur, where an increase in agricultural inputs and water management could increase production, and where agriculture could be intensified and diversified. By using this information as developed and applied by GOS institutions to be supported by the project, rural populations could directly benefit from increased and more stable agricultural production.

As a condition precedent to the disbursement of project funds a GOS project manager shall be named; and as a condition precedent to the obligation of second year funding, a service agreement acceptable to USAID shall be established by the Direction d'Aménagement du Territoire (DAT) with the University of Dakar for services to be provided by the National Remote Sensing Center (NRSC). Following a letter to the Minister of Urban Affairs on April 14, 1981, USAID has received the Minister's assurances on the execution of the agreement with the University.

As its counterpart contribution, the GOS will provide the project with office and laboratory space and personnel as specified in the Project Paper.

A waiver is requested for the procurement of airplane charter, aerial photographic, and soil testing services from Geographic Code 935 (Special Free World) and the procurement of 2 vehicles from Geographic Code 941 (U.S. and certain LDC's). The total value of this procurement is not to exceed \$75,000. The justification for this waiver is attached as Annex G.

B. Background

1. General background

Senegal, which covers an area of about 196,700 Km² in West Africa, lies in the Sudano-Sahelian Zone. Its population as of 1980 was officially estimated at 5.7 million and its annual growth rate at 2.7%. About 72% of the population live in rural areas and, although rural to urban migration is quite high, the rural population continues to grow. Of the rural population nearly 60% live in the Central Groundnut Basin which covers about 25% of the country's land area. Pressure on the land in this area is becoming acute and the Government is undertaking various measures to promote migration to the less populated areas of Eastern Senegal.

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The Gross Domestic Product (GDP) was \$462 per capita in 1980 with a real rate of growth of 1.5% per annum over the period 1970 to 1980. Agricultural and food production generally stagnated during this period, partly as a result of a series of droughts starting in the mid 1960's, partly because the agricultural technology is gradually becoming absolute. Thus, despite increasing investment in the rural sector, Senegal has not been able to substantially improve food production, and continued imports of basic grains are increasing the pressure on foreign exchange reserves.

The agriculture sector is central to Senegal's economy. In recent years some 30-35% of GDP and 60% of export value have originated in the agriculture sector. Yet, from an economic and ecological point of view, this resource base has not been optimally exploited. Estimates are that only half of Senegal's arable land (which is approximately 4.6 million hectares) is presently under cultivation and productivity figures for millet and rice are significantly below the yields of Kenya, Tanzania and other countries in Africa.

Senegal has also not fully exploited the few known mineral deposits in the country. The phosphate mines are producing at very modest levels, the off-shore oil deposits are poorly identified, and there are no present plans for further mineral exploration in potentially promising areas of the southeast.

Recent events have forced policy changes in Senegal. The economy has been under severe economic pressures which are said to be the worst since Independence. All economic indicators attest to this: negative balance of payments, high debt servicing costs, low productivity and a widening resource gap. The high rate of population growth (which is widely believed to be well in excess of the official rate of 2.7%) and the regional maldistribution of Senegal's population have seriously impacted on the resource base, especially since they are combined with declining productivity. This situation and the disastrous effects of the 1977-1979 drought on peanut product earnings and food staples (millet, sorghum and rice) have forced COS planners to reorient their policies towards maximizing the increased utilization of all available resources of the country.

The fundamental resources affecting the welfare of farmers and pastoralists are the availability of water in some form (annual rainfall, surface water or useable ground water) and the productivity of soils. Exploitation of these resources to expand agriculture, increase fuelwood production and improve range development has been restricted by limited information concerning their availability, location and potentials. The roughly 2.5 million hectares presently used for cultivated agriculture constitute little more than half of the land estimated to be potentially

arable. However, this general estimate is not based on anything resembling an accurate inventory of resources and such an inventory is necessary in order to fully understand spatial and economic development potentials and limitations.

Any effort to augment the standard of living of the agrarian-pastoral population should include a sensible program to manage natural resources development. For example, water resource development, which is critical to successful agricultural expansion and intensification, should be guided by an adequate knowledge of terrain features (baseline resource information) present and projected human and livestock distribution and land management techniques. Accurate inventories are needed to identify environmentally fragile zones so that improper development and land degradation, a problem currently recognized in Sine-Saloum groundnut basin, can be avoided. A first step is to undertake a systematic inventory of natural resources: what they are, where, their condition, and their development potential and limitations. A comprehensive documentation and resource analysis is the first prerequisite for effective resource management. Senegal now is taking this step to establish an inventory which can identify resource potential and guide development efforts.

2. PNAT - The National Plan for Land-Use and Development

Senegal has been concerned with national land-use planning since Independence. This concern has been expressed within the context of current development programs by the establishment of regional and national land-use plans. In May 1967, a national land-use planning agency (La Direction de l'Aménagement du Territoire--DAT) was created to coordinate national and regional land-use planning. DAT is located within the Ministry of Urban Affairs, Housing and Environment (Ministère de l'Urbanisme, de l'Habitat et de l'Environnement--MUHE).

In establishing DAT guidelines, the GOS Interministerial Council stated that Senegal's land-use planning needed to be reinforced and that a better planning structure was needed to organize planning data, to improve the planning methodology, and to describe the existing situations. The National Plan for Land-Use and Development (Le Plan National d'Aménagement du Territoire--PNAT) was mandated by the Council in February 1977 to fulfill these needs and, DAT was given the responsibility of developing PNAT. A special interministerial council and coordinating commission (Le Conseil Interministériel d'Aménagement du Territoire--CIAT, and La Commission Nationale d'Aménagement du Territoire--CNAT) were created by the Council in November 1977 to support DAT in the preparation of PNAT. The CIAT reviews and approves the fundamental planning options and orientations developed by the DAT for PNAT. It arbitrates and chooses among the possible alternatives proposed by PNAT. The CNAT brings together all GOS agencies concerned with land-use planning. CNAT includes technical working groups that assure inter-ministerial technical cooperation on important planning elements.

This coordinating structure extends to regional level through regional commissions (Commissions Régionales d'Aménagement--CRA). The CRA's work under the direction of the regional DAT agent to prepare regional land-use plans which are presented to the regional administrative authorities (Comités Régionaux de Développement) for approval. The regional plans are then sent to Dakar to be incorporated in the national plan (PNAT) by DAT.

The COS development objectives which are to be supported through the development of PNAT are:

- (1) to promote economic development and social well-being for the entire country taking into account the particular resources and potential of each region;
- (2) to lead to a reduction in intra and interregional disparities looking towards a means of increasing incomes and improving income distribution;
- (3) to rapidly attain a relatively advanced level of industrialization permitting Senegal to become the semi-industrial country it desires to be;
- (4) to assure West African regional economic integration while maintaining a certain national economical and political autonomy;
- (5) to involve the population in the improvement of their territory and their level of living;
- (6) to assure the protection of the environment and of natural resources;
- (7) to organize different sectors in order to best use existing infrastructure.

To attain these objectives DAT will:

- (1) Develop and maintain an information system: (DAT will invento existing land and resource data, then follow-up by analyzing what exists and defining what new information is needed);
- (2) Develop a land-use planning methodology;
- (3) Apply this information and methodology. (This will be a presentation of land-use options. Each option should show the type of organization, economic cost and social changes require and define a strategy for implementation).

- (4) Institutionalize land-use planning. (The structure will be established for continuation of the land-use planning process to accommodate new information and new national development objectives.)

The national land-use planning agency, DAT, is directing the development of PNAT. A division was created within DAT especially to work on PNAT. DAT has sought and received international donor assistance in several areas related to the preparation of PNAT. The two major projects are the United Nations Development Program (UNDP) Land-Use Planning Project and the United Nations Fund for Population Activity (UNFPA) Population Planning Project. Additional assistance is being sought from the United Nations Environment Program (UNEP) and the United Nations Housing and Human Settlement Foundation (UNHHSF).

The UNDP Land-Use Planning Project was approved in June 1979 to provide technical assistance, training and equipment for PNAT. The UNDP had been providing some technical assistance to DAT since 1977. The UNDP project is financed at \$1.2 million over a three-year period with an additional two-year phase II project extension planned. The UNDP is providing long-term specialists in planning, geography, economics, and information systems; and additional assistance in agronomy, statistics, hydrology, computer science and transportation planning. Training includes practical on-the-job training as well as seminars, workshops and third country, long and short-term training. Equipment includes vehicles and office equipment.

The UNFPA Population Planning Project will provide demographic information needed by PNAT. The project provides technical assistance to analyze population data and to develop an understanding of the social, structural and environmental relationships affecting population distribution. Data will be developed on the social organization, human resources, basic needs, and special needs of the population. Particular attention is being given to the role of youth, women and disadvantaged groups in different regions. Project funding of approximately \$1 million will be provided over three years.

With these efforts, DAT has organized a sound program to establish PNAT. The remaining inputs needed for PNAT are the baseline maps and interpretations and the technology transfer and training that would be provided by the AID project.

3. Background on Remote Sensing in Senegal:

Remote sensing with its synoptic yet detailed view and repetitive multispectral observation has proven to be an effective tool for rapid and economic acquisition of reconnaissance information on natural resources and for monitoring environmental changes like desertification. The need

for remote sensing information, has been felt by many potential user agencies in Senegal including planning agencies like the Ministry of Plan and Cooperation and DAT, rural development agencies in the Ministry of Rural Development, and research agencies like the Senegal Agricultural Research Institute and the University of Dakar. About 15 GOS resource scientists have already received some training in remote sensing. However, more than half of these are working in educational or administrative positions where they are not directly applying their knowledge of remote sensing.

Overall coordination of Senegal's remote sensing activities among governmental agencies has been handled by the State Secretariat for Scientific and Technical Research, SERST. SERST has the responsibility for planning, administering, coordinating and evaluating nearly all research in the country. A technical workgroup (GEDTEL, Groupe d'Etude pour le Développement de la Télédétection) has been created under the supervision of SERST to bring together all GOS agencies interested in remote sensing activities.

To date most remote sensing activities in Senegal have been centered in the Geography Department of the University of Dakar. The Geography Department has hosted several remote sensing seminars, procured basic photographic and interpretation equipment and started a documentation center with a \$180,000 grant received from France. The Geography Department is expecting to receive an additional \$60,000 from France for more photographic equipment and approximately \$50,000 per year over five years for maintenance and operating costs. Until recently remote sensing activities at the University of Dakar were devoted only to research and teaching. However, the University is planning to enter into an agreement with DAT which would guarantee access to the center by all GOS remote sensing user agencies. The center will be transformed into the National Remote Sensing Center-NRSC (Centre National de Télédétection) and will give priority to work connected with PNAT natural resource inventory needs. GOS user agencies, located primarily in the Ministry of Rural Development, will benefit from the expanded training program and the larger inventory of maps and documents that will be part of the new service orientation of the center.

This facility together with trained resource professionals from other GOS agencies will enable remote sensing techniques to continue to be used and further developed after the completion of PNAT. The capabilities of NRSC are to be developed in conjunction with the regional remote sensing center in Ouagadougou, Upper Volta, so that uniformity can be assured in the application of remote sensing across the Sahel and unnecessary duplication can be avoided.

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4 Regional Remote Sensing Activities

The ECA Conference of Ministers, meeting in Nairobi in February 1975, adopted Resolution 280 (XII), deciding to establish Regional International Remote Sensing facilities, and commissioning a team of international experts to elaborate a plan of action. These experts, in a report "Remote Sensing in Africa," February-March 1976, recommended the acceptance of a proposal from the French Centre National des Etudes Spatiales (CNES) that a satellitetracking station in Ouagadougou, Upper Volta, be converted into one of four projected African remote sensing centers. Kenya, along with Upper Volta, Zaire and Egypt were chosen by ECA experts to provide a good coverage of the African continent. The Government of Upper Volta seized upon the suggestion and agreed to host the regional station until an international legal status could be created under the aegis of ECA. In Ottawa in January 1977, Canada, France, and the United States formed a Technical Committee which formulated a project to establish a center, and arranged its finances.

Thus, in September 1977, the Regional Remote Sensing Center (CRTO) was established in Ouagadougou, under the temporary administration of the Government of Upper Volta. A new center, however, was of little utility without the means of developing necessary institutional capabilities. AID filled this gap in 1978 by designing and beginning the implementation of a two-phase institution-building project.

The 2-year first phase consisted primarily of technical assistance, training and related activities to familiarize Africans with utilization of Landsat imagery. It has established a bilingual regional training center, a photographic laboratory to reduplicate imagery and provide user assistance services for West Africa. An important activity in Phase I is the sensitization of African scientists and government administrators to the capabilities and limitations of the data. The ultimate success of Landsat imagery application to water, soil and forestry management in the Sahel depends as much on the wise selection of projects as the actual operation, by scientists, of the data system. This requires continuous updating of the knowledge of project planners in the Sahel as to the latest techniques and their development impact potential.

Present facilities at CRTO include a classroom with interpretation and cartographic equipment for 15 students; offices for administrative and secretarial personnel; cubicles and limited working space for the experts, advanced students, and on-the-job trainees; a library containing about 1,000 books and documents and about 1,750 maps covering much of West Africa; and a recently completed photographic laboratory capable of serving the needs of the Center.

Plans for the three-year second phase of the institutional development project are currently being discussed by the U.S., Canada, France, ECA, and the Federal Republic of Germany. Two main objectives of the three-year Phase II would be:

- (1) the development of an appropriate African regional institution to finance and to take management responsibility for the Center as expatriate personnel and financial support are withdrawn;
- (2) the construction of a satellite data reception station and capability for processing the data onto magnetic tapes and images.

It is contemplated that all of West Africa and adjacent areas within nearly a 3,000 kilometer radius of Ouagadougou would then have access to the satellite which would furnish repetitive coverage of their countries at least every 18 days. To achieve this goal, the project will probably need to be extended to the end of 1984.

C. Project Description

1. Goal, Purpose and Outputs

The goal of this project is to prepare a national plan for the management and optimal utilization of Senegal's natural and human resources. This plan (Le Plan National d'Aménagement du Territoire--PNAT) is being prepared by the Government of Senegal with multi-donor assistance.

The purposes of the project are to:

- (a) provide baseline resource maps and interpretations for development potential that are required by the GOS to prepare a coherent and balanced development plan for optimal utilization of available resources;
- (b) transfer technology and develop an appreciation and operational capability by GOS resource scientists and managers for the use and application of remote sensing as a tool for resource assessment and management; and
- (c) initiate a pilot institution-building effort to identify and assess longer-term institutional needs of Senegal for remote sensing and photo interpretation capabilities.

The project will prepare photomaps needed by PNAT and provide training in map preparation and interpretation to GOS personnel. Project activities have been designed to emphasize technology transfer, training, and institution-building so that Senegal will have a continuing capability to prepare and interpret reconnaissance resource data. At the end of the project the following outputs would indicate progress toward achieving the purpose and goal:

(a) maps for PNAT:

- (1) 6 general photomaps prepared from Landsat and other remotely sensed data at a scale of 1/500,000 or larger.
- (2) 15 thematic photomaps prepared and verified at a 1/500,000 scale concerning soils, vegetation, land capability and use, topographical and geological structures.
- (3) Improved specific area maps prepared using the general and thematic photomaps.

(b) trained GOS personnel;

- (1) 4 mid-level officials trained at CRT-Ouagadougou in remote sensing interpretative procedures.
- (2) 2 senior officials trained in U.S. in recent remote sensing technology developments.
- (3) 7 mappers trained in all phases of remote sensing application including field survey and resource interpretation.
- (4) 15 officials trained on the job in map interpretation, evaluation of data and appropriate use in their agencies' on-going programs.
- (5) Approximately 80 officials informed of remote sensing techniques and applications in seminars at the National Remote Sensing Center (NRSC).

An important spin-off accomplishment of the project will be the strengthening of GOS institutions, particularly DAT and NRSC. The project evaluation will look at the institutional impacts, and further institutional development could form part of a phase II project.

2. Project Activities

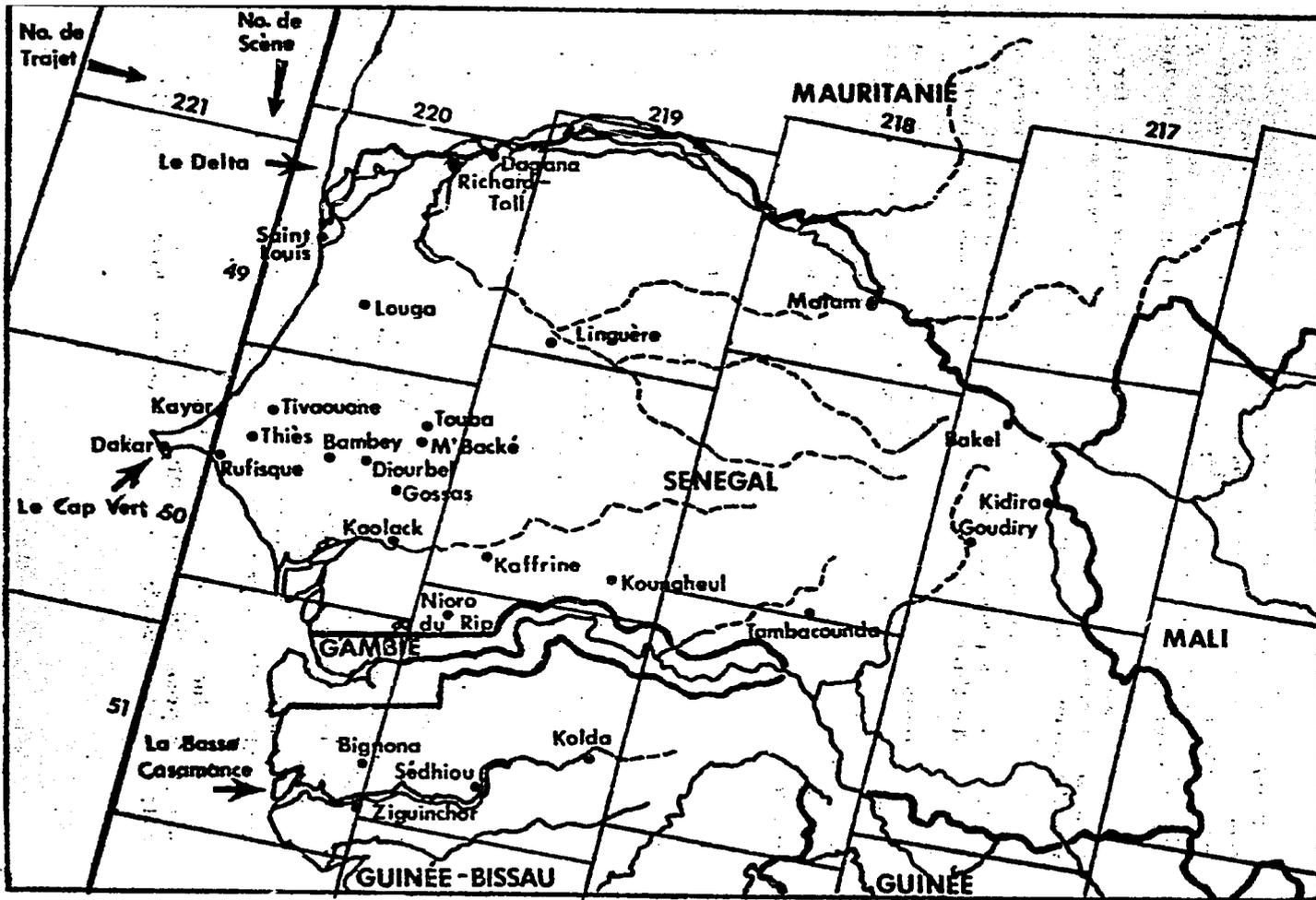
The project will be implemented over a 3-year period with technical assistance provided by South Dakota State University (SDSU). SDSU was chosen as the project contractor under the Collaborative Assistance Method of contracting with U.S. Title XII institutions. SDSU will provide technical assistance for all areas of project activities: preparing maps for PNAT; transferring technology; training GOS personnel; and initiating some institution building.

