

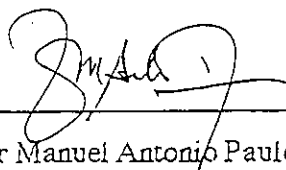
SCOPE OF WORK
ON
THE ESTABLISHMENT
OF
COMPREHENSIVE GEOGRAPHIC DATABASE SYSTEM
FOR
THE NATIONAL REHABILITATION AND DEVELOPMENT
IN
THE REPUBLIC OF ANGOLA

AGREED UPON BETWEEN

MINISTRY OF PUBLIC WORKS AND URBAN PLANNING
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Luanda, Angola

March 6, 1997



Doutor Manuel Antonio Paulo
Director National
Ministry of Public Works and
Urban Planning



Tadao DOHI
Leader
Preparatory Study Team
Japan International
Cooperation Agency

I. INTRODUCTION

In response to the request of the Government of the Republic of Angola, the Government of Japan has decided to conduct "The Establishment of Comprehensive Geographic Database System for The National Rehabilitation and Development in The Republic of Angola (hereinafter referred to as "the Study")", in accordance with the relevant laws and regulations in force in Japan and the Republic of Angola.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to "JICA"), the official agency responsible for the implementation of the technical cooperation program of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of the Republic of Angola.

Ministry of Public Works and Urban Planning (hereinafter referred to as "MPWUP") shall act as a counterpart agency to the Japanese Study Team (hereinafter referred to as "the 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 OF THE STUDY

The objective of the Study is to prepare digital topographic data covering an area of approximately 120,000km², digital geographic data for GIS covering an area of approximately 1,000km² in and around Luanda City, aerial photo covering an area of approximately 68,000km² and technical transfer concerning establishment and usage of geographic information which will assist national development and rehabilitation plan of Angola.

III. STUDY AREA

Following geographic data shall be prepared and the covering area is shown on the Appendix-1.

- | | |
|---|-------------------------|
| 1. 1:100,000 digital topographic map | 120,000 km ² |
| 2. 1:25,000 digital geographic data for GIS
(Topographic data and Land use data) | 1,000 km ² |
| 3. 1:30,000 Aerial photo | 67,000 km ² |
| 4. 1:10,000 Aerial photo | 1,000 km ² |

27

IV. SCOPE OF THE STUDY

In order to achieve the objective mentioned above, the Study shall cover following items.

1. Digital topographic data

The scale of digital topographic data shall be basically 1:100,000 and shall be prepared based on the satellite image and the existing topographic maps. The accuracy of digital topographic data shall be almost same as the existing 1:100,000 topographic maps. The spheroid and projection to be used shall be the same as the existing 1:100,000 scale topographic maps.

2. Digital geographic data for GIS

1) Digital topographic data

The scale of digital topographic data shall be basically 1:25,000. In order to carry out the topographic mapping, the Team should station in the region and collect necessary data and information, carry out the ground control survey in the Republic of Angola. Office works such as aerial triangulation and photogrammetric mapping shall be executed in Japan.

2) Land use data

The scale of digital land use data shall be basically 1:25,000 and digital land use data shall be prepared by photo interpretation of 1:30,000 scale aerial photos. These information shall be verified by Angolan side at the stage of draft interpretation map.

3. Aerial photo

1:30,000 new Black and White aerial photos covering approximately 67,000km² in Cabinda province, a portion of Zaire province, a portion of Malanje province and a portion of South Cuanza province.

1:10,000 new Black and White aerial photos covering approximately 1,000km² in and around Luanda City.

4. Data supply

Necessary information for compilation of digital topographic data and digital geographic data for GIS such as name of places, administrative boundary, location of facilities and so on shall be prepared by Angolan side and supplied to the Team.

5. Technical transfer

Technical transfer concerning establishment and usage of geographic information shall be executed to the counterpart personnel in the course of the Study by the full-scale study team.

5
27

V. STUDY SCHEDULE

The Study shall be carried out in accordance with the attached tentative study schedule shown in APPENDIX-2. The schedule, including reports submission date stated in the next clause (VI), is tentative and subject to be modified when both parties agree upon and any necessity that arises during the course of the Study.

VI. REPORT AND FINAL PRODUCTS

JICA shall prepare and submit the following report in English and final products of geographic information works to the Government of the Republic of Angola

1. Plan of operation
20 copies At the time of starting of the Study
2. Final report
20 copies At the end of the Study
3. Digital topographic data
10 copies of 1:100,000 scale digital topographic data files (ex. CD-ROM)
4. Final products of digital data for GIS
10 copies of digital data files (ex. CD-ROM)
 - 1:25,000 scale digital topographic data
 - 1:25,000 scale digital land use data
5. Aerial photo
 - 1 set of negative film
 - 3 copies of 1:30,000 scale Aerial photos
 - 3 copies of 1:10,000 scale Aerial photos

VII. UNDERTAKING OF THE GOVERNMENT OF ANGOLA

1. To facilitate smooth conduct of the Study, the Government of the Republic of Angola shall take the following necessary measures:

(1) to secure the safety of the Team ;

(2) to permit the members of the Team to enter, leave and sojourn in the Republic of Angola for the duration of their assignment therein and exempt them from alien registration requirements and consular fees;

(3) to exempt the members of the Team, from taxes, duties, fees and any other charges on

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84

equipment, machinery and other materials brought into and out of the Republic of Angola for the conduct of the Study;

(4) to exempt the members of the Team from income taxes and charges of any kind imposed on or in connection with any emoluments or allowance paid to the members of the Japanese study team for their services in connection with implementation of the Study;

(5) to provide necessary facilities to the Team for remittance as well as utilization of the funds introduced into the Republic of Angola from Japan in connection with the implementation of the Study.

(6) to secure permission for entry into private properties and restricted areas for the implementation of the Study;

(7) to secure permission for the Team to take all data and documents including topographic maps, original manuscripts, aerial photos related to the Study out of the Republic of Angola;

(8) to secure necessary permission for aerial photography by foreign registered aircraft for the implementation of the Study;

(9) the Government of Angola shall obtain the necessary permission from the Government of Zaire and Congo for the execution of aerial photography by the Team at the area of border line.

(10) to provide the medical services as needed. Its expenses will be chargeable on the members of the Team.

2. The Government of the Republic of Angola 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 arise from gross negligence or willful misconduct on the part of the members of the Team.

