

383-045 3830045 (3)

AGENCY FOR INTERNATIONAL DEVELOPMENT <b>PROJECT REVIEW PAPER FACESHEET</b>		1. TRANSACTION CODE <b>PD-AAD-082</b> <input type="checkbox"/> C    A ADD C CHANGE D DELETE		PRP 2. DOCUMENT CODE <b>2</b>
3. COUNTRY/ENTITY Sri Lanka		4. DOCUMENT REVISION NUMBER <input type="checkbox"/>		
5. PROJECT NUMBER (7 digits) <input type="checkbox"/> 383-0045 <input type="checkbox"/>	6. BUREAU/OFFICE A. SYMBOL ASIA    B. CODE <input type="checkbox"/> 04 <input type="checkbox"/>	7. PROJECT TITLE (Maximum 40 characters) <input type="checkbox"/> Agricultural Base Mapping <input type="checkbox"/>		
8. PROPOSED NEXT DOCUMENT A. <input type="checkbox"/> 3 <input type="checkbox"/> PP    B. DATE <input type="checkbox"/> MM <input type="checkbox"/> YY <input type="checkbox"/> J <input type="checkbox"/> U <input type="checkbox"/> 7 <input type="checkbox"/> 6		9. ESTIMATED FY OF AUTHORIZATION/OBLIGATION A. INITIAL FY <input type="checkbox"/> 7 <input type="checkbox"/> 8    B. FINAL FY <input type="checkbox"/> 8 <input type="checkbox"/> 3 <span style="float: right;">22p</span>		

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$1 - )						
A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	2500		2500	3300		3300
(GRANT)	( )	( )	( )	( )	( )	( )
(LOAN)	( 2500 )	( )	( )	( 3300 )	( )	( 3300 )
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY		363	363		1186	1186
OTHER DONOR(S)						
<b>TOTALS</b>	<b>2500</b>	<b>363</b>	<b>2863</b>	<b>3300</b>	<b>1186</b>	<b>4486</b>

11. PROPOSED BUDGET AID APPROPRIATED FUNDS (\$000)							
A. APPROPRIATION	D. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. FIRST FY <u>78</u>		LIFE OF PROJECT	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	H. GRANT	I. LOAN
(1) FN	180 B		053		2500		3300
(2)							
(3)							
(4)							
		<b>TOTAL</b>					

12. PROJECT PURPOSE (Maximum 480 characters)  "X" IF DIFFERENT FROM PID

Develop the Survey Department's capability to meet current and continuing national photogrammetric and cartographic needs.

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN PID FACESHEET DATA, BLOCKS 12, 13, 14, CR 15? IF YES, ATTACH CHANGED PID FACE SHEET.

2    1 = NO  
                  2 = YES

14. PLANNING RESOURCE REQUIREMENTS (Staff/Funds)  
 4-5 mm, \$40

15. ORIGINATING OFFICE CLEARANCE		16. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION	
SIGNATURE <i>[Signature]</i>		<input type="checkbox"/> MM <input type="checkbox"/> DD <input type="checkbox"/> YY <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 0 <input type="checkbox"/> 5 <input type="checkbox"/> 7 <input type="checkbox"/> 6	
TITLE A.I.D. Representative			
		DATE SIGNED <input type="checkbox"/> MM <input type="checkbox"/> DD <input type="checkbox"/> YY <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 7 <input type="checkbox"/> 6	

## 1. Priority and Relevance

Sri Lanka has a population of about 14 million people. Although the population growth rate has slowed to 1.7 percent per annum, a population of about twenty million by the turn of the century is predicted. In 1973, roughly 80 percent of the population was rural. Farming provided 50 percent of the total employment with the rural non-farm population directly dependent on agricultural related activities for employment. In the same year, the agricultural sector was estimated to provide 33 percent of the Gross Domestic Product and 78 percent of all export earnings. Major structural transformation in the Sri Lankan economy is not anticipated, and the relative importance of the agricultural sector is likely to remain.

Traditionally Sri Lanka has relied on the agricultural export sector to provide the wherewithal to purchase food to meet domestic consumption needs. For some time Sri Lanka has been adversely effected by declining terms of trade and it is estimated that this year there will be a balance of payments deficit in the order of \$250 million. Food, particularly food grains, represent roughly 50 percent of Sri Lanka's import bill. The GSL has as a major policy objective the achievement of rice self-sufficiency. In the political economy of Sri Lanka, agricultural development is also viewed as a principal means to expand employment opportunities, as well as central to improving the absolute and relative welfare/income levels of the rural population.

Agricultural and rural development require planning and decisions on resource allocations at many levels. These range from macro and large scale project planning by the central government ministries to small scale projects carried out by local governments.

A basic tool of this planning process at all levels is up-to-date information on land-use patterns, physical terrain, location of infrastructure,

property boundaries, location of villages and population centers, and dimensions and layouts of project areas.

The project is to assist the Survey Department to provide such information. The project purpose is to develop the Survey Department's capability to meet current and continuing national photogrammetric and cartographic needs. Project inputs are earmarked for the Survey Department's Air Survey and Map Publication Units. Project activities will be directed at a five-year program to develop a new island-wide medium scale (1:10,000) series base map and provide specialized, e.g., cadastral or engineering useful, large scale maps (1:1,000).

## 2. Project Description

In Sri Lanka the Survey Department has primary responsibility for:

- 1) Mapping the country;
- 2) Survey and record all state lands;
- 3) Providing photogrammetry and cartography for interpretation/analysis and planning respectively; and
- 4) Survey training.