For full coverage of Senegal (an area of over 200,000 km² if the Gambia is included) thirteen different Landsat scenes are required (see Figure III A). Most scenes have multiple data coverage back to 1972. SDSU will improve and broaden these analyses (interpretations) by the use of temporal analyses of 1/500,000 scale imageries of different years and seasons in order to gain an understanding of the temporal changes caused by the climatic and human pressures on the land (i.e., erosion, desertification, land-use changes and apparent overgrazing). Aerial reconnaissance flights will transect the country over the different physiographic (land-scene) units to assure that no major landtypes have been overlooked.

After that, representative sample areas covering all the different landscape facets will be selected and larger scale (approximately 1/50,000) aerial photographs covering these sample areas will be analyzed. Exploratory field trips for ground observation will also be made into these sample areas. (The observation will include detailed vegetation, soil and land observations as well as some sampling for laboratory analysis).

Because of the urgent need of the PNAT for information on Senegal's natural resources, preliminary maps will be prepared using landsat imagery and existing reference maps as a first estimate of the soil and land potentials of the different mapping units. These preliminary maps will be on a scale of 1/500,000 or smaller, because of the very limited number of field observations (groundtruth). However, the maps should be accurate enough to meet the immediate needs of PNAT. A certain amount of "truthing" will be provided by GOS technicians knowledgeable of the terrain who will be working with SDSU to prepare the maps. The initial map submission will occur about twelve months after the start of the project.

For preparation of the final maps by the end of the project about 12 blocks of aerial photographs (each containing 3 runs of 8 photos each) of a scale of 1/500,000 and covering selected sample areas and their surroundings will be interpreted. In addition, the necessary fieldwork will include numerous soil and vegetation/land-use observations and



La Localisation des Images Landsat du Sénégal

16x

samplings. The composition of each mapped area will be described and tabulated. Legends will be prepared and the final physiographic soil and vegetation/land-use maps will be made by means of extrapolation of field and aerial photograph observations and laboratory results. Additional aircraft observations will be conducted to assure map accuracy.

Land potential evaluations and suitability ratings for specific uses and responses to different types and levels of management practices will be executed and interpretative maps will be made.

Seven GOS counterpart personnel in a variety of resource disciplines and the proposed contract staff will use a team approach to the survey. The three-year effort will include all aspects of survey techniques starting with training in remote sensing for those unfamiliar with the techniques through image interpretation, field verification, map making, and resource interpretations. An additional 15 officials will get part-time or short-term on-the-job training in map interpretation evaluation of data, and appropriate use of techniques by their agencies. An important guideline is to maximize the use of GOS personnel and the inputs and review of interested GOS agencies.

The project's training program will provide training at a U.S. institution for two Senegalese resource and systems technicians (6 months each) to help them understand new systems and applications. The technology is rapidly changing with new sensors, satellites, and procedures being constantly improved. One trainee may concentrate on learning the applications and interpretation procedures using thermal infra-red data. The other may pursue data handling and interpretations for the thematic mapper on Landsat D. This training will be given during the third year of the project so that the latest technological developments will be transferred toward the end of the project.

In addition, four Senegalese technicians will be trained at the Ouagadougou Regional Remote Sensing Center in Upper Volta (3 months each) in resource analysis and remote sensing application. Training programs at Ouagadougou consist of courses of three and four months duration to provide management and technical personnel with a fair comprehension of remote sensing applications and their uses and limitations. With this program the trainees will gain an appreciation and an acceptance of the regional remote sensing capability, and be better able to integrate GOS remote sensing applications with regional activities and concerns.

The final type of training will be a program of seminars and workshops organized by the project at NRSC. These seminars and workshops will be held primarily during the second and third years of the project.

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after the initial maps for PNAT and some interpretations and applications of the maps have been made. Using data derived from the project, the seminars and workshops will give some 80 GOS officials a variety of training in the use of remotely sensed data, in photo interpretation, and in ground truthing techniques.

As a spin-off benefit, the project will help to strengthen DAT and to support the National Remote Sensing Center at the University of Dakar. As the GOS implementing agency for the project, DAT will coordinate all project activities and directly benefit from the technical assistance, training, equipment, and operating support provided by the project. The NRSC will benefit as a service institution which will be supplying much of the in-country training, photographic and analytical services needed to prepare resource maps for PNAT. The project will assist NRSC in obtaining, distributing and interpreting satellite data, so that it can effectively support the current needs of PNAT and will consequently be able to assist other agencies in the use of remote sensing data.

Project support for preparation of maps, training, and institution building will come through the following inputs:

(a) technical assistance;

The project will supply 6 person-years of long-term technical assistance to be complemented by 12 person-months of consultants and 30 person-months of home-office technical support by South Dakota State University.

- 1 Soil Scientist (Team Leader), 3 years
- 1 Ecologist/Remote Sensing Specialist, 3 years
- Consultants in agronomy/land-use, hydrology, geology, engineering, forestry, ecology
- University cooperative support

(The Technical Analysis is presented in Section IV A.)

(b) training;

The training will include:

- 7 mappers extensively trained on the job in all phases of project activities including field survey and resource interpretation;
- 2 senior officials in the U.S. for updating in recent technology developments;

- 4 middle-level officials at the regional center in Ouagadougou in general understanding and interpretation procedure;
- about 80 GOS officials in short-term NRSC workshops to create a general understanding and acceptance of remote sensing;
- on-the-job training for some 15 GOS personnel that will emphasize techniques, evaluation of data and appropriate use of remote sensing in their agencies, ongoing programs. (The Training Analysis is contained in Section IV A.)

(c) Commodities:

The project will provide two passenger vehicles and one all-terrain vehicle, some remote sensing and image interpretation equipment, a map digitizer and data storage supplies, laboratory equipment, and household furnishings. Two vehicles and soil testing, aircraft charter and aerial photographic services will be procured locally. A waiver justification for procurement of these is included as Annex G. (See the Financial Plan, Section IV D for a detailed commodity listing.)

(d) Operating support:

Project operating support includes local contractor support, costs for housing, vehicles, local staff, and supplies and support to the GOS for field travel, training and supplies. (See the Financial Plan, Section IV D.)

3. Project Financing

AID financing for the project is as follows:

(\$ in thousands)

<u>Cost Item</u>	<u>Year 1</u>	<u>Life of Project</u>
Technical Assistance	427	1,306
Training	25	95
Commodities	210	240
Operating Costs	10	30
Inflation and Contingencies	67	329
Total	739	2,000

AID financing for the development of PNAT is part of a multi-donor effort coordinated by DAT. The overall financing for PNAT is estimated as follows:

(\$ in millions)

	<u>Amount</u>	<u>Percent of Total</u>
Senegal	2.6	38
UNDP	1.2	17
UNFPA	1.1	16
AID	2.0	29
	<hr/>	<hr/>
Total	6.9	100

4. Relationship to Senegal Development and AID Strategy

The multiple project objective of resource mapping, technology transfer/training, and institutional development has important implications for Senegal's development initiatives. Senegal's current economic difficulties, though multi-faceted, are rooted in a long-term decline in productivity, especially in the agricultural sector. This crisis is particularly apparent in the national balance of payments. Senegal's account deficit (now estimated at 51% of exports) is due to the drop in export earnings coupled with a steady increase in imports. From 1977 to 1979, because of drought and poor harvests the value of peanut exports dropped by 42%, from 74.2 billion CFA to 43.3 billion CFA, and when 1980 data become available the picture will be worse. While imports, especially petroleum and consumer goods (including significant food purchases), rose substantially.

Bolstering the agricultural economy, especially food production, is an objective of both the GOS and USAID in their efforts to find a solution to the financial crisis now facing Senegal. U.S. assistance strategy for Senegal for 1983-87 will be dedicated to the long-term goal of food self-sufficiency by the year 2000, defined in the broadest sense as: Senegal's achievement of the capacity to feed its people, even in drought years, by domestic production and storage and by trade. USAID/Senegal, as stated in the Country Development Strategy Statement (CDSS) for FY 1983, will pursue two programmatic approaches. "The first, in agriculture, will aim at the significant increase and diversification of production and trade. The second, in the area of human development, will seek to assure the improved nutrition and general access to family health facilities which must accompany production efforts if the full benefits of production are to be realized and if fertility rates are to be reduced."

The objectives set forth in this project complement the short- and long-term goals of GOS and USAID efforts to provide programs which will promote and diversify agricultural production, employ agrarian populations, and promote human development by improving health and nutrition. The resource inventory and mapping phase of the project directly addresses three of the four main targets of USAID/Senegal's agricultural programs. Project outputs will help guide:

- (a) the development of more effective agronomic practices;
- (b) the increase in cultivated land area; and
- (c) the improved management of soil and water resources.

The proposed reconnaissance level resource survey of the soils, physiography, surface geology, vegetative land cover and surface hydrology has direct applicability to programs that attempt to:

- (a) increase crop yields through improved agronomic practices, such as irrigation, applications of chemical and natural fertilizer, and use of modern cultivation techniques;
- (b) expand agricultural production since resource data, especially soils, vegetation and hydrological information, are critical inputs for the successful siting of new lands for crop cultivation, pasture and village settlement; and
- (c) promote soil and water conservation and management, since the survey will increase the understanding of zones of fragility, erodability, favorable soil/water relations, etc

The land potential map, based on soil-physiographic interpretation will be used to develop environmental surveillance programs and land-use management plans. The understanding of development potential that will be provided by the project is critical in expanding agriculture areas, stabilizing production, and improving management. Baseline data acquired under this project will direct investment to regions where maximum returns can be derived and will offer a quantitative estimate of development potential on a countrywide basis.

The technology transfer/training aspects of the project will provide a cadre of trained personnel with skills in the areas of soil survey, vegetation analysis, geology, geomorphology and hydrology as well as remote sensing. These personnel will continue to produce and apply resource information as required for planning, designing, implementing and evaluating development programs in Senegal.

Institutional development, in this instance the pilot assistance effort to strengthen DAT and to establish a national remote sensing center for Senegal, will provide an institutional context in which the monitoring

of environmental resources and assessing of temporal and spatial land cover condition can continue. The in-depth project evaluation will look at this pilot effort in order to assess Senegal's institutional needs for remote sensing and to make recommendations for possible follow-on activities.

The project objectives also have broad implications for regional development in the Sahelian zone. Cooperative work with the Ouagadougou Remote Sensing Center (CRTO) is an important aspect of the project design. Work with the regional center will benefit Senegal not only through the facilities and consultants available and the training received at minimal cost, but also by establishing an institutional linkage between NRSC and CRTO. Large-scale environmental monitoring projects, such as are currently being designed for the Sahel, ^{1/} would benefit enormously by established institutional cooperation and by the availability of well-trained in-country personnel that have extensive experience in the use of remote sensing techniques for resource inventories and monitoring activities.

Regional cooperation and understanding of various capabilities and activities will be promoted by inviting members of surrounding Sahelian countries and donor agencies to review center activities or attend seminars/workshops. Mali and Mauritania presently are conducting surveys similar to the 1/500,000 inventory to be implemented under this project. Full coordination will be established with their activities to assure consistent map legends and that map information is available for regional analysis. For example, sources of sand to the north and north east of Senegal are nearly infinite. Sand movement, land degradation, and desertification are not unique to individual countries and are not stopped by country borders. Remote sensing will serve as a common ground to open communication and establish regional cooperation to collaboratively take action in solving these shared problems.

1/ The Project Identification Document for a \$6.2 million Monitoring of Renewable National Resources Project (685-0943) was approved by AID/Washington in June of 1980.

IV. Feasibility Analyses

A. Technical Feasibility

1. General Overview

The project is designed to assist the GOS in acquiring natural resources information to use in formulating the Plan for National Land-use and Development (PNAT) and to transfer appropriate techniques for using remote sensing in resource assessment and management.

The GOS requested project assistance from AID for preparing reconnaissance, 1/500,000 baseline resource data for the entire country at a consistent scale and legend concerning soils, surface hydrology, geomorphology, general land use, and surface geology. These baseline data will be used to assess land capability and suitability for development when combined with existing data and knowledge. Baseline resource information is of the highest priority since only limited information concerning resource availability and potential now exists. Satellite images will be used as a map base and as a record of spectral and spatial information. The Landsat satellite data that has been acquired since 1972 can be appropriately used for the 1/500,000 total country mapping and for larger scale mapping (1/200,000) for selected regions. The maps of baseline data will be interpreted for resource limitations and capabilities and for their total development potential.

Throughout the mapping efforts the contractor, South Dakota State University (SDSU) and GOS counterparts will cooperatively undertake appropriate interpretation techniques, aerial and field observations, and laboratory analyses. A multistage approach will emphasize accurate field observations and assure validity and reliability of the procedures and the results. Close SDSU/GOS collaboration in all project phases will assure the transfer of the appropriate technology for using satellite remote sensing. Most activities will be undertaken by a multi-disciplinary team of SDSU technical assistants and GOS resource scientists who have conducted and completed multistage surveys and who understand the potentials and limitations of the techniques for assessing and monitoring the resources of Senegal. This collaboration will develop knowledge, experience and understanding of the necessity for adequate field and aerial verification and will reduce chances of future inappropriate uses of the techniques. It will also help assure the validity of preliminary maps since the GOS personnel will already have a good knowledge of the terrain in many areas of the country.

In Senegal, potential user agencies have not incorporated remote sensing into their programs to any great extent largely because they do not understand the potential applications. The training and technology transfer which will occur under the project will start a process whereby these agencies can be informed of remote sensing applications and assisted when their demand for services arises. The project will obtain remote sensing services from the National Remote Sensing Center which is a training, documentation and analysis center capable of providing remote sensing services to other GOS agencies. The seminars, workshops, and demonstrations organized by NRSC will create user awareness and develop basic interpretation skills so that remote sensing approaches can be incorporated where appropriate in agency activities. The dual approach of using workshops combined with practical field and laboratory work will serve to rapidly instruct the personnel of the user agencies in appropriate techniques. The DAT will strengthen its collaborative efforts with NRSC by providing NRSC with experienced, short term consultants, with supplies and limited amounts of equipment financed under this project.

2. Remote Sensing needs of GOS

In as much as a survey of about 200,000 km² using traditional techniques would be very time consuming, the GOS has requested the assistance of a competent and experienced U.S. team financed by USAID to conduct the resource evaluation jointly with GOS scientists using remote sensing techniques. Remote sensing with its synoptic, yet detailed view and repetitive multispectral observation has proven to be an effective tool for rapid and economic acquisition of reconnaissance information on natural resources, for monitoring environmental changes like desertification, and for serving as a data base of already existing information.

The need for remote sensing information has already been felt by many potential user agencies and regional organizations. Several of these user agencies have had resource scientists trained in other countries. At least five have been trained at the Remote Sensing Institute (RSI) of SDSU. These Senegalese remote sensing specialists have initiated significant efforts in the dissemination and use of their new technology. One effort has been the creation of a national remote sensing center (NRSC) to collect, document and analyze remote sensing data. The NRSC is to become a remote sensing service center for GOS agencies and other users. An agreement is being executed by DAT and the University of Dakar to assure the service orientation of NRSC and its continued use for remote sensing applications. General coordination of remote sensing concerns within

the GOS is being assured by a technical workgroup, GEDTEL, (Groupe d'Etude pour le Développement de la Télédetection) which has been created under the supervision of SERST representing the different user agencies. These activities clearly show the GOS interest in remote sensing techniques.

3. Role of National Remote Sensing Center

Under the service agreement between DAT and NRSC the data base of NRSC will be updated with the latest data - one complete set of 1/200,000 scale digitally enhanced and corrected imageries of the entire country. This data will be available to all users. NRSC is anticipating having funds available (from France) for the next 5 years which can be used to order new imageries from the EROS Data Center in the U.S.A. or from the regional center in Ouagadougou. The existing data base of Landsat products up to the beginning of 1979 was established at NRSC by an earlier training program at RSI/SDSU in the U.S.

Most of the training and data interpretation work under the project will be done at NRSC by the geography department's remote sensing staff under a service agreement to be executed with DAT. The NRSC staff from the geography department consists of natural resource scientists, one cartographer/photogrammetist and several technicians. The head of the department is making available about 35 percent of the staffs' time for NRSC activities (including Landsat interpretation for the PNAT). Each staff member will also be available for PNAT-related fieldwork of about 6 weeks. Project use of NRSC will be guaranteed by a service agreement between DAT and the University. Inter-agency technical cooperation will be assured by SERST through GEDTEL, the interministerial committee for coordinating remote sensing activities.

Ultimately, NRSC should perform the following activities:

- data archiving,
- data reproduction and dissemination,
- laboratory technique development,
- interpretation procedure development,
- user assistance for defining and implementing appropriate techniques,
- creating user awareness,
- maintaining a library,
- assessing new developments in data types and availabilities for use by GOS users,
- coordinating with regional facility at Ouagadougou,
- providing cartographic service,
- coordinating with the U.S. and other leaders in the technology,

- assuring that projects using aerial photographs or remote sensing in Senegal make available those resources to the center for potential dissemination, and
- representing Senegal in regional projects involving remote sensing.

