

CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) - PART I

Report Symbol U-447

1. PROJECT TITLE  Remote Sensing for Agriculture		2. PROJECT NUMBER 931-1224	3. MISSION/AID/W OFFICE AID/W - S&T/FNR
		4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) <u>82-18</u> <u>4/30/82</u>	
		<input type="checkbox"/> REGULAR EVALUATION <input checked="" type="checkbox"/> SPECIAL EVALUATION	

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING		7. PERIOD COVERED BY EVALUATION	
A. First PRO-AG or Equivalent FY <u>80</u>	B. Final Obligation Expected FY <u>82</u>	C. Final Input Delivery FY <u>82</u>	A. Total \$ <u>1,400,000</u>	B. U.S. \$ <u>1,400,000</u>	From (month/yr.) <u>October 1979</u>	To (month/yr.) <u>October 1981</u>
					Date of Evaluation Review <u>October 19, 1981</u>	

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIC, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED

Agricultural statistics reporting system utilizing the Area Sampling Frame (ASF) technology has been successfully transferred to 4 LDCs (Morocco, the Philippines, Ecuador and Sierra Leone) and field surveys are underway; however, more extensive remote sensing inputs by the USDA are needed. S&T/FNR reminded all USAID Missions of the 12 LDCs still participating in this project by telegram on March 4, 1982 that the project is funded only through FY 1982, and advised them of the remaining technical assistance planned for each participating LDC. Responses from several Missions have raised questions needing decisions:

1. USAID/Morocco - "AID's centrally-funded support of remote sensing for agriculture is seriously out of synchronism with current Agency policy emphasis on transfer of technology. We feel that this matter merits thorough reconsideration. This project is at a critical juncture in implementation of the ASF. It has enabled the GOM Ministry of Agriculture (MOA) to begin producing verifiable statistics in a manner which enables it to make policy and planning decisions. The MOA now has 16 provinces in the ASF and hopes to complete the ASF for entire Country by 1983. The MOA commitment to remote sensing has increased from 3 technicians in 1980 to 30 plus the regional statistical service staff in each provisional capital, and the enumerator training school staff. Discontinuing this project at this time will have the effect of throwing a mammoth wrench into the works put together by the GOM which are about to crank out a highly useful product for future agricultural planning. No other activity epitomizes better

Dr. Charles Paul, S&T/FNR, and Mr. Stephen Lintner, NE/PD, working with USAID/Rabat  
Sept. 30, 1982

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS			10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT	
<input type="checkbox"/> Project Paper	<input type="checkbox"/> Implementation Plan e.g., CPI Network	<input type="checkbox"/> Other (Specify)	A. <input checked="" type="checkbox"/> Continue Project Without Change except more emphasis on remote sensing	
<input type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T		B. <input type="checkbox"/> Change Project Design and/or	
<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify)	<input type="checkbox"/> Change Implementation Plan	
<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P		C. <input type="checkbox"/> Discontinue Project	

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)		12. Mission/AID/W Office Director Approval	
Charles K. Paul, S&T/FNR, Project Manager William Wigton, USDA/SRS-RASA Project Manager		Signature <u>William M. Feldman</u> <u>4/30/82</u> Typed Name William M. Feldman	

CLASSIFICATION  
PROJECT EVALUATION SUMMARY (PES) -- PART I

Report Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY)		
<input type="checkbox"/> REGULAR EVALUATION <input type="checkbox"/> SPECIAL EVALUATION		

5. KEY PROJECT IMPLEMENTATION DATES A. First PRO-AG or Equivalent FY _____ B. Final Obligation Expected FY _____ C. Final Inout Delivery FY _____	6. ESTIMATED PROJECT FUNDING A. Total \$ _____ B. U.S. \$ _____	7. PERIOD COVERED BY EVALUATION From (month/yr.) _____ To (month/yr.) _____ Date of Evaluation Review _____
--	---	--

