

## 5.RECOMMENDATIONS

### 5.1. Background of Recommendations

#### 5.1.1. Pressure of desertification in Sudan-Sahel region of Burkina Faso

As seen from Figure 1 and Figure 2, Burkina Faso is a country whose social development is based on the struggle against the pressure of desertification common to the Sudan-Sahel region located at the southern end of the Sahara though there are some local differences in meteorological and vegetation conditions such as in the southwestern area with relatively high rainfall including the study area, and the arid and semi-arid north and east areas.

##### (1) Forms of progress in desertification

According to the researches into land devastation in the dry areas (UNEP, 1993), devastated land is concentrated in the semi-arid zones distant from the center of the desert, because the human activities in the agricultural and livestock-raising zones have been expanding from the dry semi-humid zones to the semi-arid zones along with increase of population.(Refer to Figure 32 and 33)

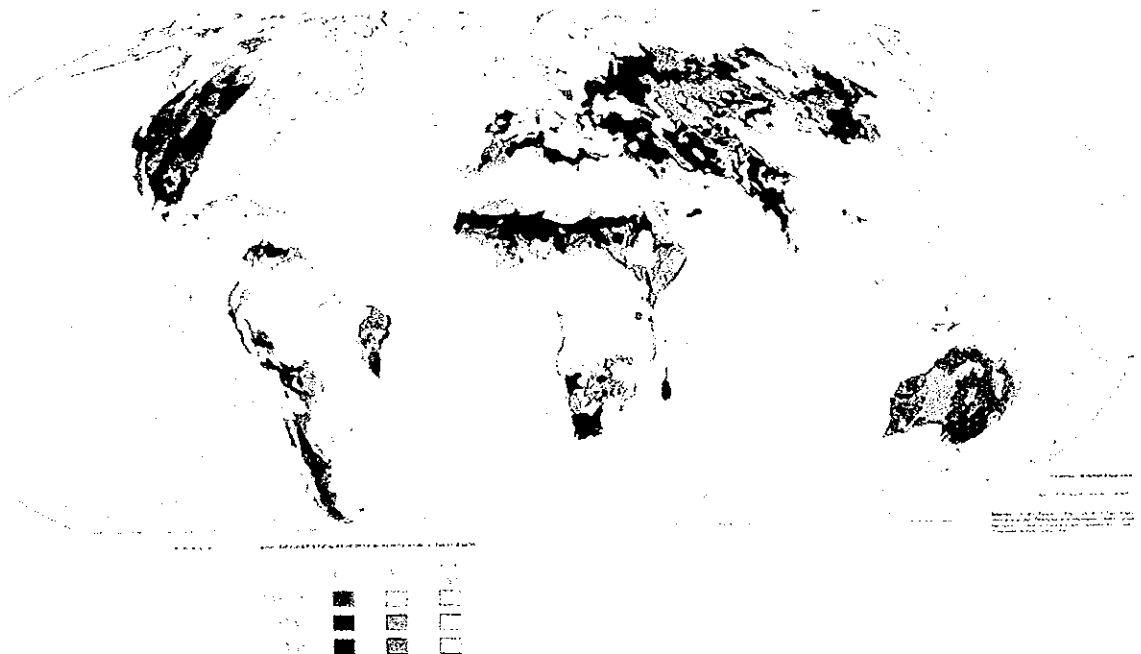


Figure 32 Progress situation of soil invasion in the world



Figure 33 Man activity in Sudan and Sahel region where can be made out from the night image by satellite

## **(2) Integrated strategic approach for sustainable development**

The national approach against desertification is to cooperate between the Government and the local residents in selection and implementation of their activities for the great goal of recovering and maintaining the balance among the nature, society and economy for the national development. This approach consists of sharing the activities in the levels of agricultural and livestock-raising production units, villages, rural districts, provinces and nation and defining the approach of activity, support, cooperation and management in each level.

### **5.1.2. Role of geo-referenced information**

The UN Agenda 21 uses the keywords such as environmental recognition, geo-referenced information and information system to show in its final chapter “Information for Decision Making” that the key to sustainable development and environmental conservation including struggles against desertification is the information for decision making. In addition, it is indicated that all people are required to be the users and providers of information at the same time in a wide sense. Further, wide range of information from international and national to individual is required for all levels.