The Ministries of Agriculture and Lands, Irrigation, Power and Highways and a host of other Ministries, Departments and Boards, such as Land Reform Commission, all depend on the Survey Department for their survey and mapping needs. Table 1 gives the aggregate performance of the Survey Department for the period 1970 to 1975 and partially reflects the demand for its services.

TABLE 1

## Survey Department Performance Summary, 1970 - 1975 \*

Year	Ground Survey Requested	Ground Survey Accomplished	Percent Accpl'd	Aerial Survey Requested	Aerial Survey Accomplished	Percent Accpl'd	Photogrammetry Requested	Photo'ry Accpl'd	Percent Accpl'd
1970	905	683	75	3,200	-0-	-0-	285	222	78
1971	1,084	588	54	6,400	80	1	265	161	61
1972	1,105	657	59	9,521	1,635	17	1,143	977	86
1973	858	400	47	11,196	1,377	12	1,484	1,303	88
1974	528	319	60	13,009	2,409	18	1,522	1,026	67
1975	751	541	72	10,600	923	9	1,757	803	46
Average annual percent accomplished			61			11			71

\* All figures given in (000) acres. Channel trace surveys, geodetic unit, and similar work expressed in line miles is excluded on this summary.

Of the ground survey work completed, roughly 1/3 was for the Department of Irrigation and involved some 16 major and 76 minor (less than 10,000 acres) schemes. Another 1/3 of the actual work performed was related to land reform, land titling and land distribution to farmers. The rest of the work of the Survey Department related to forestry, town planning and local government. Aerial survey and photogrammetry was done primarily for the Department of Irrigation in relation to land development and settlement schemes. Cain and Craib, also found considerable latent demand for Survey Department maps which is not presented in the "official requests" since users knew the Survey Department was having difficulties meeting requests and so did not "officially" seek assistance. The Land Use Division in the Department of Irrigation and the Department of Agriculture, in particular, reported they would request considerably more base maps if they knew their requests could be met. The Department of Census and Statistics also reported that they felt an acute need for an updated base map of the entire country.

The Survey Department's ability to meet the current demand for base maps, as well as to meet specific project/scheme mapping requirements, is insufficient. The Department of Agriculture, Irrigation Department, and Agriculture's Project Preparation Unit all report a serious constraint for them in implementing their responsibilities is the lack of current base maps and the inability of the Survey Department to meet their project specific map requirements. The only maps now available are based on aerial photography taken in 1956; they are seriously out of date, and relatively small scale (1:63,360) which limits their utility still further. The Survey Department recognizes that they need to improve their capability to provide timely and accurate map coverage of the country and have identified two major areas for which they seek external assistance. First,

for their Air Survey Unit to enable new photo flights and an increased rate of photogrammetric plotting. Secondly, for their Map Production Unit so that the photogrammetric work can be expeditiously published and distributed to user groups. Craib and Cain in their report confirm the Survey Department's need for equipment in these areas if the Survey Department is to meet the identified mapping requirements of Sri Lanka.

In summary, AID resources are sought for:

1. Air Survey, e.g., airplane, camera overhaul, and other photogrammetric and cartographic equipment.

2. Map Production, e.g., color litho offset printing machine, process camera, orthophoto equipment, graining machine, map enlarger scribing equipment, etc.

3. Other: 1) to strengthen Sri Lanka's geodetic net. This involves geocrovers to enable utilization of signals from geodetic satellites. This is particularly important in producing maps of larger scale for use in land titling and cadastral surveys; and 2) three months consultant assistance to help the Map Publication Branch reorganize their map production system.

Project output will be essentially two: First, the Air Survey Unit's capability will be improved and expanded. That is, they will be able to conduct aerial surveys at required altitudes, when weather permits and the job requires; Secondly, there will be an improved Map Publication Unit. The project inputs will essentially replace and/or supplement antiquated publication equipment needed to reproduce and publish maps at a rate that will meet user needs.

Project purpose, as stated earlier, is to develop the Survey Department's capability to meet current and continuing national photogrammetric and cartographic needs. Measurement of project purpose can be done by the

existence of: 1) a national agricultural base map with a scale of 1:10,000 and 5 meter contour intervals; and 2) aerial survey and photogrammetry accomplishment/request ratios of .85 respectively as a proxy measure of the Survey Department's service ability vis-a-vis user agencies' special requests for photographic flights. (These requests are usually for activities related to land registration, for example, which may need to produce maps with a scale of 1:1,000 or maps for engineering works such as rural road construction, rural electrification, initial layout of irrigation systems, etc.)

Critical to the achievement of project purpose and end of project objectives is the assumption that Survey Department personnel are qualified and able to operate sophisticated equipment. As indicated in the Craib and Cain report, the Survey Department has this capability. They are already operating, or have been operating, similar equipment to that proposed to be supplied in the project. The level of training of the Survey Department personnel is considerable with individuals trained to the graduate level at Cambridge and Ohio State Universities in cartography, geodetic science and photogrammetric engineering. Both are recognized as leading institutions in the field. Considerable staff training has also been carried out at the International Training Center of the Netherlands and in Australia.

Another major assumption underlying this project is that the departments of government charged with agriculture and rural development can effectively utilize maps and that they contribute significantly toward achievement of their programs. Craib and Cain interviewed a considerable number of user personnel and concluded that user organizations, particularly the Department of Irrigation and Department of Agriculture have experienced people that can utilize and be significantly assisted by improved maps and photography in their program/project planning and implementation activities.

### 3. AID and Other Relevant Experience

The Air Survey Unit was started in 1955 with assistance from the Canadian Government under the Colombo Plan. In 1959 the unit received the current airplane, a twin Beechcraft Super 18 from AID's predecessor, ICA. More recent AID experience with photogrammetry has been in Latin America with projects that were in support of agricultural and rural development planning and project implementation.

