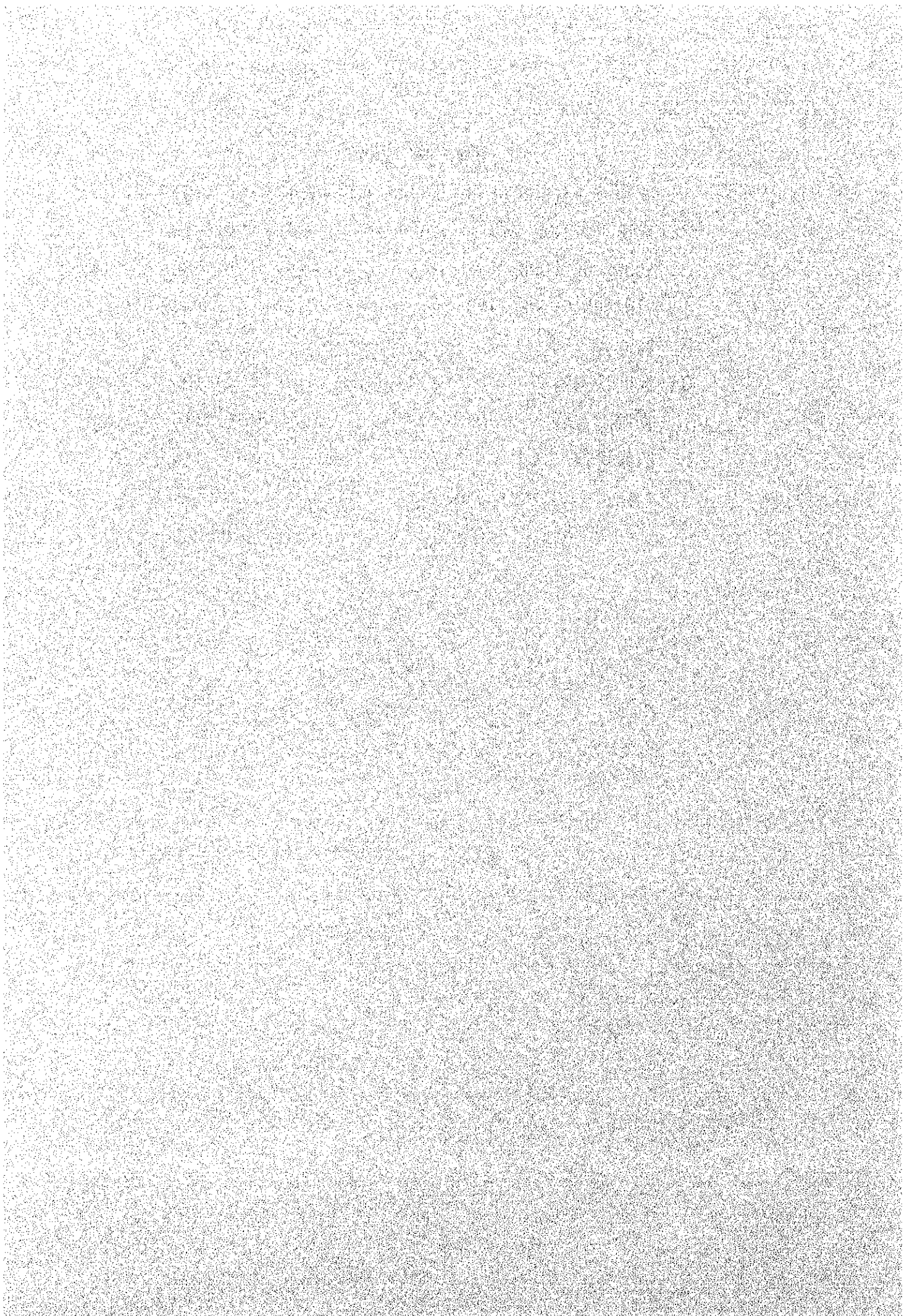


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1. 要請書、TERMS OF REFERENCE (T/R)

In case of reply the number and date of this letter should be quoted.

Our Ref. No. JAP/G/00.7

Your Ref. No. _____

Tel. No. _____



REPUBLIC OF GHANA

MINISTRY OF FINANCE AND
ECONOMIC PLANNING
P O. BOX M.40
ACCRA

29th September, 19 93

SPECIAL REQUEST FOR JAPANESE GOVERNMENT TECHNICAL
ASSISTANCE PROGRAMME - TOPOGRAPHICAL MAPPING

In response to your offer of assistance in the field of Mapping, we submit herewith a project proposal from our Survey Department for your review and onward transmission to the appropriate Japanese Government Authorities.

We hope this proposal meets with your approval and acceptance for funding, as it will be the first of its kind in Ghana.

for MINISTER OF FINANCE AND
ECONOMIC PLANNING
(MICHAEL BADDOO)

THE SPECIAL ASSISTANT,
EMBASSY OF JAPAN,
ACCRA.

In Case of reply the number and date of this letter should be quoted.

My Ref. No. BO6/19/Vol. I/37

Your Ref. No. _____

Telephone No. 77131 Accra.



REPUBLIC OF GHANA

Survey Department

P. O. Box 191,

Accra, Ghana.

11th August, 1993

HIS EXCELLENCY,
THE JAPANESE AMBASSADOR,
JAPAN EMBASSY,
ACCRA, GHANA.

THRO' THE HON. MINISTER,
MIN. OF FOREIGN AFFAIRS,
ACCRA.

THRO' THE HON MINISTER,
MIN. OF LANDS AND FORESTRY,
ACCRA.

Dear Sir,

APPLICATION FOR JAPANESE GOVERNMENT TECHNICAL ASSISTANCE FOR TOPOGRAPHIC MAPPING

The Survey Department of Ghana has the statutory responsibility of planning, supervision and execution of all topographic and other national surveys as well as the production of maps, plans and other map substitutes required for socio-economic development and judicious exploration and exploitation of the natural resources of the nation.

In meeting the above responsibilities, the Department is mainly supported by the Central Government both financially and materially. However, due to the many financial constraints on the Central Government's budgetary financing, it is unable to fully meet all the departmental needs for funding necessary to satisfy the ever increasing demands of the map users and the requests for survey.

It is due to these constraints that the Ghana Government has obtained some assistance from the World Bank, on behalf of the Survey Department for limited digital equipment and large scale mapping of a few urban centres. This assistance, needless to say is not adequate and doesn't tackle mapping of the identified area. If the Department is to meet the increasing large demands for maps and survey data there is an urgent need for technical assistance support from other sources. Therefore as part of the interventions for institutional strengthening, the Survey Department, acting through the Ministry of Lands and Forestry, is seeking Japanese Government Technical Assistance to map the Southern portion of Ghana bounded approximately by longitudes 3° 00'W and 1° 30'E; and latitudes 4° 30'N and 6° 30'N (the area is as shown on the attached to the Project Proposals).

PROJECT OBJECTIVES

The project, which covers an area of about 35,000 sq kms, has the following objectives :

1. Topographic mapping covering a portion of the Southern part of Ghana to be provided in multiple colours at a scale of 1:50,000.
2. Necessary technology to be transferred to the Survey Department Staff at each stage of the mapping process (both locally and in Japan).


It is to be noted that the entire cost of the project would be borne by the Japanese Government.

In view of the importance of mapping to national development, we pray that the Japanese Government would give this request all the needed attention, to enable this project become a reality.

We are forwarding herewith, a project proposals for your kind consideration and approval.

Please, accept our highest assurances in this regard.

Yours faithfully,


DIRECTOR OF SURVEYS
(ALHAJI I. ABU)

cc:- The Hon. Minister,
Ministry of Finance and
Economic Planning,
Accra.

Project Title : Topographic Mapping of Southern part of the Republic
of Ghana
Requesting Agency : The Survey Department of Ghana (Ministry of Lands and
Forestry)
Implementing Agency : Survey Department of Ghana
Responsible Ministry : Ministry of Lands and Forestry
Source of Assistance : The Government of Japan
Type of Assistance : Development study

SUMMARY

The Government of the Republic of Ghana seeks technical co-operation of the Government of Japan to realize a project of National Base Mapping of the South of the country. The tasks and objective are defined and justification for the project is stated hereunder. The mapping shall be done in metric units.

PROJECT NAME

1:50,000 Topographic mapping of Southern part of Ghana

LOCATION

An area of approximately 35,000 sq. km bounded by Longitudes $3^{\circ} 00'W$ and $1^{\circ} 30'E$ and Latitudes $4^{\circ} 30'N$ and $6^{\circ} 30'N$ lying at the Southern area in Ghana. Please see the attached map.

BACKGROUND

Ghana covers an approximate area of 240,000 sq. km and is divided into Ten (10) administrative regions.

The project covers the Southern and part of the country lying approximately between Latitudes $4^{\circ} 30'N$ and $6^{\circ} 30'N$ and Longitudes $1^{\circ} 30'E$ and $3^{\circ} 00W$

Some major cities lying in the area are:- Accra, Cape Coast, Sekondi-Takoradi, Obuasi, Prestea, Tema, Tarkwa and Saltpond etc.

AGRICULTURAL IMPORTANCE

Even though the total land area to be mapped under, this project is only 13% of the country's total, its contribution to the Socio-economic activities

of the nation as a whole is very significant. About 20% of the crop output of the country was produced by this area in 1990 and 18% of total crop output in 1991. The following items are also available in large quantity which contribute to the nation's foreign exchange earnings :- Coffee, Timber (various species), copra, palm-trees, etc.

INDUSTRIAL IMPORTANCE

The area has the highest concentration of industries ie. 71% (1852 out of a total of 2,612 for the whole country). The industries range from electrical, wood processing to food and beverage manufacturing.

MINING ACTIVITIES

The area has some of the richest gold mines in both Ghana and the world. Over 90% of the total number of mines in Ghana are located in the area. Other existing minerals are manganese and bauxite. Notable places where the minerals are mined are Obuasi-(Gold), Esaase (Ashanti)-(Gold) Tarkwa-(Gold), Prestea-(Gold), Teberebie-(Western-(Gold), Bogoso-(Gold) Nsuta-(Manganese), and Awaso-(Bauxite). Besides these existing mining operations, about 82 mining companies have been recently granted prospecting licences to begin operation within the area. There is also offshore oil prospecting within the project area.