3. MPWUP shall act as a counterpart agency to the Team and also as a coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

4. MPWUP shall, at its own expense, provide the Team with the following, in cooperation with other organizations concerned:

- (1) available data and information (such as original manuscripts) related to the Study;
- (2) counterpart personnel;
- (3) Suitable office space with necessary equipment in Luanda;
- (4) vehicles with drivers;
- (5) credentials or identification cards

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87

VIII. UNDERTAKING OF JICA

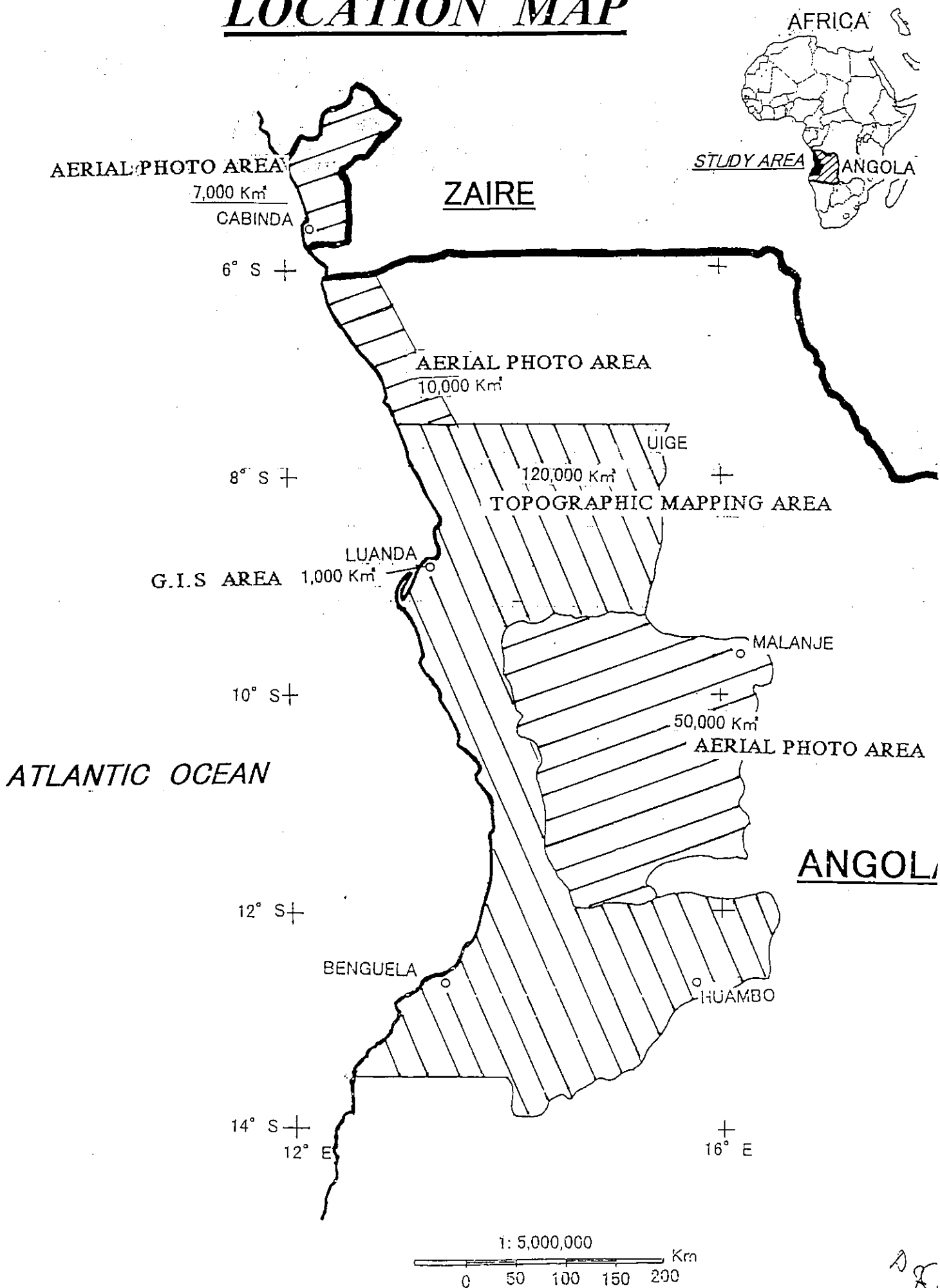
For the implementation of the Study, JICA shall take the following measures:

- (1) to dispatch, at its own expense, the study team to the Republic of Angola; and
- (2) to pursue technology transfer to the Angola counterpart personnel in the course of the Study.

IX. CONSULTATION

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

LOCATION MAP



TENTATIVE SCHEDULE OF THE STUDY

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Work in Angola	[Shaded Bar]												[Shaded Box]											[Shaded Box]
Work in Japan	[Shaded Box]											[Shaded Bar]												[Shaded Box]
Report and Final Products	△ P/O1												△ P/O2											

Month	25	26	27	28	29	30	31	32	33	34	35	36			
Work in Angola	[Shaded Bar]												[Shaded Bar]		
Work in Japan	[Shaded Box]	[Shaded Bar]											[Shaded Box]		
Report and Final Products	△ P/O3												△ F/R,F/P		

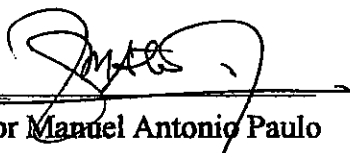
Note: P/O : Plan of Operation
 F/R : Final Report
 F/P : Final Products

287

MINUTES OF MEETING
UPON
INCEPTION REPORT
FOR THE
ESTABLISHMENT OF
A COMPREHENSIVE GEOGRAPHIC DATABASE SYSTEM
FOR
THE NATIONAL REHABILITATION AND DEVELOPMENT
IN THE REPUBLIC OF ANGOLA

AGREED UPON BETWEEN
MINISTRY OF PUBLIC WORKS AND URBAN PLANNING
THE REPUBLIC OF ANGOLA
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

Luanda, Angola
18 December, 1997



Doutor Manuel Antonio Paulo
Director National
Ministry of Public Works and
Urban Planning



Takeshi HIRAI
Leader
Mission Study Team
Japan International
Cooperation Agency

Based on the Scope of Work agreed upon between the Ministry of Public Works and Urban Planning (hereafter referred to as "MPWUP") and JICA on March 6, 1997, the Japanese Study Team organized by JICA and headed by Mr. Takeshi Hirai (hereafter referred to as "Study Team") visited the Republic of Angola from 4th to 19th December 1997 to discuss the inception report of the Establishment of a Comprehensive Geographic Database System for the National Rehabilitation and Development in the Republic of Angola (hereafter referred to as "the inception report").

During the stay of the Study Team in Angola, several meetings were held to discuss the inception report and the details of the study to be executed. The following items were agreed upon between the MPWUP and the Study Team.

1. The Study Team submitted the inception report and explained the outline of the first phase of work in Angola during the first fiscal year. The MPWUP agreed upon the outline of the first phase of work in Angola and asked to complete the Portuguese version of the inception report as quickly as possible in order to explain this study to related agencies within the Angolan government.
2. The area to be studied mentioned in the inception report (P.3 – P.6) were explained by the Study Team and confirmed by the MPWUP and the Study Team.
3. Concerning the basic concepts of geographic information systems (GIS) in Angola, necessary and important thematic (attribute) data were discussed. The MPWUP explained that a governmental committee to study the data to be contained and processed by the GIS was just started. At this moment, however, there is very little available and reliable data. The MPWUP and the Study Team agreed that the study should start with the first step of GIS implementation. The GIS to be introduced in this study is a kind of experimental GIS, but applicable to practice in the MPWUP.
4. In recognition of the state of GIS development in Angola mentioned above, the Study Team explained their proposal of which GIS software should be introduced in addition to the hardware and software configuration and operating scheme. The MPWUP accepted this proposal.