**8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR**

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
<p>meaningful technology transfer from the U.S. to LDCs. By its very nature, AID's participation in Remote Sensing for Agriculture should be continued on a centrally-funded basis, given the interchange of experiments and experience which should be monitored by some central coordinating mechanism to avoid redundant errors and hasten wider application of remote sensing on a regional and global basis. Therefore USAID/Rabat strongly recommends continuation of this activity."</p>	Dr. Charles Paul S&T/FNR, working with Mr. Carl Pendorf, ASIA/ISPA, and USAID/Manila	Sept. 30, 1982
<p>2. The Philippines - "USAID regrets action to terminate project. We feel subject project is an economical means of providing a constructive ongoing stimulant to an improved data system. Future USAID development strategy will continue to need access to timely, dependable data which can be a product of the ASF in the Country's data collection system. The centrally funded project seemed to provide a relatively low-cost professional service which encouraged adoption and implementation of the ASF. We believe there is significant merit and sound justification for continuation of a centrally funded and managed activity such as this project. Practically all USAID bilateral projects are users of basic statistical information. Few are designed to have any influence on its quality.... Continuity of one or two 4 to 6 week consultative professional visits per year over a period of 10 to 15 years could be a strong stimulant and quality monitor for establishing the improved ASF. The central pool of expertise could be fully employed in multiple short-term assignments and still not overload the professional capacity</p>		

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS	10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT															
<table style="width: 100%;"> <tr> <td><input type="checkbox"/> Project Paper</td> <td><input type="checkbox"/> Implementation Plan e.g., CPI Network</td> <td><input type="checkbox"/> Other (Specify) _____</td> </tr> <tr> <td><input type="checkbox"/> Financial Plan</td> <td><input type="checkbox"/> PIO/T</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Logical Framework</td> <td><input type="checkbox"/> PIO/C</td> <td><input type="checkbox"/> Other (Specify) _____</td> </tr> <tr> <td><input type="checkbox"/> Project Agreement</td> <td><input type="checkbox"/> PIO/P</td> <td>_____</td> </tr> </table>	<input type="checkbox"/> Project Paper	<input type="checkbox"/> Implementation Plan e.g., CPI Network	<input type="checkbox"/> Other (Specify) _____	<input type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T	_____	<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify) _____	<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	_____	<table style="width: 100%;"> <tr> <td>A. <input type="checkbox"/> Continue Project Without Change</td> </tr> <tr> <td>B. <input type="checkbox"/> Change Project Design and/or <input type="checkbox"/> Change Implementation Plan</td> </tr> <tr> <td>C. <input type="checkbox"/> Discontinue Project</td> </tr> </table>	A. <input type="checkbox"/> Continue Project Without Change	B. <input type="checkbox"/> Change Project Design and/or <input type="checkbox"/> Change Implementation Plan	C. <input type="checkbox"/> Discontinue Project
<input type="checkbox"/> Project Paper	<input type="checkbox"/> Implementation Plan e.g., CPI Network	<input type="checkbox"/> Other (Specify) _____														
<input type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T	_____														
<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify) _____														
<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	_____														
A. <input type="checkbox"/> Continue Project Without Change																
B. <input type="checkbox"/> Change Project Design and/or <input type="checkbox"/> Change Implementation Plan																
C. <input type="checkbox"/> Discontinue Project																

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)	12. Mission/AID/W Office Director Approval
	Signature _____ Typed Name _____

CLASSIFICATION  
PROJECT EVALUATION SUMMARY (PES) - PART I

Report Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY)		
<input type="checkbox"/> REGULAR EVALUATION <input type="checkbox"/> SPECIAL EVALUATION		

5. KEY PROJECT IMPLEMENTATION DATES A. First PRO-AG or Equivalent FY _____ B. Final Obligation Expected FY _____ C. Final Input Delivery FY _____	6. ESTIMATED PROJECT FUNDING A. Total \$ _____ B. U.S. \$ _____	7. PERIOD COVERED BY EVALUATION From (month/yr.) _____ To (month/yr.) _____ Date of Evaluation Review _____
--	---	--

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR		
A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED

<p>of any of the participating countries."</p> <p>3. Ecuador - "Mission concurs that subject project has demonstrated application of concept of technology transfer of agricultural data collection and analysis... <u>Mission sees continuation of USDA work essential for development of Ecuador's capacity in agricultural policy, analysis and statistics.</u></p> <p>4. USDA technicians will concentrate on using more remote sensing data for remainder of project.</p>	<p>Dr. Charles Paul, S&amp;T/FNR, working with Mr. Robert Lindsay, LAC/SA and USAID/Quito.</p> <p>William Wigton, USDA/SRS</p>	<p>Sept. 30, 1982</p> <p>Sept. 30, 1982</p>
--	--	---