JUSTIFICATION FOR THE PROVISION OF MAPS

The project which is to cover an approximate area of 35,000 sq. km within the Southern area of Ghana is of great importance because the maps are required for resource planning and judicious exploitation and exploration of the vast natural resources as well as implementation of development projects. The present maps of the area are very old and were produced from 1960's and 1970's photographs.

In view of the heavy concentration of socio-economic and cultural activities in the Southern part of Ghana the need for up-to-date maps and mapping data cannot be over emphasised as the present ones are totally out of date.

With changes in land use, expansion of cities and towns and other infrastructural changes, as well as environmental degradation, the maps no

longer furnish the current and reliable data required for national developmental planning, with the required degree of accuracy.

From various meetings with map users, it could be seen that there is a great demand for topographical maps (1:50,000) of all the major cities and towns, particularly the regional and district capitals.

These maps are needed for use by many organizations, such as :-
Geological Survey Department, Town and Country Planning Department, Department of Urban Roads, Department of Feeder Roads, Ghana Highway Authority, Lands Commission Secretariat, Land Title Registry, Deeds Registry, District Assemblies, Volta River Authority, Electricity Corporation, Environmental Protection Council, Ghana Water and Sewerage Corporation, Universities and Schools.

Coupled with the above is the numerous requests received from private mining and timber companies for current and reliable maps in the Southern part.

Ghana under the Environmental Resource Management Project (GERMP) financed with credit facility from IDA is embarking on digitization of the existing 1:50,000 maps produced over 20 years ago for the creation of a topographic data base for an operational GIS for environmental monitoring. The Survey Department and the World Bank recognised the need for revised 1:50,000 maps at the planning stage of the GERMP. This was however shelved because of time and financial constraints. The only alternative is to seek assistance from donor agencies to separately revise or up-date the 1:50,000 maps in digital format for future maintenance of the data base to be established under the GERMP.

The points raised above therefore, indicate the need for the revision, of the 1:50,000 maps sheets, so that investors, researchers, decision-makers and implementors would have current and accurate data needed for all development planning in the country, which is necessary for socio-economic growth.

The existing 1:50,000 maps were produced in imperial units. Since Ghana went metric in 1974, both foreign and local map users have been demanding data

and information in metric units, which unfortunately could not be met. Latest developments in equipment for Surveying and Mapping as well as the new world reference system have necessitated the need to collect data in metric units. It is therefore appropriate that this project should be carried out in metric units to meet the demand for metric data and information.

In the light of the above reasons, the request of the Government of Ghana to the Government of Japan for Japanese Technical Assistance to realize the topographic mapping of the Southern area is a laudable one and needs full support.

PROJECT OBJECTIVES

- (1) Topographic maps covering the Southern area shall be provided in multiple colours at a scale of 1:50,000
- (2) Necessary technology shall be transferred to the Survey Department staff through each stage of the mapping process (both locally and foreign).

PROJECT COMPONENTS

The project area covering approximately 35,000 sq. km will consist of the following components :-

- (i) Aerial photography at a scale of 1:40,000 (rural areas) & 1:10,000 (Cities/Towns)
- (ii) Signalization and Monumentation
- (iii) Ground Control Survey (Levelling and Control Survey by GPS) in metric units.
- (iv) Preliminary photogrammetric plotting at a scale of 1:50,000 (metric units)
- (v) Field completion
- (vi) Cartography
- (vii) Printing
- (viii) Technical Seminars
- (ix) Technology Transfer (both locally and foreign)

PROJECT DURATION

The project shall be within a period of 3 years.

IMPLEMENTING AGENCY

The Survey Department, Ministry of Lands and Forestry of Ghana shall be the implementing agency of the project.

OVERVIEW OF SURVEY DEPARTMENT-GHANA

Survey Department which is the sole mapping agency for Ghana, was established in 1901 as the Mines Survey Department. It was reconstituted in 1908 as the Gold Coast Survey Department, and assigned the statutory responsibility of planning, supervision and execution of all topographic and other national surveys as well as the production of maps, plans and other map substitutes required for the socio-economic development and judicious exploration and exploitation of our vast natural resources by all relevant sectors of the economy.

The department also supervises, surveys carried out by private surveyors for various individuals and Government Organisations. It is responsible for aerial photographic specifications, Air Surveys, storage of aerial photos, air survey films (negatives and positives) for public use. It is responsible too for the examination and certification of all Survey Instruments and equipment used by Licensed Surveyors.

PROGRAMMES

The programme of the department over the years include :-

- (i) Framework Surveys and Research
- (ii) Topographical mapping at medium and Small scales
- (iii) Large Scale Mapping of Cities and Towns
- (iv) Cadastral and Engineering Surveys
- (v) Provision of Secondary Vertical and Planimetric Controls
- (vi) Demarcation of International Boundaries
- (vii) Hydrographic Surveys
- (viii) Revision of Maps
- (ix) Land Title Registration
- (x) Cartographical Designing and Production
- (xi) Lithographic Reproduction
- (xii) Departmental Training

In order to carry out its numerous survey programmes, the department has a Training School, which trains Technical Surveyors and Draughtsmen to complement the Professional Staff.

EXECUTION PROCEDURES

The Survey Department is programmed into the following sections for effective management and optimal production :-

- (i) General Administration
- (ii) Regional Field Section
- (iii) Examination and Computing Section
- (iv) Photogrammetric Section
- (v) Cartographic Section
- (vi) Lithographic Section
- (vii) Land Title Registration Section
- (viii) Survey and Cartographic Schools

CONSTRAINTS

The Survey Department capabilities are currently limited to conventional surveys and mapping.

The conventional surveys are slow, labour intensive and expensive. Triangulation, Trilateration and Traversing must be used to extend control from the existing network. Adjustments to the survey networks are only rudimentary because the Department lacks the computing equipment necessary for network-wide adjustments. The Department cannot densify the high order survey works because it does not have adequate long range, accurate electronic distance measuring equipment (EDM). This limitation severely constraints surveying productivity.

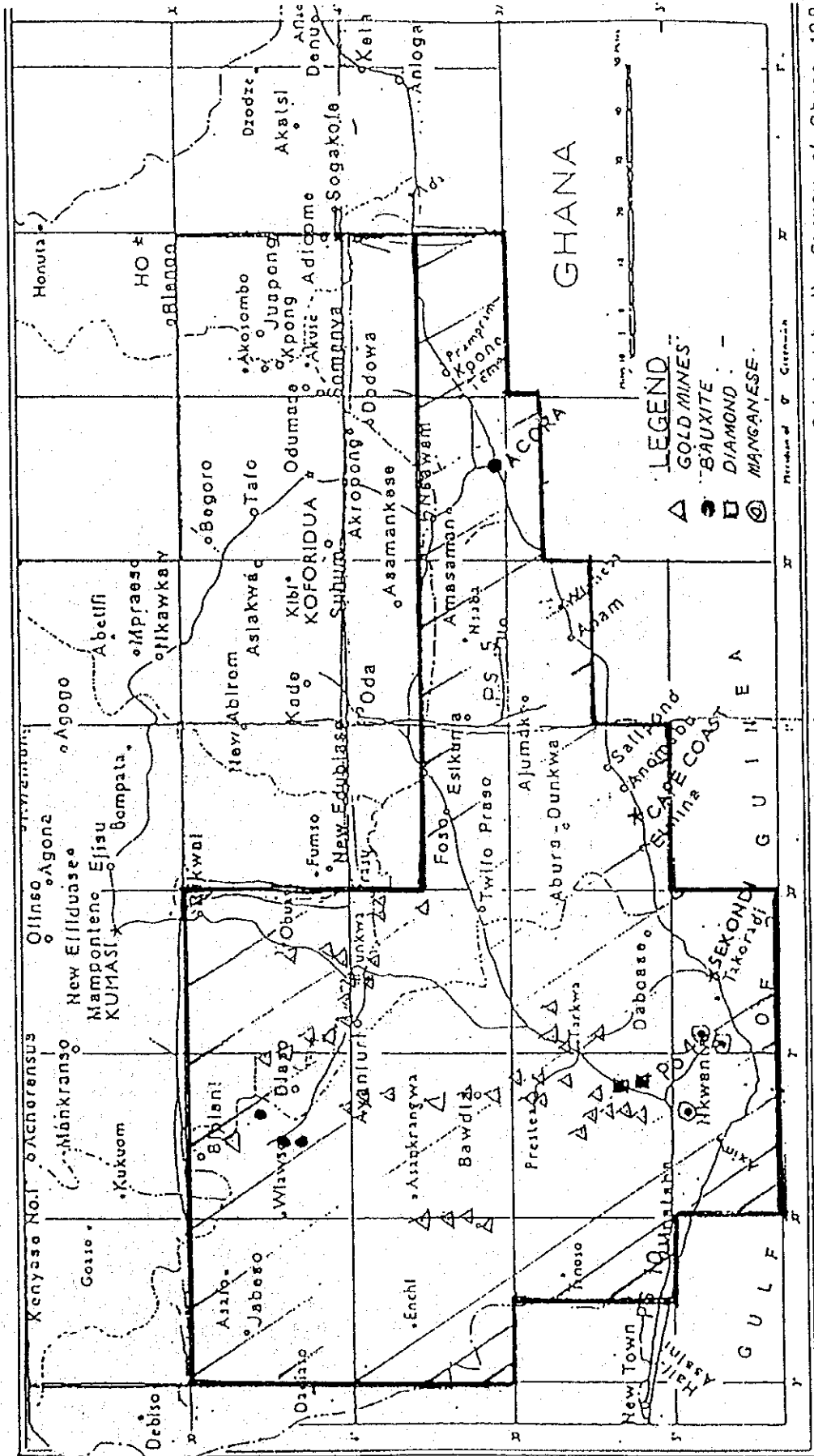
The few stereoplotting equipment available are in poor condition owing to the environmental conditions under which they have been operated and due to age and lack of spare parts for maintenance.