5. Based on item 4) facilities to house the GIS were proposed and the Study Team asked the MPWUP to obtain quotations for the construction and installation of the proposed facilities. The MPWUP agreed.
6. The Study Team examined the materials maintained by the Institute of Geodesy and Cartography and the Study Team found that they are considerably well kept and very useful. The Study Team concluded that it is very important to compile a digital database of the list of materials available at the Institute of Geodesy and Cartography in order to facilitate storage and retrieval by a computer system, as this is a necessary step in introducing GIS in Angola.
7. The MPWUP and the Study Team agreed that the GIS introduced should be advertised or given publicity to enable more widespread use of the system and its data. The tools necessary for the promotion of this system should be included in this study.
8. The Study Team explained the outline of the counter-part training during the four year study period. The MPWUP was pleased with the concept of the training plan, however asked to increase the number of personnel able to take part in the training. The Study Team also submitted a plan to hold an open class or seminar to show how to use the Global Positioning System (GPS) and digital levels which will be used by the Study Team during their field work. The MPWUP accepted this plan.
9. The Study Team and the Angolan counter-part discussed the map symbols and the notation for marginal information for complete printed maps. They agreed that the topographic map data shall be grouped according to the main themes of the legend of the corresponding topographic maps of Angola published by the Institute of Geodesy and Cartography. Such layer themes as roads, rivers, built-up areas, vegetated areas and administrative boundaries, etc. will be converted. Discussions on the layer themes will be on-going and finalization of the symbols will be made after creating enough new topographic data which will act as a sample. They also agreed that the following notation shall be printed in the margin of each map if all of the topographic database layers are printed out in the form of a complete map sheet. The notation as follows is: "This map was prepared jointly by the Japan International Cooperation Agency (JICA) under the Japanese Government Technical Cooperation Program and the Government of Angola. This map was



created for the urgent recovery of Angola based on SPOT satellite imagery without field survey verification.” The same notation shall be written in the heading of the database or in the metadata stored within the digital form of the topographic data.

87

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Appendix 1

LIST OF ATTENDANTS

1. Angolan Side

Doutor Manuel Antonio Paulo	National Director, Cabinet of Planning and Analysis Ministry of Public Works and Urban Planning
Mr. Domingos Armando	Technical Director, G.C.I (Institute of Geodesy and Cartography)
Mr. Manimo Simao	Technical Specialist, Ministry of Foreign Affairs
Mr. Mario Roberto Pires de Sousa	Head of Public Works Department, Ministry of Public Works and Urban Planning
Mr. Montenegro Duarte	Head of Information Department, Ministry of Public Works and Urban Planning
Ms. Lourdes Liahuca	Economist Cabinet of Studies and Analysis, Ministry of Public Works and Urban Planning
Ms. Maria Cecilia Afonso	Technical Specialist, Cabinet of Studies and Analysis, Ministry of Public Works and Urban Planning

2. Japanese Side

Mr. Takeshi Hirai	Leader
Mr. Yutaka Kyakuno	Member
Mr. Mamoru Araseki	Member
Mr. Reese W. Plews	Member
Mr. Alberto M. Miyazato	Member
Dr. Yoshitake Egawa	Infrastructure Development Institute (IDI)



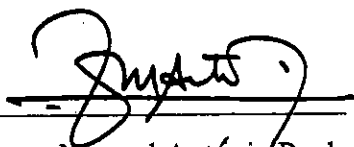
MINUTES OF MEETINGS
ON
THE ESTABLISHMENT
OF COMPREHENSIVE GEOGRAPHIC DATABASE SYSTEM
FOR
THE NATIONAL REHABILITATION AND DEVELOPMENT
IN
THE REPUBLIC OF ANGOLA

- The Second Year -

Agreed upon between
Ministry of Public Works and Urban Planning
The Republic of Angola
and
Japan International Cooperation Agency

Luanda, Angola

24 June, 1998



Doutor Manuel António Paulo
Director National
Ministry of Public Works and
Urban Planning



Takeshi HIRAI
Leader
JICA Study Team

The Study team for "Establishment of Comprehensive Geographic System for the National Rehabilitation and Development in The Republic of Angola" (hereinafter referred to as "the Study") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Takeshi Hirai as the team leader visited the Republic of Angola on 17th of June, 1998 to carry out the second phase work in Angola.

The meetings were held at the Ministry of Public Works and Urban Planning (hereinafter referred to as MPWUP).

The Study team discussed the following items with the representative delegation of the MPWUP and other organizations concerned headed by Dr. Manuel Antonio Paulo.

The list of attendants is shown in Annex 1.

1. Progress report 1

The Progress report 1 which describes works done during the first phase work in Japan and in Angola was presented by the Study team to the Angolan delegation. The Study team explained the contents of the report and both sides accept the report.

2. Field verification of 1/25,000 scale maps

Concerning the field verifications necessary for the production of 1:25,000 scale maps, the Study team requested the Angolan delegation to provide counterparts for four parties, at least one engineer for one party. The Angolan delegation agreed the request.

3. Engineering work for GIS related facility

The Angolan delegation explained that MPWUP already prepared one room for GIS related facilities. The inside of the room is already painted white beautifully and lighting facility is nicely arranged.

The Angolan delegation requested the Study team to install the GIS related facilities as early as possible and the Study team promised to convey their request to JICA Tokyo.

Handwritten signature and initials in the bottom right corner of the page.

The Study team proposed to organize a sub-group to discuss the GIS related facility in detail and to estimate the cost to equip the facility fully, and requested the Angolan delegation to provide specialists of this field as counterparts. The Angolan delegation agreed the requests.

4. Reproduction of the Existing Aerial Photos

The Study team explained that in order to prepare keys for interpretation of satellite image, it is necessary to reproduce 1,000 existing aerial photos and asked the Angolan delegation to prepare photo materials for this task.

The Angolan delegation accepted this request.

5. Digitizing and Compilation of 1/100,000 scale Topographic Maps

For compilation of 1/100,000 scale topographic maps, the Study team requested the Angolan delegation to arrange the meeting with Angolan specialists of this field.

The Angolan delegation accepted this request.

6. Digitizing 1/1,000,000 scale Maps

The Study team explained that the original maps with proper scale for digitizing should be discussed and selected.

The Angolan delegation agreed.

7. Digital plotting for 1/25,000 scale Maps

The Study team explained the process of digital plotting for 1/25,000 scale Maps and the Angolan delegation accepted the explanation and requested to produce printed maps as mentioned in the request from MPWUP.

8. GIS Programming

The Angolan delegation explained that within MPWUP the list of subjects of GIS applications and their attributes are being collected.

Both sides agreed that, based on this list, development of GIS application systems should be proceeded.

9. The Angolan delegation stressed that the need of technology transfer.

The Study team agreed.

10. Request from MPWUP

MPWUP requested to include the following two items in the second phase work of the study.

First - MPWUP requested to complete the environment of the GIS facilities to utilize the facilities fully for many application purposes.

Second - MPWUP requested to produce printed topographic maps of Luanda area with the scale of 1/25,000.

The need of printed maps is very strong and MPWUP requested to produce 1,000 copies of printed map for each sheet.

The Study team agreed to convey these requests to JICA headquarters.