The development of NRSC to perform these activities is a longer-term objective that will not be realized with this project. Under the DAT/NRSC service agreement the project will provide NRSC some limited resources to support the preparation of PNAT and will monitor the progress of NRSC. The project evaluation after two years will look closely at the existing and potential role of NRSC and make recommendations for continued development of the center.

4. Role of U.S. technical assistance

The role of U.S. technical assistance will be to conduct a rapid inventory of the natural resources by means of remote sensing techniques. The output of this inventory will be the land capability maps and interpretations needed by PNAT. In conducting this inventory the U.S. technical assistance team will work with and transfer remote sensing technology capability and knowledge to GOS personnel.

5. Training needs

At present some 15 GOS resource scientists have been trained in remote sensing. More than half of these are working in education or in administrative positions and not actually applying remote sensing for the country's practical needs. At least 8 or 10 agencies have indicated to DAT a need for staff training in order to make use of remote sensing technology.

Since a number of trained personnel exist in Senegal, assistance will be given to update their training as the technology advances, and to apply remote sensing to actual development needs in Senegal. The planned seminars, workshops, and cooperative investigations will use the staff and facilities of DAT and NRSC. In preparing the resource maps for PNAT, project resources will supplement and upgrade, while maximizing the use of existing training capabilities in Senegal. This strategy should be effective and will be cost-effective.

The project will not provide training in all aspects of remote sensing, only in the use of remote sensing data and outputs. Remote sensing is high technology. A high level of knowledge is required to build and launch the satellite and rockets and to telemeter data and process those data

into a useful form. This high technology has all been and will continue to be provided to Senegal through programs conducted in the U.S. The high technology has been used to produce the data disseminated from central facilities, presently the EROS Data Center of the U.S. Geological Survey in South Dakota and later from the reception and processing station planned for CRT-Ouagadougou. The user can take advantage of the technology without necessarily understanding all the steps involved. Very few remote sensing specialists for instance understand a rocket guidance system.

On the other hand, most resource specialists have familiarity with interpretation of aerial photographs. The tasks in training will be to:

- (a) give brief familiarity with the satellite systems;
- (b) reorient interpretation of large-scale photographs to small-scale satellite images; and
- (c) develop an understanding of interpretation models including multi-spectral and temporal advantages of satellites.

This training will be accomplished in Senegal as far as possible. However, for specialized training with a regional perspective 4 middle-level officials will be trained at CRT-Ouagadougou, and for familiarization in the latest technological development 2 officials will be trained in the U.S. at the Remote Sensing Institute of SDSU or another comparable institute.

B. Economic Analysis

This project is not conducive to a traditional economic analysis since its outputs are intermediary outputs that are consumed by other projects and activities. In the short run, the direct beneficiaries will be a few cartographers, photo interpreters, and other personnel who are employed by the project. If project outputs were not utilized and further applied, the project would have little economic value. It is when the maps, data and other information generated by the project are used by planners, project implementers, agriculturists, environmentalists, ecologists, geologists and other resource technicians and managers that they have a real economic value. This value is derived from improved management of resources, production increases, higher standards of living, and protection of the environment. For these purposes, the potential benefits are enormous, although practically speaking they cannot be clearly quantified.

1. Cost-effectiveness of remote sensing

The major economic question for project design is the cost-effectiveness of the project approach relative to other alternatives for achieving the desired outputs and purposes. For using remote sensing technology the primary economic justifications are the cost of data collection, the cost and value of timely information, and the value of data availability and use.

Based on experience in the U.S., the cost in 1973 for preparing 10 to 12 category maps of an area approximately the size of Senegal was about \$1 million using traditional mapping techniques, \$200,000 using high altitude photography, and \$80,000 using Landsat Imagery. Since 1973, the costs of mapping using conventional methods and aerial photography have skyrocketed while the costs of using satellite imagery have remained static or have even decreased because of improved technology, so that the ratio now would be more on the order of 1 to 20 in favor of using satellite imagery over traditional methods in applications where such imagery is appropriate. The imagery is appropriate for preparing synoptic, small scale, large area maps such as are needed in this project.

In the case of fragile zones (of which Senegal has several) where the situation is very dynamic, new information can be very important. The lack of timely information can result in the non-use of available resources, the delayed use of resources or even the destruction of resources because of mismanagement. Often the availability of certain resources is unknown or the gradual change in a resource is not fully perceived, resulting in a cost of lost resources or damages much higher than need be. With Landsat new information can potentially be made available every 18 days, providing there are few clouds or sandstorms. In the normal course of events, repetitive coverage every 1 to 5 years can be used to check the effects of erosion, transportation, animals, urbanization or deforestation, and corrective measures can be applied while the damage is still small. The use of remote sensing offers timely information that promises very high returns in guiding efforts to

to alleviate these problems.

Senegal has many varied programs to acquire, synthesize, and use resource information. A significant portion of the country has been covered by aerial photographs to acquire data for specific development objectives. A recent example is the Senegal River Basin Survey and Mapping Project of the OMVS. These data could have many additional uses if they were archived within the GOS and if the capability existed within an organization such as NRSC to disseminate the images and train users in appropriate ways of interpreting them. The data could also be maintained to establish an historical perspective or baseline against which changes associated with resource degradation, development, or changes in climate could be measured.

An effective and operational organization such as NRSC could help to valorize these maps by assuring their continued use and by avoiding the need for duplication. Many surface features such as geology or soils change very slowly and the aerial photographs, if properly handled, will retain their value for resource management for 20 years or longer. This is only one example of data which have been or are being acquired and which can have high value for ongoing or planned programs other than that for which they originally were acquired. The establishment NRSC is a small initial investment with low recurrent costs that could offer large benefits from improved data availability and use.

2. Cost effectiveness of project

Since there is no opportunity for a project of this kind to return a profit in the normal sense, the principal factor to consider is if the project is capable of delivering the major outputs at a cost as low or lower than could be expected from other methods of doing the job. This project is designed to achieve three purposes:

- (a) to provide baseline resource maps,
- (b) to transfer technology and train GOS resource scientists,
- (c) to initiate a pilot institution-building effort for remote sensing and photo interpretation.

If only the maps required to meet the needs of the PNAT were to be produced, it is likely that the job could be done for \$1.2 million. This would be based on the following estimates:

<u>ITEM</u>	<u>COST</u>
Basic soils/vegetation map	\$600,000
5 additional maps at \$50,000 each	250,000
15 Thematic maps and map updates at 25,000 each	375,000
	<hr/>
	\$1,225,000

Likewise, the development of the capabilities of the staffs of DAT and NRSC for training, data analysis, and map preparation offers Senegal the capability to continue to evaluate its resources, monitor their use, measure changes, and check on the effects of erosion, desertification, overgrazing and other degrading activities with only limited outside help.

In summary, any of the outputs of the project could possibly be achieved more cheaply by direct contracting for services to provide them, but the project clearly proposes the most cost-effective alternative for achieving the desired multiple objectives and is clearly the alternative desired by the GOS.

C. SOCIAL ANALYSIS

The socio-cultural feasibility of this project depends first of all on the viability of the administrative and technical arrangements for conducting the resource inventory, producing the maps required for the PNAT, and providing the appropriate institutional climate for effective technology transfer. Secondly, socio-cultural feasibility depends on the eventual impact of this project and the PNAT on various groups in the population of Senegal.

Senegalese participation in all aspects of the project is integral to project design. The resource inventory and map production phase of the project will involve seven Senegalese resource specialists who will be selected by and will represent a number of different ministries within the GOS. A Senegalese support staff will be important for project administration and the field survey phase. Cartographic representation of collected data will be done through DAT and NRSC. This will involve the use of draftsmen and specialized cartographic technicians from the two institutions. The staff of NRSC will provide, with the assistance of U.S. project personnel, basic remote sensing training to Senegalese user agency technicians and managers involved in resource inventory and mapping. Seminar training will be given to approximately 80 representatives of various user agencies. Involvement of potential user agencies in the activities of the NRSC is a stated objective of the center and will be accomplished through workshops, seminars and longer term training programs.

Technology transfer and diffusion (i.e., the dissemination of technical knowledge and appreciation of the applications of remote sensing is basic to the project design. The spread effect should be considerable among potential users of the technology. Indirectly the technology, once put in the hands of Senegalese planners, managers, and resource specialists, will affect other groups of the population, especially those in the agricultural sector. Environmental monitoring will be greatly enhanced through use of remote sensing techniques. Furthermore, Remote Sensing is effective for collecting planning and management information for agricultural intensification and expansion as well as environmental protection. Agricultural development plans can be guided by the information so that they produce significantly greater improvement in agricultural productivity, thereby providing employment in the agricultural sector, raising incomes, standard of living and generally improving the lot of the rural population.

The social consequences and benefits incidence of this project are related partly to the purposes and success of the PNAT and partly to the continued functioning of the technology transfer and training aspects of the project. The PNAT and the DAT have as their overall objective to assure balanced national geographic distribution of benefits from transportation and communications infrastructure, government services, industry, and employment opportunity. They have an advisory function vis-a-vis other ministries and the private sector.

There is generally agreement that past development has been overly centralized in Cap Vert and has favored urban populations more than rural. Within the rural areas development efforts have favored the peanut basin, immediately inland from Dakar, and areas along the railroad lines. The result is that the outlying provinces have lower per capita incomes (\$40-80 annually in the Fleuve vs. \$400-1000 in Cap Vert) and higher rates of outmigration. From its inception, DAT has been a voice in favor of redressing this imbalance. To the extent that this project is successful, the poorer outlying regions' populations will benefit from an improved allocation and better use of resources, since new infrastructure and services would be targeted to benefit the areas that can best use them. Since this project's focus is primarily geographic rather than socio-economic, the non-beneficiaries are possibly that share of Dakar's population which earns less than \$400 annually, the urban middle and upper classes, although they too will share from improved production resulting from the improved use of resources.

The beneficiaries of the training aspects of the project are most immediately the Senegalese project participants and user agency personnel, which will include both male and females, who can take advantage of the training opportunities offered by the project, for both classroom and on-the-job training. The intermediate and long-term beneficiaries are planners, managers, project implementors and finally the people of Senegal.

The survey will provide knowledge of agricultural land suitability for the entire country. This information will define where logical resettlement could occur, where an increase in agricultural and water management would increase and stabilize production, and where agriculture could be intensified and diversified. All of these actions would help to stabilize production and optimize production, even in unfavorable climatic years. Thus, the rural population would benefit from increased stability in production as well as increased production. The urban areas would benefit by a decrease in rural to urban migration as the rural sector determines that their rural life can be maintained. The urban population would also find increased employment in industries such as peanut processing, shipping, and other agricultural processing that would benefit by an increase in production and subsequently in exportation.

The development and use of resources needs to be paralleled with a rational plan for resource conservation in order to assure future populations of a continually productive resource base. Inadequate resource knowledge often leads to resource development which does not consider the long-term impact of changes in resource use or management. Social benefits will arise from project activities to acquire a better data base, to better assess resources and to develop rational programs which utilize the renewable resources but also protect and conserve the resource base for future generations.

There is always a finite amount of human and financial resources which are available for development. The judicious use of these resources is the goal of GOS and donor agencies. Maps which present agricultural development potential for PNAT will allow implementation of development projects optimizing return on the investment. This will be of direct benefit to the people of Senegal who are the intended beneficiaries of any development activity.

D. Financial Analysis

1. Explanation of Cost Elements

The total three-year cost of the project to AID is expected to be \$2.0 million. The GOS will finance approximately \$380 thousand in personnel and direct project support costs. (See Table IV B for a breakdown.) While these direct GOS contributions are only about 19% of the total project cost, it should be noted that for the overall multi-donor financed PNAT program the GOS is contributing approximately \$2.6 million or 38% of total cost.

(a) Technical Assistance

Four person-years of long-term technical assistance will be provided. The cost of this assistance has been calculated at \$80,000 per person-year. (See Table IV A.) This amount does not include in-country support for the contractor including housing, vehicle support and other items to be funded under a separate administrative support contract.

For the 12 person-months of consultants planned under the project, \$12,000 per-person month has been budgeted. This is based on an average salary of \$170/day, a \$95/day Dakar per diem, a \$1,800 roundtrip airfare, Defense Base Act Insurance, 12% fringe benefits and 32% university overhead.

University home-office support includes:

- Principal investigator for 1/4 time over 3 years at \$48,000/year	\$36,000
- Technical assistant for 1/3 time over 3 years at \$25,000/year	\$25,000
- Secretary at 6 months over 3 years at \$9,000/year	\$ 4,500

Staff benefits were calculated at 17% and university overhead at 32.4%. Office support costs were calculated for photographic image products (\$27,000), expendable supplies (\$15,000), communications (\$15,000), travel (\$15,000), and publications and map printing (\$60,000).

In-country support for the contractor consists of administrative and staff support to be supplied by an administrative contractor and USAID/Senegal and of supporting materials and services like local maps, aircraft charter, and soil testing. The amounts shown for each category of support costs are shown on the Summary Cost Estimate and Financial Plan.

(b) Training

Costs were calculated for three types of training: (1) participant training in the U.S., (2) participant training at CRT-Ouagadougou, (3) and in-country training at NRSC.

(1) Participant training in U.S.:	<u>\$50,000</u>
- tuition for 2 persons for six months at \$2,600/month.	\$31,200
- travel at \$1,800 per roundtrip	\$ 3,600
- Per diem, miscellaneous cost, local travel, etc.	\$15,200
(2) Participant training at CRTO:	<u>\$15,000</u>
- Tuition for 4 persons for 3 month course at \$750/month	\$ 9,000
- travel at \$1,500/roundtrip	\$ 6,000

- (3) NRSC training for seminars and workshops and for equipment and supplies including support for on-the-job training \$30,000

(c) Commodities

All the equipment is to be purchased in the first year of the project. A final detailed commodity list will be developed by South Dakota State University working with the Project Support Office of USAID/Senegal.

- (1) Equipment \$195,000
 - vehicles: two passenger vehicles and 1 all-terrain, off-road vehicle and spare parts 32,000
 - remote sensing equipment 15,000
 - image interpretation equipment 8,000
 - stand-alone map digitizer and data storage unit 30,000
 - drafting and cartography equipment 6,000
 - office and laboratory furniture 5,000
 - miscellaneous tools and equipment 4,000
 - household furnishings 30,000
 - packing, shipping, insurance at 50% 65,000
- (2) Supplies 45,000
 - miscellaneous expendable office supplies
 - supplies for field activities
 - documentation and printing

(d) Operating support for the GOS

The project will pay limited GOS operating support costs for field travel, field support, and training. The amounts paid will be in accordance with the USAID/Senegal policy on project indemnities. The amount of operating support has been budgeted as follows:

- local field per diem at 3,500 CFA \$ 20,000 and 2,500 CFA per day depending on rank
- field labor 5,000
- training 5,000

(e) Evaluation

For the in-depth project evaluation to be held after two years of implementation \$25,000 is budgeted for 2 months of independent technical assistance.

2. SUMMARY COST ESTIMATE AND FINANCIAL PLAN

(\$ in thousands)

ITEM	YEAR 1	YEAR 2	YEAR 3	TOTAL
A. Technical Assistance	427.0	427.0	427.0	1,281.0
1. Long-term technicians	160.0	160.0	160.0	480.0
2. Consultants	48.0	48.0	48.0	144.0
3. Home Office Support	77.0	77.0	77.0	231.0
a. personnel	(33)	(33)	(33)	(99)
b. photographic image products	(9)	(9)	(9)	(27)
c. supplies	(5)	(5)	(5)	(15)
d. communications	(5)	(5)	(5)	(15)
e. travel	(5)	(5)	(5)	(15)
f. publications and map printing	(20)	(20)	(20)	(60)
4. In-country support for contractor	142.0	142.0 ^x	142.0 ^x	426.0 ^x
a. contractor housing	(60)	(60)	(60)	(180)
b. support staff	(40)	(40)	(40)	(120)
c. local maps and data base	(1)	(1)	(1)	(3)
d. library materials	(1)	(1)	(1)	(3)
e. vehicle support	(6)	(6)	(6)	(18)
f. soil testing	(7)	(7)	(7)	(21)
g. aircraft charter	(8)	(8)	(8)	(24)
h. translation and copying	(4)	(4)	(4)	(12)
i. in-country travel	(15)	(15)	(15)	(45)

	YEAR 1	YEAR 2	YEAR 3	TOTAL
B. Training	25.0	10.0	60.0	95.0
1. U.S. Training	—	—	50.0	50.0
2. Ouagadougou	15.0	—	—	15.0
3. In-country training	10.0 ^x	10.0 ^x	10.0 ^x	30.0 ^x
C. Commodities	210.0	15.0	15.0	240.0
1. Equipment	195.0	—	—	195.0
2. Supplies	15.0 ^x	15.0 ^x	15.0 ^x	45.0 ^x
D. Operating Support for GOS	10.0^x	10.0^x	10.0^x	30.0^x
E. Evaluation	—	—	25.0	25.0
SUBTOTAL	672.0	462.0	537.0	1,671.0
Inflation 10% py	—	46.0	116.0	162.0
Contingency 10%	67.0	46.0	54.0	167.0
TOTAL	739.0	554.0	707.0	2,000.0

^x Local currency expenditures.

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x

3. Project Expenditure Schedule

(\$ in thousands)

FISCAL YEAR	A. I. D.	SENEGAL (1)	TOTAL
1981	550	75	625
1982 ^x (2)	620	140	760
1983 ^x (2)	650	120	770
1984 ^x (2)	180	50	230
TOTAL	2,000	385	2,385

(1) Exchange rate at \$1 = 230 CFA.

(2) Inflation calculated at 10% per year.

TABLE IV A.

Average Annual Technical Assistance Cost FY 1981

The estimate of the average cost of one person-year of long-term technical assistance assumes an average assignment of 3 years and an average family size of 2 adults and 1 child of primary school age.

A. Salary	5,000
B. Transportation (1 roundtrip/yr. at \$ 1,800 x 3 persons)	5,400
C. Household Effects transportation (surface and air)	7,000
D. U.S. Storage	600
E. Post Differential (15 %)	4,500
F. Post Cost of Living Allowance	4,000
G. Educational Allowance	3,000
H. Defense Base Insurance (4.64%)	1,400
I. Staff Benefits (17%)	5,100
J. Temporary Lodging	1,000
K. Retirement, FICA (6.65%)	2,000
 SUBTOTAL	 64,000
L. Overhead (25%)	16,000
 TOTAL	 80,000

TABLE IV. B.