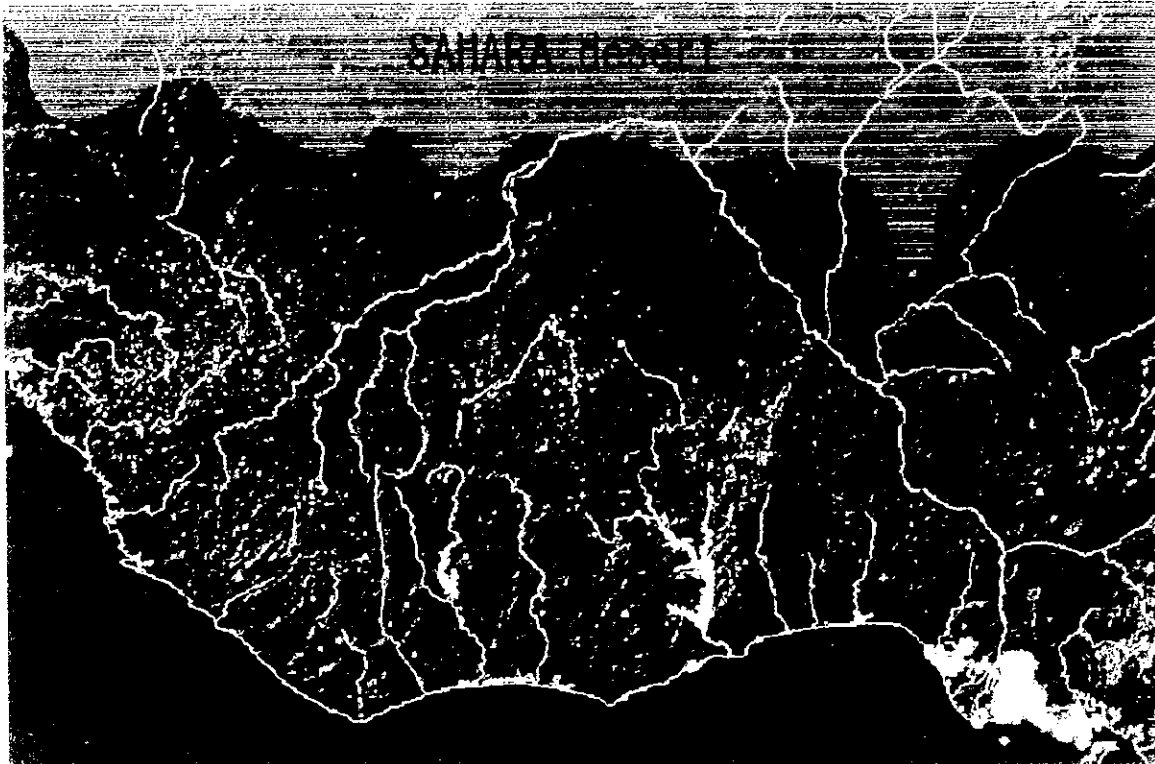


Figure 33 Man activity in Sudan and Sahel region where can be made out from the night image by satellite

## (2) Integrated strategic approach for sustainable development

The national approach against desertification is to cooperate between the Government and the local residents in selection and implementation of their activities for the great goal of recovering and maintaining the balance among the nature, society and economy for the national development. This approach consists of sharing the activities in the levels of agricultural and livestock-raising production units, villages, rural districts, provinces and nation and defining the approach of activity, support, cooperation, and management in each level.

### 5.1.2. Role of geo-referenced information

The UN Agenda 21 uses the keywords such as environmental recognition, geo-referenced information and information system to show in its final chapter "Information for Decision Making" that the key to sustainable development and environmental conservation including strategies against desertification is the information for decision making. In addition, it is indicated that all people are required to be the users and providers of information at the same time in a wide sense. Further, wide range of information from international and national to individual is required for all levels.