LIST OF ATTENDANTS

1. Angolan Side

Mr. Doutor Manuel Antonio Paulo	National Director Cabinet of Studies and Analysis Ministry of Public Works and Urban Planning
Mr. Domingos Armando	Technical Director Institute of Geodesy and Cartography, Angola Ministry of Defence
Mr. Wola N'toni a Mmbu	Head of Economic Department Cabinet of Studies and Analysis Ministry of Public Works and Urban Planning
Mr. Antonio J. Airosa de Oliveira	Head of Aerial-photo/geodesy Institute of Geodesy and Cartography, Angola Ministry of Defence
Mr. Antonio G. Montegro F. Duarte	Head of Information Department Ministry of public Works and Urban Planning

2. Japanese Side

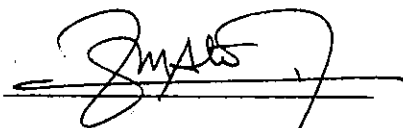
Mr. Takeshi HIRAI	Leader
Mr. Yoshiaki OTOKU	Deputy Leader
Mr. Mamoru ARASEKI	Member Specialist of GIS Housing
Mr. Carlos KIMURA	Transrator

MINUTES OF MEETINGS
ON
THE ESTABLISHMENT
OF COMPREHENSIVE GEOGRAPHIC DATABASE SYSTEM
FOR
THE NATIONAL REHABILITATION AND DEVELOPMENT
IN THE REPUBLIC OF ANGOLA
- The Second Year -

Agreed Upon Between
Ministry of Public Works and Urban Planning
The Republic of Angola
And
Japan International Cooperation Agency

Luanda, Angola

16 February, 1999



Doutor Manuel Antonio Paulo
Director National
Ministry of Public Works and
Urban Planning



Yoshiaki Otoku
Deputy Leader
JICA Study Team

The Ministry of Public Works and Urban Planning (hereinafter referred to as "MINOPU") and JICA Study Team had a series of meetings at the first and the end of the Third Phase Field Work of the Second Year for the Establishment of Comprehensive Geographic Database System for the National Rehabilitation and Development in the Republic of Angola, and discussed following items.

1. JICA Study Team requested MINOPU the approval for the setting of a generator, air-conditioners and their electric wiring in the GIS room.

MINOPU approved these peripheral maintenance for the GIS room.

2. JICA Study Team made progress report concerning to aerial photography on the Second Year as follows to MINOPU;

Aerial photography on the Second Year has been on less progress due to the unfavorable conditions such as the bad weather and unstable political situations in additions that the permissions concerned had not available to meet with the daily flight activities. Unless these situations could not be improved, the continued aerial photography would not be assured.

3. The JICA Study Team requested to expedite the resolves of the permissions to MINOPU, and MINOPU agreed to do MINOPU's best to resolve it.

4. AS a substitute for aerial photography, MINOPU leaves SPOT imagery out of consideration in this status. This disturbance in country will be settled shortly. Therefore, even though the photo-scale was changed to 1/40,000 to keep the safe flight, MINOPU needs the new aerial photographs.

5. MINOPU strongly requested the continuation of aerial photography on the Third Year. The Study Team agreed to convey MINOPU's intention to JICA headquarters.

Annex -- 1

LIST OF ATTENDANTS

1. Angolan Side

Mr. Doutor Manuel Antonio Paulo	National Director Cabinet of Studies and Analysis Ministry of Public Works and Urban Planning
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2. Japanese Side

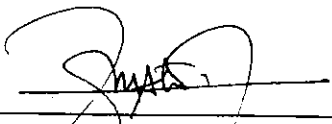
Mr. Yoshiaki Otoku	Deputy Team Leader
Mr. Mamoru ARASEKI	Member Specialist of GIS Housing
Mr. K. Okumura	IDI JICA's Technical Adviser
Mr. Kiyoshi Kinoshita	Interpreter

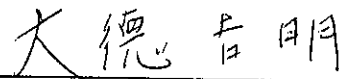
MINUTES OF MEETINGS
ON
THE ESTABLISHMENT OF
COMPREHENSIVE GEOGRAPHIC DATABASE SYSTEM
FOR
THE NATIONAL REHABILITATION AND DEVELOPMENT
IN
THE REPUBLIC OF ANGOLA

- The Fourth Year -

Agreed Upon Between
Ministry of Public Works and Urban Planning
The Republic of Angola
And
Japan International Cooperation Agency

Luanda, Angola
01 November 2000


Doutor Manuel Antonio Paulo
Director National
Ministry of Public Works and
Urban Planning


For: Takeshi HIRAI
Team Leader
The JICA Study Team

The Study team for "The Establishment of Comprehensive Geographic Database System for the National Rehabilitation and Development in the Republic of Angola" (hereinafter referred to as "the Study") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Takeshi Hirai as the team leader visited the Republic of Angola on 14 September to 21 December 2000 to carry out the fourth year's work In Angola.

The First meeting between the Ministry of Public Works and Urban Planning (hereinafter referred to as "MINOPU") and the study team was held at MINOPU before starting the works of this year on 20 September. (List of Attendants is attached as Annex 1.)

At the meeting Mr. Otoku submitted the results of previous year's works to MINOPU, and briefed on each content as follows;

- | | |
|--|-----------------|
| a. Progress report 2 and Progress report 3 | 20 volumes each |
| b. Color aerial photo prints with the scale of 1/10,000
(Luanda area) | 3 sets |
| c. Black and white aerial photo prints with the scale of 1/30,000
(Luanda area) | 3 sets |
| d. ArcView manual | 10 volumes |
| e. Arc/Info manual (draft) | 10 volumes |
| f. Land-use classification manual (draft) for Luanda land-use
maps with the scale of 1/25,000 | 10 volumes |
| g. Samples of the out-put maps with the scale of 1/1 million,
1/100,000 and 1/25,000 digital topographic map data | 1 set |

Regarding to the original negative films, the Study team informed MINOPU that AOC, South African aerial photography company, would bring them to Angola by their aircraft at the time of their next photography mission.

MINOPU has accepted the results of the aerial photography, field and laboratory works of the second and third year, and showed their appreciation on the restart of remaining field works, and also informed the Study team that they have been keeping the space for GIS instruments.

The Study team expressed its gratitude to MINOPU's efforts of good maintenance over one year of the space allocated for GIS rooms.

The second meeting was held at MINOPU on 27 October 2000. (List of Attendants is attached as Annex 2.)

The subjects of the meeting were following;

- 1) Discussion on the progress report 2 and 3 presented by the study team
- 2) Discussion on the plan of works proposed by the study team
- 3) Training of the counterpart personnel requested by MINOPU
- 4) Instruments and software necessary for carrying out the transfer of technology program in the course of the Study

Following discussions were made;

1. Discussion on the progress report 2 and 3

(1) The study team explained following points;

1) Concerning topographic mapping

- Spot image was used to acquire GIS revision data. It is to be understood that the output of GIS data is not exactly the same as printed topographic maps.
- Revision of big objects on the map was done using satellite images such as changes of big forests and wide expansion of residential area. But small changes, such as change of a road smaller than 1 mm on the map, were not revised.
- However, villages in mountainous area are left as they are on the map, because it can not be interpreted whether the villages are still inhabited or not.

2) Concerning 1/1 million data

- 1/1 million digital map data are obtained compiling;
 - ① existing 1/1 million road map,
 - ② DCW (Digital Chart of the World),
 - ③ 1 km mesh vegetation data of USGS, and
 - ④ 1/1.5 million administrative map of Angola.
- 1/1 million road map was used as the base map. Data obtained from other sources were adjusted to fit the base map data as proper as possible.
- USGS vegetation data are reclassified referring to the legends of the IGCA (Institute of Geodesy and Cartography, Angola) topographic map.
- Main objects of the 1/1 million digital map data are to integrate the nation wide statistical data on the map and to utilize for training of staffs in order to make them familiar with the digital map data and handling them.