### 4. Beneficiaries

The linkage between aerial photography, cartography, etc., and individual farmers or laborers is indirect. Demonstration of a direct causal relationship between improved maps and improvements in people's welfare is very difficult. Nevertheless, the project assumes there is a positive relationship between AID's target group, the poor majority, and this project. This is predicated on the Mission's belief that up-to-date cartography and photo information will facilitate more effective GSL planning and implementing of agriculture and other development activities that will promote improvements in the welfare of the poor majority.

The GSL is seriously and meaningfully concerned with distributing the benefits of development to Sri Lanka's poor majority. The food ration system, which supplies about 20 percent of the lower 40 percent's calorie intake, has been a major factor in redistributing income. Similarly, more equitable distribution of income has been sought through public ownership and operation of various economic activities, price policies, labor legislation, taxation policies, etc. Internal terms of trade in Sri Lanka have consistently favored the rural sector where 80 percent of the population lives. The share of income of the lower 40 percent of the population rose from 12 percent to 15 percent between 1963 and 1973. The income received by the top 10 percent fell from 39 percent to 30 percent in the same period.

These changes have been abetted by a number of social services which have been provided to the needy. Health care, education, shelter and public transport have been provided on a subsidized basis. While average per capita income levels have remained low, cheap food supplies and quality medical care have helped to maintain health standards. Average caloric and protein intake, for example, are considered adequate by international standards. standards.

Improvements in the relative welfare of the agricultural population has been facilitated by recent government policies which emphasize agricultural production. In addition to programs to intensify production through expansion of credit and widespread distribution of inputs, the Government has instituted a land reform program which is redistributing about 500,000 acres of land from large land owners to small farmers and cooperatives.

Sri Lanka has been a leader among developing nations in insuring that real development in terms of education, food, shelter, and health care reaches the majority of its citizens. The record on growth - particularly with the droughts of the past two years - has been less salutatory. Unemployment is still increasing. Nevertheless, the basic point, in terms of AID's concern with the poor majority, is that Sri Lanka is relatively egalitarian, and its social system is geared toward low-income groups. Because of this, the Mission has some confidence that the acceleration of agriculture and rural development which is intended as a result of this project will, in fact, benefit Sri Lanka's small farmers and low income groups which comprise the bulk of the population.

There is a direct link between this program and the small farmers who have received land under the land reform or previous schemes of granting state lands to villages and individual settlers. Although about

800,000 parcels of land have been distributed, progress on titling these parcels has lagged. An improved base map and special overflights of areas for cadaster purposes will greatly speed the process of giving the peasant farmers and others firm title to their lands. Security of tenure is, of course, an important ingredient in intensifying production on agriculture lands.

#### 5. Feasibility Issues

The reader is again referred to the Craib and Cain report. There seems to be little doubt that the Survey Department can most effectively utilize AID supplied inputs. Craib and Cain have suggested alterations in equipment needs but essentially the nature of the equipment is the same as the Survey Department originally requested. The program of aerial photography proposed by the Survey Department is the most expeditious and cost effective means of producing the required maps.

As Craib and Cain point out, agricultural base maps can be made using ground techniques that approach the same quality as that provided through aerial techniques, but at the cost and time of doing so is prohibitive. Craib and Cain suggest that using aerial techniques, a national base map could be completed in four years. To approximate this using ground techniques would require 800 ground survey teams (8,800 people) at something like 30 times the cost, even with the relatively low price of labor in Sri Lanka.

A major technical issue of the project is whether or not purchase of an airplane is the most cost effective approach for obtaining aerial photos. Craib and Cain suggest that while contracting for aerial photo services could be done, the weather conditions in Sri Lanka and the nature of the demand for Survey Department services are such that, in their judgment, it would be more expeditious for the Survey Department to obtain a plane. That is, the cloud pattern is such that there isn't a long enough time span

during any part of the year for a contractor to come in and fly the country in total. It is estimated that only two days a week are suitable for photo flights and so flying the island would be a protracted endeavor and, therefore, excessively expensive to contract for. More importantly, however, is the need to respond to on-going requests for special flights, photogrammetry and maps. For example, over the last five years as various projects or programs, e.g., land reform, soil surveys, area development etc., have moved ahead the Survey Department surveyed and mapped annually about 300,000 acres for these kinds of activities. Requests, however, were for an area of three times this much. Contracting with outside companies would not allow the on-going response capability that seems warranted. In-country flying capability also allows expeditious reflights that inevitably have to be made in any aerial mapping project.

The issue of in-country flying and maintenance of aircraft was also looked at extensively by Craib and Cain. It is their judgment that the Sri Lankan Air Force has highly qualified pilots and maintenance personnel. The Air Force has expressed an interest in cooperating with the Survey Department and no problems are anticipated with this sort of arrangement.

Some highlights of other technical issues addressed by Craib and Cain are:

1. Type of aircraft: To do the job, an aircraft costing about 1/3 that suggested in the PID was identified, i.e., \$350,000.

2. Aerial camera: The RC 10 originally suggested was found to be excessive and that reconditioning of an existing RC 8 camera would be satisfactory.

3. Stereo Plotting Equipment: The Wild A 10 was thought not necessary but an additional Wild A 7 and A 8 was suggested to insure timely photogrammetric plotting.

4. Map Publication Equipment: A copier machine was deleted from the original equipment list but a process camera, color sensitometer, color densitometer and air conditioning equipment was suggested.