## (1) Global maps

The basic information for environmental analysis and development projects in global or continental scale was advocated by Japan as a global map concept in 1992, and the necessity for it was adopted and defined in the document at the UN special general assembly for environmental development in 1997. The International Global Map Management Council is promoting the global mapping at present.

Burkina Faso declared its participation in this concept in 1997. The number of countries that declared participation reached 81 in November 2000. As Burkina Faso has basically completed the digitization of 1/200,000 national topographic maps through IGB's efforts, it can be evaluated that Burkina Faso has the technical capability to complete its portion of the global map data through its participation in "the Training for Transfer of Technology Necessary for Production of Global Map". Although strong information resources could not be developed through the efforts of only one country, each country in the Sahel region must make the same effort, it is important for Burkina Faso to take the leadership as the adviser to the other countries in the Sahel region. Figure 34 is a result of having simulated the annual soil erosion volume in Namucam basin of the Thailand northeastern portion. It was simulated by using the global map data and the meteorological data in 1993 based on the RUSLE(Revised Universal Soil Loss Equation) model.

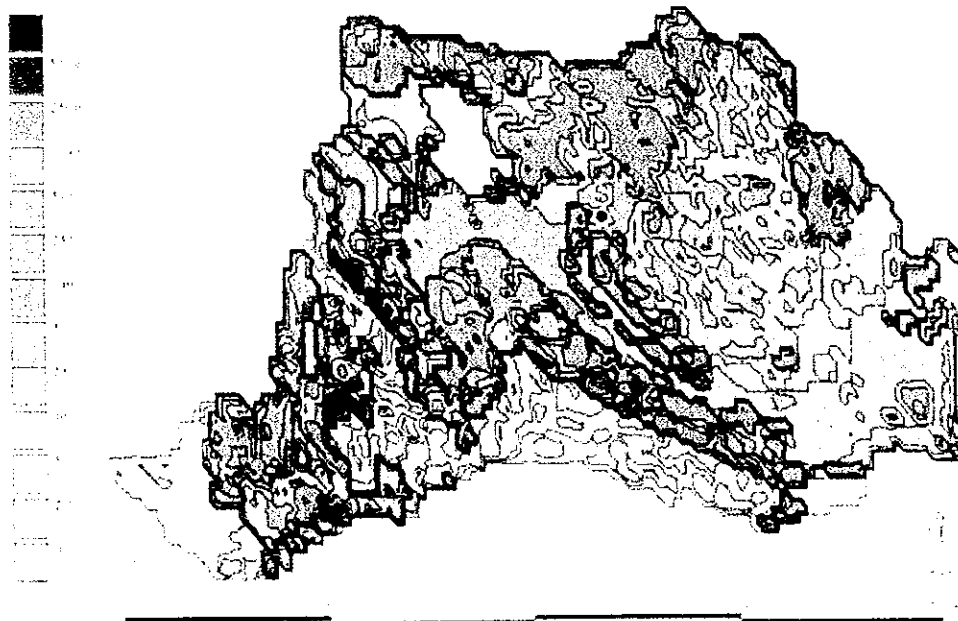


Figure 34 The annual soil erosion volume that was simulated by using the global map data

From the global point of view, it is important to examine the use of high-resolution satellite images with high time resolution and to use those as necessary. For exchange of related information with the neighboring countries, importance should also be attached to the Web GIS concept advocated by the African Map Association.

## **(2) 1/50,000 national topographic maps and digital topographic data**

The information on the projects in the national, municipal or village level or the production unit level including relatively large-scale agricultural and livestock-raising organizations has the most basic value of information. The last level is a personal level including private agricultural and livestock-raising entrepreneurs, in which they can plan their sustainable development actions and provide the information environment that they can positively participate in. The 1/50,000 national topographic maps and digital topographic data will play a pivotal role as the basic information in this level.

## **(3) Development of cadastral maps**

The cadastral survey has been made using the local coordinate system in the urban area, but in the future, it is necessary to take the measures to control the land use in accordance with the environmental policies using the standardized maps based on the national standard coordinate system.

## **5.2. Recommendations for Operation of 1/50,000 National topographic maps and Digital Topographic Information**

### **5.2.1. Popularization of simple GIS**

Some administrative offices that use geographic information on the business were visited in order to investigate the situations of GIS use.