The Photomechanical Reproduction capabilities are limited to one-to-one scale contact work with the film being processed manually.

Printing capabilities are based on a new, high capacity, two colour offset press. The printing shop is functional but it is limited in capacity by its poor facility for plate making.

The capabilities described above are often completely negated by lack of materials.

TOPOGRAPHIC MAPPING OF THE SOUTHERN PART OF THE REPUBLIC OF GHANA



Drawn and Printed by the Survey of Ghana, 1968

2. 変更T/R

In Case of reply the
number and date of this
letter should be quoted.

My Ref. No. B06/19/Vol.1/42

Your Ref. No. _____

Tel. No. 777331 Accra.



REPUBLIC OF GHANA

Survey Department

P. O. Box 191,

Accra, Ghana.

15th February 1995.

THE RESIDENT REPRESENTATIVE
JAPAN INTERNATIONAL CO-OPERATION AGENCY (GH)
P.O. BOX 6402
ACCRA-NORTH

Dear Sir,

APPLICATION FOR JAPANESE GOVERNMENT
TECHNICAL ASSISTANCE FOR TOPOGRAPHIC MAPPING

We acknowledge with thanks receipt of your letter No. JICA/JMG/64/Vol.2/53 dated 2nd February, 1995 and forward herewith the redesignated and prioritized map of the new project area covering approximately 25,000 sq.km. The complete description of the boundaries is attached.

In respect of the scale of photography for 1:50,000 topographical map, we prefer a larger photoscale because technically, errors are increased when small scale maps are enlarged, and therefore a photoscale of 1:60,000 used to produce line maps of scale 1:50,000 means an enlargement and will also increase the magnitude of errors on the maps.

On the other hand if the photoscale is larger than the scale of the line map, then a reduction in scale from photo to map scale will result in the reduction of errors.

Furthermore, our experience have shown that photography at 1:40,000 or larger is most suitable for the type of terrain we have in Ghana. We are concerned that it will be very difficult to extract features required to be shown on 1:50,000 maps from 1:60,000 photography.

We appreciate fully all your efforts to assist us on this project and look forward to working with you soon.

Yours faithfully,


DIRECTOR OF SURVEYS
(NAA ALHAJI I. ABU)

Project Title : Topographic Mapping of Southern part of the Republic of Ghana.

Requesting Agency : The Survey Department of Ghana (Ministry of Lands and Forestry).

Implementing Agency : Survey Department of Ghana.

Responsible Ministry : Ministry of Lands and Forestry.

Source of Assistance : The Government of Japan.

Type of Assistance : Development study.

SUMMARY

The Government of the Republic of Ghana seeks technical co-operation of the Government of Japan to realize a project of National Base Mapping of the South of the country. The tasks and objective are defined and justification for the project is stated hereunder. The mapping shall be done in metric units.

PROJECT NAME

1:50,000 Topographic mapping of Southern part of Ghana

LOCATION

An area of approximately 25,000 sq.km bounded by longitudes 3° 00' W and 0° 00' and Latitudes 4° 40' N and 6° 30' N lying at the Southern area of Ghana. Please see the attached map.

BACKGROUND

Ghana covers an approximate area of 240,000 sq.km. and is divided into Ten (10) administrative regions.

The project covers the Southern part of the country, lying approximately between Latitudes 4° 40' N and 6° 30' N and Longitudes 0° 00' and 3° 00' W.

Some major cities lying in the area are: -Accra, Cape Coast, Sekondi-Takoradi, Obuasi, Prestea, Tema, Tarkwa and Saltpond etc.

AGRICULTURAL IMPORTANCE

Even though the total land area to be mapped under this project is only 11% of the country's total, its contribution to the Socio-economic activities of the nation as a whole is very significant. About 20% of the crop output of the country was produced by this area in 1990 and 18% of total crop output in 1991. The following items are also available in large quantity which contribute to the nation's foreign exchange earnings:-

Coffee, Timber (various species), Copra, Palm-trees, etc.

INDUSTRIAL IMPORTANCE

The area has the highest concentration of industries i.e. 71% (1852 out of a total of 2,612 for the whole country). The industries range from electrical, wood processing to food and beverage manufacturing.

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The area has some of the richest gold mines in both Ghana and the world. Over 90% of the total number of mines in Ghana are located in the area. Other existing minerals are manganese and bauxite. Notable places where the minerals are mined are Obuasi-(Gold), Esaase (Ashanti)-(Gold), Tarkwa (Gold), Prestea (Gold), Teberebie (Western)-(Gold), Bogoso-(Gold), Nsuta (Manganese), and Awaso (Bauxite). Besides these existing mining operations, about 82 mining companies have been recently granted prospecting licences to begin operation within the area. There is also offshore oil prospecting within the project area.

JUSTIFICATION FOR THE PROVISION OF MAPS

The project which is to cover an approximate area of 25,000 sq. km. within the Southern area of Ghana is of great importance because the maps are

required for resource planning and judicious exploration and exploitation of the vast natural resources as well as implementation of development projects. The present maps of the area are very old and were produced from 1960's and 1970'S photographs.

In view of the heavy concentration of socio-economic and cultural activities in the Southern part of Ghana the need for up-to-date maps and mapping data cannot be over emphasised as the present ones are totally out of date.

With changes in land use, expansion of cities and towns and other infrastructural changes, as well as environmental degradation, the maps no longer furnish the current and reliable data required for national developmental planning, with the required degree of accuracy.

From various meetings with map users, it could be seen that there is a great demand for topographical maps (1:50,000) of all the major cities, towns, and particularly the regional and district capitals.

These maps are needed for use by many organizations, such as:- Geological Survey Department, Town and Country Planning Department, Department of Urban Roads, Department of Feeder Roads, Ghana highway Authority, Lands Commission Secretariat, Land Title Registry, Deeds Registry, District Assemblies, Volta River Authority, Electricity Corporation, Environmental Protection council, Ghana Water and Sewerage Corporation, Universities and Schools.

Coupled with the above is the numerous requests received from private mining and timber companies for current and reliable maps in the Southern part.

Ghana under the Environmental Resource Management Project (GERMP) financed with credit facility from IDA is embarking on digitization of the existing 1:50,000 maps produced over 20 years ago for the creation of a topographic data base for an operational GIS for environmental monitoring. The Survey Department and the World Bank recognised the need for revised 1:50,000 maps at the planning stage of the GERMP. This was however shelved because of time and financial constraints. The only alternative is to seek assistance from donor agencies to separately revise or up-date the 1:50,000 maps in digital format for future maintenance of the data base to be established under the GERMP.

The points raised above therefore, indicate the need for revision, of the 1:50,000 map sheets, so that investors, researchers, decision-makers and implementors would have current and accurate data needed for all development planning in the country, which is necessary for socio-economic growth.

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PROJECT OBJECTIVES

- (1) Topographic maps covering the Southern area shall be provided in multiple colours at a scale of 1:50,000
- (2) Necessary technology shall be transferred to the Survey Department staff through each stage of the mapping process (both locally and foreign).

PROJECT COMPONENTS

The project area covering approximately 25,000 sq. km. will consist of the following components:-

- (i) Aerial photography at a scale of 1:40,000 (rural areas) & 1:10,000 (cities and towns)
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- (viii) Technical Seminars
- (ix) Technology Transfer (both locally and foreign)

PROJECT DURATION

The project shall be within a period of 3 years.

IMPLEMENTING AGENCY

The Survey Department, Ministry of Lands and Forestry of Ghana shall be the implementing agency of the project.

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PROGRAMMES

The programme of the department over the years include :-

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- (v) Provision of Secondary Vertical and Planimetric Controls

- (vi) Demarcation of International Boundaries
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- (x) Cartographical Designing and Production
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EXECUTION PROCEDURES

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- (viii) Survey and Cartographic schools

CONSTRAINTS

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The conventional surveys are slow, labour intensive and expensive.

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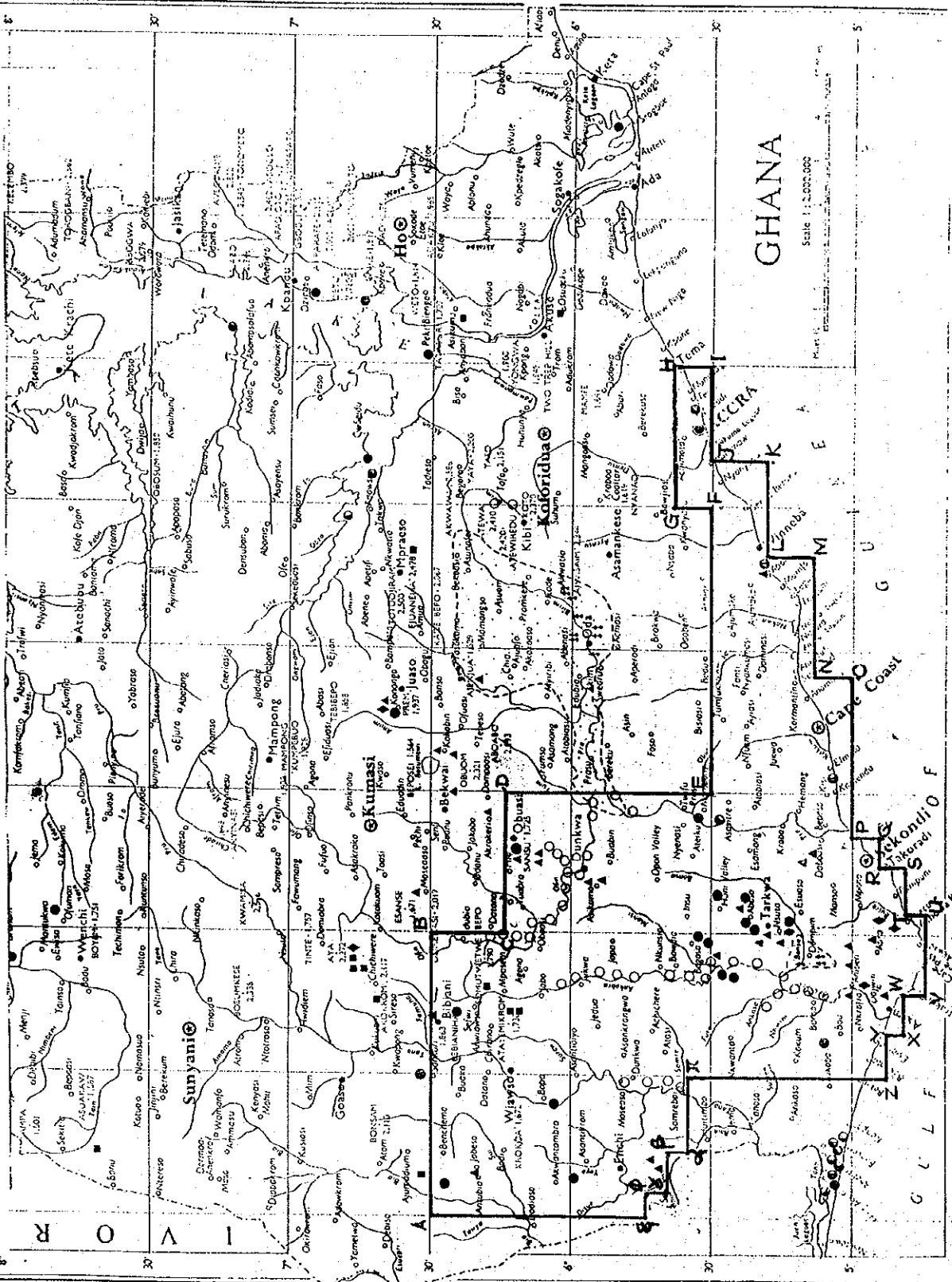
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The Photomechanical Reproduction capabilities are limited to one-to-one scale contract work with the film being processed manually.