87

3) General comments

- Data in the data base are old and become estranged from the present situation. It is expected to be updated by the effort of the Angolan counterpart organization
- (2) Angolan counterpart personnel expressed their opinions and advice on the progress report 2 and 3 as follows;
- There are no serious problems related to the topographic maps except geographic names and their spellings.
 - 1/1 million road map does not consider topography. While 1/1 million topographic map is also available.
 - There are some mistakes on the page 4 of the progress report 3 such as;
A meeting was not held in January 1999, and
During May to August in 2000, AOC visited Angola, but they did not start the job from July 2000.
- (3) Answers to the opinions and advice of the counterpart personnel by the study team
- The new 1/1 million topographic map is compiled from the 1/0.5 million topographic map and it contains too much small details, and it is not suitable to acquire the data for the planned 1/1 million digital map data.
 - Annual schedule annexed in the progress report 3 shall be replaced by the annual schedule in the plan of operation of the fourth year's works which is already handed over to MINOPU.

The Angolan counterpart accepted the answers and respective corrections.

2. Discussion on the plan of works

The study team explained the plan of works of the fourth year. The fourth year's works have not been started as is planned in the progress report 3 due to some safety reasons. Annual schedule is attached in the plan of operation of the fourth year, and at the time of next visit to Angola, January 2001, 1 or 2 sheets of land use data will be shown as a sample of the final results and will be used for the seminar.

Following discussions were made between the counterpart personnel and the Study team.

- IGCA requested a new set of aerial photographs, as the one handed was used for field work.

MINOPU agreed that the study team handed the new set of aerial photographs over to IGCA.



- MINOPU proposed to organize two different types of seminar at the end of the Study. One is for the high rank officials of the related organizations. It aims at preparing the circumstance to accept GIS as a useful tool for important governmental decisions, for this reason the importance for the integration of various information to support decision making by the referred government organizations. The other is for the technical staffs of the related organizations. It aims at explaining what types of data base can be created and how they can be utilized for the application in various sectors.
- The Study team agreed to MINOPU's proposal.
The Study team answered that the seminar is scheduled at the end of February 2001, and promised to discuss how to organize the seminar with MINOPU.
- The Study team asked to obtain the permission for flight as quickly as possible.
- The Study team stressed that it is very important to obtain the permission for flight in order to execute the Study as planned. The Study team asked MINOPU to inform the team expected data to be able to obtain the permission.
MINOPU answered that the approval of flight is beyond MINOPU's authority now. Therefore we have to wait, but MINOPU expects it will be approved by the authority concerned soon.
The Study team asked whether the approval covers the whole area.
MINOPU answered that it shall be included..

The plan of works was accepted by the counterpart personnel.

3. Training of the counterpart personnel

MINOPU handed the study team a list of candidate of counterpart trainee. (List is attached as Annex 3.)

MINOPU explained that these candidates shall be core persons to utilize GIS in Angola and the training them is very important to make this study useful for Angola. The Study team answered that the team has no right to answer on MINOPU's request for the training to be conducted also in Japan, the same way it was done for the Angolan counterpart management personnel. The team will convey MINOPU's request to the Hedquarter of JICA, Tokyo.

87

4. Instruments and software used in the Study

MINOPU asked the Study team the detail information about the instruments and software which would be used in the follow up works after the Study by Angolan side.

The study team answered that it is difficult to give more detail information than given in the progress report 1.

JICA will decide the final specification. The study team will ask JICA to consider the advancement of hardware and technique achieved in almost 3 years since the submission of the progress report 1.



Annex - 1

LIST OF ATTENDANTS (20 Sep.2000)

1. Angolan Side

Dr, Manuel Antonio Paulo	National Director Cabinet of Studies and Analysis Ministry of public Works and Urban Planning
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2. Japanese Side

Mr, Yoshiaki OTOKU	Deputy Leader
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Mr, Sadao MATSUMOTO	Member Supervisor for land-use map
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Mr, Carlos KIMURA	Translator
-------------------	------------



Annex - 2

LIST OF ATTENDANTS (27 Nov. 2000)

1. Angolan Side

Dr. Manuel António Paulo	National Director Cabinet of Studies and Analysis Ministry of Public Works and Urban Planning
Mr. Domingos Armando	Technical chief of IGCA
Mr. Rodolo Guedes Silva	Geodetic section chief of IGCA
Ms. Lourdes Vaendela Domingos Lياهوca	Economist of MINOPU

2. Japanese Side

Mr. Takeshi HIRAI	Leader
Mr. Yoshiaki OTOKU	Deputy Leader
Mr. Sadao MATSUMOTO	Member Supervisor of land-use map
Mr. Carlos KIMURA	Translator

87



REPÚBLICA DE ANGOLA
MINISTÉRIO DAS OBRAS PÚBLICAS E URBANISMO
GABINETE DE ESTUDOS, PLANEAMENTO E ESTATÍSTICA
GABINETE DO DIRECTOR

AO
EXMO SENHOR HIRAI TAKESHI
CHEFE DA EQUIPA DE ESTUDO
DA JICA
TOKYO

JAPÃO

S/Referência: S/Comunicação: N/Referência: CX.P. 1061 LUANDA

1/50/03.01/2000

20/10/2000

ASSUNTO: IMPLANTAÇÃO DO GIS

Para o vosso conhecimento e devido tratamento, tenho a honra de enviar-lhe a lista dos elementos que poderão beneficiar de formação profissional ou transferência de tecnologia de acordo com o protocolo assinado em Março de 1997.

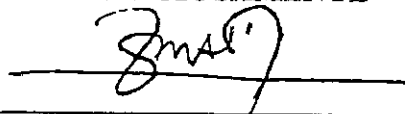
São eles:

- 1 - MANUEL ANTÓNIO PAULO - Coordenador
- 2 - ANTÓNIO MONTENEGRO DUARTE FERREIRA - Gerente
- 3 - DOMINGOS ARMANDO - Gerente
- 4 - RODOLFO GUEDES SILVA - Técnico de Contrapartida
- 5 - ANTÓNIO JOAQUIM AIROSA DE OLIVEIRA - Técnico de Contrapartida
- 6 - DOMINGOS JACINTO GANGA - Técnico de Contrapartida
- 7 - JOSÉ MANUEL JANUÁRIO - Técnico de Contrapartida
- 8 - BENJAMIN AFONSO - Técnico de Contrapartida
- 9 - JOÃO LUÍS BERNARDES DA SILVA - Técnico de Contrapartida
- 10 - FRANCISCO TECA - Técnico de Contrapartida
- 11 - LOURDES VAENDELA DOMINGOS LIAHUCA - Administrativa
- 12 - ELVIRA MARIA AFONSO TAVEIRA - Secretariado

51

Sem outro assunto de momento, aproveito a oportunidade para reiterar os protestos da minha elevada estima e consideração.

DE V. EX^a
ATENCIOSAMENTE



MANUEL ANTÓNIO PAULO
DIRECTOR DO MINOPU-GEPE

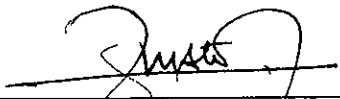
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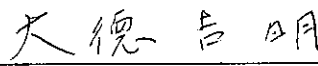
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MINUTES OF MEETINGS
ON
THE ESTABLISHMENT
OF COMPREHENSIVE GEOGRAPHIC DATABASE SYSTEM
FOR
THE NATIONAL REHABILITATION AND DEVELOPMENT
IN THE REPUBLIC OF ANGOLA
- The Fourth Year -

Agreed Upon Between
Ministry of Public Works and Urban Planning
The Republic of Angola
And
Japan International Cooperation Agency

Luanda, Angola
07 March, 2001


Doutor Manuel Antonio Paulo
Director National
Ministry of Public Works and
Urban Planning


Yoshiaki Otoku
Deputy Leader
JICA Study Team

The Ministry of Public Works and Urban Planning (hereinafter referred to as "MINOPU") and JICA Study Team had a series of meeting at the end of the Fourth Year's Work for the Establishment of Comprehensive Geographic Database System for the National Rehabilitation and Development in the Republic of Angola from 26th February through 7th March 2001 in Luand.