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS <input type="checkbox"/> Project Paper <input type="checkbox"/> Implementation Plan e.g., CPI Network <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Financial Plan <input type="checkbox"/> PIO/T    _____ <input type="checkbox"/> Logical Framework <input type="checkbox"/> PIO/C <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Project Agreement <input type="checkbox"/> PIO/P    _____	10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT A. <input checked="" type="checkbox"/> Continue Project Without Change B. <input type="checkbox"/> Change Project Design and/or <input type="checkbox"/> Change Implementation Plan C. <input type="checkbox"/> Discontinue Project
--	---

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)	12. Mission/AID/W Office Director Approval Signature _____ Typed Name _____
--	---

## PROJECT EVALUATION SUMMARY (PES)

### PART II

13. Summary: The AID missions have been very supportive of this project and with their help AID/W S&T FNR and the USDA/ESS have successfully transferred the technology of area frame sampling to the countries of Equador, Morocco, Sierra Leone, and the Philippines. In measuring success, all four countries have developed land use theme maps, drawn sample segments (phase 1), and have conducted a field survey of the sample segments (phase 2) in at least one agriculturally important province. Ecuador and Morocco have plans to complete the ASF for the entire country in 1982. Sierra Leone and the Philippines plan to expand the ASF to many more provinces with their own resources. The USDA has successfully identified the key personnel within the host country ministries of agriculture, aided in the sampling design, provided guidance in the stratification process, and materially supported the inauguration of computerized data summarization and analysis systems.

None of the four countries are exploiting remote sensing techniques to the degree they could, but impacting a country's information system is a very slow process. The countries are using outdated aerial photography (with respect to the changing field patterns and cropping conditions), they are not getting photos enlarged regularly because of lack of funds and equipment failures, they lack adequate interpretation and measuring equipment, and they lack a sufficient number of trained remote sensing professionals. The project has increased awareness of remote sensing and its role in the area frame, but much more technology needs to be transferred before state of the art remote sensing is achieved.

14. Evaluation Methodology: The evaluation was carried out in order to review the technical progress in the building of area sampling frames in Ecuador, Morocco, Sierra Leone, and the Philippines, and to determine the expected length of time for each country to complete field surveys for the entire crop-producing areas of the country. In the case of Morocco, the team was directed to assess the capability of the country to proceed to phase 3 (digital area measurement). The method used for this evaluation consisted of an external (to A.I.D.) evaluation team of two remote sensing experts (Dr. Stanley Morain, Director of Technology Applications Center in Albuquerque, and Professor Ta Liang of Cornell), which spent one week in each of the four countries interviewing appropriate participating host country personnel and reviewing field notes, crop tabulations, maps, and LANDSAT imagery and air photos. The external team was joined by Mr. Steve Lintner of NE/PD for the evaluation in Morocco. The cost of the evaluation, including salaries, travel, and per diem, was \$30,500. A.I.D. mission personnel in each of the four countries participated in the evaluation.

In Ecuador, Fausto Maldonado was the key USAID participant, Guillermo Otanez of the Instituto Nacional de Estadística y Censos (INEC) was the main GOE participant. Unfortunately, the USAID/Quito representative most familiar with the project was on home leave. In Morocco, Melissa Cable, USDA coordinator under contract in the A.I.D. mission, participated in the evaluation. The GOM was represented primarily by Hassan Sereghini, Chief of the Economics and Statistics Service of the Direction of Planification. In Sierra Leone, Charles Uphaus of USAID/Freetown, Mr. Hector Vila of the UNDP/FAO Agriculture project, and Mr. Osmond Gordon of the GOSL Land and Water Development Division participated in the evaluation. The Philippines evaluation involved Dr. Ron Pollock of USAID/Manila and Mr. David Besa of the GOP Bureau of Agricultural Economics.

15. External Factors: Except for the Philippines, where rice and corn statistics were simultaneously acquired by both area frames and traditional list frame techniques, thus allowing a comparison, none of the other three countries used both acquisition techniques for the pilot areas. The Philippine Ministry of Agriculture has indicated that the ASF figures are closer to what is believed to be reality and that the precision of the present list frame is not adequate for MOA planning. Since the Philippine government is using their own funds to complete the area frame, the government must consider the costs of area frame technology along with alternative uses of development funds. The government of Philippines is in the process of changing from lists to area sampling frames.

If a comparative system is not in place, a host country ministry would have to use the statistics, both the estimators themselves and variances, to judge the data reliability. This is acceptable when non-sampling errors are low and should (and will) be done in the final evaluation of the project.