Printing capabilities are based on a new, high capacity, two colour offset press. The printing shop is functional but it is limited in capacity by its poor facility for plate making.

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TOPOGRAPHIC MAPPING OF THE SOUTHERN PART OF THE REPUBLIC OF GHANA



GHANA

Scale 1:2,000,000

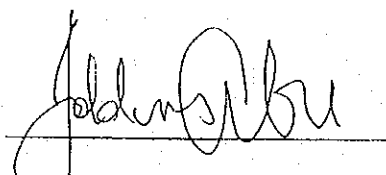
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A	6° 30'N	3° 00'W
B	6° 30'N	2° 00'W
C	6° 14'N	2° 00'W
D	6° 14'N	1° 30'W
E	5° 30'N	1° 30'W
F	5° 30'N	0° 30'W
G	5° 37'N	0° 30'W
H	5° 37'N	0° 00'
I	5° 30'N	0° 00'
J	5° 30'N	0° 20'W
K	5° 18'N	0° 20'W
L	5° 18'N	0° 41'W
M	5° 08'N	0° 41'W
N	5° 08'N	1° 06'W
O	5° 00'N	1° 06'W
P	5° 00'N	1° 39'W
Q	4° 54'N	1° 39'W
R	4° 54'N	1° 45'W
S	4° 48'N	1° 45'W
T	4° 48'N	1° 56'W
U	4° 44'N	1° 56'W
V	4° 44'N	2° 12'W
W	4° 48'N	2° 12'W
X	4° 48'N	2° 21'W
Y	4° 53'N	2° 21'W
Z	4° 53'N	2° 30'W
α	5° 35'N	2° 30'W
β	5° 35'N	2° 46'W
γ	5° 39'N	2° 46'W
δ	5° 39'N	2° 55'W
ϵ	5° 44'N	2° 55'W
ζ	5° 44'N	3° 00'W

3. SCOPE OF WORK

SCOPE OF WORK
FOR
TOPOGRAPHIC MAPPING
OF
SOUTHERN PART OF THE REPUBLIC OF GHANA
AGREED UPON BETWEEN
SURVEY DEPARTMENT OF GHANA,
MINISTRY OF LANDS AND FORESTRY
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

ACCRA, GHANA

17th March, 1995



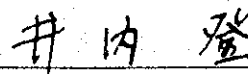
MAA Alhaji Iddrisu Abu

Leader

Director of Surveys

Survey Department of Ghana,

Ministry of Lands and Forestry



Mr. Noboru INOUCHI

Leader

Preparatory Study Team

Japan International

Cooperation Agency

I. INTRODUCTION

In response to the request of the Government of the Republic of Ghana (hereinafter referred to as "GHANA"), the Government of Japan (hereinafter referred to as "JAPAN") has decided to conduct the Topographic Mapping of Southern Part of the Republic of Ghana (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of JAPAN, will undertake the Study in close cooperation with the authorities concerned in GHANA.

Survey Department of Ghana, Ministry of Lands and Forestry (hereinafter referred to as "SDG"), the official agency responsible for survey and mapping in Ghana, shall act as an executing agency to the Japanese Study Team and also as a coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

The present document sets forth the Scope of Work with regard to the Study.

II. OBJECTIVE

The objective of the Study is to prepare the 1/50,000 Metric Topographic Map covering an area of approximately 25,000km² (25,000 square kilometers) shaded on an attached map (APPENDIX-1).

III. SCOPE OF WORK

In order to achieve the above mentioned objective, the Study will cover the following items (The technical details are shown in APPENDIX-2).

1. Aerial Photography

Aerial Photographs shall be taken at a scale of approximately 1/60,000.

Setting of airphoto signals shall be done, if necessary, prior to commencement of the aerial photography.

2. Ground Control Point Survey

Although existing control points will be used for the topographic mapping, establishment of temporary control points shall be carried out, if necessary.

(1) Traversing and Satellite Geodesy

Supplementary map control points necessary for aerial triangulation and mapping work shall be established by traversing and/or satellite positioning.

(2) Leveling

Leveling shall be carried out to obtain vertical controls for aerial triangulation and mapping work starting from existing bench marks.

3. Pricking

Pricking of identified control points on the aerial photographs shall be done in the field.

4. Field Verification

The topographic map information related to land use, vegetation, etc. shall be verified in the field.

5. Aerial Triangulation

Aerial Triangulation shall be carried out by analytical block adjustment method.

6. Stereo Plotting

Stereo Plotting shall be carried out using stereo plotting instruments at the scale of 1/50,000.

7. Compilation

Compilation shall be carried out based on restitution manuscripts and field verification data.

8. Field Completion

Topographic features, vegetation, etc., which cannot be properly identified in the course of compilation shall be verified in the field and plotted on the compilation sheet. Administrative boundaries and geographical names shall be verified and indicated on the paper copy of the compilation sheet by SDG.

9. Drafting

Based on the compiled sheet, scribing shall be carried out on stable polyester base for several color separation plates. Map style and symbols shall be those adopted by SDG. And the contents of map shall comply with the standards

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of SDG.

10. Printing

Plate making shall be carried out using 1/50,000 scribed negatives, and printing shall be carried out by offset method.

11. Recommendations

Recommendations for improvement of management and operation systems and maintenance system of control points and maps shall be provided.

IV. STUDY SCHEDULE

The whole work shall be conducted in accordance with the attached tentative schedule (APPENDIX-3).

V. REPORTS AND FINAL RESULT

Annual Reports shall be submitted to SDG by the Japanese Study Team (hereinafter referred to as "the Study Team") every Japanese fiscal year (from April to March). The materials mentioned in APPENDIX-4 shall also be submitted to SDG by the Study Team.

All maps produced under the Study shall bear at the lower margin the following:

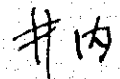
"This map was prepared jointly by Japan International Cooperation Agency (JICA) under the Japanese Government Technical Cooperation Programme and the Government of Ghana."

VI. UNDERTAKING OF GHANA

1. To facilitate smooth conduct of the Study, GHANA shall take necessary measures;
 - (1) to ensure the safety of the Study Team,
 - (2) to permit the members of the Study Team to enter, leave and sojourn in Ghana for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees,
 - (3) to exempt the members of the Study Team from taxes, duties and other charges on equipment, machinery and other materials brought into Ghana for the conduct of the Study,

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- (4) to exempt the members of the JICA Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the JICA Study Team for their services in connection with the implementation of the Study,
 - (5) to provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced into Ghana from Japan in connection with the implementation of the Study,
 - (6) to secure permission for entry into private properties or restricted areas with Ghanaian counterpart for the conduct of the Study,
 - (7) to secure permission for the Study Team to take all data and documents (including maps, photographs) related to the Study out of Ghana to Japan, provided said documents shall remain the property of Government of Ghana except those paid for by the Study Team, and
 - (8) to provide medical services as needed. Its expenses will be chargeable on members of the Study Team.
2. GHANA shall bear claims, if any arises, against the members of the Study Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arises from gross negligence or willful misconduct on the part of the members of the Study Team.
3. To facilitate smooth conduct of the Study, SDG shall make necessary arrangements for the Study Team, in cooperation with other relevant organizations as follows;
- (1) to secure permission for flights for the aerial photography and the use of airports for the implementation of the Study upon written request,
 - (2) to assist to take permission for the use of communication facilities including transceivers which may be used in Japanese language, with allocated frequencies, and
 - (3) to assist hiring necessary number of laborers and watchmen in the project sites.



4. SDG shall, at its own expense, provide the Study Team with the following in cooperation with other related organizations;

- (1) available data and information related to the Study upon request,
- (2) counterpart personnel (staff of SDG),
- (3) suitable office space with necessary equipment in Accra,
- (4) credentials or identification cards to the members of the Study Team,
- (5) administrative and technical support,
- (6) existing facilities and space of SDG for processing aerial photographs,
- (7) information on necessary administrative boundaries and geographical names to be shown on the maps. The correctness of such information is the responsibility of SDG.
- (8) cartographic specifications for 1/50,000.

VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures;

1. To dispatch, at its own expense, the Study Team to Ghana for Premarking, Aerial Photography, Ground Control Point Survey, Pricking, Field Verification and Field Completion with the use of local expertise as much as applicable with JICA's supervision,
2. To carry out Aerial Triangulation, Stereo Plotting, Compilation, Drafting and Printing in Japan at its own expense, and
3. To pursue technology transfer to Ghana counterpart personnel in the course of the Study.

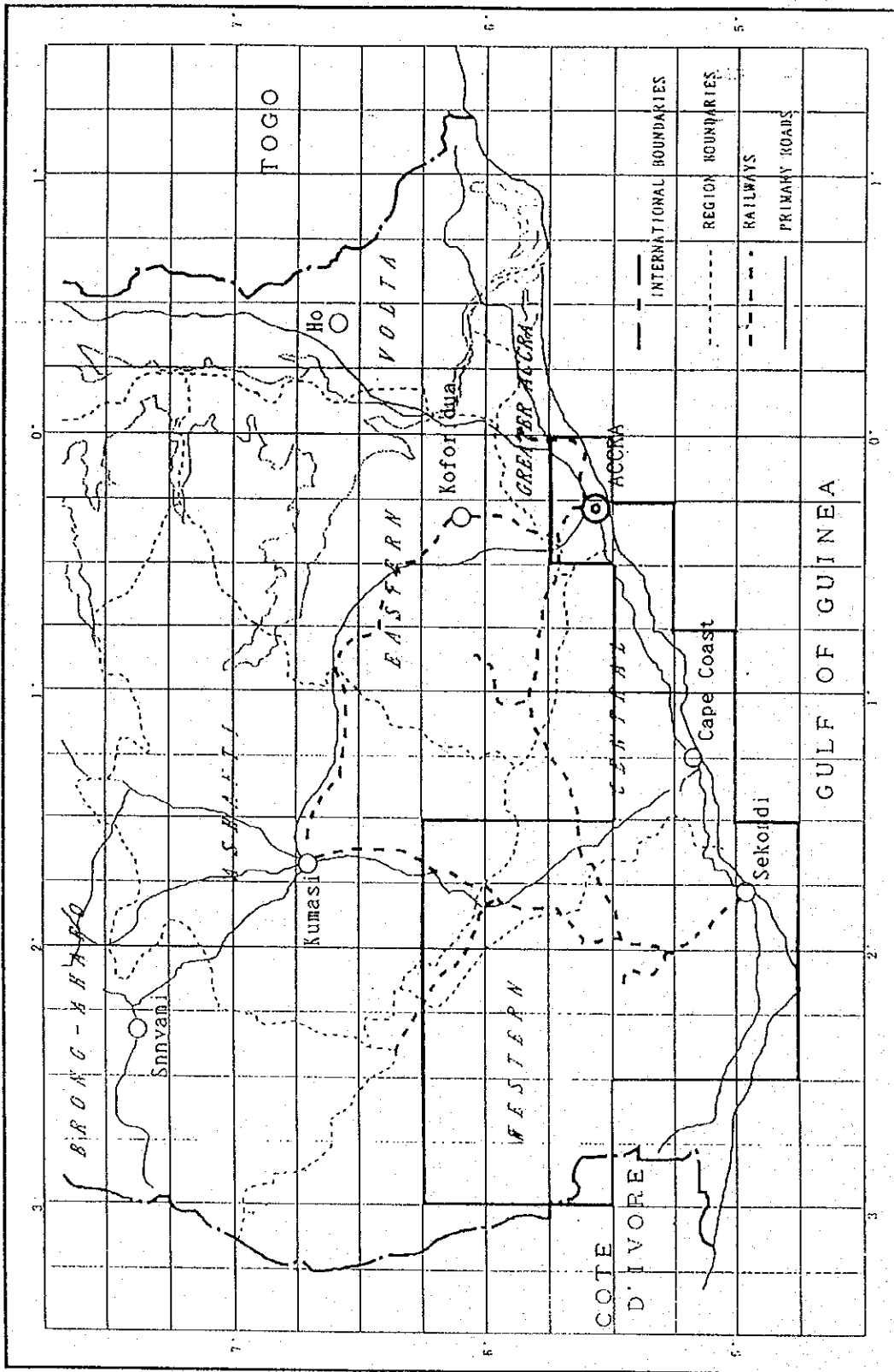
VIII. CONSULTATION

JICA and SDG shall consult with each other in respect of any matter that may arise from or in connection with the Study.



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APPENDIX-1



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Principal Technical Specification

1. Aerial Photography: super-wide angle camera
2. Ground Control Point Survey: 10^{-6} (Relative Accuracy)
3. Leveling
 - (1) Limit of Difference of Reciprocal Observation for Minor Order Leveling for Photo Control
5cm \sqrt{S} , where S is expressed in km.
4. Mapping
 - (1) Projection: Ghana Modified Transvers Mercator Projection
 - (2) Sheet Line: 15' \times 15' in Latitude and Longitude
 - (3) Contour Interval: 10m
 - (4) Number of Colors: 5 colors

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TENTATIVE SCHEDULE

ITEM	MONTH	1	3	10	20	30	40	42
Signalization (premarking)								
Aerial Photography								
Ground Control Point Survey								
Pricking								
Aerial Triangulation								
Field Verification								
Stereo Plotting								
Compilation								
Field Completion								
Drafting								
Printing								

Note:  Work in Ghana
 Work in Japan

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FINAL RESULTS

1. Aerial Photography
 - (1) original negative-film (1set)
 - (2) contact positive prints (2sets)
 - (3) index map of aerial photographs

2. Ground Control Point Survey
 - (1) final result tables
 - (2) distribution and route diagram

3. Pricking
 - (1) description of Pricking

4. Aerial Triangulation
 - (1) final result tables
 - (2) diapositive films (1set)

5. Topographic Mapping
 - (1) scribed sheets
 - (2) printed maps (1000 copies for each sheet)
 - (3) reproduceable sheets (1set)

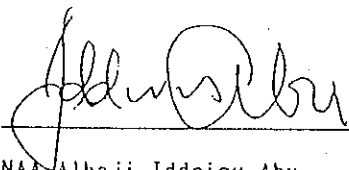
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4. MINUTES OF MEETING

MINUTES OF MEETING
FOR
THE SCOPE OF WORK
FOR
TOPOGRAPHIC MAPPING
OF
SOUTHERN PART OF THE REPUBLIC OF GHANA
AGREED UPON BETWEEN
SURVEY DEPARTMENT OF GHANA,
MINISTRY OF LAND AND FORESTRY
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

ACCRA, GHANA

17th March, 1995



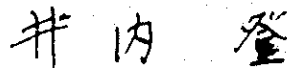
NAA Alhaji Iddrisu Abu

Leader

Director of Surveys

Survey Department of Ghana,

Ministry of Lands and Forestry



Mr. Noboru INOUCHI

Leader

Preparatory Study Team,

Japan International Cooperation Agency

The Preparatory Study Team (hereinafter referred to as "the Team"), for Topographic Mapping of Southern Part of the Republic of Ghana (hereinafter referred to as "the Study") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Noboru INOUCHI visited the Republic of Ghana from March 12 to March 31, 1995, and had a series of discussions with the Ghana side, represented by Survey Department of Ghana, Ministry of Lands and Forestry (hereinafter referred to as "SDG"). List of Participants is shown in Attachment.

As a result of the said discussions, both sides came to an agreement on the SCOPE OF WORK (hereinafter referred to as "S/W") of the Study, and signed it on March 17, 1995.

This document summarizes major items discussed between both sides and is meant to supplement the S/W for the smooth conduct of the Study.

1. Mapping Area

Both sides agreed that the mapping area should be approximately 25,000km² (shown in appendix-1 of S/W).

2. Scale of Aerial Photography

The scale of aerial photography 1/60,000 is finally agreed upon.

3. Flight Permission

SDG shall obtain flight permission for aerial photography from the Government of Ghana upon written request. And on the national border of Cote d'Ivoire, SDG will obtain the permission from the Government of Cote d'Ivoire. Both shall be obtained prior to commencement of the Study.

In case the flight permission by Cote d'Ivoire is not available, the area



approximately 10km inside along the national border shall be basically excluded for aerial photography.

4. Radio Frequency

SDG shall assist the Japanese Study Team to take permission for the use of radio frequency from Frequency Board.

5. Contour Interval

Due to the eager and strong request of Ghana side, contour interval will be 10m. However in mountainous and/or steep area, contour interval will be 20m.

6. Necessary Vehicles

SDG strongly requested necessary vehicles for the Study because the Government of Ghana cannot arrange those vehicles. The Team promised to convey that request to JICA.

7. Counterpart Training

SDG strongly requested to send participants to the counterpart training in Japan. The Team promised to convey that request to JICA and related organizations.

8. Retainment of Maps

SDG agreed that Japanese sides can retain some sets of printed maps which will be produced as a result of the Study as long as they are not given to third parties without approval of Government of Ghana represented by SDG.