5. Geodetic Net: Deficiencies in the geodetic net were not felt significant enough to adversely affect the product of a base map. However, in the interest of supporting more extensive cadastral mapping, the geodetic net should be strengthened. At the margin, using geocounters, the additional project cost was estimated to be about \$60,000 and by far the least expensive and most accurate way.

A remaining issue to be addressed related to the map publication units internal organization and the flow of materials through it. The Mission suggests that part of the project preparation process should be specifically focused on this area. It is suggested that one and a half to three month consultancy is required with the objective of identifying a system(s) for more effective use of existing and new equipment in order to speed the publication of maps.

## 6. Other Donor Coordination

No other donors are assisting the Survey Department's Air Survey and Map Publication Units. The FAO crop diversification project, the IBRD-led consortium for the Mahaweli Ganga project, the Chinese assisted Ging Ganga projects are donor supported projects most likely to be early beneficiaries of the improved mapping services. The original project proposal was prepared by the Survey Department with the assistance of ODM personnel assigned to the Agricultural Project Preparation Unit.

## 7. Financial Plan

Tables 2 and 3 give the estimated budget costs that are essentially rough order of magnitudes. The \$810 for contingency and inflation is inserted by the mission as a 20 percent estimation factor. Since most of the equipment can be ordered early on in the project, inflation is not expected to upset estimated budgets greatly. Prices of equipment required, on the other hand, can not be easily checked from Colombo and so the exact amount of \$810,000 was arrived at and inserted as called for in AID's project guidelines.

TABLE 2

SUMMARY COST ESTIMATE AND FINANCIAL PLAN( US \$ 000 )

Source	AID		Host Country		Other (s)		Total
	FX	LC	FX	LC	FX	LC	
U.S. (D.L.)							
1. Commodities							
a. Aerial Survey	920						920
b. Map Publication	1410						1410
c. Doppler Sattellite	60						60
2. Training							
a. Aerial Survey	25						25
b. Map Publication	25						25
3. Technical Assistance							
a. Aerial Survey	25						25
b. Geodetic	25						25
GSL							
1. Aerial Survey							
a. Equipment				510			150
b. Personnel				213			213
2. Map Publication							
a. Equipment				132			132
b. Personnel				691			619
Inflation factor							
Contingency	810						810
Total	3300			1186			4486

TABLE 3

COSTING OF PROJECT OUTPUTS/INPUTS  
(In \$000 or equivalent)

Project Inputs (U.S.)	<u>Project Outputs=</u>				TOTAL
	<u># 1</u>	<u># 2</u>	<u># 3</u>		
Summary of Total Project					
Costs					
1. Aerial Survey	1286				1286
2. Map Publication		1905			1905
3. Doppler Satellite Positioning			109		109
Total	1286	1905	109		3300

AID/W should budget in the neighborhood of \$40,000 for project design and development work. The project development activities are anticipated to be working out organizational alternatives of the Map Publication Unit, carrying out cost effective analysis and developing detailed project budget and implementation schedules. This is expected to require about 4-5 man months of consultancy effort.

#### 8. Implementation Plan

The principal implementing agency for the GSL will be the Survey Department. Technically they are well staffed by people capable of utilizing the equipment to be procured by the project and ultimately achieving the purpose of the project. They will, however, likely need help in procuring equipment as per AID regulations. Other than assistance in this area little direct project implementation by AID direct hire personnel is envisioned. It is also anticipated that there is probably a need for some technical assistance early in the project (about three months) which can be secured through private consultants and or U.S. government agencies like the USGS. This help may be needed in setting up some of the new equipment or in upgrading the qualifications of Survey Department staff.

AID's direct responsibility for managing the project should be minimal. However, AID's evaluation/oversight responsibility regarding the use of U.S. provided resources may need to be carried out in conjunction with expert assistance from private consultants or experts from other government agencies if in house capacity is not available. In developing the evaluation plan in the project paper, careful consideration will need to be given to identifying the kind of timing of likely assistance.

Also to be addressed in developing the Project Paper will be the issue concerning the most appropriate and attractive means for the Survey Department to offer photo interpretation facilities to user organizations. That is, while each user organization needs to do their own photo interpretation, duplication of expensive facilitative equipment and photo libraries is unnecessary. Craib and Cain suggest one approach for provision of these services. There may be others or variations of this approach which can be effectively utilized.

#### 9. Project Development

Project Development support will be needed to:

1. Address the management/organizational needs of the Map Publication Unit. More detail is presented by Craib and Cain on this.
2. Carry out costing analysis of required equipment and firm up budget estimates.
3. Carry out a cost effectiveness analysis of contracting versus developing in country flying capability.
4. Develop detailed project implementation schedules.
5. Draft initial Project Paper.

Timing: The Mission suggests follow-on activity as soon as possible starting in early CY 1977. Assistance of this nature can probably be most expeditiously obtained from private consulting firms. The Mission recommends going to Resource Development Associates because of their familiarity with the Survey Department and AID requirements.

Annex A. Preliminary Log-Frame

Goal: Agricultural Development that increases domestic food production, expands employment opportunities and improves small farmer's standard of living.

Purpose: Develop the Survey Departments capability to meet current and continuing national photogrammetric and cartographic needs.

End-of-Project Status (EOPS): Agricultural Base Map for the entire country that is 1:10,000 scale, and topographic with 5 meter countour intervals.

Aerial Survey and photogrammetry accomplishment/request ratios of .85 respectively.

Outputs:

1. Air Survey Unit's equipment improved and expanded
2. Map Publication Unit's equipment improved and expanded
3. Geodetic Control Net Strengthened
4. Trained Personnel

Inputs:

U.S.