16. Inputs: (a) In Ecuador, only one standard 1:250,000 scale LANDSAT scene was evident and it is insufficient to delineate photomorphic regions. The USDA team has never attempted to electronically enhance the image because the quality is not good. In Ecuador, USDA used old aerial photography to stratify land areas. (b) Adequate LANDSAT images and air photos are used in Sierra Leone, at various scales, but cost of reproduction hinders greater use of these inputs. A zoom transfer scope should be purchased since many errors are associated with transferring land use boundaries back and forth from photos to maps. Host country inputs of facilities with light tables, stereoscopes, and planimeters are excellent. A Sierra Leone counterpart needs to be trained, since Mr. Vila is an employee of the FAO and will soon be transferred. (c) No input problems in the Philippines. (d)

Aerial photography is difficult to obtain in Morocco because of the expense of photographic paper. Computer enhanced LANDSAT should be purchased from the European Space Agency, which operates a LANDSAT receiving station in Italy, and used in the areas of Morocco where stratification is needed to expand the project. It would be expected that the PL480 moneys now available to the economics and statistics unit of GOM and identified as a self help project will greatly enhance the use and availability of much needed scenes.

17. Outputs: (a) Ecuador: The memorandum of understanding between USDA, INEC of Ecuador and USAID/Quito agreed to a pilot project of fifty segments (each of area 2 km<sup>2</sup>), each enumerated for 15 different crops and land uses. Ecuador has continued to work on the ASF and plans to complete the ASF by June 1982 for the entire country because it has been so successful (b) Sierra Leone: no completed crop production statistics were reported by evaluation team. Photo products and Landsat imagery are being used only limitedly. Since the evaluation team's visit, crop production statistics for one district (pilot) have been completed. (c) Philippines: Aerial photography dates back to 1972-73. Rice and corn estimates for one province were compared to data collected by traditional means. Rice and corn crop acreage estimates using ASF methodology fall more in line with what the ministry believes to be correct. The BAEcon is expanding the ASF to more provinces using their own funding. (d) Morocco: Maps, irrigation plans, and resource data have been collected for the province (Kenitra) and transferred to 1:50,000 scale topographic maps. Field questionnaires have been compiled and an area frame (strata boundaries and segments) constructed. Seven land use strata are defined in the area frame. The ASF is being expanded to all major agricultural area of the country. It is recommended that USDA provide computer enhanced images for areas in Morocco that are currently under ASF construction.

18. Purpose: The purpose of this project is to improve crop production statistics using remotely sensed data. It started out as a four phase effort where area sampling frames would be constructed as the first phase. The second phase was a national survey using the ASF technology. The third phase was digital processing of current LANDSAT data in a statistically correct way such that estimates of crop areas can be measured. The fourth phase was to improve yield estimates of crops using the latest Agro-Met models. Phases 3 and 4 were never approved because: (1) LANDSAT D was not launched in time, (2) more countries requested to participate in the area frame than the project originally envisaged and (3) a satisfactory research proposal was never prepared for Research Advisory Committee (RAC) review. Table I is a status report on each country.

Table I--Country Status

Country	Pilot ASF Complete	Estimated Date of Completion of ASF for entire Country	Ready for Phase III	Comments
Sierra Leone	1981	1983	No	a
Costa Rica	1979	1981	No	b
Dominican Republic	1972	1981	No	c
Ecuador	1979	1982	Maybe	d
Jamaica	1978	1980	Maybe	e
Philippines	1978	1984	Yes	f
Morocco	1978	1982	Yes	g
Tunisia	1975	1977	Yes	h
Sudan	1981	1985	No	i
Liberia	1982	1985	No	j
Indonesia	1980	1985	Yes	k
Bolivia	1977	1985	Yes	l

## Comments on Country Status

### Sierra Leone:

a. Coordination between remote sensing institutions and Ministry of Agriculture (MOA) is excellent. Progress has been slow because of problems between FAO advisor and MOA personnel. Mr. Osmond L.A. Gordon of the Land and Water Development Division of the Ministry of Agriculture and Forestry of Sierra Leone presented a paper at a regional conference in Ouagadougou, Upper Volta., Nov 1980 Title "Area Sampling Frame for Agricultural Survey in Sierra Leone".

### Costa Rica:

b. This work started as a ROCAP project and we supported it with personnel and travel. They are running a First National Survey in Costa Rica in Feb 1982. A poster session was presented at the ERIM conference in Costa Rica, April, 1980. National Agricultural Statistics for Costa Rica by Eladio Carden, Alvaro Garreta, Statistics and Census Direccion, Orlande Hernandez, Ministry of Agriculture, Costa Rica, and co-authors from USDA.