BUDGET - GOS CONTRIBUTION

A. DAT Contribution

(CFA in thousands)

<u>Personnel - Salary</u>	
Director of projects (1/4 time at 1000,000 cfa/mo for 3 years)	900
2 assistants (cartographers 1/4 time at 60,000 cfa/mo/3 years)	1,080
Administrative Assistant - 1/4 time at 60,000 cfa/mo/3 years	540
<u>Per diem costs</u>	
Director (60 days at 12,000 cfa per day)	720
Assistant (120 days at 6,000 per day)	720
Photographer (40,000 cfa/mo/3 years) - full time	1,440
	<hr/>
Total personnel	5,400
<u>Equipment</u>	
In photo laboratory	1,210
In cartography section	1,000
Photography	500
	<hr/>
Total equipment	2,710
<u>Space rents</u>	
3 offices at (16,000 cfa/mo each)	1,152
Photo laboratory (16,000 cfa/mo)	576
	<hr/>
Total space	1,728
3 Field counterparts - survivors 3 for 8 mo/year at 60 000 cfa/mo	1,440
	<hr/>
Total contribution	11,278

<u>B. Geography Department, University of Dakar Contribution</u>		CFA (000)		
Salaries Un. staff & per diem		9,000		
Office Space, lab Space		1,000		
Equipment in country		37,500		
Equipment to be ordered (1)		15,000		
Supplies (5million/year programmed)		5,000		
Transport (1 car and fuel)		1,420		
Camping equipment		600		
Total		69,520		
<u>C. Other Department of Government Contribution</u>				
Personnel				
5 for total of 10 mo. per year at 60,000/mo		1,800		
per diem at 6,000 cfa/day for 900 days		5,400		
Miscellaneous cartographers, geologists, foresters etc. loaned to project - 6 pm at 60,000/mo		360		
Total		7,560		
<u>D. Totals</u>		(000) cfa		
DAT		11,278		
University of Dakar		69,520		
Other departments		7,560		
Total		88,358		
<u>E. Breakdown of costs. GOS</u>		(000 cfa)		
	<u>DAT</u>	<u>U.D.</u>	<u>OTHER</u>	<u>TOTAL</u>
Personnel	5,400	9,000	7,560	21,960
Equipment	2,710	54,250		56,960
Space	1,728	1,000		2,728
Field work	1,440			1,440
Supplies		5,270		5,270
Total	11,278	69,520	7,560	88,358

(1) Requested and very likely to receive.

Dollars equivalents of GOS Budget

\$ I : 242 & 230 fcfa

	D.A.T.		U.D		OTHER		TOTAL	
	\$:242	\$:230	\$:242	\$:230	\$:242	\$:230	\$:242	\$:230
Personnel	22,314	23,478	37,190	39,130	31,240	32,870	90,744	95,478
Equipment	11,198	11,783	224,174	235,870			235,372	247,652
Space	1,140	7,313	4,132	4,348			11,273	11,861
Field work	5,950	6,261					5,950	6,261
Supplies			21,777	22,913			21,777	22,913
	46,602	49,035	287,273	302,261	31,240	32,870	365,116	384,165

Best Available Document

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E. ADMINISTRATIVE ANALYSIS

1. Project Administration

The cooperating GOS agency for this project is the Direction de l'Aménagement du Territoire (DAT) located within the Ministry of Urban Affairs, Housing and Environment. DAT will have overall responsibility for project administration including implementation, financial management, and coordination with other GOS agencies.

As the agency directly responsible for PNAT, DAT has had considerable experience coordinating activities among GOS agencies and directing donor-financed project inputs for PNAT. DAT successfully solicited and received project support for PNAT from the UNDP and UNFPA, and has been effectively guiding the implementation of these projects.

In developing this project, the project paper design team worked closely with the Director of DAT. The Director is a professional geographer who has shown good technical and administrative competence in guiding the preparation of PNAT. He has also shown a strong interest in this project and in remote sensing applications. In fact, in order to be in a better position to manage this project, he is currently taking a course in remote sensing at the University of Dakar. Based on the experience and managerial capability shown in implementing the two UN-financed projects and on the effectiveness of DAT's coordination of the project design, the PP design team concludes that DAT has the capability to implement this project.

The administrative structure of the project (Figure IV C) has DAT as the GOS cooperating agency. Project activities will be coordinated by DAT within the context of its mandate to prepare PNAT. The involvement of other GOS agencies, particularly the Regional Development Agencies, in remote sensing applications under the project will be coordinated by GEDTEL (Groupe d'Etude pour le Développement de la Télédétection) which has been established under the supervision of SERST (Secrétariat d'Etat à la Recherche Scientifique et Technique). Remote sensing services including training, data analysis, and documentation storage will be provided by NRSC under a service agreement with DAT. (A proposed draft agreement is attached as Annex I). USAID/Senegal will appoint a project manager to monitor project activities. USAID will contract for technical assistance with South Dakota State University and handle off-shore procurement to expedite implementation. All other implementation responsibilities will be with DAT.

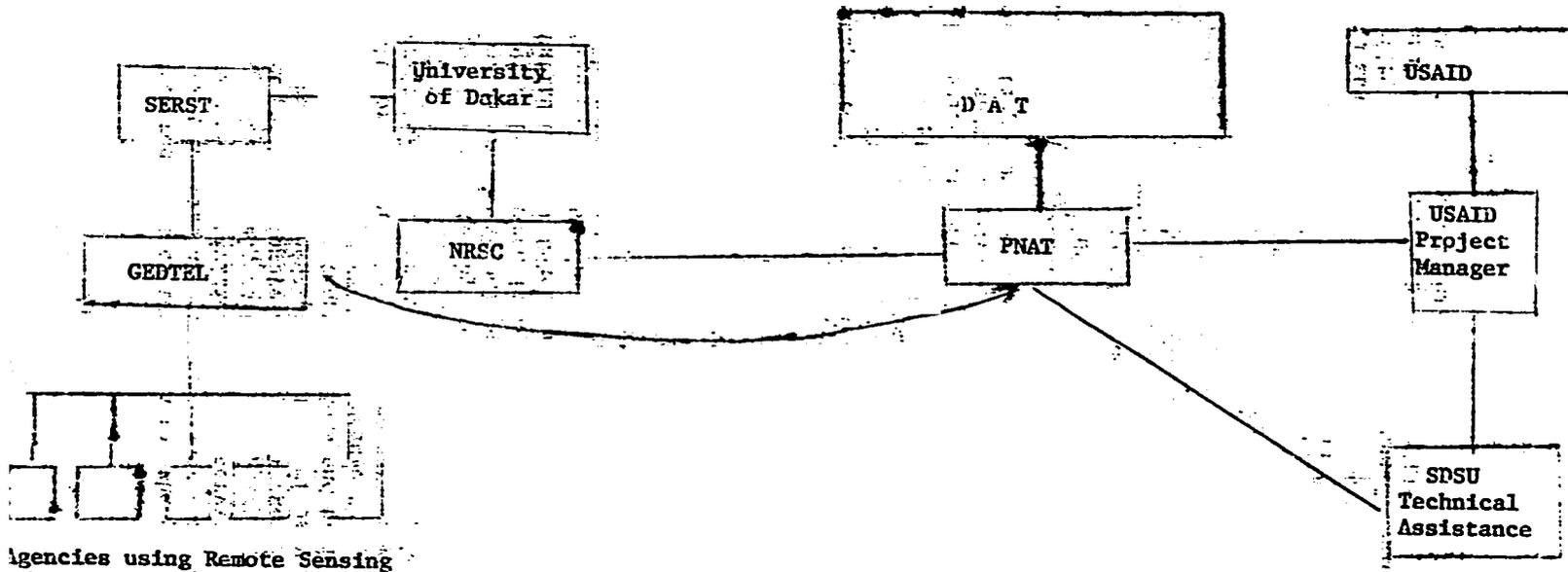
2. Technical Coordination

The Secretariat of State for Scientific and Technical Research - SERST - has the responsibility for coordinating nearly all research in the country. SERST currently also has administrative jurisdiction over research at the University of Dakar. Both SERST and the University of Dakar are under the overall jurisdiction of the Ministry of Higher Education.

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Figure IV C

Project Administrative Organization



SERST provided technical coordination for the preparation of this project by cataloging existing equipment, laboratory facilities and personnel for remote sensing activities and by supervising GEDTEL. A special meeting of GEDTEL was held on December 24, 1980 to solicit project participation of all potential remote sensing user agencies. Follow-up to this meeting by DAT has established several areas of user agency interest which will be used to guide project applications and training. The continuing project involvement of SERST will assure that computer services are available to the project and that a service agreement is reached between DAT and the University of Dakar covering activities of the NRSC.

The NRSC will be directed by the Chairman of the Geography Department, University of Dakar. He is well qualified to direct the development of the Center, having been trained in remote sensing applications at the Remote Sensing Institute, South Dakota State University. Following his training, he immediately organized training courses in remote sensing at the University. The development of NRSC has in fact arisen from his desire to broaden the training/services orientation of the University as well as from the needs of this project.

Under the service agreement between DAT and the University, outside agencies and their representatives would be able to work in the NRSC laboratory on projects such as land-use monitoring, surface water monitoring, vegetation monitoring or anything else of interest which depends on remotely sensed data. When an agency plans a major project or lacks the personnel needed to do the required analysis, they would be able to purchase imagery, analytical maps, and/or technical advice from the Center. The NRSC will serve as an archive of remote sensing and aerial photography for use by all GOS agencies, and will help to assure continued use of the data collected by various projects. This structure offers every probability of having excellent spread effects at minimal cost and should make maximum use of already existing agencies, procedures, and facilities.

3. Project Personnel

Adequate allocation of time by Senegalese technicians assigned to the project should be a concern only during the early months of the project. The maps needed for the PNAT were originally planned to be prepared by November 1980, so there is considerable urgency.

It is important that the seven Senegalese specialists necessary to complete the initial maps be available on a full time basis for a full 6-month period. It is also important that GOS project technicians be available for the field work necessary to establish ground truth. This work will require absences from home for field work of periods of a month or more. University and other counterpart personnel could find this difficult. Careful attention must be paid to initial job descriptions and work incentives to counteract this effect.

The need for GOS personnel by the project will be specified in the Project Agreement and the GOS will provide them as its counterpart contribution. For the training and monitoring phases of the project, all of the Ministries and agencies visited by the design team expressed a preference for short-term and part-time involvement of their personnel, so that monitoring and remote sensing could be related to their other work. No serious problem of time availability is foreseen in that phase. There is general agreement that this formula of part-time, applied training offers the best probability of the technology being used to maximize resource management. Only a few highly specialized training needs can be met more cost-effectively at Ouagadougou and in the U.S.

Effective communication of the implications of resources analysis and monitoring are also emphasized in the project design. Specifically, the ready availability of imagery at low cost to any interested user via the NRSC and the involvement of personnel of a wide variety of ministries and agencies helps assure that their parent organizations will be ultimate users. Nearly every national or regional service contacted by the design team expressed an interest in having their personnel involved, even after the limitations had been carefully pointed out. The most commonly expressed desires were to be able to monitor the evolution of vegetation and land-use patterns seasonally and annually as well as establishing an inventory of natural resources. It was pointed out that much of the data now being used are 20 years or more old.

The PP team carefully explained to all GOS officers interviewed that monitoring of actual crops was not feasible yet, and that the technical feasibility of demographic monitoring, of urbanization and frontier colonization remains uncertain. Both may be possible in certain areas as the technology of remote sensing improves.

In summary, it appears that the GOS agencies concerned with gathering and analyzing data and those who are the ultimate consumers of such information have agreed upon an administrative system for tying together a capability for interpretation and analysis of data. Within the limits of their personnel and limited facilities, these GOS agencies will be able to develop much of the information needed for better resource management and monitoring. It is important to note also that this system eliminates most chances of duplication, calls for a great deal of cooperation and coordination among user agencies, and puts the ultimate control in the hands of the users. The design team has met most of the personnel who will be involved in the project as technicians, managers and directors and is confident that with the help envisaged in other parts of this paper, the project can be well managed to produce usable and needed information on a timely basis.

F. ENVIRONMENTAL ANALYSIS

This project is concerned with data collection and analysis and with training which will not have a direct impact on the environment. Applications of project outputs could have a favorable environmental impact through better planning and more balanced development but these would be long-term, indirect effects. An Initial Environmental Examination (IEE) was prepared with the PID and a Negative Determination was approved by the Assistant Administrator for Africa. The basis for that determination remains valid. No further environmental analysis is required.

G. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

1. Conditions Precedent

It is recommended that the Project Agreement contain two Conditions Precedent:

A Condition Precedent to the disbursement of funds under this project will be the appointment of a GOS project manager who will be responsible for project implementation and accountable for project funds.

A Condition Precedent to the obligation of second year funding for the project will be the establishment of a service agreement acceptable to USAID by DAT with the University of Dakar for project services to be provided by the National Remote Sensing Center (NRSC).

The DAT and the Geography Department of the University of Dakar have prepared a draft cooperative agreement (Annex I) to create the National Remote Sensing Center which would provide remote sensing analysis and training for PNAT. This agreement needs to be refined or supplemented by a service agreement to clearly delineate the services and staff time NRSC will provide to the project and, in turn, the project resources that DAT will furnish to NRSC. The overall cooperative agreement will be executed by the parent agencies - the Ministry of Urban Affairs, Housing and Environment and the University of Dakar. However, the more specific services agreement for this project could be negotiated directly by DAT and NRSC within the cooperative agreement.

To implement the project, the GOS will have to appoint a project manager with overall project responsibility. This project manager will be within DAT, the cooperating agency for the project; most likely he will be the director of DAT. Although he will be responsible for implementation, the project manager will be able to delegate certain aspects of his authority to other agencies. For example, the NRSC will be given authority for preparation and interpretation of certain maps and for conducting certain training. The redelegation of authority (including the DAT/NRSC service agreement) will be considered by USAID as a contract under the project and thereby subject to the standard grant agreement provisions requiring AID review and approval before execution.

2. GOS contribution :

The Project Agreement will require that the GOS provide the project with office and laboratory space and certain personnel. These will be provided by DAT and include:

- (a) Permanent office and laboratory space for the 2 long-term technical assistants from SDSU and other long-term GOS project personnel, and temporary space for SDSU consultants and short-term personnel from other GOS agencies.
- (b) project personnel:
 - (1) D.A.T.:
 - Project Director - 1/4 time
 - 2 Cartographers - 1/4 time
 - 1 Administrative Assistant - 1/4 time
 - 3 Field Surveyors - 8 months per year
 - (2) DAT through agreement with user agencies:
 - 5 technical specialists - agriculture, hydrology, forestry, livestock, ecology, etc.
 - (3) Through a service agreement with NRSC, DAT will obtain services expected to require
 - 5 staff members working 1/3 time and including approximately 6 weeks of fieldwork per year

V. IMPLEMENTATION PLAN

A. Project Activities

The project activities can be divided into four main aspects, each of which will be executed in a rather distinct way and each depending on some specific elements. A summary of activities and work statements is given in Figure V A.

The initial Landsat imagery analysis and aerial photograph interpretation will require a laboratory with such basic equipment as hand lenses, stereo-scopes and cartographic materials as well as the timely procurement of the remote sensing data, aerial photographs, topographic and historic data. Therefore, immediately after the Project Agreement has been signed, procurement of these items should start. This phase of the work should be complemented by reconnaissance aircraft flights and selection of representative sample areas for verification. Cartographic services provided by DAT and NRSC will be utilized for initial and final map preparations.

The training aspects of the project will require the elements mentioned above with the addition of lecture rooms, lecture materials, remote sensing manuals and literature to supplement local information. This training will complement the on-the-job training of the GOS counterpart personnel. An early identification of counterpart personnel is important since the first phase of preliminary imagery interpretation will teach them the theoretical background for further work.

The training of user agency personnel will require a laboratory facility, instructors, a good map data base, and interpretation equipment. For this activity, it is planned that GOS resource technicians will use the facilities of the NRSC working under the guidance of University staff. The technicians will thereby acquire an understanding of the most important aspects of image interpretation and resource analysis. Some field investigations will be included to fully assess the utility of the image interpretations and to characterize and describe the mapping units. The offices and lab facilities for this training will be provided under a service agreement with the NRSC.

The third aspect, field observations in the elected sample areas will be practical in nature. The trainees will work with technical advisors to verify and check their own interpretations on the ground. This part of the project will require vehicles, gasoline, camping equipment and field support personnel such as drivers, workers, etc...

The fourth aspect, preliminary and final map drawing and reporting will require the participation of cartographers and draftsmen, the use of cartographic equipment and availability of a bilingual typist-secretary.

The principal physical elements required for a timely development of the project activities will be the availability of offices, cartographic rooms, equipment and a classroom for the counterpart trainees.

FIGURE V A.

PROJECT TIMING CHART

WORK STATEMENTS

YEAR 1

YEAR 2

YEAR 3

A. RESOURCE INVENTORY RELATED :

1. Define and develop image data base
2. Define and procure commodities (1)
3. Initial documentation and field familiarization
4. Training basics of remote sensing
5. Training image interpretation, initial map preparation, definition of legend
6. Preliminary fieldwork
7. Initial map update and draft
8. Air photo interpretation
9. Soil lab analysis
10. Map compilation
11. Resource classification and documentation
12. Land evaluation and suitability ratings
13. Report preparation, review, translation & publication
14. Review workshops

1) See table V B on commodities procurement schedule

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FIGURE V A.

PROJECT TIMING CHART

(2-1)

WORK STATEMENTS	YEAR 1	YEAR 2	YEAR 3
B. TECHNOLOGY TRANSFER/TRAINING RELATED;			
1. Operational mapping (from A - Resource Inventory Related)			
2. Remote Sensing Commodity definitions & procurement			
3. Assist NRSC training workshops			
4. Assist NRSC in user applications & cooperative investigations			
5. 6-month training in U.S. for 2 GOS resource & system technicians in understanding of new systems & applications			
6. 3-month training at Ouagadougou, regional facility in resource analysis & remote sensing for 4 GOS technicians			
7. In-depth evaluation & definition of project extension			
8. Final report preparation, translation, reviews and publication			

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The principal commodity elements for the interpretation and technology transfer aspects of the project will be Landsat products, aerial photographs, maps and basic drawing and interpretation materials, and equipment.

The GOS will provide offices and cartographic rooms with equipment and personnel in the DAT building in Dakar. It would be very useful if DAT could also arrange for field office space with the RDA's for the field work outside of Dakar in place like St. Louis, Ziguinchor, and Tambacounda.