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PARTICIPANT LIST

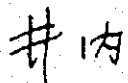
GHANA SIDE

NAME	POSITION
NAA ALHAJI IDDRISU ABU	Leader, Director of Surveys
Dr. George J.M. Zarzycki	Advisor Land Administration and Information Systems, Ghana Urban II Project
Mr. E.S.SAI	Acting Deputy Director
Mr. J.DOTSE	Principal Staff Surveyor/Regional Surveyor
Mr. J.T.ODAMETAY	World Bank Project Unit /Principal Survey and Cartographic School
Mr. R.TETTEH	Chief Lithographer
Mr. ANDOH KESSON	Officer-in-charge Photogrammetric Section
Mr. JOHN AYER	World Bank Project Unit
Mr. ARKU LAWSON	Chief Cartographer
Mr. J.ESSIEN	Assistant Chief Cartographer
Mr. JONES OFORI BOADU	Assistant Examiner
Mr. W.K.OPOKU	World Bank Project Unit
Mr. E.A.LOMO	Assistant Chief Lithographer
Mr. MARCUS A. TABIL	Examiner and computing

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JAPAN SIDE

NAME	POSITION
Mr. INOUCHI, Noboru	Leader of the mission Director, Geodetic Department, Geographical Survey Institute (GSI), Ministry of Construction (MOC)
Mr. TSUJI, Hiromichi	Survey planning Research Geodesist, Geodetic Department, GSI, MOC
Mr. TAKITA, Yoshimi	Cost Estimate Topographic Division, Topographic Department, GSI, MOC
Mr. MAGOME, Hiroshi	Photogrammetry Director, Japanese Association of Surveyors
Mr. TANIKAWA, Toshiaki	Control Point Survey Chief, Japanese Association of Surveyors
Ms. KUDO, Mikako	Study Planning First Development Study Division, Social Development Study Department, Japan International Cooperation Agency (JICA)
Mr. KAI, Toshiharu	Deputy Director JICA Ghana Office

QUESTIONNAIRE

OF

JICA PREPARATORY STUDY TEAM

FOR

THE TOPOGRAPHIC MAPPING OF SOUTHERN PART

OF THE REPUBLIC OF GHANA

FEBRUARY, 1995

JAPAN INTERNATIONAL COOPERATION AGENCY

This questionnaire is prepared by the JICA preparatory Study Team for the Topographic Mapping of Southern Part of the republic of Ghana (hereinafter referred to as "the Study") so as to obtain basic information and data required for the Study.

Please try to answer all the questions in English and also identify materials requested in this questionnaire.

It would be highly appreciated if you could prepare replies for all the questions listed hereunder before the Study Team's arrival in Ghana.

Based on the filled-in questionnaire, the Study Team hopes to ask for additional data/information for further clarification during the mission.

Thank you for your kind cooperation in advance.

I. GENERAL

The Preparatory Study Team would like to receive general explanation and related information on the following issues at the occasion of 1st meeting:

- (1) Background and priority of the Project
- (2) Conditions of existing maps and aerial photographs
- (3) Actions/discussions having been undertaken / being undertaken between the Ghana government and international organizations (such as World Bank, UNDP etc.) in connection with the Project or Survey of Ghana.
- (4) Budgetary / manpower / survey equipment situations of Survey Department of Ghana for the past five years.
- (5) Details of existing and on-going mapping/survey project

II. Confirmation of contents of your request

- (1) Area of aerial photography (attach the location map)
- (2) Scale of aerial photograph
- (3) Area of topographic mapping (attach the location map)
- (4) Scale of topographic map
- (5) Contour interval
- (6) Projection
- (7) Reference Ellipsoid / Ellipsoidal elements
- (8) Sheet line
- (9) Number of colors

III. AVAILABLE DATA / INFORMATION
 1. SOCIO-ECONOMIC DATA / INFORMATION

ITEM OF NECESSARY DATA	AVAILABILITY		NAME OF MATERIALS
	AVAILABILITY	PLACE OF DATA AVAILABLE	
1. Latest socio-economic indicies (1) GNP and GDP (2) Population (3) Past and future population growth rate (4) Agricultural, industrial and mining products (by main sort) (5) Foreign trade (quantity and value) (6) Others 2. Existing development plans and reports (1) Economic development plans (2) Transportation development plans (3) Industrial development plans (4) Agricultural development plans (5) Mining development plans (6) Tourism development plans (7) Forecast of socio-economic indicators 3. Annual national budget with breakdown 4. Public investment by sector			

Note: Please mark for the Data/Item in the "Availability" which is available.

2. ORGANIZATIONS AND FACILITIES

ITEM OF NECESSARY DATA	AVAILABILITY		NAME OF MATERIALS
	AVAILABILITY	PLACE OF DATA AVAILABLE	
<p>1. Central Government Organization</p> <p>(1) Organization chart</p> <p>(2) Related organizations of this project</p> <p>2. Organization of Survey Department of Ghana</p> <p>(1) Organization chart</p> <p>(2) Number of the employees</p> <p>(3) Recruiting system</p> <p>(4) Training system</p> <p>(5) Annual report</p> <p>3. List of equipments</p> <p>(1) EDM</p> <p>(2) Theodolite</p> <p>(3) Level</p> <p>(4) Comparator</p> <p>(5) Plotter</p> <p>(6) Computer</p> <p>(7) GPS</p> <p>(8) Others</p>			

3. TECHNICAL DATA/INFORMATION

ITEM OF NECESSARY DATA	AVAILABILITY		NAME OF MATERIALS
	AVAILABILITY	PLACE OF DATA AVAILABLE	
<p>1. Control point survey (horizontal and vertical)</p> <p>(1) Index maps, description of points, control data</p> <p>(2) Number and location of real existing points</p> <p>*(Please prepare (1)&(2) before our arrival because we need these for planning of our site survey.)</p> <p>(3) Datum</p>			
<p>2. Map</p> <p>(1) Existing topographic and thematic maps</p> <p>*(urgently need : 1/50,000 and 1/250,000 topographic maps</p> <p>Please prepare for our site survey.)</p> <p>(2) Specification of mapping</p> <p>(3) Laws and regulation of map</p>			
<p>3. Aerial photography</p> <p>(1) Existing aerial photographs for the proposed area</p> <p>(2) Airplane</p> <p>(3) Aerial camera</p> <p>(4) Organization for aerial photography</p> <p>(If you have any experience, please recommend some company)</p> <p>(5) Airport base</p> <p>(6) Facilities for aerial photo processing</p> <p>(7) Permission of taking aerial photographs</p> <p>(Permission of GHANA and COTE D'IVOIRE)</p> <p>(8) Appropriate season for aerial photography</p>			

(TECHNICAL DATA / INFORMATION)

ITEM OF NECESSARY DATA	AVAILABILITY		NAME OF MATERIALS
	AVAILABILITY	PLACE OF DATA AVAILABLE	
4. Meteorological data in the proposed area (1) Rain fall by months (2) Temperature by months (3) Amount of cloud by months (4) Inundation area and its duration			

4. OTHER RELATED INFORMATION

ITEM OF NECESSARY DATA	AVAILABILITY		NAME OF MATERIALS
	AVAILABILITY	PLACE OF DATA AVAILABLE	
<ol style="list-style-type: none"> 1. Approval of use of radio call equipment 2. Transport (vehicles) 3. Counterpart personnel (person of SDG) 4. Office space (in the office of SDG) 5. Information of harmful animals, insects, plants, and Disease 6. Restrictions or constraints of this project 			

6. 質問書回答

ANSWERS TO QUESTIONNAIRE FOR JAPANESE TEAM

1. Background of this city

Please refer to pages 1-4 of the attached project document.

Q2. Conditions of existing maps and photographs.

Existing photographs were taken in 1960's and 1970's.

These are old and out of date and need revision.

Existing maps are totally out of date with present developments such as changes in land use, urbanisation and other infrastructural changes, environmental degradation, impact assessment and auditing.

Existing measurements are in feet. Since Ghana went metric in the 1974, our maps are still in imperial units. We therefore wish that this project will be the starting of metric mapping in this country.

Q3. Actions and discussions with World Bank etc.

There had not been any discussion with the world bank on this particular project. The world bank is however helping to digitise the old existing maps.

4. Budgetary situation from 1990-1995

Year	Recurrent budget	Capital budget
1990	170,792,000	
1991	192,878,000	
1992	239,676,000	
1993	363,823,000	
1994	414,570,000	473,600,000
1995	809,320,000	800,000,000

Manpower Situation

Year	Total Strength
1990	600
1991	586
1992	583
1993	554
1994	540
1995	550

Manpower distribution for 1995

i)	General Administration	46
ii)	Photogrammetric Section	26
iii)	Examination Section	32
iv)	Land Title Section	26
v)	Stores	11
vi)	Cartographic Section	70
vii)	Lithographic Section	42
viii)	Regional field sections	
	Accra	36
	Eastern	19
	Volta	23
	Central	32
	Western	37
	Ashanti	32
	Brong Ahafo	39
	Northern	23
	Upper East	22
	Survey School	34
Total		= 550

EQUIPMENT SITUATION

The Survey department has the following equipment:

PHOTOGRAMMETRY

(i) Three (3) Wild A8 stereoplotter	1968
(ii) one (1) Wild B8 stereoplotter	1967
(iii) one (1) Cartoflex	1993
(iv) one (1) Topocart	1993
(v) one (1) Wild A7	1971

FIELD SECTIONS

(vi) Sixty-two (62) Jena Theodolites
(vii) Twenty-six (26) Level instruments
(viii) Twenty (20) RETA EDM
(ix) Ten (10) wild T2 Theodolites
(x) Eighteen (18) sokkia total stations
(xi) Four (4) 1600 Distomat (Wild)
(xii) four (4) Geodimeter 422 LR
(xiii) One set of wild GPS System

LITHOGRAPHIC SECTION

(xiv) one (1) double Demy Crabtree single colour printing machine acquired in 1943
(xv) one (1) double Demy Man single colour fast three offset printing machine acquired in 1951
(xvi) one (1) Quad crown printing down frame and Arc lamps acquired in 1953
(xvii) one Quad crown little John Whirler acquired in 1953
(xviii) one automatic Guillotine acquired in 1953

- xix) one quad crown duffa fully automatic proofing press acquired in 1954
- xx) one Quad crown suspension Graining Machine acquired in 1956
- xxi) one letter press printing machine acquired in 1959
- xxii) one double demy little John Whirler acquired 1955
- xxiii) one Aurelia A60 single colour offset press acquired in 1961
- xxiv) one De Vere 101 enlarger acquired in 1961
- xxv) one Roland Parva offset press acquired in 1991
- xxvi) one Mann Machie no.1 machine acquired in 1951
- xxvii) one Mann Machie no.3 machine acquired in 1955

ACQUISITION OF INSTRUMENTS OVER THE PAST 10 YEARS

1980, Jena Teodolite ..	40
Automatic Level ..	10
EOT 2000 EDM ..	10
T2 Wild Theodolite	5
Alidade with plane table	1
1985, Electronic Tacheometer Reta	10
T2 Wild Universal Theodolite	2
Carl Zeiss Jena Tacheometer Dahlta	15
Level instrument	8
1990, D1 1600 Distomat ...	4
T2 Wild Theodolite	4
Kassel Theodolite	10
Sokkia Total Station	4
Wild GPS System 200	1 (4 units)
Geodimeter 422	1
1995, Electronic Total Station	4

Total Station Set 3B 5

Wild Total station TC1010 4

5 Existing and on going projects

Digitisation of the existing topographic maps for the creation of a data base under the GERMP project is currently going on in the department

Ghana Environmental Resource Management Project.