### Dominican Republic:

c. This work started as a mission funded program in 1969. This mission funded work is well documented. Support has been erratic since 1978. Personnel in the D.R. are good but lack organization.

Ecuador:

d. This work was started with AID/W funds in 1979 and has been one of several real successes. The frame will be completed and the first National Survey will be conducted in 1982. The pilot project was almost entirely paid for by AID/W funds. Two reports were written as a result of that pilot project. Encuesta Agropecuaria Piloto de Pichincha Por Muestreo de Areas - Evaluacion de Experiencias e Informe Final and Resume del Informe Final. These reports enabled the Institute Nacional de Estadisticas y Censos (NEC) to obtain government funds to complete the entire country. Support from the mission has been excellent. Guillermo Otanez presented a paper at the UN Seminar in Costa Rica in April, 1980, explaining the ASF in Ecuador.

Jamaica:

e. This work was started as a mission funded program but was completed as a AID/W project. A second National Survey has been completed. Roy Russell, Director of the Data Bank and Evaluation Division, Ministry of Agriculture, presented two papers at ERIM conferences. Those papers have been widely distributed in many countries around the world, and are titled:

Agricultural And Resource Assessment In Jamaica Using An Area Sampling Frame, Roy Russell and Harold Huddleston, April 1979, Agricultural Production in Jamaica, Roy Russell and Harold Huddleston, April 1980.

In addition Mr. A.K. Sahney, Data Bank and Evaluation Division, Ministry of Agriculture, Jamaica will be presenting two papers in 1982, presenting the results of the First National Survey in Jamaica using ASF technology. Each paper presents slightly different aspects.

Philippines:

f. The Philippines was the first country that signed an Agreement under this Remote Sensing for Agriculture project. Several papers have been generated reporting on the results of the first pilot survey in Pangasinan. David Besa, Supervising Statistician, Bureau of Agricultural Economics, (BAEcon) Ministry of Agriculture, Philippines presented a paper: Remote Sensing for Agriculture in the Philippines at the Eighth Session, FAO Symposium for Agricultural Statisticians, Khatmandu, Nepal, October, 1980. Since that time, progress has been slow but BAEcon is progressing using their own funds and they have determined that ASF completion is important. To date, they have completed 2 provinces in Luzon.

Morocco:

g. Morocco has also been a success from our point of view. This program was started with AID/W funds in 1979. This summer Morocco plans to have completed the frame in the important agricultural provinces. Mr. Hassan Sereghini, Moroccan Ministry of Agriculture, was co-author on a paper presented at the ERIM conference on Arid and Semi-Arid lands in Cairo, Egypt in January 1982.

Tunisia:

h. Tunisia has a mission funded project that was started in 1972. An ASF was built without use of aerial photography or LANDSAT imagery. In addition, the data summary process has been very slow. The AID/W funds were used to evaluate improvements that could be made using LANDSAT and also to supply the Tunisian Ministry of Agriculture with microcomputer processing equipment. Progress has been slow. Nevertheless, Tunisia is running regular surveys and publishing results within six months of data collection.

Sudan:

i. USAID/W funds were used for two years in the Sudan to train and start the project. Progress has been slow but, at present, USAID Khartoum has a PASA with USDA to complete the project. We are just getting started in this effort.

Liberia:

j. Liberia was one of the first countries to sign an Agreement with USDA. There has been no progress since the military took over the government. USDA is waiting for data to be collected in the field.

Indonesia:

k. Indonesia is the world's biggest importer of rice and consequently this program could have tremendous pay-off. The ASF technology has been transferred to the Central Bureau of Statistics (CBS) in Jakarta. Progress has been slow because aerial photography has been excessively costly and obtaining it is nearly impossible. Nevertheless, there are host of personnel in CBS who have showed continuous support for adapting this technology. The pilot project was good and Mr. Machin Ervan presented a paper at a Remote Sensing Symposium held in Indonesia on the subject project.

Bolivia:

l. To our knowledge, nothing has happened since the military took over at the Government.

19. Goal/Subgoal: To improve agricultural land utilization and crop forecasting in LDC's through assistance in the use of remote sensing and related techniques. In all countries, the technology transferred. In some countries, the technology has

had an impact on the agricultural estimates since 1982. In other countries ASF technology will start impacting the agricultural estimates in 1982. In still other countries more work needs to be done. If better material becomes available such as computer enhanced LANDSAT imagery, then stratification could be more precise and the project goal reached more quickly.