B. PROJECT RESPONSIBILITIES

1. Implementation

As stated in the Administrative Analysis, Section IV E, DAT is the cooperating GOS agency and will have overall responsibility for project implementation. The Director of DAT will be appointed as the GOS project manager. As project manager he will oversee all phases of project implementation. He will coordinate the development of annual workplans, supervise the project activities of all DAT employees and of the South Dakota State contract team, administer local project expenditures under a special project bank account to be established by DAT, coordinate activities of the NRSC and other GOS agencies involved in the project, and work closely with his counterpart, the USAID project manager.

The USAID project manager will have to initiate actions for contracting for technical assistance from SDSU, for commodity procurement, for local contract and project support services, and for consultants for evaluation. However, these implementation actions will be confined to a few support functions. The major role of USAID will be that of monitoring project implementation. The project manager will maintain communications between USAID and DAT. Formal monitoring will be done through the quarterly implementation reports which will be reviewed jointly by DAT and USAID. An outline of the project implementation report is included as Figure V B. USAID monitoring will be assisted by reports of the technical assistance contractor that will be required quarterly in a format consistent with the USAID implementation report.

The project lends itself well to milestones for reporting and evaluation. Quarterly and annual summary progress and workplan reports by SDSU will be prepared and submitted as well as a final report at the end of three years. The final report will include multiple copies of all 1:500,000 baseline maps as well as appropriate thematic maps. These will be accompanied by statistical data and summaries of the map information. The reports shall include a listing of major activities, any problems developed, and major tasks to be accomplished for the next reporting period.

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FIGURE V B

Project Implementation Report Outline

Project N. 685-0233

National Plan For Land-Use and Development

Quarterly Implementation Report : (Period Covered)

I. BASIC DATA

- A. Project Authorization Date :
- B. Project Agreement Date :
- C. Date Conditions Precedent Met :
- D. Project Assistance Completion Date :
- E. Cooperating Agency :
- F. USAID Project Manager :
- G. Cooperating Agency Project Manager :
- H. Life of Project Funding :
- I. A I D :
- 2. Cooperating Agency :
- I. Accrued Expenditures :
- 1. Technical Assistance :
- 2. Commodities :
- 3. Training :
- 4. Operating Costs :

II. PROJECT PURPOSE

(Brief Statement)

III. MAJOR EVENTS DURING REPORTING PERIOD

(Covers previous two months)

IV. PROBLEMS OR DELAYS

V. REMEDIAL ACTIONS

VI. MAJOR ACTIONS PLANNED NEXT REPORTING PERIOD

VII. PROJECT PERFORMANCE TRACKING CHART

Two specialized reports will be prepared for interim evaluation and use. The first will be submitted at the end of the first year and will include a preliminary 1:500,000 interpretation map, data, statistics, and narrative on the preparation. The preliminary map will be used as an early input into PNAT. A second report summarizing the in-depth evaluation is to evaluate the progress of the NRSC and define any project extension that might be appropriate.

2. Procurement

Major equipment and vehicles for the project will be purchased by USAID. The project commodity list is provided in the Financial Analysis, Section IV D, and the procurement schedule is presented in Figure V C.

The detailed specifications of each piece of equipment will be developed by the contractor working with the Project Support Office of USAID. SDSU will provide technical assistance for this under its contract for project design since the work will be required prior to execution of a long-term contract for project implementation. Two passenger vehicles will be procured locally within the first few months of project implementation. (A waiver for this is attached as Annex G.) Other equipment and vehicles are to be purchased from a U.S. source and origin.

For support of contract activities in the U.S., SDSU will be authorized to procure certain photographic imagery and office supplies. For in-country contractor support, USAID will arrange for the leasing of housing (this will possibly be done through a contract for administrative services) payment of a local per diem, contracting for soil testing, aerial photography and aircraft charter services, and possibly for other services. DAT will handle arrangements for some types of support like local maps, library materials, vehicle support, translation and copying and in-country travel. Many of these local costs will be funded by the project through a local bank account with DAT. The exact division of local support costs between direct AID procurement and procurement by DAT will depend on USAID project management decisions and will be specified by Project Implementation Letters.

The authorized source and origin for commodities financed by USAID under this project is the United States (Code 00). A waiver is requested for procurement in Senegal of soil testing, aerial photography, and aircraft charter services from the special Free World (Code 935) for an amount not to exceed \$60,000 and for procurement of 2 vehicles from the U.S. and certain LCD's (Code 941) for an amount not to exceed \$15,000. A waiver justification is provided as Annex G. For local procurement of materials and supplies, shelf-item procurement from the special Free World (Code 935) is authorized for items not exceeding a unit price of \$2,500 and not totalling more than 10% of local currency expenditures, or not more than approximately \$50,000. The price paid for shelf-items will be not more than the lowest available competitive price, and will be in accordance with good commercial practice.

Project contracting will follow direct-AID contracting procedure. Under the Collaborative Selection Procedures of AID (AIDPR 7-4.58), South Dakota State University was selected as the project contractor and a contract was executed for designing this project. For project implementation following approval of the PP, USAID intends to negotiate a second contract with South Dakota State for the technical services described in Annex F., Technical Assistance Scope of Work. The determination to use direct-AID contracting is in accordance with the exceptions permitted to AID Policy Determination 68 for Host-Country Contracting.

C. SCHEDULE OF ACTIVITIES

1. Actions prior to ratification of project agreement.

The Project Agreement is expected to be signed by the end of May 1981. In order not to lose more time in the already delayed natural resource investigations, procurement of needed commodities should begin immediately after signing the agreement. Arrangements should be made with the proposed contractor to prepare specifications for all commodities to facilitate this procurement.

2. Actions soon after the ratification of Project Agreement.

The technical assistance contract is expected to be signed by the end of June 1981. By the first of July, the contractor's two long-term technicians should arrive in Dakar. Their priority task will be to obtain all the necessary reference documents, maps and aerial photographs available from the different services/agencies in the country. The early identification of counterpart personnel, the organization of office space in DAT, renting houses, hiring support personnel (bilingual secretary, administrative assistant and drivers) and providing assistance to the NRSC for preparation of the project training program will be priority activities.

3. Two vehicles will be procured locally; commodities should begin to arrive in 1981.

4. In the beginning of September 1981, the training of counterpart personnel should start. After one month of more or less theoretical training on Landsat products already available at NRSC, the selection of trainees for training at the regional facility in Ouagadougou should take place.

5. In October, applied training of a practical nature on the now, digitally enhanced and corrected Landsat data will start with the participation of the rest of the counterpart resource scientists. Preliminary image interpretations and legends for field use will be prepared.

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FIGURE V

COMMODITIES PROCUREMENT SCHEDULE

Project Agreement signed	YEAR 1	YEAR 2	YEAR 3
- AID PROCUREMENT			
1. Vehicles			
2. Remote Sensing & inter. Equipment for survey	_____		
3. Mapdigitor & storage	_____		
4. Drafting & cartographic equipment		_____	
5. Office & lab furniture		_____	
6. Field tents & equipment	_____		
7. Miscellaneous field supplies	_____		
8. Imagery Acquisition for field survey	_____		
9. Computer tapes of landsat (delivered to US)	_____		
10. Image data processing subcontract in US	_____		
11. General office supplies & equipment	_____		
12. ORSTOM Soil Testing Services	_____		
13. Aircraft charter		_____	
14. General office supplies	_____	_____	
15. Household furniture	_____	_____	
16. NRSC Equipment & supplies for training	_____		_____
- SDSU Home office support			
1. Landsat Image product for training support	_____		
2. Report & map printing	_____	_____	
3. Home office supplies			_____
- SDSU Dakar office support			
1. Local maps, library & reference documents	_____		
2. Vehicle support			_____
3. Translation services			_____

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6. In February-March 1982, aerial reconnaissance flights will be made and representative sample areas selected and exploratory field trips (including some sampling for laboratory analysis) made.
7. By the end of May 1982, preliminary maps (with limited field-checks) will be completed as a first gross estimate for the PNAT. (See point 6 of the overall survey plan below).
8. The first workshop on remote sensing should be organized in June-July 1982, at NRSC, for representatives and decision makers of different user agencies/departments.
9. More detailed natural resources studies in the field (sample area) together with aerial photo interpretation (approx. scale 1:500,000) will start in August 1982.
10. Detailed descriptions of natural resources will be made in the field and samples collected for analyses in laboratories in Dakar (ORSTOM).
11. In early 1983, new Landsat data will be ordered to be used during the second workshop training session to be held in July-August 1983 at NRSC.
12. The hiring of short-term consultants should also start in early 1983.
13. a) The agronomist/landuse consultant should arrive in April-May 1983 to collect field and research information for the preparation of land capability evaluation criteria and their ratings. b) The hydro(geo)logist should arrive during the second half of the field survey. c) The forester should arrive during the time of field observations in the Casamance sample areas.
14. In April-May 1983 the fieldwork should be completed and map update and compilation should be done in June-July 1983, at a final scale of 1:500,000).
15. Two counterparts to be trained in the newly developed systems and applications (like the thematic mapper of Landsat 4 and the French SPOT satellite) should be selected (including testing on their English language capability and language training if it is needed) for training in the Uf. in June 1983.
16. In-depth evaluation and definition of possible project extension should take place in August 1983.

17. A second workshop for review of the data and field findings should be held at NRSC in this stage (in July-August 1983). New Landsat data should be analysed and compared with the older data to study environmental changes.
18. After the receipt of all laboratory results, the taxonomic soil classification will be finalized and maps and data sheets adjusted and completed on a scale of 1:500,000 in September-October 1983.
19. Final land evaluation and specific use suitability ratings, including the preparation of final interpretative maps should be completed by the end of 1983, on a scale of 1:500,000 or smaller.

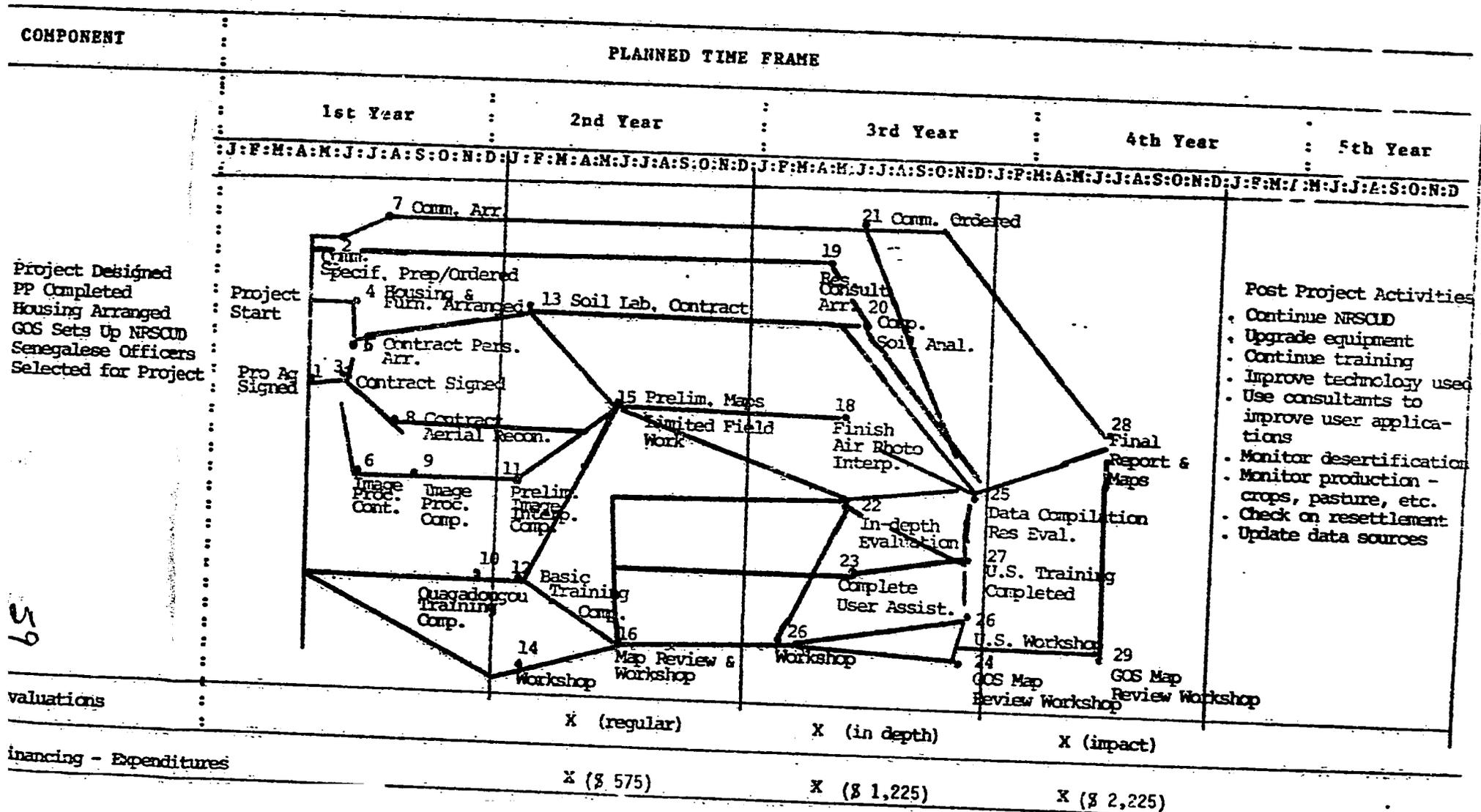
FIGURE V.3.

PROJECT PERFORMANCE TRACKING CHART

PROJECT NAME: National Plan for Land-Use and Development

DATE: 2/20/81

PROJECT NUMBER: 685-0233



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FIGURE V D

Project Performance Tracking Network

Performance Indicators

Prior Actions :

2/20/81	Project Designed
4/30/81	PP Authorized
5/01/81	USAID Implementation planning
	GOS sets up NRSCUD
	Senegalese officers selected for project

Project Activities :

- | | | |
|-----|----------|--|
| I. | 05/81 | Pro Ag Drafted and Signed |
| 2. | 06/81 | Contractor prepares specifications for commodities and orders placed |
| 3. | 6/30/81 | Technical Assistance contract signed with South Dakota State |
| 4. | 7/01/81 | Housing and Furniture procured |
| 5. | 7/15/81 | 2 Contract Personnel arrive |
| 6. | 7/30/81 | Image processing Contract signed |
| 7. | 7/30/81 | Commodities arrive |
| 8. | 8/30/81 | Contract signed for aerial reconnaissance |
| 9. | 9/30/81 | Image processing completed |
| 10. | 11/30/81 | Complete Ouagadougou training |
| 11. | 2/28/82 | Preliminary image interpretations completed |
| 12. | 2/28/82 | Basic and applied training completed |
| 13. | 2/28/82 | Soil lab contract negotiated |
| 14. | 2/28/82 | Assist UD in conducting workshops |
| 15. | 6/30/82 | Submit completed Preliminary maps, limited field work |
| 16. | 6/30/82 | GOS resource mapping review and workshop |
| 17. | 2/28/83 | Workshop |
| 18. | 4/30/83 | Finish air photo interpretations and field survey |
| 19. | 4/30/83 | Resource consult for multidisciplinary mapping |
- ...

- 20. 6/30/83 Complete Soil Analysis
- 21. 6/30/83 Complete procurement for training, technology transfer and inst. Development
- 22. 6/30/83 Conduct in depth evaluation and project redirection if necessary
- 23. 6/30/83 Complete user assistance program
- 24. 2/30/83 GIS resource mapping review, workshop
- 25. 12/30/83 Data compilation and Resource Evaluation
- 26. 12/30/83 Workshop
- 27. 12/30/83 Complete US training on advanced systems
- 28. 6/30/83 Final Documentation and maps due.
- 29. 6/30/83 Workshop-final reviews

VI. EVALUATION PLAN:

Three evaluations are planned during the three-year life of the project:

A. Regular evaluation: A regular evaluation is planned at the completion of the first year's work by the contractor. This evaluation will focus primarily on project implementation--the success of the GOS in establishing the proposed Remote Sensing Center within the Geography Department of the University of Dakar, the functioning of the technical committee for the NRSC, the appropriateness of the work schedule and scope of activities proposed in the PP, and the efficiency and effectiveness of the work being done.

B. Special In-Depth Evaluation: It is planned to conduct a special evaluation at the end of the second year of contract work to: (1) review progress made under the project, (2) determine if the course of action is appropriate in view of the needs of Senegal at that time, and (3) decide if the project should be extended to complete additional maps needed by Senegal, to monitor and plan for protection as well as the best use of its natural resources, or to complete the establishment of the NRSC as a permanent institution in Senegal.

C. Third evaluation: There are two courses of action possible for the evaluation at the end of the third year, depending on the decisions made as a result of the Special Evaluation mentioned above.

1. If the decision is made to extend the project, the evaluation at the end of the third year would be similar to the first evaluation but examination would be made to see if the decisions made during and following the special evaluation were still valid.

2. If the decision is to terminate the project at the end of the third year, the evaluation would be a terminal evaluation at which time the impact of the project would be evaluated. In addition the evaluation would assess the success of the project in accomplishing the objectives and outputs listed in the PP, and the efficiency with which the project had been conducted would be looked at and evaluated with particular attention being given to reasons for outstanding successes, failures and unexpected results. The final evaluation report would emphasize these features along with any lessons which have been learned which might be of value to AID, other donors, the GOS, or other developing countries.

D. Evaluation elements: The elements to be particularly studied during the above evaluations are as follows:

1. Preparation of maps and data for the PNAT:

It is expected that the general soils/vegetation map will be completed by end of year one. The final maps are scheduled for completion at the end of the third year with others being completed during the course of the project as shown on the Project Timing Chart. (Figure V. A)

2. Training of Senegalese Personnel.

The training is aimed at providing properly oriented personnel when needed early in the project. Some trained people are available in-country before the commencement of the project and it is expected that some of the training at CRT-Ouakadougou will commence as soon as the Project Agreement (Pro Ag) is signed or as soon thereafter as arrangements can be made with CRTO to receive them. (See implementation schedule).

3. Procurement of Commodities and Services:

The commodities and services to be procured under this project are not expensive but they are very important to the success of the project. Procurement should start as soon as the Project Agreement is signed. The lists of commodities agreed upon during the preparation of the PP is presented in the Financial Analysis Section IV D.