A. Commodities

1. Air Survey	\$ 920
2. Map Publication	1410
3. Doppler Sattellite Positioning	60

B. Training

1. Aerial Survey	25
2. Map Publication	25

C. Technical Assistance

1. Aerial Survey	25
2. Geodetic Survey	25

D. Inflation and Contingency	<u>810</u>	3300
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G.S.L. A. Aerial Survey

1. Equipment 150

2. Personnel 213

B. Map Publication

1. Equipment 132

2. Personnel 691 1186

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1186 4486

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ANNEX B: Issues to be addressed in the development of the Project Paper.

A. Implementation Plan

1. Estimation of Photographic and Cartographic needs by region and type.
2. Prioritize photographic and cartographic needs.
3. Develop initial flight schedules based on 2 above.

B. Staff requirements

1. Photogrammetric teams required and phasing of their work loads.
2. Draftsmen requirements.
3. Alternatives for meeting technician requirements, i.e. recruitment or double/triple shift work.
4. Process required to recruit additional staff if required and likelihood of being able to expand staff.
5. Training requirements.

C. Equipment

1. Detailed review of all equipment needs and a cost effectiveness analysis of alternative arrangements.
2. Detailed budget estimates.
3. Identify sources of equipment.
4. Phasing of equipment orders.
5. Geociever requirements.
6. Air conditioning equipment/systems requirements.
7. Lighting requirements.
8. Light table requirements.
9. Need for Log-E-Tronic printer.

10. Possibility of modifying existing S.L.A.F. aircraft for  
for Survey Department requirements.

11. Type of aircraft Special consideration should be given  
to the pros and cons of staying with the Cessna 337  
since the Air Force currently has several of these  
aircrafts.

12. Oscilloscope requirements.

13. P.I. requirements.

D. Construction/Building requirements

1. Reassess physical facilities currently available.

2. Identify and estimate costs of any building  
modifications required particularly in regard to:

a. Airconditioning

b. Electrical/power requirements

c. Maintaining dust free environment.

d. Vibration.

E. Budgetary implications for Survey Department

1. Identify additive LC and FX resources required to be  
supplied by the Survey Department, particularly those  
associated with O & M of requested aircraft.

2. Process by which to get additional LC and FX and likelihood  
of additive resources being obtained.

F. Others:

1. Means of assuring disciplined utilization of Survey  
Department resources. E.G. charging for photographic  
and cartographic services performed, perhaps for  
expendables on a replacement cost basis in both FX and  
LC as appropriate.

2. Relationship to University of Sri Lanka/Peradeniya and this project. Identify support requirements as appropriate.
3. Cost-effective analysis between in country photo flight capability and contracting out for desired services.
4. Relationship between the LANDSAT program and project. Identify complementarities between the project and LANDSAT and additional support requirements if warranted.
5. Identify procedure to insure cleanliness requirements in photogrammetric and publication facilities.
6. Identify working/contractual procedures and requirements between Survey Department and the Sri Lanka Air Force operation and maintenance services.
7. Schedule of periodic evaluation of project.
8. Role of women in the project.

383-045

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AID 1350-1X (7-71)  
1-4-77  
PIO/T  
APPROVED

DEPARTMENT OF STATE  
AGENCY FOR  
INTERNATIONAL DEVELOPMENT  
PROJECT IMPLEMENTATION  
ORDER/TECHNICAL  
SERVICES

1. Cooperating Country  
SRI LANKA  
2. PIO/T No.  
498-249-3-6478308  
4. Project/Activity No. and Title  
PROJECT DEVELOPMENT & SUPPORT (Agricultural  
Base Mapping/Sri Lanka)  
PD-AAD-082

Page 1 of 9 Pages  
3.  Original or  
Amendment No. \_\_\_\_\_

DISTRIBUTION

5. Appropriation Symbol  
72-11X1026

6.A. Allotment Symbol and Charge  
426-64-498-00-69-71

6.B. Funds Allotted to:  
 A.I.D./W  Mission

7. Obligation Status  
 Administrative Reservation  Implementing Document

8. Funding Period (Mo., Day, Yr.)  
From 1/9/77 To 5/15/77

9.A. Services to Start (Mo., Day, Yr.)  
Between 1/9/77 and 1/20/77

9.B. Completion date of Services  
(Mo., Day, Yr.) 4/1/77 90

10.A. Type of Action  
 A.I.D. Contract  Cooperating Country Contract  Participating Agency Service Agreement  Other

10.B. Authorized Agent  
AID/W

Estimated Financing		(1) Previous Total	(2) Increase	(3) Decrease	(4) Total to Date
\$1.00=					
11. Maximum A.I.D. Financing	A. Dollars		\$50,000		50,000
	B. U.S.-Owned Local Currency				
12. Cooperating Country Contributions	A. Counterpart				
	B. Other				

13. Mission References

14. Instructions to Authorized Agent:  
ROD/ASIA is requested to obtain services requested from Resources Development Associates, Los Alto, CA.

Amount \_\_\_\_\_  
Restrictions \_\_\_\_\_  
AID: SER/FM: RSD

- Contractor should be authorized to work six days per calendar week.
- Photogrammetrist/Mapping Specialist should spend five working days in US, prior to departure, in data collection, six days international travel, two days Switzerland, 30 days Sri Lanka, two days US report preparation.
- Photogrammetrist/Facilities Specialist should spend six days international travel, twelve days Sri Lanka, two days US report preparation.