Following items were agreed between MINOPU and JICA Study Team in this termination.

1. JICA Study Team and Mr. Otoku apologized to MINOPU for Mr. Hirai's not being able to attend the meeting due to his health problem.

Dr. Paulo of MINOPU expressed a great care about Mr. Hirai's health, and wished his comeback to the project soon. Dr. Paulo also welcomes JICA Study Team's entering Luanda.

2. Mr. Otoku explained that due to the delay in works of taking aerial photos in the fourth year work, remaining of the works such as installation of the materials and printing of the maps after the data correction, will be carried out as the fifth year work. The work schedule is as attached.

Mr. Otoku added that the schedule for the remaining of the works is only a plan, and is unable to fix at this point.

According to MINOPU, the permission of taking aerial photos should be arranged in an early point, and acquired within this fiscal year, in the end of March at the latest.

3. MINOPU approved of postponing the last part of the work schedule as JICA Study Team explained. In order to the permission of the Ministry of National Defense of taking aerial photos by the Minister of Public Works, making an arrangement was also given a definite promise.

4. JICA Study Team explained about following works: the land use survey based on the 25 items of classification mutually agreed with Angola, the survey of the annual changes, and the data outputs of the land use survey converted into the numerical value. These works were explained based on the progress note and sample figures.

5. MINOPU confirmed the explanation of the work progress, and accepted information about the work progress.
6. To start working as soon as permission of aerial photos is obtained, JICA Study Team submitted new four sets of documents for aerial photos including details about camera types and pilots, that will be necessary to apply separately when processing the work. Then contents of the documents were explained.
7. Lastly, MINOPU gave an address of gratitude deeply about the trainees, and asked JICA Study Team for reliable transferring the technical skills to the trainees.

87

Annex – 1

LIST OF ATTENDANTS (20 Sep. 2000)

1. Angolan Side

Mr. Doutor Manuel Antonio Paulo	National Director Cabinet of Studies and Analysis Ministry of Public Works and Urban Planning
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2. Japanese Side

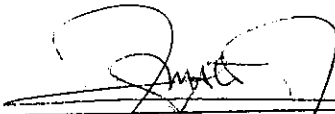
Mr. Yoshiaki Otoku	Deputy Leader
Mr. Kiyoshi Kinoshita	Coordinator

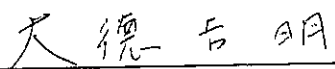
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MINUTES OF MEETING
ON
THE ESTABLISHMENT
OF COMPREHENSIVE GEOGRAPHIC DATABASE SYSTEM
FOR
THE NATIONAL REHABILITATION AND DEVELOPMENT
IN THE REPUBLIC OF ANGOLA
- The Fifth Year -

Agreed Upon Between
Ministry of Public Works and Urban Planning
The Republic of Angola
And
Japan International Cooperation Agency

Luanda, Angola
10 August 2001


Doutor Manuel Antonio Paulo
Director of Technical Group
Ministry of Public Works and
Urban Planning


Yoshiaki Otoku
Deputy Leader
JICA Study Team

The Ministry of Public Works and Urban Planning (hereinafter referred to as "MINOPU") and the JICA Study Team had a series of meeting before starting the Fifth Year's Work for "The Establishment of Comprehensive Geographic Database System for the National Rehabilitation and Development in the Republic of Angola" (hereinafter referred to as "the Study") from 6th August through 8th August 2001 at MINOPU in Luand.

The JICA Study Team explained the following issues to MINOPU.

1. The JICA Study Team explained that the Work would be completed in five years; originally it was planned that the Work would be completed in four years. This extension of the Work schedule has been caused by the delay of aerial photographing due to unfavorable weather conditions as well as formalities on flight and photo shooting permissions in government agencies concerned of Angola.
2. The JICA Study Team conveyed JICA Headquarters' intention to MINOPU that JICA would not continue the aerial photographing for the remaining area any more. The reason is that the current circumstances in the air of the Study area was unfavorable and JICA could not, nor the JICA Study Team, take any responsibility against the occurrence of serious problems to the sub contracted photographing company.
3. The JICA Study Team proposed the acquisition of satellite images instead of the aerial photographs that had been planned but not yet taken.

The satellite image to substitute the aerial photograph is as follows;

- (1) Luanda area (for the remaining area of approx. 320km²)

Acquisition of IKONOS color imagery with one meter resolution and output print at a scale of 1/25,000

- (2) Cabinda, Zaire West, Malanje Southwest / Cuanza-Sul West area (for the remaining area of approx. 64,770km² in total)

Acquisition of SPOT color fusion imagery with 10 meter resolution and output prints at a scale of 1/100,000 in 30' x 30' format (the same size as a map sheet)

4. The JICA Study Team submitted the following results to MINOPU and explained the contents and successive working schedule.

- Progress report 4 20 volumes

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Relating to the successive working schedule, JICA Study Team conveyed to MINOPU that the planning month for installation of instruments, software and all results data are not yet fixed the date, and the schedule depend on the JICA's purchasing schedule for the instruments. Therefore the date might be occurred some discrepancy from the working schedule described in the progress report 4.

5. The JICA Study Team explained the each specification of the GIS instruments to be installed and materials, and requested to arrange required article of desk and furniture, etc. in GIS room by MINOPU.
6. The JICA Study Team requested MINOPU to check the 1/25,000-scale maps after updating by Angolan side prior to final printing.
7. The JICA Study Team explained that at one visible size of data query on the computer, a size of the whole Survey area at a scale of 1/100,000 will cause the heavy burden of the data processing in large quantities, and sizes of a single map sheet and/or a few map sheets will be therefore employed for at one view for the data query. While, the matching of the existing adjusting sheets was left in final data as if was without making new data matching. With regard to the topographic and land-use maps at a scale of 1/25,000, one visible size of the data query will be created for both sizes of the whole Study area and of a map sheet because that the data quantities are smaller than ones at a scale of 1/100,000.

MINOPU understood above explanation of the JICA Study Team and consented to substitute to satellite imagery for the remaining aerial photographs and to transact the others.

MINOPU explained and requested following items to the JICA Study Team.

8. The new organization in cooperation with the Technical Group will be responsible for the operations and maintenance of the data systems established by this Project according to the new ordinance enacted by the Minister in May 2001. This organization therefore is also responsible for the applications of the database systems for the fields such as town planning, environment, agriculture and mining of the national projects as well as the periodical report for the organization's activities to the Minister.

9. MINOPU requested the JICA Study Team to submit the final report of this Project by around February or March 2002.
10. MINOPU would wish to request strongly to the Japanese Government for dispatching a Japanese GIS expert who will conduct the technical transfer for the sustainable operations and maintenance of the database systems after the completion of the Study.

The JICA Study Team promised that the above request will be conveyed to JICA Headquarters in Japan.