4. Technical Assistance:

The contract technicians should be available to start working after the signing of the contract. The soil surveyor/team leader should have at least an S-3 ability in French and fluency in English. The ecologist should have an S-3 ability in French, but an S-2 would be acceptable. All contract personnel must be competent in a science related to the disciplines and areas to be mapped and must arrive as scheduled in the implementation schedule. The quality of service, speed of response and accuracy of performance are important to the success of the project.

5. GOS Personnel:

GOS personnel should be appointed to the positions of DAT project manager, director of the NRSC, and other jobs in the remote sensing, photography, and cartography as soon as the Pro Ag is signed. Other personnel needed for mapping, interpretation, and surveying should be made available as scheduled and should be supported with adequate travel, per diem and support funds. GOS personnel will also be needed to fill the training

slots planned within the project.

6. Coordination with Regional and Other Remote Sensing Activities in the Area.

The project should be able to present evidence that it is coordinating and cooperating with other remote sensing activities in Mali, Mauritania, Upper Volta and other CILSS countries and with the Regional Remote Sensing Center in Ouagadougou. Information, techniques being developed, and reports should be freely available to these counterpart organizations and, if possible, training and other services made available whenever requested.

7. Technology Transfer.

One of the project purposes is to transfer technology concerning remote sensing to Senegal. Successful transfer will be evidenced by the quality of information being generated in the project, the number and quality and amount of planning and project implementation being done using maps and other information gathered and analyzed in this project.

8. Institution Building.

The GOS has verbally agreed that a remote sensing center will be established, and DAT and the University of Dakar have agreed to joint sponsorship of this institution. A joint convention to create the center has been prepared by DAT and the University of Dakar (See Annex I) and it is expected to soon be executed. While the GOS has said that it wants to establish such a center, the draft convention is not clear that the center is intended to be a continuing institution. The project will assess the need for a permanent center and determine if further strengthening is needed through training and support from other centers such as the EROS Center in the US or the Regional Remote Sensing Center (CRTO) at Ouagadougou. The provision of equipment for more advanced enhancement and interpretation techniques and of more technical assistance to keep up with the new technology to be developed when Landsat IV is launched could be considered as part of a Phase II follow-on project.

9. Preparation of maps and data.

The first map is to be completed by the end of year one of the contract and others are to be produced as indicated in the project timing chart, Figure V A. To assure accuracy, data is to be verified by ground truth studies, either by reconnaissance surveys, aerial observation, or

both, as appropriate. Maps will be updated and corrected as new information and new techniques become available.

10. Appropriateness of the project and changes needed.

Two general questions can be asked here, "Is this the right kind of project for Senegal?" and "Is it being done in the most efficient and effective way?" Unless the answers to both questions are a very positive "yes", then the evaluators must determine what they believe to be better solutions to the problem. They will recommend improvements for action by the project leaders, the Mission and the GOS. This aspect of the evaluation will be especially important at the special in-depth evaluation. At that time, the evaluation team is expected to make recommendations on the following questions as a minimum:

1. Should the project be continued beyond three years?
2. Should it continue as is or should it focus on new aspects such as more emphasis on institution building, on introducing more advanced technology, on introducing new technology, on more automation, etc.?
3. What changes should be made in goal, purposes, outputs and inputs?
4. Make recommendations for administrative and operational changes.
5. Is the USAID and GOS staffing adequate to do the job?
6. What is required in training and commodities to improve the project?
7. Are the results of the project being used by the GOS? How? If not, why not?
8. Any other suggestions for improving progress, results and efficiency.
9. Is the project on schedule?
10. Can certain elements of the project be discontinued?

E. Conducting the Evaluation:

1. The regular evaluation will be conducted by a committee made up of DAT project director, the USAID project manager, the contract team leader, and any others designated by USAID or the GOS. Most attention in this evaluation will be given to project administration, fiscal management, timeliness and adequacy of personnel, commodities and training, delivery of inputs as scheduled, and progress (both qualitatively and quantitatively) compared to the original estimates. This evaluation will ordinarily take about a week. At its conclusion, a Project Evaluation Summary (PES) will be prepared. The PES should list all decisions and/or unresolved issues and make recommendations for further action. It should also note any deficiencies, any unplanned effects or exceptional progress made during the past year and should make recommendations for changes required in any of the documentation governing the project.

2. The special in-depth evaluation - will be conducted by an outside contract team under the direction of the evaluation officer of USAID and a senior officer of the GOS. As noted above, the principle purpose of this evaluation is to determine the future of the project. Consequently, all of the points listed above in section D, Evaluation Elements, are important. Most attention will be given to the items covered in item 10 concerning the continuation of the project.

It is suggested that the evaluation team meet at the RSI for 3 or 4 days to review the project documentation, become familiar with project activities and results, check on contributions by RSI and the University of South Dakota and visit the EROS Data Center to be briefed on the latest technology. Then, the team would proceed to Dakar to conduct an intensive evaluation of the whole project, using all of the criteria presented above. The team will visit survey areas, cooperating institutions, AID offices, GOS officials, etc. in search of information, data and records and will then make a detailed report to the USAID Mission Director and the GOS with recommendations concerning the project's continuation, new directions, goals, purposes, inputs and outputs, level of training, sources of information, international cooperation, financing, etc. as a guide to the conduct of the project during its recommended life. The AID mission will then use this information to redesign the project as necessary to accomplish the new goals and purposes.

3. The Final Evaluation - will focus on accomplishments, failures, cost effectiveness, impact on the intended beneficiaries, value to the GOS and the people of Senegal and lessons that can be learned. Otherwise it will follow the same pattern as the regular evaluation and will be handled by the same team.

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Life of Project :
 From FY 1981 to FY 1984
 Total US Funding 2.0 million
 Date Prepared 03/16/81

Project Title & Number National Plan for Land-Use & Development (685-0233)

PAGE 1

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal : The broader objective to which this project contributes :</p> <p>I. Preparation of a national plan for the management & optimal utilization of Senegal's natural & human resources.</p>	<p>Measures of Goal Achievement</p> <p>I.</p> <p>a) Preparation of resource maps statistics & completed inventories of Senegal's physical & human status & Senegal's resource development potential.</p> <p>b) Plan prepared at national level which proposes to maximize the utilization of Senegal's physical & human resources.</p> <p>c) Regional development authorities plan for improved use of resources in their areas.</p> <p>d) Development projects started, such as : irrigation perimeters making better use of water & soil; mines to develop mineral deposits; roads to supply inputs & remove produce to consuming areas; market towns constructed; etc.</p> <p>e) Concrete proposals made for redressing imbalances in current use of land & human resources (overpopulation in the peanut basin vs. labor shortage in Casa-</p>	<p>a) Copies available</p> <p>b) Copies available</p> <p>c) Copies available of inventories of surface water & land resources.</p> <p>d) Observation of new development projects planned and/or started such as; irrigation perimeters, mines, main roads established, & market roads built in currently undeveloped hinterland.</p> <p>e) Man/land ratios equalized in different parts of country; maps prepared showing areas with land suitable for grazing, re-settlement, or other uses</p>	<p>Assumptions for Achieving goal targets :</p> <p>That the GOS is willing to invest in planning for development & conservation.</p> <p>That enough educated people are available to be trained to analyze the data collected by remote sensing & incorporate it in a country plan.</p> <p>That trained technicians will remain with the project until the plan is completed.</p> <p>That planners and senior officials will be able to make use of the remote sensing data when drafting & implementing the plan.</p> <p>That the GOS wants & needs a system for monitoring & recording quantitative & qualitative effects of livestock, migrations</p>

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PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Project Title & Number : National Plan for Land-Use and Development (685-0233)

Life of Project :
 From FY 1982 to FY 1984
 Total US Funding \$ 1.0 million
 Date Prepared 3/16/81

PAGE 3

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS.	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Purpose :</p> <p>I. To provide baseline resource maps and interpretations for development potential that are required by the GOS to prepare a coherent and balanced development plan for optimal utilization of available resources.</p> <p>2. To transfer technology & develop an appreciation & operational capability by GOS resource scientists & managers for use & application of remote sensing as a tool for resource assessment and management.</p> <p>3. To initiate a pilot institution-building effort to identify & assess longer-term institutional needs of Senegal for remote sensing & photo interpretation capabilities.</p>	<p>Conditions that will indicate purpose has been achieved : End of project status :</p> <p>I. Maps based on remote sensing and field data prepared showing vegetation, soil type & land capability, surface hydrology, mineral outcrops, forest, cropping areas, range areas, advance or recession of desertification, growth of cities, etc.</p> <p>2. a) User departments & agencies staffed with several officers and technicians trained in remote sensing techniques & use. b) User departments & agencies have ground truth establishment & cartographic capability. c) Development officers are using improved maps & data based on remote sensing techniques to plan & conduct projects.</p> <p>3. a) Remote sensing center & training capability developed at University of Dakar.</p>	<p>I. Records & observation.</p> <p>2. Observation and evaluation.</p> <p>3. Observation and evaluation.</p>	<p>Assumptions for achieving purpose :</p> <p>I.</p> <p>a) That the technical assistance contractor will provide timely & effective services. b) That the GOS will support the project with personnel, facilities & operating support. c) That NRSC will provide technical services to the project under a service agreement with DAT.</p> <p>2. a) That user agencies will make people available for training. b) That the center being established by the University of Dakar will make its facilities available to all department & agencies wanting to use them. c) That the spread of remote sensed information & data to planners and policy makers will be rapid and have far reaching effects on national resource conservation and use.</p> <p>3. a) That UD & DAT will establish a remote sensing center for use by all departments of government.</p>

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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project :
From FY 1981 to FY 1984
Total US Funding\$ 2.0 million
Date Prepared 03/15/81

Project Title & Number National Plan for Land Use and Development (685-0223)

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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal : The broader objective to which this project contributes :</p>	<p>Measures of Goal Achievement</p> <p>mance; areas grossly overgrazed in some desert areas versus unused pasture in others ; etc.</p> <p>f) Use of resources to produce more from limited soil/water availabilities & to feed rural people better.</p> <p>g) Programs initiated to conserve resources for continued use by combatting land degradation and desertification.</p>	<p>indicated are available.</p> <p>f) Reports of monitoring of vegetation growth & use, seasonal surface water changes, live-stock movements, etc, prepared by various agencies of government.</p> <p>g) Forest conservation, controlled grazing, & continued environmental monitoring programs initiated.</p>	<p>Assumptions for Achieving goal targets :</p> <p>weather changes, desertification roads settlements, etc on its basic natural resources.</p> <p>That trained officers will be responsible for monitoring, environmental changes as they occur.</p> <p>That U.N., France & other donor agencies will continue to assist GOS planning & development efforts</p>

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Project Title & Number National Plan for Land-Use and Development (685-0233)

Life of Project :
 From FY 1981 to FY 1984
 Total US Funding \$ 2.0 million
 Date Prepared 03/16/81

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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Outputs :</p> <p>I. Maps for PNAT :</p> <p>(a) general photomaps prepared from Landsat and other remotely sensed data at a scale of 1/500,000 or larger;</p> <p>(b) thematic photomaps prepared & verified at a 1/500,000 scale concerning soils, vegetation, land capability & use, topographical & geological structures; and</p> <p>(c) improved specific area maps prepared using the general & thematic photomaps.</p> <p>2. Trained GOS personnel :</p> <p>(a) mid-level officials trained at CRT-Ouagadougou in remote sensing interpretative procedures;</p> <p>(b) senior officials trained in US. in recent remote sensing technology developments;</p> <p>(c) mappers trained in all phases of remote sensing application including field survey & resource interpretation;</p> <p>(d) officials trained on the job in map interpretation, evaluation of data, & appropriate use in the agencies' on-going programs;</p> <p>(e) officials informed of remote sensing techniques & applications in seminars of the NRSC.</p>	<p>Magnitude of Outputs</p> <p>I. (a) 6 general photomaps</p> <p>(b) 15 thematic photomaps</p> <p>(c) approximately 5 per year or more as demanded by GOS agencies.</p> <p>2. (a) 4 mid-level officials</p> <p>(b) 2 senior officials</p> <p>(c) 7 mappers</p> <p>(d) 15 officials</p> <p>(e) 80 officials</p>	<p>I. Physical verification of maps.</p> <p>2. Reports on training</p>	<p>Assumptions for achieving Outputs :</p> <p>I. That inputs will be provided as planned by USAID, SDSU & the GOS.</p> <p>2. Data required for the maps will be available locally and from EROS.</p> <p>2. (a) That the GOS really wants the project & will make people available as counterparts and trainees.</p> <p>(b) That participants are willing to go to UD Ouagadougou and/or the US for training.</p> <p>(c) That the various GOS Ministries now working on remote sensing will continue cooperating & use the service of the UD remote sensing center.</p>

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Life of Project :
 From FY1981 to FY 1984
 Total US Funding \$ 2.0 million
 Date Prepared 03/16/81

Project Title & Number : National Plan for Land-Use and Development (685-0233)

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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS.	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Project Purpose :</p>	<p>Conditions that will indicate purpose has been achieved : End of project status :</p> <p>b) Linkages established with remote sensing & utilization facilities in neighboring countries, the U.S., France & Upper Volta.</p> <p>c) Land capability, land-use & other thematic maps prepared & in use.</p> <p>d) User agencies making use of the remote sensing center of the University of Dakar.</p>		<p>Assumptions for achieving purpose :</p> <p>b) That the quality of work done by the NRSC will be equal to or better than that of other similar centers.</p> <p>c) That NRSC will prepare & sell to client departments & agencies photographs & photographic maps made from Landsat & other imagery at reasonable prices.</p> <p>d) That the user agencies as well as the University of Dakar will continue to improve the quality of the maps & information being gathered & analyzed.</p> <p>e) That Senegal will cooperate with other national & regional remote sensing centers in Africa.</p>

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Project Title & Number National Plan for Land-Use and Development (685-0233)

Life of Project ;
From FY 1981 to FY 1984
Total US Funding \$ 2.0 million
Date Prepared : 03/16/81

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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Inputs :</p> <p>3. Commodities: \$ 240,000</p> <p>(a) equipment</p> <p>(b) supplies</p> <p>4. Operating support for DAT \$ 30,000</p> <p>5. Evaluation \$ 25,000</p> <p><u>G O S</u> \$ 384,000</p> <p>1. Personnel</p> <p>2. Office Space</p> <p>3. Other</p>	<p>Implementation Target (Type and Quantity) :</p> <p>3. (a) vehicles, remote sensing equipment, interpretation equipment, map digitizer, drafting equipment, office & lab furniture, household furniture. \$ 195,000</p> <p>(b) supplies \$ 45,000</p> <p>4. per diem, field labor, training</p> <p>5. Contract for 2 person months technical assistance.</p> <p>1. DAT staff, NRSC staff & counterparts from user agencies.</p> <p>2. 5 offices & 2 labs for project work.</p> <p>3. Photo, remote sensing & cartographic equipment, operating support.</p>	<p>Records.</p>	<p>Assumptions providing inputs</p>

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PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK

Life of Project ;
 From FY 1981 to FY 1984
 Total US Funding \$2.0 million
 Date Prepared : 03/16/81

Project Title & Number National Plan for Land-Use and Development (685-0233)

PAGE 6

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	. IMPORTANT ASSUMPTIONS
<p>Inputs :</p> <p style="text-align: center;"><u>USAID</u></p> <p>I. Technical assistance : \$ 1,281,000</p> <p>(a) long-term technicians (b) consultants. (c) home-office support for contractor. (d) in-country support for contractor.</p> <p>2. Training : \$ 95,000</p> <p>(a) U.S training (b) CRT-Ouagadougou training (c) in-country training</p>	<p>Implementation Target (Type and Quantity) :</p> <p>I. a) I soils scientist/team leader 36pm I ecologist/environmentalist 36pm (b) in agronomy/land-use, hydrology, geology, engineering, forestry, ecology, etc for a total of 12pm (c) I principal investigator 9pm I technical assistant 12pm I secretary 6pm - materials & supplies \$ 132,000 (d) Housing, support staff, local maps & data, library materials, vehicles support, soil testing, aircraft charter, travel, translation. \$ 396,000</p> <p>2. a) 2 trainees, 6 months each (b) 4 trainees, 3 months each (c) 7 long-term, on the job 15 short-term, on the job</p>	<p>Project records. Contractor records.</p>	<p>Assumptions providing inputs</p> <p>That all inputs will be provided in a timely and efficient manner.</p>

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Annex B

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?
HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PRODUCT?

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) The project was included in the Congressional Presentation for FY 1981.
(b) An advice of Program Change is being prepared to show the changes in project funding from that presented in the FY 81 CP.

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 the assistance?

Necessary plans and cost estimates have been established

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?

The execution of an agreement between the Ministry of Urban Affairs, Housing & Environment, & the University of Dakar to establish the National Remote Sensing Center is expected momentarily.

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?

NA

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 to consideration the country's capability effectively to maintain and utilize the project?

The Project is not capital assistance.

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.

The project strengthens national capabilities for undertaking resource surveys & mapping & interpreting these for aiding development efforts. The project ties closely with and complements regional programs such as the Regional Remote Sensing Center in Ouagadougou & the proposed regional project for Monitoring of Renewable National Resource (AID-625-0943)

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A.

7. FAA Sec. 601(a). Information on 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

NA. The main impact of the project will be upon planning & institution building.

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).

US enterprises will be used to the maximum extent possible for providing project goods and services.

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.

Senegal is financing 36% of the total cost of PNAT.

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 US does not own excess foreign currency in Senegal.

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

Yes. South Dakota State University was chosen for the technical assistance contracting using competitive selection under AID's Collaborative Assistance selection procedure.

12. FY 79 App. Act Sec. 601. 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?

NA

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b); 111; 113; 281a. Extent to which activity will involve the development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained

The project will benefit the entire Senegalese population by providing better knowledge of agricultural land suitability & more balanced geographic development. The project will define where logical resettlement could occur, where an increase

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B.1.a.

basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

in agricultural inputs and water management could increase production and where agriculture could be intensified and diversified.

b. FAA Sec. 103, 103A, 104, 105, 106, 107.

Is assistance being made available: (include only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.)

NA

(1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;

(2) [104] for population planning under sec 104(b) or health under sec. 104(c); if so, extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems and other modes of community research.

(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;

(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:

(i) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

(ii) to help alleviate energy problems;

(iii) research into, and evaluation of, economic development processes and techniques;

(iv) reconstruction after natural or manmade disaster;

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8.1.b.(4).

(v) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(vi) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

c. [107] Is appropriate effort placed on use of appropriate technology?

Yes. The project presents the most technologically appropriate cost-effective approach

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

This requirement does not apply to the Sahel Development Appropriation. However, the GOS is funding 36% of the cost of PNAT.