(continued on page 6)

15. Clearances - Show Office Symbol, Signature and Date for all Necessary Clearances.

A. The specifications in the scope of work are technically adequate  
ASIA/TR/ARD - Charles H. Antholt

B. Funds for the services requested are available  
ASIA/DP, William Lefes 12/22

C. The scope of work lies within the purview of the initiating and approved Agency Programs  
ASIA/BIS - Richard Nelson

D. J. O'Brien (phone)  
SER/FM - J. Ito

E. ASIA/PD/SA - Jeffrey Evans

F. ASIA/PD/SA - Bruce O'Dell

16. For the cooperating country: The terms and conditions set forth herein are hereby agreed to

17. For the Agency for International Development

18. Date of Signature

Signature and date:  
Title:

Signature: Alexander R. Love  
Title: ASIA/PD, Director

1/4/77

AID 1350-1X (9-70)  PIO/T	Cooperating Country SRI LANKA	PIO/T No. 498-249-3-6478308	Page 2 of 9 Pages
	Project/Activity No. and Title PROJECT DEVELOPMENT & SUPPORT (Agricultural Base Mapping/Sri Lanka)		

**SCOPE OF WORK**

**19. Scope of Technical Services**

**A. Objective for which the Technical Services are to be Used**

Assist Mission in final development of the Agricultural Base Mapping Project.

**B. Description**

The contractor shall prepare a written report reflecting analysis and recommendations in the following areas of the GSL survey department and (the) agricultural Base Mapping Program: (Continued on page 7)

**C. Technicians**

(1) (a) Number	(b) Specialized Field	(c) Grade and/or Salary	(d) Duration of Assignment (Man-Months)
1	Photogrammetrist/Mapping Specialist	F 320	46 days
1	Photogrammetrist/Facilities Specialist	297	20 "
1	Economist/Resource Survey Specialist	320	34 "

**(2) Duty Post and Duration of Technicians' Services**

Colombo

**(3) Language requirements**

None

**(4) Access to Classified Information**

None

**(5) Dependents**

Will

Will Not

Be Permitted to Accompany Technicians

**D. Financing of Technical Services**

(1) By AID - \$50,000

(2) By Cooperating Country -

AID 1350-1X (9-70)	Cooperating Country <b>SRI LANKA</b>	PIO/T No. <b>498-249-3-6478308</b>	Page 3 of 9 Pages
<b>PIO/T</b>	Project/Activity No. and Title <b>PROGRAM DEVELOPMENT &amp; SUPPORT (Agricultural Base Mapping/Sri Lanka)</b>		

20. Equipment and Supplies (Related to the services described in Block 19 and to be procured outside the Cooperating Country by the supplier of these services)

A. (1) Quantity	(2) Description	(3) Estimated Cost	(4) Special Instructions
N/A			

B. Financing of Equipment and Supplies

(1) By AID - \$

(2) By Cooperating Country -

21. Special Provisions

- A. This PIO/T is subject to AID (contracting) (PASA implementation) regulations.
- B. Except as specifically authorized by AID, or when local hire is authorized under the terms of a contract with a U.S. Supplier, services authorized under this PIO/T must be obtained from U.S. sources.
- C. Except as specifically authorized by AID/W, the purchase of commodities authorized under this PIO/T will be limited to the U.S. under Geographic Code 000.      N/A
- D. Other (specify):      N/A

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22. Reports by Contractor or Participating Agency (Indicate type, content and format of reports required, including language to be used if other than English, frequency or timing of reports, and any special requirements)

1. Contractor shall complete a written draft of the final report in two copies three days prior to leaving post.
2. Contractor shall give oral briefing to USAID and Survey Department summarizing draft report three days prior to leaving post.
3. Contractor should forward final report to USAID/Sri Lanka within twenty days of return to home office.
4. USAID/Sri Lanka should receive five copies of final report and AID/W (ASIA/PD) five copies.

23. Background Information (Additional information useful to Authorized Agent and Prospective Contractors or Participating Agency; if necessary cross reference Block 19.C(4) above.)

N/A

24. Relationship of Contractor or Participating Agency to Cooperating Country and to AID

A. Relationships and Responsibilities - Contractor is acting on behalf of USAID/Sri Lanka in addressing issues and developing recommendations necessary to finalize USAID's project paper for the Agricultural Base Mapping project.

B. Cooperating Country Liaison Official Deputy Director General, Survey Department

C. AID Liaison Officials Thomas Arndt, A.I.D. Representative

**LOGISTIC SUPPORT**

25. Provisions for Logistic Support	IN KIND SUPPLIED BY		FROM LOCAL CURRENCY SUPPLIED BY		TO BE PROVIDED OR ARRANGED BY SUPPLIER
	AID	COOPERATING COUNTRY	AID	COOPERATING COUNTRY	
<i>A. Specific Items (Insert "X" in applicable column at right. If entry needs qualification, insert asterisk and explain below in C. "Comments")</i>					
(1) Office Space		X			
(2) Office Equipment	X	X			
(3) Housing and Utilities					X
(4) Furniture N/A					
(5) Household Equipment (Stoves, Refrig., etc.) N/A					
(6) Transportation in Cooperating Country		X			X
(7) Transportation To and From Country					X
(8) Interpreter Services/Secretarial		X			X
(9) Medical Facilities					X
(10) Vehicles (official)		X			
(11) Travel Arrangements/Tickets					X
Other: (12) (specify)					
(13)					
(14)					
(15)					

B. Additional Facilities Available From Other Sources N/A

- APO                       PX                       COMMISSARY  
  
 OTHER (specify, e.g., duty free entry, tax exemption)