(Canada)

PART II

Confirmation of Request:

- 1) Area 25000 km² shown on attached map
2. Scale of aerial photographs should be at least 1:40,000 or larger because of the following reasons
 - (a) Errors are minimised if scale of photography is larger than scale of line maps
 - (b) photographs are not only used for production of line maps but also serve as input for various departments and research institutions such as Forestry Department, Universities, Mineral prospecting companies. These use simple mirror stereoscopes for photo interpretation but require a lot of detail information
 - (c) For the more urban areas, information for large scale maps are often required which can not be extracted from small scale photographs.
- (3) Area of topographic mapping is 25,000 Km² shown on map
- (4) Scale of topographic maps shall be 1:50,000
- (5) Contour interval from 10m-15m
✓ previously we have used 50 ft (= 16 m)
- (6) PROJECTION:

Ghana has previously used a Traverse Mercator projection so existing values were computed on TM.

1/250,000

200 sheets Ghana
100 sheets in
Ghana

7) REFERENCE ELLIPSOID:

In 1977 Ghana agreed to change and adjust its coordinates on Clark 1880 spheroid and adopted beacon No. GCS 121 on longitude $-0^{\circ} 11' 46.08''$ and latitude $5^{\circ} 38' 52.27'' N$ as datum with coordinates 363356.268 in easterns and 108527.253 in Northern.

Ellipsoidal elements:

a=6378249 m. , b=6356515 m

(8) Sheet line 15' X 15'

(9) No of colours = 5

PART III

1. Information on 1.1-1.3 may be obtained from statistical Services department

Information on 1.4-1.6 may be obtained from ministry of trade and tourism

2 Information on Existing development plans may be obtained from Ministry of Finance and Economic Planning

3. Information on annual national budget may be obtained from ministry of Finance and Economic planning

4. Public Investment by sector information may be obtained from ministry of Finance and Economic planning

part iii section (2)

Organizations and facilities

1. Central Government Organization

1.1 Organisation chart

1.2 Related organizations of this project

Survey Department is the SOLE MAPPING ORGANIZATION for all government mapping projects. However there are many user organizations of the maps.

2.0 Organization of Survey Department of Ghana

- 1) Please see the attached Organization Chart of the Survey Department.
- 2) No of employees for 1995 is 550
- 3) Recruiting system:

Technical level personnel are normally trained by the department at its training school after approval is sought from the head of civil service. Middle level personnel are appointed through the public services commission.

4) Training system

The department has a training school which trains officers up to technical officer grade. The Department is currently preparing to upgrade its training school to diploma level. Since this has not materialised yet, training to diploma level is pursued at the University of Science and Technology. U.S.T. also runs degree programmes in Geodetic Engineering. The department also sponsors employees to pursue further training in institutions outside the country to update their knowledge on new mapping techniques.

5) Annual Reports

Annual reports are prepared on each section's performance as well as on each individual employee.

3.0

List of equipments

1) EDM	20
2) Theodolites	72
3) Level	26
4) Plotter	4
5) Computer	10

6) GPS 1 (4 units)

8) Other (Please see Section I above)

SECTION III

1. Control point survey

1.1-1.2 Description of points

Please refer to framework diagram attached

1.3) Datum

The height datum is the mean sea level

2. Maps

Please see accompanying 1:50,000 and 1:250,000 topographic maps

2.2 Specification of mapping

Line maps to be produced at 1:50,000 in accordance with the Ghana national Grid system but in metric units.

The strips as well as photographic overlaps should be shown on flight plans

Scale and type of camera

The approximate scale of photography shall be 1:40,000.

The forelap and sidelap shall be 60% and 30% respectively

3. AERIAL PHOTOGRAPHY

1. Existing photographs of the proposed area are available at the Survey Department photo library.

2. Although Survey department has no airplane for aerial photography there is a local registered company in Ghana currently that has one resident in Ghana called CTK-NETWORK AVIATION LTD.

3. The aforementioned company has an airplane with aerial camera fitted.

4. The Department has assessed photographs taken by the above company and has found them suitable for only large scale mapping and photointerpretation.

Their address is:-

CTK NETWORK AVIATION LTD
THE KOKUM. No.7 1st Crescent
Kuku Hill, Christianborg.
P.O.Box 4576, Accra, Ghana
Tel.233.21.222432

5. There are two airport facilities in the project area;

ACCRA and TAKORADI

6. Survey Department has a photolaboratory which is currently being renovated.

7. Survey Department will write through the Ministry of Foreign affairs for notification to the Cote D' Ivoire Authorities.

8. Ghana has two windows suitable for aerial photography;

i) September to November ← 11-8 11

ii) March to May

4. Meteorological data in the proposed area may be obtained from the METEOROLOGICAL SERVICES DEPARTMENT.

OTHER RELATED INFORMATION

1. Approval of use of radio call equipment can only be given by the National Frequency Regulation Board. ¹¹⁻⁸

2. The Survey Department at the moment has only few vehicles which are all being used for it's on going traditional assignments. These vehicles may only be shared with such staff as are already using them.

3. Counterpart personnel can be provided by the Survey Department. The following six names are suggested.

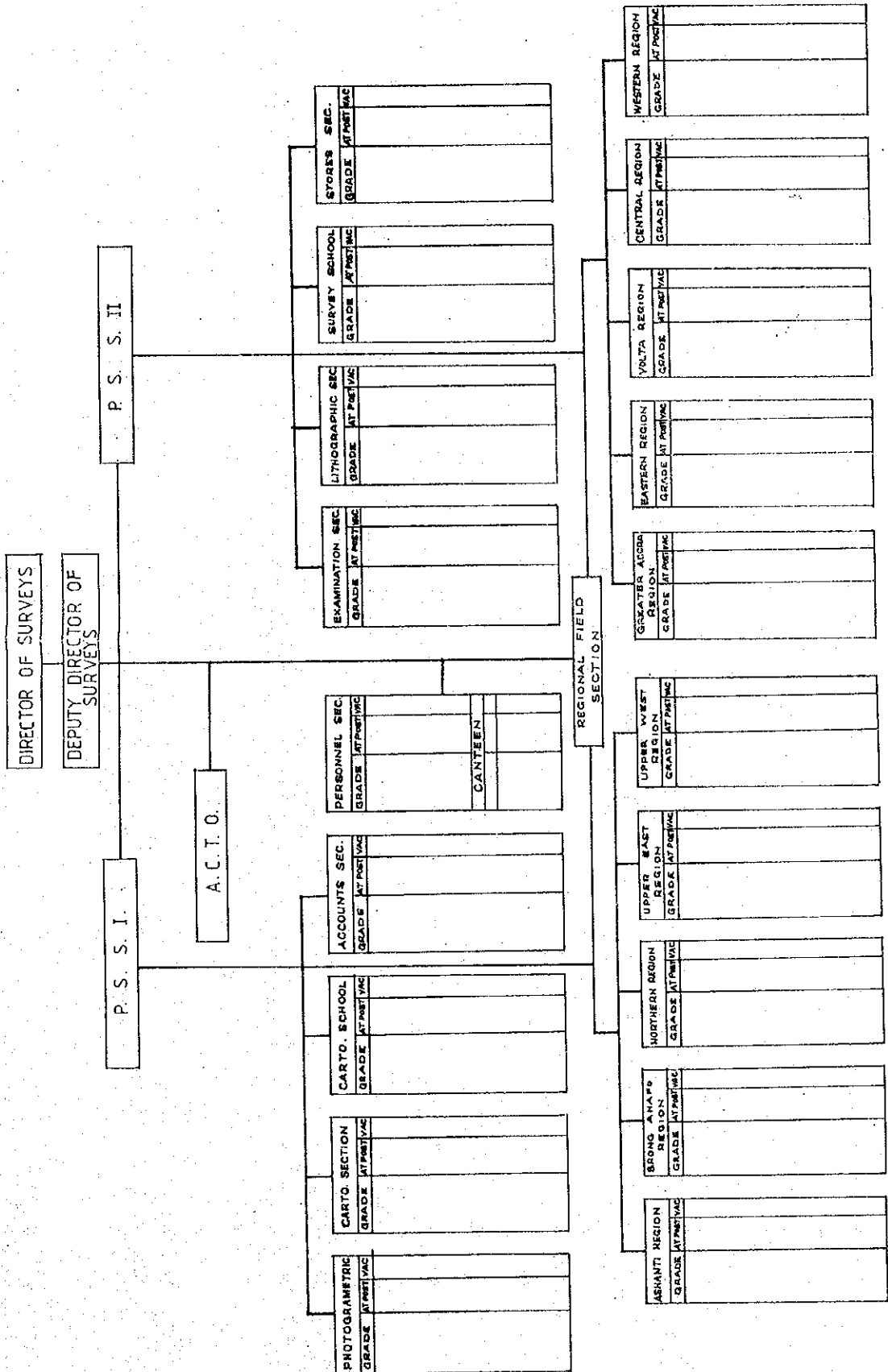
- i) Mr. Jones Ofori-Boadu
- ii) Mr. Christian B. Antwi
- iii) Mr. H. Q. Quartey
- iv) Mr. K. D. Wemegah
- v) Mr. C. K. Adabor
- vi) Mr. John Quist

4. Survey Department will look for office space to house the project personnel.

5. Information on harmful animals, insects, plants, and diseases may be obtained from Game and Wildlife Department, Forestry Department, Ministry of Agric, and Ministry of Health.

6. Permission will be sought if restricted areas have to be covered by the mapping. Since Survey Department has no Government budget allocation for this project, it will appreciate if the whole cost of the project is borne by JICA so that finances does not become a constraint to the smooth implementation of this important project.