20. Beneficiaries: The direct beneficiaries are the agricultural statisticians who are charged with acquiring agricultural data. In this respect, all four country agencies have greatly benefitted from this project to date, because they now have the know-how and training of the ASF technology. To complete the ASF for the entire country and to carry out data collection activities, however, will require more resources and a dedicated institution. Until current crop reporting does take place, there can be no direct beneficiaries; i.e., small farmers; because without accurate crop information, prices cannot accurately capture the benefits of grain export/import balances, and small farmers will continue to suffer low prices if excessive grain is imported, and local consumers will assume an inequitable economic burden in local prices they have to pay if grain imports are too low. In addition, the lack of an open, precise crop reporting system deprives a small farmer from verifying the extent of his collateral (crops) in getting credit for future farm improvements. With the crop reporting system in place, the additional input of remote sensing technology implies that this technique would definitely be used in every LDC where A.I.D. works in agricultural development.

21. Side Effects: Prior to the introduction of microcomputer technology, processing survey data generally took two years. Using microcomputers, the pilot

survey data have been summarized in four to six weeks. Full country surveys are being processed in less than three months in Jamaica. Microcomputers have been installed and host government officials trained to utilize them in Morocco, Tunisia, Sierra Leone, Jamaica, Philippines and Ecuador. The transfer of technology in utilizing microcomputers has been very successful, and has had a major impact on host governments capabilities to process survey data in a timely manner.

22. Lessons Learned: The area frame sampling methodology can be transferred to almost any LDC, regardless of its technical base in agricultural development. The effective use of this technology definitely requires an aggressive and imaginative influx of remote sensing technology and a strong interagency working relationship in the LDC to insure that the remote sensing capability (if it does exist) in the natural resources agency is effectively applied by the agricultural users. It takes two to four years to build a frame (depending on the size of the LDC). However, once the Area Sampling Frame is built, surveys can be completed in several months - a time that is adequate to impact food decisions. The suggested follow-on in those LDC's is the development of more advanced image enhancement techniques and, for two of the countries (Morocco and the Philippines), movement into phase 3-automatic area measurements from digital tapes.

**ACTION  
COPY**

UNCLASSIFIED  
*Department of State*

Attachment 4  
**INCOMING  
TELEGRAM**

PAGE 01 MANILA 03912 120542Z  
ACTION AID-35

1954 017411 A101342

MANILA 03912 120542Z

1954 017411 A101342

THE AREA FRAME.

ACTION OFFICE STFN-01  
INFO ASEM-01 ASPT-02 ASOP-02 PPCE-01 POPR-01 PPPB-03 ASPD-03  
ASTR-01 AAST-01 STAG-02 AGRI-01 RELO-01 MAST-01  
/021 A4 012

INFO OCT-00 INR-10 EB-00 EA-12 AMAD-01 /066 W  
-----323775 120555Z /38

R 120520Z FEB 52  
FM AMEMBASSY MANILA  
TO SECSTATE WASHDC 0102

UNCLAS MANILA 03912

AIDAC

E.O. 12065: N/A  
SUBJECT: EVALUATION OF REMOTE SENSING FOR AGRICULTURE  
PROJECT NO. 931-1224

REF: STATE 342807

1. RESPONSE TO REFTEL HAS BEEN DELAYED PENDING RECON-  
FIRMATION OF THE BUREAU OF AGRICULTURAL ECONOMICS' (BAECOM)  
POSITION ON THE USE OF THE AREA FRAME TECHNIQUE, VALUE OF  
THE PROJECT IN IMPROVING QUALITY OF DATA, AND DESIRE TO  
CONTINUE THE PROJECT ACTIVITIES.

2. DIRECTOR JESS ALIX, DIRECTOR OF BAECOM HAS REAFFIRMED  
THE PLANS AND EFFORTS BEING MADE TO EXPAND USE OF AREA  
FRAME TECHNIQUES TO OTHER PROVINCES. HE REPORTS THAT  
MANUEL Q. LIM, DEPUTY MINISTER OF AGRICULTURE, WHO IS WELL  
INFORMED ON THE MERITS AND ADVANTAGES OF THE AREA FRAME,  
HAS PROVIDED MUCH NEEDED SUPPORT WITHIN THE MA AND IS ALSO  
SEEKING IMPROVED COOPERATION OF OTHER AGENCIES TO REDUCE  
IMPLEMENTATION CONSTRAINTS, I.E., AERIAL PHOTOGRAPHY, MAPS,  
FINANCE, ET. AL.