C. Comments

ESTIMATED BUDGET

TAs			
1. Photogrammetrist/Mapping Specialist	320	46	\$14,720
2. Photogrammetrist/Facilities Specialist	297	20	5,940
3. Economist/Resources Survey Specialist	320	34	10,880
			\$33,140
Transportation			
1. International			7,000
2. Domestic			1,200
Per Diem <span style="float: right;">3,500</span>			
Miscellaneous (Report preparation, <del>in-country</del> , in-country travel, telephone, <del>xxxx</del> local sectional assistance etc.)			
			2,000
			\$46,840

CONTINUATION  
SHEET

FORM SYMBOL

DEPARTMENT OF STATE  
AGENCY FOR  
INTERNATIONAL DEVELOPMENT

TITLE OF FORM

 Worksheet  Issuance

PAGE 6 OF 9 PAGES

1. Cooperating Country  
SRI LANKA2.a. Code No.  
498-249-3-6478308

2.b. Effective Date

2.c. Amendment  
 Original OR No: \_\_\_\_\_

3. Project/Activity No. and Title

PROJECT DEVELOPMENT & SUPPORT (Agricultural  
Base Mapping/Sri Lanka)Indicate block  
numbers.

14

Use this form to complete the information required in any block of a PIO or PA/PR form.

4. Economist/Resource Survey Specialist should spend 7 working days in U.S. prior to departure in data collection, 6 days international travel, 21 days Sri Lanka, 2 days U.S. report preparation.
5. Team members Photogrammerist/Mapping specialist and Economist Resources Specialist should complete assignment at approximately the same time. The two, photogrammatists should begin assignment simultaneously.

CONTINUATION  
SHEET

FORM SYMBOL

DEPARTMENT OF STATE  
AGENCY FOR  
INTERNATIONAL DEVELOPMENT

TITLE OF FORM

 Worksheet  Issuance

PAGE 7 OF 9 PAGES

1. Cooperating County  
SRI LANKA2.a. Code No.  
498-249-3-6478308

2.b. Effective Date

2.c. Amendment  
 Original OR No: \_\_\_\_\_3. Project/Activity No. and Title  
PROJECT DEVELOPMENT & SUPPORT (Agricultural  
Base Mapping/Sri Lanka)Indicate block  
numbers.

Use this form to complete the information required in any block of a PIO or PA/PR form.

## A. Map Production Unit

1. Perform a work flow analysis, defining work flow, identifying potential problem areas and providing recommendations to solve these problems.
2. Develop recommendation concerning organization and operations for more effective use of existing and new equipment for efficient map production.

## B. Staff Requirements for implementing the Project:

1. Determine the staff requirements to implement the project and GSL plans to obtain necessary staff. Determine if these plans will provide the staff necessary.
2. Review requirements for and phasing of photogrammetric teams.
3. Review requirements for and phasing of field control teams.
4. Review requirements for and phasing of draftsmen.
5. Review alternatives for meeting workload requirements; i.e., reassignment of personnel, new recruitment, multiple work shifts.
6. Evaluate staff training needs.

## C. Facilities to implement the project:

1. Perform a detailed review of existing physical plant and facilities to determine if these facilities are adequate to implement the project. Areas to be considered should include:
  - a) Air conditioning (temperature and humidity control)
  - b) Dirt and dust free environment
  - c) Electrical power
  - d) Vibration
  - e) Lighting
2. Where facilities are not adequate define improvements necessary and the cost and appropriate manner of making these improvements.

CONTINUATION SHEET

FORM SYMBOL

DEPARTMENT OF STATE  
AGENCY FOR  
INTERNATIONAL DEVELOPMENT

TITLE OF FORM

<input checked="" type="checkbox"/> Worksheet	<input type="checkbox"/> Issuance	PAGE <u>8</u> OF <u>9</u> PAGES
1. Cooperating County SRI LANKA		2.a. Code No. 498-249-3-6478308
2.b. Effective Date		2.c. <input type="checkbox"/> Original OR Amendment No: _____
3. Project/Activity No. and Title		

Indicate block numbers.

Use this form to complete the information required in any block of a PIO or PA/PR form.

D. Equipment and Materials

and material

1. Perform a detailed review of all equipment/needs for data collection and map production, including source and cost of equipment and materials.
2. Determine the ratio of expendable supplies required by the project to those required for operation by the map production unit without the project.
3. Recommendations proper phasing of equipment/material orders to insure material is (a) on hand when needed, but (b) won't deteriorate on the shelf.
4. Define requirements for color-separation light tables, identify source and cost if needed.
5. Evaluate and define need for <sup>Long-E</sup>Long-Electronic printer; identify source and cost if needed.
6. Define requirements for field vehicles, identify cost.
7. In collaboration with the Survey Department develop specifications and ~~draft~~ tender documents for all material and equipment required under the project.

E. Aircraft Requirement, Procurement, Modification, and Operation

1. Develop detailed recommendations for and specifications of aircraft requirements, instrumentation, and modification for aerial survey operations.
2. Evaluate possibility of modifying existing S.L.A.F. aircraft for Survey Department Requirements.
3. Review and evaluate economic and technical feasibility of contracting for flight services.
4. Identify procurement sources and prepare cost estimates of required aircraft.
5. Identify aircraft ground support equipment requirements and prepare specifications for equipment needed.
6. Define requirements, identify sources and confirm availability of pilots, navigation, and aerial photographic personnel.
7. Evaluate need for and make recommendations concerning personnel training.
8. Review procedures and make recommendations to insure adequate aircraft support and maintenance of operational readiness.
9. Review film handling procedures and make recommendations concerning survey operations.
10. Review alternatives and recommend system for Survey Department to maintain "responsibility" for the aircraft.
11. In collaboration with the Survey Department prepare draft contracts for
  - (a) Purchase of plane ~~ix~~ and associated delivery, training, and spare parts;

- (b) Modification of plane necessary for aerial photography;
- (c) Maintenance of plane in-country;
- (d) Flight services (pilot)

F. Survey Research Center (SRC) (Photo Interpretation)

1. Review feasibility and make recommendation concerning establishment and organization of SRC to support Survey Department programs and photo interpretation requirements of other GSL agencies using agricultural resources inventory/base mapping program products.
2. Develop detailed specifications for data analysis and interpretation equipment required to support ag base mapping programs.
3. Identify sources of equipment and prepare cost estimates.
4. Identify personnel training requirements both for Survey Department and user agency personnel.