ORGANIZATIONAL CHART FOR SURVEY DEPARTMENT



7. 物価調査表

\$=1150₯ : 円=10.8₯

項目	品名	セー	円	\$	
1. 燃料等	ガソリン(ハイオク)	2,350	218	2.04	
	軽油(1ガロン)	2,025	188	1.76	
	エンジンオイル(軽油用 5リットル)	11,800	1,093	10.26	
	ブレーキオイル(1リットル)	2,500	231	2.17	
	点火プラグ (一本)	2,000	185	1.74	
2. 作業用資材	パンク修理	2,000	185	1.74	
	セメント	5,600	519	4.87	
	針金(1/2インチ 4m)	3,000	278	2.61	
	砂	40,000	3,704	34.78	
	砂利	50,000	4,630	43.48	
	ロープ(1m)	2,000	185	1.74	
	釘(1kg)	1,000	93	0.87	
	ベニヤ板(1/8インチ 2×1m)	8,000	741	6.96	
	ドライバ (+)	1,000	93	0.87	
	(-)	1,000	93	0.87	
3. 工具類	スパナ(6本セット)	20,000	1,852	17.39	
	レンチ	4,000	370	3.48	
	スコップ	8,000	741	6.96	
	ハンマー	2,000	185	1.74	
	鋸	5,000	463	4.35	
	ブッシュ	3,000	278	2.61	
	テフロン	10,000	926	8.70	
	梯子(6m 伸縮)	80,000	7,407	69.57	
	ペンキ(5リットル)	7,000	648	6.09	
	ル	2,000	185	1.74	
	ホース(φ1インチ 100m)	20,000	1,852	17.39	
	4. 文具類	鉛筆	850	79	0.74
		ボールペン	2,400	222	2.09
		消しゴム	250	23	0.22
		レポート用紙	2,800	259	2.43
三角定規		2,800	259	2.43	
コピー用紙(A4)		6,000	556	5.22	
カメラ		50,000	4,630	43.48	
フィルム(36枚)		3,600	333	3.13	
同時プリント		5,000	463	4.35	
フロッピーディスク(5)		1,500	139	1.30	
(3.5)		2,000	185	1.74	
関数電卓		30,000	2,778	26.09	
乾電池(単一)		3,200	296	2.78	
(単三)		1,400	130	1.22	
006P		2,700	250	2.35	
マシ		2,500	231	2.17	
セー		1,000	93	0.87	
紙切りハサミ		6,000	556	5.22	
穴あけパン		5,500	509	4.78	
のり		2,000	185	1.74	
封筒	2,500	231	2.17		
5. 事務用家具	絵はがき	400~800	37~74	0.35~0.70	
	両袖机	60,000	5,556	52.17	
	片袖机	50,000	4,630	43.48	
	椅子	25,000	2,315	21.74	
	ロッカー	30,000	2,778	26.09	
	自転車	120,000	11,111	104.35	
6. 電化製品	小型発電機	2,000,000	185,185	1739.13	
	パワーアンプ	15,000	1,389	13.04	
	テレビ(14インチ)	320,000	29,630	278.26	
	電球(100W)	500	46	0.43	
	電気スタンド	60,000	5,556	52.17	
	クーラー	1,300,000	120,370	1130.43	
	洗濯機	950,000	87,963	826.09	
	炊飯器	50,000	4,630	43.48	
	冷蔵庫	590,000	54,630	513.04	

\$=1150t7i: 円=10.8t7i

項目	品名	セー	円	S
	アロワ	60,000	5,556	52.17
	懐中電灯	8,000	741	6.96
	電気コト	460,000	42,593	400.00
	電子レンジ	150,000	13,889	130.43
7. 衣類	作業服	15,000	1,389	13.04
	カッターシャツ	15,000	1,389	13.04
	ソックス	20,000	1,852	17.39
	ズボン	25,000	2,315	21.74
	ベルト	10,000	926	8.70
	帽子	5,000	463	4.35
	下着(上)	3,000	278	2.61
	(下)	2,000	185	1.74
	靴下	1,500	139	1.30
	襪子	15,000	1,389	13.04
	ハスタ柄	10,000	926	8.70
	作業靴	45,000	4,167	39.13
	長靴	20,000	1,852	17.39
	スニーカー	30,000	2,778	26.09
7. 食器類	皮靴	60,000	5,556	52.17
	鍋(大)	45,000	4,167	39.13
	(中)	25,000	2,315	21.74
	フライパン	50,000	4,630	43.48
	ヤク	60,000	5,556	52.17
	包丁	8,500	787	7.39
	まな板	8,000	741	6.96
	コーヒーカップ	1,000~2,000	93~185	0.87~1.74
	ガラスコップ	1,200~1,500	111~139	1.04~1.30
9. 食品類	インスタントラーメン	650	60	0.57
	インスタントスープ(47g)	1,500	139	1.30
	ハスタソース(42g)	1,500	139	1.30
	食用油	2,050~2,600	190~241	1.78~2.26
	香辛料	1,400~2,600	130~241	1.22~2.26
	粉ミルク(400g)	3,400	315	2.96
	リンゴ	800	74	0.70
	バナナ	500	46	0.43
	卵	100	9	0.09
	砂糖(1kg)	1,150	106	1.00
	バター	3,000	278	2.61
	マーガリン	3,000	278	2.61
	ソース(250g)	2,600	241	2.26
	ケチャップ	2,250	208	1.96
	マヨネーズ(385g)	3,100	287	2.70
	ジャム	3,600	333	3.13
	コーラ・ジュース	400~800	37~74	0.35~0.70
	クリーム(250g)	4,000	370	3.48
	インスタントコーヒー(250g)	12,000	1,111	10.43
	紅茶(50g~125g)	1,000~2,500	93~231	0.87~2.17
	ビール	800~2,000	74~185	0.70~1.74
	ウイスキー	1,600~37,000	148~3,426	0.00
	ミキサー(1.5リットル)	2,000	185	1.74
10. 日用雑貨	練り歯磨き	1,900~3,200	176~296	1.65~2.78
	歯ブラシ	850~2,050	79~190	0.74~1.78
	洗濯石鹼(粉 6kg)	28,400	2,630	24.70
	(固型)	220	20	0.19
	食器用洗剤	2,500	231	2.17
	スポンジ	2,300	213	2.00
	カッター	1,800	167	1.57
	石鹼	850	79	0.74
	殺虫剤	6,000	556	5.22
	髭剃り	25,000	2,315	21.74
	シャンプー	3,400	315	2.96
	ティッシュペーパー	2,100~2,400	194~222	1.83~2.09

S=1150tフイ：円=10.8tフイ

項 目	品 名	tフイ	円	\$
	トイッパ-カ-(1~40-ル)	400~2,800	37~259	0.35~2.43
	カコ	1,160	107	1.01
	使い捨てライター	500	46	0.43
11. 雇用費	人夫賃	2,000	185	1.74
	運転手	12,000	1,111	10.43
12. 宿泊料	外人用ホム☆4	4,000	370	3.48
	☆3	80,000	7,407	69.57
	☆2	38,000~43,000	3,519~3,981	33.04~37.39
	ガスめス	1,000	93	0.87
13. 通信費	国際電話	4,500~6,000	417~556	3.91~5.22
	外国郵便(葉書AER)	200~500	19~46	0.17~0.43
	(封書)	800	74	0.70

8. 収集資料リスト

区分	資料の名称	作成年月日 / 作成機関	概要	備考
地形図	1:50000 INDEX		印刷 1992	
	SCALE 1:50000			
	Sheet No 0402-A-1	不明	撮影年 1973	
	0402-A-2	"	1973	
	0403-B-1	"	1973	
	0403-B-2	"	1973	
	0501-A-1	"	1972	
	0501-A-4	"	1975	
	0501-B-3	"	1975	
	0501-B-4	"	1974	
	0501-C-1	"	1974	
	0501-C-2	"	1974	
	0501-C-3	"	1971	
	0501-D-1	"	1974	
	0502-A-1	"	1973	
	0502-A-2	"	1973	
	0502-A-3	"	1973	
	0502-A-4	"	1973	
	0502-C-1	"	1973	
	0502-C-2	"	1973	
	0502-C-3	"	1973	
	0502-C-4	"	1973	
	0502-B-1	"	1973	
	0502-B-2	"	1973	
	0502-B-3	"	1973	
	0502-B-4	"	1973	
	0502-D-1	"	1972	
	0502-D-2	"	1972	
	0502-D-3	"	1973	
	0502-D-4	"	1973	
	0503-A-1	"	1973	
	0503-A-2	"	1973	
	0503-A-3	"	1973	
	0503-A-4	"	1973	
	0503-B-1	"	1973	
	0503-B-2	"	1973	
	0503-B-3	"	1973	
	0503-B-4	"	1973	
	0503-C-2	"	1973	
	0503-C-3	"	1973	
	0503-C-4	"	1973	
	0503-D-1	"	1973	
	0503-D-2	"	1973	
	0503-D-3	"	1973	
	0503-D-4	"	1973	
	0602-C-3	"	1973	

区分	資料の名称	作成年月日	作成機関	概要	備考
	0602-C-4	〃			1973
	0603-C-1	〃			1973
	0603-C-2	〃			1973
	0603-C-3	〃			1973
	0603-C-4	〃			1973
	0603-D-1	〃			1973
	0603-D-2	〃			1973
	0603-D-3	〃			1973
	0603-D-4	〃			1973
	SCALE 1:250000				
	Sheet NAME WIAWSO	不明		不明	
	ACCRA	〃		〃	
	TAKORADI	〃		〃	
	PRESTEA	〃		〃	
	KOFORIDUA	〃		〃	
	KUMASI	〃		〃	
資料図	ISOGONIC CHART				1969
	PHYSICAL				1969
	ADMINISTRATIVE				1986
	VEGETATION ZONES				1969
	MINERAL DEPOSITS				1969
	FRAMEWORK DIAGRAM				1992

JICA