3. FACT STILL REMAINS THAT AN OPERATIONAL LIST FRAME IS  
IN EXISTENCE AND IS DELIVERING INFORMATION ON A REGULAR  
BASIS. THIS ACTIVITY INVOLVES MANY CLERICAL EMPLOYEES,  
SUPERVISORS AND PROFESSIONAL STAFF WHO MAY BE MORE CON-  
CERNED WITH THE STATUS QUO OF THE ORGANIZATION THAN WITH  
THE QUALITY OF DATA THEY GENERATE. IN OTHER WORDS THEY  
TEND TO BE PART OF A SILENT INTERNAL RESISTANCE WHICH  
MUST BE MANAGED. ON THE OTHER HAND, EXTERNAL POLICY MAKERS  
AND BUDGET PERSONNEL MAY NOT BE EASILY CONVINCED THAT A  
TECHNICAL PRESENTATION OF THE MERITS OF THE PROPOSED NEW  
TECHNIQUE FULLY JUSTIFIES EVEN A TEMPORARY, SHORT-TERM  
INCREASE IN PERSONNEL AND/OR BUDGET OF BAECOM FOR IMPE-  
LEMENTATION.

4. REPRESENTATIVES OF THE USAID WHO DISCUSSED THE PROJECT  
WITHIN THE EVALUATION TEAM ARE STRONG ADVOCATES OF THE  
PROJECT AND SUPPORTERS OF THE BAECOM EFFORTS TO MAKE THE  
TRANSITION TO FULL USE OF AREA FRAME TECHNIQUES. SOME OF  
THE COMMENTS AND DISCUSSION WITH THE TEAM WERE INTENDED  
TO HELP KEEP A FOCUS ON THE REAL WORLD IMPLEMENTATION  
PROBLEMS. MANY OF THESE ARE NON-TECHNICAL IN NATURE.  
FOR EXAMPLE, MINISTRY AND USAID OFFICIALS AND SUPPORT  
PERSONNEL CHANGE, SOMETIMES FREQUENTLY. WHAT WAS CON-  
SIDERED TOP PRIORITY LAST YEAR MAY NOT BE THIS YEAR. IT  
WAS SUGGESTED THAT REGULAR UPDATE BRIEFINGS OF MINISTRY  
AND USAID OFFICIALS ON PROGRESS AND MERITS OF AREA FRAME  
CONTINUE TO BE VERY IMPORTANT IN MAINTAINING USAID SUPPORT  
FOR EXTENDING LENGTH OF TIME AND/OR EXPANDING COVERAGE OF  
PROJECT ASSISTANCE. THE REGULAR AND CONTINUING FLOW  
OF EVEN A SMALL AMOUNT OF TA CAN BE VALUABLE IN HELPING  
BAECOM IN OBTAINING RESOURCES FOR EXPANDING COVERAGE OF

5. IT WAS OUR UNDERSTANDING FROM DISCUSSION WITH THE  
EVALUATION TEAM THAT THE PHILIPPINES IS THE ONLY COUNTRY  
INCLUDED IN THE REMOTE SENSING PROJECT WHICH WAS IN PLACE  
A SCIENTIFICALLY DESIGNED SAMPLING SYSTEM (LIST FRAME)  
FOR COLLECTION OF AGRICULTURAL STATISTICS. THIS FACT  
SEEMED TO MERIT SOME SPECIAL RECOGNITION IN THE EVALUATION  
REPORT. AS POINTED OUT IN PARA 3, IT MAY REQUIRE A  
SOMEWHAT MORE COMPLICATED STRATEGY TO EXPAND THE AREA  
FRAME TECHNIQUE BECAUSE IT IS IN COMPETITION WITH AN  
EXISTING LIST FRAME.