11. The shipping invoices shall be finally submitted to MINOPU at the least in the end of August or the beginning of September 2001 in order to clear the customs for the computers, software and related materials to be delivered through the Study in expected October 2001.
12. The seminars to be held after the delivery of the computers will be desirably held twice as previously requested for the technical experts and for higher level of the ministers and administrators will be held after the seminar for the technical experts taking enough time for MINOPU to have in-house review of the seminar.
13. It is requested that the explanatory materials for the whole contents of the Study will be distributed to the participants of the seminars.

The JICA Study Team has fully appreciated the formation of the new direction to enhance the applications of the Study results by the Angolan side.

27

Annex - 1

LIST OF ATTENDANTS

1. Angolan Side

Mr. Doutor Manuel Antonio Paulo

National Director

Director of Technical Group

Ministry of Public Works and Urban Planning

Mr. Armondo Domingos

Manager of Technical Group

Ministry of Public Works and Urban Planning

(IGCA)

Mr. António Montenegro

Manager of the Technical

Ministry of Public Works and Urban Planning

2. Japanese Side

Mr. Yoshiaki Otoki

Deputy Leader

JICA Study Team

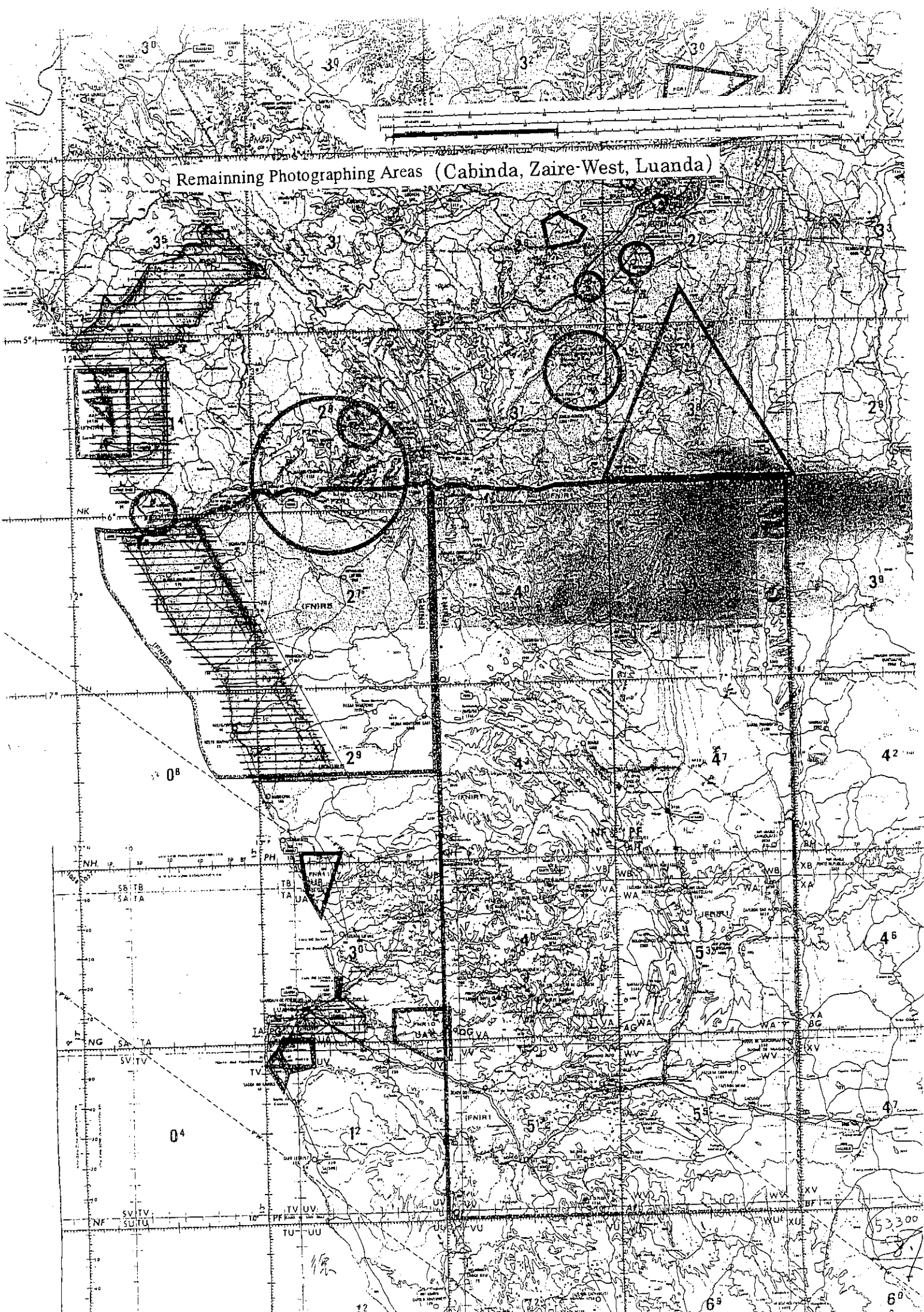
Mr. Kiyoshi Kinoshita

Translator

Annex-2

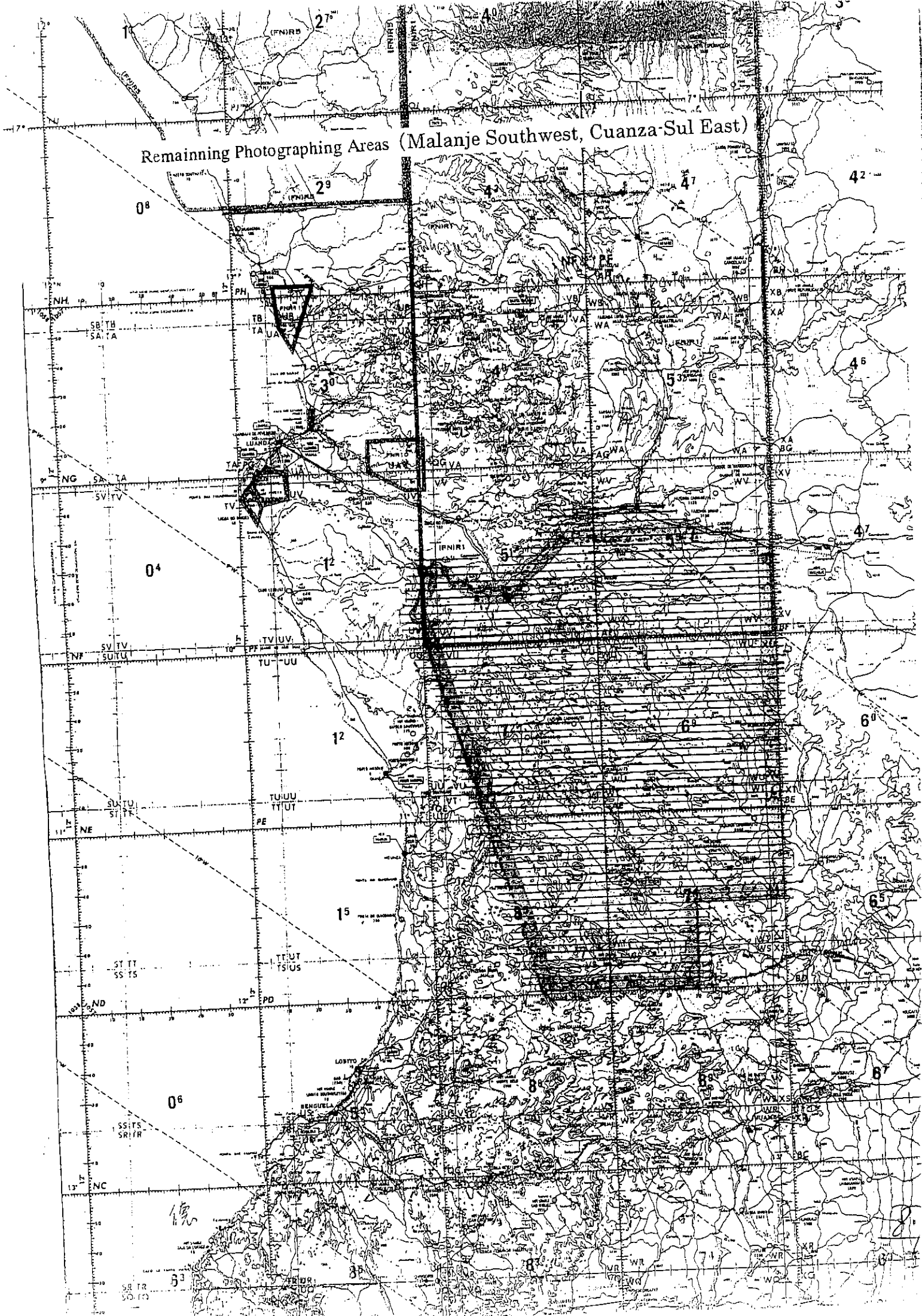
(Figures)