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to the Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?

This requirement does not apply to the Sahel Development Appropriation.

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

The project will increase the knowledge of Senegalese natural resources and Land Development suitability, & thereby lead to better decision making on development alternatives.

g. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase or productive capacities and self-sustaining economic growth?

Yes. The use of project information should lead to better use of natural resources for geographically balanced & more effective development.

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.

NA

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

NA

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8.

3. 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? NA

b. FAA Sec. 533. Will assistance under this chapter be used for military, or paramilitary activities? NA

5C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed? **Yes.**
2. FAA Sec. 604(a). Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him? **Yes.**
3. FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the United States on commodities financed? **Yes. However,, Senegal does not discriminate against US Marine insurance companies.**
4. FAA Sec. 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? **No offshore procurement of an agricultural commodity is to be financed.**
5. FAA Sec. 608(a). Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items? **Yes. The USAID/Senegal, Project Support Office will determine the practicability of such procurement.**
6. FAA Sec. 603. (a) Compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. **Yes. The Project Agreement will contain this requirement**
7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the **Technical assistance contracting will be with South Dakota State University under the Title XII Collaborative Assistance Contracting Method.**

A.7.

facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

8. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available?

Yes.

9. FY 79 App. Act Sec. 105. Does the contract for procurement contain a provision authorizing the termination of such contract for the convenience of the United States?

Yes. This provision will be included.

B. Construction

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?

Construction will not be financed by this project.

NA

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

NA

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the United States not exceed \$100 million?

NA

C. Other Restrictions

1. FAA Sec. 122 (e). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?

NA

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?

NA. Controller General will have audit rights.

3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-bloc countries, contrary to the best interests of the United States?

Yes.

4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the United States, or guaranty of such transaction?

Yes

C.

5. Will arrangements preclude use of financing:

- a. FAA Sec. 104(f). To pay for performance of abortions or to motivate or coerce persons to practice abortions, to pay for performance of involuntary sterilization, or to coerce or provide financial incentive to any person to undergo sterilization?
- b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property?
- c. FAA Sec. 660. To finance police training or other law enforcement assistance, except for narcotics program?
- d. FAA Sec. 662. For CIA activities?
- e. FY 79 App. Act Sec. 104. To pay pensions, etc., for military personnel?
- f. FY 79 App. Act Sec. 106. To pay U.N. assessments?
- g. FY 79 App. Act Sec. 107. To carry out provisions of FAA sections 209(d) and 251(h)? (Transfer of FAA funds to multilateral organizations for lending.)
- h. FY 79 App. Act Sec. 112. To finance the export of nuclear equipment, fuel, or technology or to train foreign nations in nuclear fields?
- i. FY 79 App. Act Sec. 601. To be used for publicity on propaganda purposes within United States not authorized by the Congress?

Yes. All these are precluded from project financing.

à Monsieur David SHEAR
Directeur de l'U.S.A.I.D.

DAKAR

O B J E T : Demande d'Aide
Plan National d'Aménagement
du Territoire (P.N.A.T.)
Projet U.S.A.I.D. de la Télé-
détection.

Monsieur le Directeur,

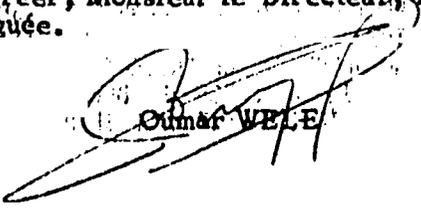
Je vous accuse réception de l'Avant-Projet U.S.A.I.D. concernant la préparation du Plan National de l'Aménagement du Territoire (P.N.A.T.) pour la gestion et l'utilisation optimale des ressources naturelles et humaines du Sénégal.

Je donne par la présente mon accord sur les propositions du projet dont les objectifs sont :

- l'acquisition et l'interprétation des cartes des ressources de base pour la préparation du P.N.A.T. ;
- le transfert de technologie et la formation des techniciens scientifiques sénégalais dans l'utilisation et l'application des méthodes de télédétection ;
- la création d'une institution-pilote pour l'initiation à la télédétection.

Je vous saurais donc gré de bien vouloir nous allouer le montant de \$ 2.0 millions de dollars nécessaire au financement de ce projet qui permettrait par la suite de compléter les travaux du P.N.A.T.

Je vous prie d'agréer, Monsieur le Directeur, l'assurance de ma considération distinguée.


Oumar WELÉ

mpliation :
M.P.C.

TELEGRAM

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PR 211254Z SEP 79
 FM SECSTATE WASHDC
 TO RUT ADR/AMEMBASSY DAKAR, PRIORITY 4091
 INFO RUFHOK/AMEMBASSY NOUAKCHOTT 9047
 RUABO/AMEMBASSY BAMAKO 3888

BT
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STATE 248 168

AIDAC

E.O. 12065 N/A

TAGS:

SUBJECT: NATIONAL PLAN FOR NATURAL RESOURCES PID (685-0293)

REFS: (A) PID OF DECEMBER 8, 1978 (B) TO AID A-18 OF JULY
 16, 1979 (C) STATE 112004 (D) DAKAR 6075

1. AFRICA BUREAU HAS REVISED PID FOR NATIONAL PLAN OF NATURAL
 RESOURCES (PNAT), AND MISSION RESPONSE (REF B) TO QUESTIONS
 RAISED BY AID/W (REF C). AA/AFR ACCEPTS REVIEW GROUP RECOM-
 MENDATIONS AND APPROVES PID WITH FOLLOWING CLARIFICATIONS AND
 REVISIONS.

A. PNAT PURPOSE, ORGANIZATION AND USE : THE PP SHOULD CONTAIN
 A FULL DESCRIPTION OF THE NATIONAL PLAN OF NATURAL RESOURCES,
 INCLUDING A STATEMENT OF PURPOSES TO BE SERVED AND GOS PLAN
 FOR ORGANIZING AND MANAGING INITIAL AND ON-GOING OPERATIONS.
 THIS SECTION OF THE PP SHOULD EXPLAIN THE LINKS TO BE MADE
 BETWEEN THE CENTER RESPONSIBLE FOR RESOURCE INVENTORY AND THE
 GOS MINISTRIES AND AGENCIES RESPONSIBLE FOR PROGRAMS AND
 POLICIES RELATED TO NATURAL RESOURCE UTILIZATION. THE PP SHOULD
 MAKE PROVISION FOR EVENTUAL GOS END-USE PLANNERS TO BE INVOLVED
 IN SHAPING THE RESOURCE INVENTORY, ITS TECHNOLOGY, AND ARRANGEMENTS
 FOR LINKAGES BETWEEN THE CENTER TO BE ESTABLISHED AND USER AGENCIES.

THESE LINKAGES HAVE TO DO BOTH WITH MECHANISMS FOR ORGANIZING,
 DISSEMINATING AND UPDATING THE INFORMATION BASE AND WITH ADMI-
 NISTRATIVE ARRANGEMENT PLANNED FOR AND BY SUPPLYING AND USING
 AGENCIES, INCLUDING PLANS FOR OPERATING BUDGETS AND STAFF TRAINED
 IN USING INTEGRATED INFORMATION TECHNOLOGY. FOR INSTANCE, HOW
 WILL SODESP, SAED OR SOMIVAC BE GUIDED BY OR APPLY FORTHCOMING PNAT?

OF INTEREST WILL BE GOS PLANS FOR ASSESSING AND MANAGING INFORMATION
 TO PROVIDE A BETTER BASIS FOR REACHING DECISIONS ON PRIORITIES, FOR
 IMPROVING JUDGMENTS ON PROJECT INVESTMENT DECISIONS AND FOR MONITOR
 AND EVALUATING PROGRESS AND DEVELOPMENT PROJECTS UNDERTAKEN IN FUTURE
 YEARS. ALSO IF INTEREST WILL BE PLANS BEING FORMED FOR

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GOS USE OF INFORMATION SO AS TO STIMULATE DEVELOPMENT WHICH IMPACTS ON THE RURAL POOR AS INFERRED IN SECTION ONE OF AID A-18.

B. DONOR ROLES: THE PP SHOULD DESCRIBE THE ROLE AND DISTINCT BUT REINFORCING CONTRIBUTIONS OF UNDP, AID, AND ANY OTHER DONORS ASSISTING THE GOS IN DEVELOPING THE NATIONAL PLAN OF NATURAL RESOURCES.

C. TRAINING: THE PP SHOULD INCLUDE DETAILS OF THE PLAN FOR TRAINING GOS STAFF (A) IN INFORMATION PRODUCTION TECHNOLOGIES, SUCH AS REMOTE SENSING, EXTRAPOLATION, AND ANALYSIS TECHNIQUES AND (C) IN INTERPRETATION AND UTILIZATION OF DATA BY RESOURCE ANALYSTS, PLANNERS AND PROJECT DESIGNERS IN END-USER MINISTRIES AND AGENCIES. PROVISION FOR THE NECESSARY TRAINING SHOULD APPEAR IN AID AND GOS BUDGETS, AND SOURCE OF PARTICIPANTS AND COOPERATIVE MINISTRIES/AGENCIES SHOULD BE GIVEN.

D. THE GEOBASED COMPUTER SYSTEM IS AN ADVANCED TECHNOLOGY WHICH IS NOT YET FULLY DEVELOPED IN THE U.S. GIVEN THIS UNCERTAINTY AND THE ADEQUACY OF THE REMOTE SENSING TECHNOLOGY PROVIDED FOR UNDER THIS PROJECT, WE PROPOSE OMITTING GEOBASED COMPUTERS FROM THE PROJECT SCOPE AND BUDGET.

E. LEARNING FROM EXPERIENCE OF OTHERS: PP TEAM MEMBERS WILL ACQUIRE BACKGROUND MATERIALS FROM AND CONSULT WITH TECHNICIANS AND HOST COUNTRY PERSONNEL INVOLVED IN AID RESOURCE INVENTORY PROJECTS IN MALI AND MAURITANIA. THEY WILL MAKE ON-SITE VISITS, DISCUSS PROJECT DESIGN, TRAINING OPPORTUNITIES, USES OF SATELLITE IMAGERY, ETC., AND ARRANGE FOR ON-GOING EXCHANGES OF INFORMATION, AS APPROPRIATE. AN ATTEMPT SHOULD BE MADE TO ESTABLISH PERMANENT LINKAGES.

BETWEEN SIMILAR ACTIVITIES IN THE THREE COUNTRIES. THE OBVIOUS ADVANTAGES WHICH WOULD ACCRUE TO THE THREE COUNTRIES FROM ESTABLISHING A REGIONAL APPROACH TO RESOURCE MANAGEMENT AT SOMETIME IN THE FUTURE SHOULD NOT BE NEGLECTED. AID IS IN A PARTICULARLY ADVANTAGEOUS POSITION AS A CATALYST TO PROMOTE THIS KIND OF REGIONAL COORDINATION, FOR INSTANCE, THROUGH OMVS, IN SUCH AREAS AS TRAINING, MONITORING DESERTIFICATION, ASSESSING ENVIRONMENTAL IMPACT OF RIVER BASIN DEVELOPMENT, AND UNDERTAKING FORESTRY SURVEYS.

F. COORDINATION WITH REGIONAL PROGRAMS: THE PP SHOULD DESCRIBE HOW OPERATIONS OF THE GOS CENTER AND THE AID ASSISTED REGIONAL REMOTE SENSING PROGRAM IN OUAGADOUGOU WILL BE COORDINATED. THE NATURE AND EXTENT OF COLLABORATION SHOULD BE DESCRIBED AND ADMINISTRATIVE ARRANGEMENTS PROVIDED FROM LINKING THE GOS AND REGIONAL FACILITIES. ALSO

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ARRANGEMENTS FOR COORDINATION WITH CILSS SHOULD BE DESCRIBED, INCLUDING ATTENTION TO THESE PURPOSES TO BE SERVED AND WAYS AND MEANS FOR ACCOMPLISHING INTERCHANGE.

G. FINANCE: REF (D) CONFIRMS PID BUDGET OF DOLS. 1,840,000, REFLECTING TO AID A-18 BUDGET OF DOLS. 1,675,900 PLUS INFLATION AND CONTINGENCY. HOWEVER, TRAINING ACTIVITIES CALLED FOR BY REVIEW GROUP AND REPORTED ABOVE COULD REQUIRE SOME INCREASE IN THIS BUDGET. PP WILL HAVE TO PROVIDE DETAILED BUDGET INCLUDING COMPONENTS TO BE FINANCED FROM GOS. UNDP AND AID SOURCES.

H. RECURRENT COSTS: THE PROJECT BUDGET PLAN WILL PROVIDE FOR GOS ASSUMPTION OF COSTS ON A PHASED BASIS STARTING MID-WAY THROUGH THE AID PROJECT. IT IS RECOGNIZED THAT MOST DIRECT RECURRENT COSTS WILL BE ASSOCIATED WITH THE COSTS FOR OPERATING A CENTER WITH PHOTOGRAPHIC LABORATORY AND COMPUTER FOR CONTINUED SUPPORT OF RESOURCE MINISTRIES. HOWEVER, PP BUDGET SHOULD ALSO IDENTIFY STAFF END-USERS IN GOS MINISTRIES AND AGENCIES (INCLUDING SOURCES OF SALARY AND FACILITIES) WHO WILL BE RESPONSIBLE FOR SUCH PROGRAMS AS DESERTIFICATION, MONITORING OF DISASTERS, AND DEVELOPING AND MANAGING OF NATURAL RESOURCES.

I. INITIAL ENVIRONMENTAL EXAMINATION: IEE NEGATIVE DETERMINATION IS ACCEPTED BY PID REVIEW COMMITTEE.

2. PROCEDURE:

A. CONSIDER THIS PROJECT APPROPRIATE FOR TITLE XII IMPLEMENTATION, POSSIBLY BY USDA. RECOMMEND INCLUSION OF A RESOURCE ECOLOGIST IN PP TEAM. (FYI: USE OF USDA WOULD REQUIRE MODE APPROVAL FOR DIRECT HIRE EMPLOYEES INVOLVED).

B. MISSION IS HEREBY AUTHORIZED TO HAVE PP PREPARED IN ACCORDANCE WITH PID AND TOAID A-18. AS MODIFIED ABOVE.

C. THE CURRENT SDP ACCOUNT PROVIDES LOP DOLS. 1,840,000 FOR THIS PROJECT, WITH DOLS. 1,050,000 OBLIGATION IN FY 1980. AFTER CONGRESSIONAL ACTION AND WHEN FIRM FY 80 FUNDING AVAILABILITIES FOR SENEGAL ARE KNOWN, WE WILL LET YOU KNOW FUNDING DECISION REGARDING THIS PROJECT.

D. MISSION IS HEREBY AUTHORIZED TO REVIEW AND APPROVE PROJECT PAPER ONCE ADVICE IS RECEIVED THAT FUNDS ARE AVAILABLE AND CONGRESSIONAL NOTIFICATION HAS BEEN PROCESSED. VANCE

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Project Paper Response to PID Approval Cable

(referenced to State Z48168, September 21, 1979)

- A. A full description of PNAT, its purpose and organization is provided in the Project Description, pages 4-6. PNAT is being directed by a commission which includes representatives of the COS agencies responsible for policies and programs concerning natural resource utilization. Remote sensing activities in Senegal are likewise directed by an interministerial group (GEDTEL). The project will integrate user agencies particularly those in the Ministry of Rural Development into all aspects of map preparation and interpretation. Technology transfer and institution building are two of the purposes of the project.
- B. The role of other donors is described in the Project Description Background, page 6.
- C. The training is described in the Project Description and Technical Analysis.
- D. The geobased computer information system has been implemented with UN assistance using the Ministry of Finance's computer and a plotter at the airport. The system is presently operational and is under the supervision of Mr. Deprez and his UN associates. All the demographic data are being digitized into the computer system. Counterpart Senegalese have been trained and are participating in the effort. The system will be used to merge the spatial resource data and the demographic data for analysis and for thematic map production. This project will provide a stand-alone digitizing table to be integrated into the total system. The digitizing table is necessary for efficient entry of data to the computer system. Therefore, all the project will provide in terms of computer technology is a periphery to their existing operational capability.
- E. Three of the members of the PP team, including the Mauritanian project campus coordinator, are from RST/SDSU which is conducting the project in Mauritania. The project manager of the Mauritanian project was in Dakar for discussions concerning the Mauritania/Senegal effort.

Similarly, technicians from CRT-Ouagadougou were consulted in the project design and one member of the PP team had been on the technical assistance team for CRTO.

- F. The Regional Training Center in Ouagadougou will be integrated into total project activities. Four Senegalese will be trained (3 months) at the center and center staff will be requested to participate in user assistance activities conducted under this project. Other regional agencies will be invited to project reviews and seminars to assure information transfer and a regional understanding and potential cooperation with the project.
- G. The PP budget is within the \$1,840,000 approved for the PID. See the Financial Analysis for details.
- H. The recurrent costs for this project of approximately \$25,000 per year are not a significant factor since most project personnel will be existing employees of DAT, the University of Dakar, and CGS user agencies. However, longer-term support to the pilot institution-building effort of this project could entail larger recurrent costs in the future. This will be considered as part of the special in-depth evaluation after two years of project implementation.

I. Project Data

A. Country : Senegal
 B. Project : National Plan for Land-Use and Development
 C. Funding : \$ 2,000,000
 D. Life of Project : 3 years

II. Justification

During the last few years, Senegal's development has been slowed by decreasing yields, degradation of the environment caused by dry weather, deforestation and actions of man and animals; rising population; and other factors influencing both production and consumption. Taking note of the situation, the Government of Senegal has issued orders that a National Plan for Land-Use and Development (PNAT) be implemented, under which plans will be formulated for the systematic, coherent and balanced utilization of the country's resources to achieve optimum results. The UNDP was asked to assist with this effort and USAID has been asked to help inventory Senegal's natural resources. The Government of Senegal is very committed to this effort and is well aware of the seriousness of the situation. It is also aware that it is impossible to adequately plan for the use of resources when little is known about their development potential, composition, location, quantity or quality. Senegal is, therefore, very anxious to conduct this inventory quickly and accurately.

III. Certification

As the principal officer of the Agency for International Development in Senegal, I affirm that, in my judgement, Senegal has both the financial capability and the human resources to effectively maintain and utilize the goods and services being provided by the National Plan for Land-Use and Development Project (685-0233).