G. Implementation Plan

1. Estimate Photographic and Cartographic needs by region and type
2. Develop initial project implementation plan for life of project including commodity ordering schedules and photographic and cartographic plans of work.
3. Identify GSL mapping priorities to be followed in implementing project.

H. Other

1. Evaluate relationship between LANDSAT program and ag base mapping project. Identify complementarities. Make recommendations concerning possible project integration. Identify support requirements.
2. Identify the continuing local and foreign exchange costs that must be borne by the GSL, necessary to maintain the project (i.e. maintenance of equipment and continual updating of maps) when AID support ceases.
3. Review and determine feasibility of Survey Department charging user agencies for services. If feasible evaluate and recommend method(s) of implementing a service for cost system. Consult user agencies and Ministry of Finance to determine feasible recommendations.
4. Identify in project implementation plan major points at which evaluation of the project should occur. Recommend nature and magnitude of evaluation resources required including nature of expatriate assistance required.

UNITED STATES OF AMERICA  
AGENCY FOR INTERNATIONAL DEVELOPMENT

c/o American Embassy, Colombo, Sri Lanka

3830045(5)  
PD-AAD-082

November 21, 1978

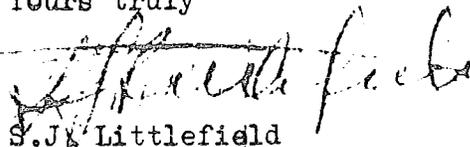
Mr. S. Velayutham  
Director  
External Resources Department  
Ministry of Finance & Planning  
Ceylinco House - 2nd Floor  
Colombo 1

Dear Mr. Velayutham:

Agricultural Base Mapping  
AID Project No. 383-0045  
AID Loan No. 383-T-020  
Implementation Letter No.4

This letter is to advise you in accordance with Article 5  
Section 5.3 of the Loan Agreement for Agricultural Base  
Mapping, that AID has determined that the conditions  
precedent specified in Sections 5.1 and 5.2 of the Agreement  
have been met.

Yours truly



S.J.K. Littlefield  
Director.

UNITED STATES OF AMERICA  
AGENCY FOR INTERNATIONAL DEVELOPMENT

American Embassy, Colombo, Sri Lanka.

3830045 (6)  
PD- AAD- 082

February 9, 1979

Mr. S.D.F.C. Nanayakkara  
Deputy Surveyor-General  
Surveyor-General's Office  
Kirula Road  
Colombo 5

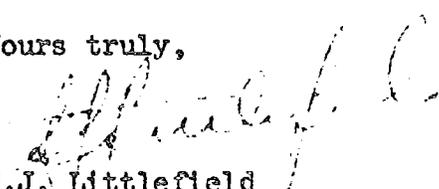
Dear Mr. Nanayakkara:

Agricultural Base Mapping  
AID Loan 383-T-020  
Implementation Letter No.6

This is to advise you that AID approves the tender document for air conditioning with the following changes as discussed in your office on February 8, 1979.

1. The tender document should show where the contractor's responsibility starts with regard to electrical service;
2. The document should note that no air handling equipment should be housed in rooms 2 and 3 since these rooms should be free of vibration;
3. Page 26 item 21.4 (a), the next to last sentence should be changed to read " ... parts will be excluded in determining ..."
4. Page 57 (7) add the following sentence "all motors over two horsepower must be 3 phase 400/440 volts."

Yours truly,

  
S.J. Littlefield  
Director

UNITED STATES OF AMERICA  
AGENCY FOR INTERNATIONAL DEVELOPMENT

American Embassy, Colombo, Sri Lanka.

March 19, 1979

Mr. S.D.F.C. Nanayakkara  
Deputy Surveyor General  
Surveyor-General's Office  
Kirula Road  
Colombo 5

Dear Mr. Nanayakkara:

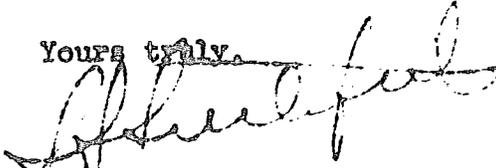
Agricultural Base Mapping  
AID Project No. 383-0045  
AID Loan No. 383-T-020  
Implementation Letter No.7

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This is to advise you that AID approves the draft contract for procurement of the CESSNA Aircraft with the following changes:

1. Article XVI 3(a) - pg 34 should be revised to read "Unless otherwise specified in writing, all goods and services except insurance provided by the Seller or any subcontractor under this contract shall have their nationality, source and origin in AID Geographic Code 941. The source and origin of insurance may be AID Geographic Code 935."
2. In the fourth line from the bottom on page 34, substitute "An eligible source/origin country" for "U.S.A."
3. Change Article XVI (6) d. on page 36 by making the first line read "The Seller agrees to endeavor to include ---."
4. Change Article XVI (7)b. on page 36 by making the first line read "The Seller agrees to endeavor to insert ---."
5. Change prices and dates to reflect purchase of the 1978 CESSNA instead of the 1979 CESSNA.

Yours truly,



S.J. Littlefield  
Director