Remaining Photographing Areas (Cabinda, Zaire-West, Luanda)



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Remaining Photographing Areas (Malanje Southwest, Cuanza-Sul East)



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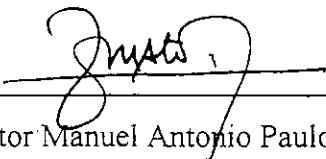
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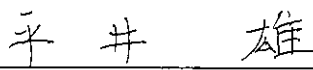
MINUTES OF MEETINGS
ON
THE ESTABLISHMENT
OF COMPREHENSIVE GEOGRAPHIC DATABASE SYSTEM
FOR
THE NATIONAL REHABILITATION AND DEVELOPMENT
IN THE REPUBLIC OF ANGOLA
- The Fifth Year -

Agreed Upon Between
Ministry of Public Works and Urban Planning
The Republic of Angola
And
Japan International Cooperation Agency

Luanda, Angola

14 March, 2002


Doutor Manuel Antonio Paulo
Director National
Ministry of Public Works and
Urban Planning


Takeshi HIRAI
Leader
JICA Study Team

Based on the Scope of Work agreed upon between the Ministry of Public Works and Urban Planning of the Republic of Angola (hereinafter referred to as “MINOPU”) and the Japan International Cooperation Agency (hereinafter referred to as “JICA”), the Japanese Study Team organized by JICA, and headed by Mr. Takeshi Hirai (hereinafter referred to as “Study Team”) started the study “The Establishment of Comprehensive Geographic Database System for the National Rehabilitation and Development in the Republic of Angola” in November 1997 and finished in March 2002.

During the Study Team stay, several activities have been done in accordance with the predefined program, and at a series of meetings it was reassured the followings:

- MINOPU expressed its sincere thanks for the reception of the final results of the Study “The Establishment of Comprehensive Geographic Database System for the National Rehabilitation and Development in the Republic of Angola”, a donation from the Government of Japan through JICA;
- MINOPU and the Study Team confirmed that although all the problems, the objectives initially defined were, in general, met;
- MINOPU and the Study Team appreciated that the Seminar organized jointly by both sides, presenting the results of the Study “The Establishment of Comprehensive Geographic Database System for the National Rehabilitation and Development in the Republic of Angola”, on 6 March 2002, at Hotel Tropico for various organizations and GIS users, corresponded to the expectancies, as expressed by the participants;
- MINOPU expressed its satisfaction and thankfulness to the Study Team for the Seminar, informing that one of the recommendations was that MINOPU would be in charge to organize a Meeting of GIS users to discuss the aspects related to its development;
- MINOPU analyzed and discussed with the Study Team the Draft Final Report presented, suggesting some changes (Appendix 2), that the Study Team accepted;
- The Study Team agreed to convey their concern on technology transfer to JICA Headquarters;
- MINOPU manifested its preoccupations concerning consultation about the installed system. The technical staff of the Study Team agreed to cooperate through internet or by other communication tool.

87

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Appendix 1

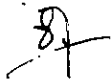
LIST OF ATTENDANTS

1. Angolan Side

Dr. Manuel António Paulo	National Director Cabinet of Studies, Analysis and Statistics Ministry of Public Works and Urban Planning
Mr. António Guilherm Montenegro	Chief of Department Cabinet of Studies, Analysis and Statistics Ministry of Public Works and Urban Planning
Mr. Domingos Armando	General Director of IGCA
Mr. Antonio J. Airosa de Oliveira	Administrative Director of IGCA
Mr. Rodolfo Guedes Silva	Provincial Director of IGCA
Mr. José Manuel da Conceição Januária	Technical Director of IGCA

2. Japanese Side

Mr. Takeshi HIRAI	Leader
Mr. Yoshiaki OTOKU	Deputy Leader
Mr. Kozo OKUMURA	Technical evaluator, IDI
Mr. Takanori ZEMMOTO	JICA Headquarters, Tokyo
Mr. Carlos KIMURA	Translator



Appendix 2

From the Angolan side, following corrections are recommended and the Study Team agreed:

- Page 1 - Substitute “civil war for 25 years” to “war for 40 years”
- Page 1 - Insert “após a independência” after “Dentro de uma situação”
- All the months must be written with its first letter in maiuscule
- Page 2 – Delete “In addition, the movements of an anti-governamental organization became so active in the surrounding area of Luanda for a certain time duration of the study period that the Japanese Study Team was interrupted to enter in Angola”
- Substitute “litorânea” to “litoral” (whole text)
- Substitute “fato” to “facto”
- Page 5 – Substitute “However, aerial photography was impossible due to their climatic conditions and the restrictions in permit of photography and flight in most of these other areas except the Luanda area used for digital mapping” to “However, aerial photography was impossible due to their climatic conditions and flight permission could not obtained in time in most of these other areas except the Luanda area used for digital mapping”
- Substitute in the whole the verb “planejar” to “planear”; “planejamento” to “planeamento;
- Substitute “Estudo Estrutural da Base Geral de Dados Geográficos para o Programa de Melhoramento e Desenvolvimento da República de Angola” to “Implantação do Sistema de Informação Geográfica para a Reabilitação e Desenvolvimento da República de Angola”
- Substitute “Leiaut” to “layout”
- Substitute “branco e preto” to “preto e branco”
- Page 7 – Substitute “proceder-se-á” to “procedeu-se”; “levarão” to “levaram”; “serão” to “foram;
- Substitute “agrimensura” to “medição” (whole text)
- Substitute “editoração” to “edição” (whole text)
- Substitute “colecta” to “recolha” (whole text)
- Substitute “não é ruim” to “não é mau”;
- Substitute “usuário” to “utilizador”;
- Substitute “Gabinete de Estudos, Planeamento Urbano” to “Gabinete de Estudos, Planeamento e Estatística do MINOPU”;
- Substitute “Divisão de Estatísticas” to “Instituto Nacional de Estatística” (page