6. WE HOPE THE NEGATIVE IMPRESSION INDICATED BY REFTEL  
IS CLARIFIED AND CORRECTED BY FOREGOING COMMENTS. WE  
REPEAT THAT BAECOM DIRECTOR AND MA DEPUTY MINISTER ARE  
PLEASED WITH ASSISTANCE PROVIDED FOR SUBJECT PROJECT AND  
DESIRE TO CONTINUE ON A MUTUALLY AGREEABLE BASIS.  
MISSION EXPECTS TO BE KEPT INFORMED AND HAVE A REGULAR  
OPPORTUNITY TO PROVIDE ITS INPUTS. ROSENTHAL

UNCLASSIFIED

Annex 9  
PROJECT DESIGN SUMMARY  
LOGICAL FRAMEWORK

AID 1020-28 (1-78)

Life of Project:  
From FY 79 to FY 82  
Total U.S. Funding 1,400  
Date Prepared: 10/78

Project Title & Number: 931-1224 Remote Sensing for Agriculture

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>To improve agricultural land utilization and crop forecasting in LDCs through assistance in the use of remote sensing and related technologies.</p>	<p>Measures of Goal Achievement:</p> <p>Pre-forecast estimates, with accuracies greater than 90%, of selected major crops in demonstration areas of four LDC's.</p>	<p>Check with post-forecast production reports.</p>	<p>Assumptions for achieving goal targets:</p> <p>Some type of crop production reporting system (farmer questionnaires) must be available or implemented to calibrate accuracy. If not, host country ministry will have to rely on USDA assurance that area frame statistics are sufficiently reliable to make food planning decisions based herefrom.</p>
<p>Project Purpose:</p> <p>To demonstrate the application of satellite imagery and aerial photography to delineate sample fields representative, in a statistically significant sense, of a nation's total agricultural crop production</p>	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <ol style="list-style-type: none"> <li>1. Sample field statistics (97 - 100% accurate) based on satellite and air photo analysis.</li> <li>2. Land use ratios of total area to sample area for expansion to national estimates, based on satellite imagery.</li> </ol>	<ol style="list-style-type: none"> <li>1. USDA spot checks to verify accuracy of field data collected on the ground by trained LDC enumerators</li> <li>2. Comparison of Landsat derived land use maps with recent air photos or with field data collected under 1.</li> </ol>	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> <li>1. Host country can learn remote sensing applied to statistical sampling.</li> <li>2. Landsat imagery and air photos sufficiently recent (within one year) and of sufficient coverage are available.</li> <li>3. Sample fields can be delineated on satellite imagery.</li> <li>4. Sample fields truly are representative of agricultural potential.</li> </ol>
<p>Outputs:</p> <ol style="list-style-type: none"> <li>1. Land use theme maps</li> <li>2. Enhanced Landsat satellite images.</li> <li>3. Tables of Crop Production estimates</li> <li>4. Field enumerator notes</li> </ol>	<p>Magnitude of Outputs:</p> <ol style="list-style-type: none"> <li>1. Maps at 1:250,000 scale for all demonstration areas.</li> <li>2. Landsat images at same scale and coverage as maps.</li> <li>3. Estimates of tonnage by state or province for 4-5 major crops.</li> <li>4. Page of notes for each sample field. Several hundred sample fields for LDC.</li> </ol>	<ol style="list-style-type: none"> <li>1. Visual inspection at ministries of agriculture</li> <li>2. Crop reports by USDA and host countries</li> </ol>	<p>Assumptions for achieving outputs:</p> <ol style="list-style-type: none"> <li>1. Host country commitment to provide full time personnel to project.</li> <li>2. Host country provides cartographic and surveying facility for project use.</li> <li>3. Host country enumerators are conscientious and objective in collecting data.</li> </ol>
<p>Inputs:</p> <ol style="list-style-type: none"> <li>1. US AID: \$1.4 million</li> <li>2. USDA: technical assistance, equipment</li> <li>3. Host Country: manpower, mapping facility and supplies, aerial photos, 4-wheel drives, computer facility</li> </ol>	<p>Implementation Target (Type and Quantity)</p> <ol style="list-style-type: none"> <li>1. PASA w/ USDA and contract with university and/or industry</li> <li>2. For each LDC, USDA will provide 1 statistician, 1 photo-interpreter, and 3 field enumerators.</li> <li>3. Non-government U.S. institute provides computer expert and metsat expert.</li> <li>4. Host country provides statistician, photo interpreter, &amp; 10-20 field enumerators.</li> </ol>		<p>Assumptions for providing inputs:</p> <ol style="list-style-type: none"> <li>1. Amenable working relationship among AID, USDA, and private industry.</li> <li>2. Landsat - 3 will remain operational for 2 more years.</li> <li>3. Landsat D will be successfully launched in 1981, or Landsat 3 will survive 3 more years.</li> <li>4. Host country has general purpose computer for project use.</li> </ol>