David Shear 5/18/81

David Shear,
 Director
 USAID/Senegal

Date

SCOPE OF WORK FOR TECHNICAL ASSISTANCE

1. Objectives: The objective is to prepare 1:500,000 scale, reconnaissance maps of the resources of Senegal, including soils, vegetation, surface hydrology, and surface geology. In preparing these maps the contractor will transfer remote sensing techniques to Government personnel in a variety of user agencies and assist in upgrading the Government's institutional capacity for analyzing and applying remote sensing.
2. Location: Both long-term technical assistants will be located in Dakar with office and laboratory facilities provided by the Direction de l'Aménagement du Territoire - DAT. The short-term consultants will utilize facilities of DAT, University of Dakar, and the GOS user agencies with which they are working.
3. Job Descriptions: The contractor will provide personnel for the following positions:

A. Soil Surveyor/Team Leader (36 months)

1. Working collaboratively with the Director of DAT, the Soil Surveyor would:
 - Define the legends and thematic maps for final survey products.
 - Establish working relationships with various GOS service agencies, in addition to DAT, in transferring technology of remote sensing and in conducting the PNAT resource inventory.
 - Conduct soil and geomorphology surveys and interpret land capability.
 - Assist in remote sensing training workshops.
 - Act as senior advisor to upgrade capabilities and services of the DAT and the National Remote Sensing Center - NRSC.

As the team leader, the following functions are required:

- serve as administrative leader of the team of long-term and short-term consultants;
- provide liaison among GOS, USAID/Senegal, the Regional Center and Ouagadougou, and university home office;
- assist in identifying short-term consultants
- assist GOS in selecting project counterparts and trainers and in defining the specific type of training most needed by the NRSC and other GOS agencies.

3. The qualifications and experience of the soil scientist/team leader are:

- an M.S. in soil science and land classification or related fields;
- at least five years experience in soil survey/remote sensing, preferably with soil survey experience in Africa;
- knowledge of French at the FS-3 level or above.

4. Duty station is with the DAT in Dakar, Senegal.

B. Ecologist/Remote Sensing (36 months)

1. Working under the direction of the team leader and the DAT, the ecologist would:

- establish legend and work statements for biological inventory (range, agriculture, forests, land use categorizations);
- work with GOS user agencies collaboratively with NRSC and DAT for technology transfer and demonstration projects;
- assist NRSC and DAT in designing and offering training seminars and workshops;
- assist in upgrading GOS facilities by defining laboratory supply and equipment needs and user services appropriate for the furthering of remote sensing applications.

2. The qualifications and experience of the ecologist/remote sensing consultant are:

- a B.S. in biological sciences, preferably plant ecology, plant taxonomy, range management, or agronomy;
- at least 3 years experience in using remote sensing for vegetation mapping or monitoring, preferably at least a minimum of experience in the Africa Sahelian zone;
- experienced in broad applications of remote sensing;
- knowledge of French at the FS-2 level or above.

3. Duty station is with DAT in Dakar, Senegal.

C. Short-term Consultants

Eight different short term consultants for a total of 12 pm in Senegal will be provided. Their purpose is to assist in field verification and analysis

to support the survey and user assistance projects. Assistance will be provided to interpret the baseline maps of development potential. Assistance will also be provided to project workshops, seminars, and user assistance activities. Their discipline and experience may include: agronomic/land use, hydrogeology, hydrology, remote sensing, range management, geology, or other appropriate disciplines. The consultants should have at least limited experience in a developing country or working with developing country scientists, and preferably Sahelian experience. No French language capability is required although desirable. A specific scope of work for each consultant will be defined by the contractor during project implementation and approved by DAT and USAID.

D. Home Office Facilities and Support Staff

The university home office should be active in remote sensing research and applications relating to agriculture, hydrology, and other land and water resources. Home-office personnel should have experience in offering training to foreign scientists and technicians and in conducting large area resource inventories in developing countries, preferably the Sahel.

E. Housing:

All in-country technicians should be prepared for extensive field work. Two housing units will be required in Dakar for the long-term technicians. Short-term consultants require no specific housing.

F. Level of Effort

1. Soil Scientist/Team Leader	36 pm
2. Ecologist/Remote Sensing	12 pm
3. Consultants in Senegal	12 pm
4. Consultants at home office	27 pm

G. Reports Required

1. Quarterly reports: The team leader will provide quarterly reports describing:

- progress toward objectives
- problems encountered
- major activities during the period
- actions planned during next period
- recommendations for revisions in any project activities

2. Annual project reports

3. Annual workplan defining objectives, general approach, personnel requirements, and time frames.
4. Interim technical workshop and user assistance summaries including maps (as produced, according to annual workplan).
5. Final report and maps describing techniques for survey and the survey results in map and tabular form. A base map of soil and vegetation at 1:500,000 with at least 5 separate 1:500,000 maps and legends describing land capabilities.

H. OVERALL COMPONENT PLAN FOR MULTI-STAG INVENTORY SURVEY

1. Obtain Landsat products of different seasons and years and one complete set of digitally enhanced and corrected imageries of 1:200,000 scale, together with topographic and thematic maps and other relevant material.
2. Make preliminary interpretation of Landsat imageries (including temporal analysis and preliminary legend preparation).
3. Conduct aerial reconnaissance flights.
4. Select representative sample areas (about 12 probably) Delta of the Senegal river, mid valley of the Senegal river with border zone, upper valley of the Senegal river with border zone, upper coastal area with coastal dunes, Lac de Guier area, Cap Vert, Central Senegal, East Senegal, Lower, Middle and upper Casamance and Gambia (if GOS and Gambia agree).
5. Conduct exploratory fieldchecks in the sample areas (including some detailed soil and vegetation descriptions and sampling for laboratory analysis).
6. Preliminary update of maps and legends and data interpretation for land capability evaluation to produce preliminary land capability map on a 1:500,000 scale or smaller for PNAT.
7. Semi-detailed (approx. 1:50,000) aerial photo-interpretation and field work in sample areas (including detailed soil, vegetation and physiographic descriptions and sampling for laboratory analysis).
8. Soil classification (after receipt of laboratory results) and update of final maps and legends.

9. Land evaluation and suitability ratings for specific land use and management (estimate crop adaptability, expected field levels (if possible), management needs and development potentials).

PROCUREMENT WAIVER

Request for (a) procurement source and nationality waiver from Geographic Code 00 (U.S. only) to Geographic Code 935 (Special Free World) for aerial photography, aircraft charter and soil testing services, and (b) procurement source and origin waiver from Geographic Code 00 (U.S. only) to Geographic Code 941 (US and certain LDC's) for two vehicles.

I. A. Cooperating Country	: Senegal
B. Authorization Document	: Project Agreement to be executed
C. Project	: National Plan for Land-Use and Development (685-0233)
	: Grant
D. Nature of funding	: (a) Aerial photography and Aircraft charter and Soil testing.
E. Nature of goods	: (b) 2 passenger cars
F. Approximate value	: \$ 75,000 total
	: (1) \$ 37,000 for aerial photography
	: (2) \$ 23,000 for soil testing
	: (3) \$ 15,000 for 2 vehicles
G. Probable sources	: France for aerial photography and soil testing
	: Brazil for vehicles
H. Waivers previously granted for the project	: None
I. Presently Authorized Sources	: Code 935 for limited shelf item procurement
	: Code 000 for all other procurement.

II. Discussion

The subject project will use multi-stage integrated survey techniques including remote sensing, ground survey and air photo interpretation to provide the baseline maps needed by the National Plan for Land-Use and Development (PNAT). The project has been designed to assure quick preparation of the required maps while strengthening GOS institutions and giving GOS personnel training in appropriate techniques so that they can continue effective resource monitoring and assessment. South Dakota State University (SDSU) will provide technical assistance for project implementation.

a) Aerial photography and soil testing

Since most of the project work and the technical assistance provided by SDSU will be done in Senegal, some local services are required for map verification and interpretation. These services are for aerial photography and soil testing.

It is recommended that USAID/Senegal contract with a firm resident in Senegal for the aerial photography and soil testing services. Because of the nature and cost of these services it not practical to contract with a firm not

already established in Senegal. Both services will be needed primarily during the second year of the project to validate certain LANDSAT interpretations. The exact magnitude and location of these services will be determined by the need for further verification following the preparation of the preliminary maps by the end of the first year of the project.

The PP preparation team investigated possible sources for these services and found that those firms capable of supplying the needed services are of French nationality. No Senegalese firms capable of providing the required services were found. The justification for Code 935 procurement is based on the criteria for source and nationality waivers presented in AID Handbook 1, Supplement B, Chapter 5.

b) 2 passenger vehicles

Because the project has been delayed one year beyond the original time-frame, the GOS is very eager to start the project. The GOS implementing agency has already been working for over a year with UNDP assistance to prepare the National Plan for Land-Use and Development (PNAT) and urgently needs the baseline maps to be prepared by the project to support PNAT. Complying with GOS requests, SDSU is prepared to field a technical assistance team in the summer of 1981. Two vehicles are needed to support the technical assistants when they arrive. Since it takes at least six months to procure vehicles from the U.S., it would be impossible to get U.S. origin vehicles within the anticipated timeframe. It is therefore recommended that two GMC vehicles (Chevettes) be procured locally. Since these vehicles are Code 941 origin (they are assembled in Brazil), a waiver for Code 941 procurement is required. There is no other comparable Code 941 vehicle available locally.

III. Recommendation

For the above reasons, it is recommended (a) that a change in the authorized Geographic Code 000 (US only) to Geographic Code 935 (Special Free World) be approved to permit the procurement of aerial photography, aircraft charter and soil testing services not to exceed \$ 60,000; (b) that a change in the authorized Geographic Code 00 (US only) to Geographic Code 941 (US and certain LDC's) be approved to permit the local procurement of two vehicles not to exceed \$ 15,000; and (c) and that the authorizing officer certify that the interests of the United States are best served by permitting the procurement of goods and services from Code 941 and 935 countries, and that procurement from the sources recommended is necessary to the attainment of US foreign policy objectives and objectives of the foreign assistance program.

Annex H 1

U.N. Project Budgets

Title: Le "Plan National d'Aménagement du Territoire" (PNAT)

GOS contribution: 463,000 CFA (\$2,000,000 at \$1 = 231.8 CFA)

UNDP contribution: \$1,214,600

The main thrust of this project is to supply experts to help the DAT prepare PNAT. The project will help do analyses and studies for PNAT, conduct training, import needed equipment and supplies, and finance a minimum of construction.

A. Estimated Project Costs (UNDP)

Personnel (114 p.m. and support)	\$ 934,200
Training-travel, seminars, etc.	113,900
Equipment	120,000
Miscellaneous	46,500

Total expected UNDP contribution \$ 1,214,600

B. Estimated Project Costs (GOS)

Contribution of the GOS in thousands of CFA and dollar equivalent at 231.8 CFA = \$1.

	<u>CFA</u> <u>(000)</u>	
Personnel (202) Person/months	309,000	1,333,046
Support	28,000	120,794
Training	15,600	67,299
Equipment	56,000	241,587
Miscellaneous	55,000	232,274
Total GOS contribution	463,600	1,995,000

(rounded to 2,000,000)

C. Personnel:

Within the above contributions, the UNDP expects to contribute the services of a project leader (53 PM), a geographer, economist, and an information specialist (a total of 66 PM) from the UNDP's permanent staff. In addition, there will be associate experts in agronomy, agro-economy, demog-statistics, hydrology, computer science and transportation (174 PM). U.N. Volunteers will work as cartographers for 30 PM. For support, the project will fund the help of local experts (36 PM), secretaries (36 PM), and drivers (36 PM).

The GOS will supply support staff consisting of 3 clerks, a cartographer, 3 secretaries, and 2 chauffeurs, and a professional staff consisting of the director (53 PM), 2 geographers (54 PM), research assistants (90 PM), and a number of short-term specialists.

D. Equipment:

The U.N. will furnish 2 Peugeot sedans, 2 off-road vehicles, an administrative vehicle, a minibus, a photo-copier and miscellaneous tools, and camping equipment.

The GOS will supply furniture, vehicle supplies, office and photo supplies and a variety of expandable items.

E. Training

The UNDP will offer long-term participant training totaling 126 PM for 5 officers and a total of 47 PM of short-term training for up to 25 agents.

The GOS will furnish one person to be trained in each of the following disciplines:

1. Computer Science
2. Geography
3. Ag-economics
4. Ecology
5. Sociology

2. Title: Population/Aménagement

GOS contribution: \$255,235 (\$1 = 215 CFA)
UNFPA contribution \$1,068,406

The immediate objectives of the project are to organize and analyze population data to first present a better understanding of the geographic distribution of Senegal's population and second to plan future population growth to promote social welfare. The principal UNFPA contributions are for 8 technical experts, administrative support personnel, national personnel, scholarships for overseas training, seminars, vehicles, office equipment, and operating and maintenance support.

A. Estimated Project Costs (UNFPA)

Personnel	\$ 528,550
Administrative support	110,915
Senegalese personnel	123,171
Scholarships	134,800
In-country training	55,935
Commodities	62,430
Miscellaneous	52,605
	<hr/>
Total	\$1,068,406

B. Estimated Project Costs (GOS)

Personnel	\$ 169,675
Training	3,595
Commodities	42,210
Office space	32,030
Miscellaneous	7,725
	<hr/>
Total	\$ 255,235

C. Personnel

Within the above contribution, the UNFPA expects to contribute the services of a project leader/demographic economist (36 pm), and a demographer/planner (36 pm) and consultants in statistical analysis, computer programming, planning and evaluation (a total of 7 pm). UNFPA will also finance local administrative support and three Senegalese project specialists.

The GOS will assign through DAT six planners to project fulltime. Other personnel including draftsmen, cartographers, secretaries, and technical specialists will be assigned part-time as needed.

D. Equipment

The UNFPA will furnish 4 vehicles, 9 calculators, office equipment, office supplies, and funding for computer time and computer software.

The GOS will provide the project with six furnished offices, copying equipment, and arrange for local services such as computer time and vehicle maintenance.

E. Training

The UNFPA will finance (1) a 3-4 month training course for 4 Senegalese in population geography, computer applications for population studies, or demographic analysis; (2) a 9-12 month course for 2 Senegalese for studies of demographic factors and socio-economic development, and of population policy; and (3) a 2-year degree program for 2 Senegalese in demography at IFORD (Yaoundé) or at a European (Paris, Louvain) or Canadian (Montréal) university. In addition there will be considerable on-the-job training and several seminars and workshops given by the technical assistance staff.

Annex I-1

PL/468/PND/AD

PROJET DE CONVENTION POUR UN ACCORD DE COOPERATION ENTRE
L'UNIVERSITE DE DAKAR ET LE MINISTERE DE L'URBANISME, DE
L'HABITAT ET DE L'ENVIRONNEMENT (DIRECTION DE L'AMENAGE-
MENT DU TERRITOIRE).

Le Ministère de l'Urbanisme et de l'Environnement
(Direction de l'Aménagement du Territoire)

et

L'Université de Dakar (Département de Géographie
de la Faculté des Lettres et Sciences Humaines)

Désireux de promouvoir une étroite collaboration dans
l'exécution de l'étude de télédétection du Plan National
d'Aménagement du Territoire (PNAT) sont convenus des
dispositions suivantes :

TITRE - I

OBJECTIFS

Article 1er : chacune des deux parties s'engagera à atteindre
les objectifs suivants :

- Mise en route de l'étude de télédétection du projet PNAT,
- Formation d'un personnel pouvant assurer le suivi de ce projet,
- Création d'un Centre National de Télédétection accessible à tous
les services utilisateurs.

1. - Le Département de Géographie de la Faculté des Lettres et Sciences Humaines de l'Université de Dakar s'attachera :
 - a)- à apporter son appui à l'exécution de l'étude du projet PNAT en mettant notamment à la disposition de ce projet le laboratoire de télédétection comprenant les locaux et équipement suivants :
 - une salle machine
 - une salle d'interprétation
 - une salle de documentation
 - une salle de cours ou de conférence
 - un système de traitement numérique vision one/20
 - un stéréofacet plotter
 - un radiomètre de terrain
 - cinq tables lumineuses
 - un diazo printer developer
 - b)- à participer aux différents programmes et à contribuer à la formation chaque année, par des stages et des séminaires, d'une dizaine de spécialistes.
2. - Le Ministère de l'Urbanisme et de l'Environnement (Direction de l'Aménagement du Territoire) s'attachera :
 - a)- à compléter l'équipement du laboratoire de télédétection par la mise en place du matériel suivant :
 - un color camera system
 - un digitaliseur d'images
 - un laboratoire photo (N/B et couleurs)
 - un microdensitomètre
 - un radiomètre de laboratoire
 - un groupe électrogène
 - un logiciel AREAS
 - 4 armoires à deux portes
 - 4 tables à dessin individuelles
 - Divers matériels de bureau
 - Imprimés, papiers spéciaux.
 - b)- à mettre à la disposition du centre les moyens matériels et financiers nécessaires à l'exécution du projet, ceux-ci devant comprendre :

- Les moyens d'acquisition des données (auprès de l'Eros Data Center)
- les moyens de traitement des données (Heures de calcul)
- Les moyens de contrôle sur le terrain (véhicule tous terrains)
- Le personnel d'exécution : Secrétaires, Chauffeurs, techniciens-cartographes)
- et enfin à contribuer au fonctionnement du Laboratoire durant et à la fin du projet.

TITRE - II

MODALITES.

Article 2.: Les conditions d'utilisation du laboratoire seront déterminées par un comité de gestion comprenant des représentants de la DAT, de l'Université de Dakar et des services utilisateurs. Ce comité aura entre autres pour mission la définition des objectifs et des moyens (programme annuel de recherches, évaluation des résultats à la fin de chaque année, calendrier d'utilisation du laboratoire et règlement des litiges entre services utilisateurs).

Article 3. : Le laboratoire de télédétection et d'analyse des milieux reste un laboratoire de l'Université de Dakar. Le Département de Géographie de la Faculté des Lettres et Sciences Humaines de l'Université de Dakar s'attachera à le rendre le plus accessible possible à la DAT et aux utilisateurs extérieurs.

TITRE - III

APPROBATION DU PRESENT ACCORD

Article 4. : La présente convention et le programme visé à l'Article 2 sont soumis pour approbation aux autorités compétentes selon les procédures propres à chacune des deux parties.

Article 5. : Cette convention est conclue pour une période de deux ans qui prend effet à partir de la date de signature. Elle sera reconduite pour une période de même durée et sa dénonciation s'effectuera par écrit six mois avant l'expiration de la période en cours.

Fait en 2 exemplaires le

Le Recteur de l'Université
de Dakar

Le Ministre de l'Urbanisme
et de l'Environnement.