The offices of about 70% of the visited offices had the personal computers and the marketed GIS engines according to the result of the investigation. However, only the number of offices that construct a business data base and operate GIS effectively was about 20% of the number of offices that have personal computers and the marketed GIS engines.

For the popularization for business use GIS, these situation show that the data base construction is a load for GIS users.

The GIS basic data produced by this study have about 150 kinds of useful data, so that even when the business database is not constructed, it can support some business easily.

Therefore, it is possible to popularize it as simple GIS which is explained on 4.4 even if the business database is not completed.

And, the popularization of simple GIS promotes digital computerization in each business field in Burkina Faso.

### **5.2.2. For GIS Development Stage**

#### **(1) Construction of the regional agricultural development support system**

The regional agricultural development is important to promote the agricultural development policies because an overwhelming majority of the population of Burkina Faso is engaged in agriculture that is a major share of the gross national product (GNP) of this country. Therefore, it is recommended to develop a full-scale GIS system based on the evaluation of the pilot GIS for support of regional agricultural development and the agricultural development program in the framework of the Second Five-Year National Development Plan. This full-scale system is required to comprehensively arrange, reconstruct and enhance the efficiency of the services of the Department of Surveying and Planning and National Bureau of Soil of Ministry of Agriculture, various agricultural research institutes and local agencies. The regional agricultural development support system has a high utility effect even in the stage in which 1/50,000 GIS basic data is provided only for a part of regions in the country. Therefore, it is recommended to implement this project as early as possible.

#### **(2) Construction of simulation GIS for regional environment evaluation**

In Burkina Faso, its sustainable development has to be pursued under the pressure of desertification unique to the Sudan-Sahel region. For this purpose, it is necessary to evaluate the effect on the environment in formulating the development plan. In the environmental evaluation in the global scale or in the scale of the entire Sudan-Sahel Region, the global maps serve greatly as the basic data, but in the regional development in Burkina Faso, the environmental evaluation in the regional scale is indispensable. Therefore, it is recommended to construct the simulation GIS for regional environmental evaluation by using the GIS basic data. This system will greatly contribute to higher efficiency of administrative services if all the relevant agencies of Ministry of Environment, Ministry of Agriculture, Ministry of Infrastructure, Housing and Urban Planning and Ministry of Mining cooperate in its development.

### **(3) Construction of service GIS for administrative agencies and research institutes handling geographic information**

It was found that the administrative agencies and research institutes handling geographic information did not utilize computers and GIS engines effectively because the information database was not available. It is, therefore, recommended that a service GIS will preferentially be developed and used for the services in which the use of GIS has a high effect.

In particular, for the services of municipalities, it is recommended that the agencies doing the services closely related to the local areas and provided with facilities and equipment as well as operating personnel will develop their own service GIS systems. Most of municipal services are common to all municipalities, so that if a typical service GIS is developed, it can be customized with a little modification and used by each municipality with high efficiency.

#### **5.2.3. Provision of the printed maps**

There are many villages that have not introduced computers. In such villages, the printed maps are usable. To make the printed maps available in an easy way, it is necessary to set up the points of sale on consignment in major rural districts. In the rural districts that are provided with 1/50,000 national topographic maps, it is recommended to adopt the methods of reading and using maps in school education.

#### **5.2.4. Provision and Management of GIS Basic Data**

##### **(1) Pricing policy for providing of GIS basic data**

As description in 5.1. Background of Recommendation, and in order to attain the integrity of the action plans in the residents level with the governmental programs, it is desirable that the conditions and plans in each level are depicted on the basic information that is common with the governmental programs. It is important that the GIS basic data can be utilized in any level and that it is indispensable information to be promoted to any level of the nation.

Therefore, as the pricing policy, it is necessary to supply the GIS basic data at a low price in possible.

## **(2) GIS basic data management**

The GIS basic data is technically easy to reproduce, transmit and process, but difficult to manage. It is deemed to be appropriate that IGB as the owner of the copyright to the GIS basic data is entitled to assign or transfer the right to use the information. The users of the information shall be granted only the right to use the information, but no right to reproduce and assign or transfer the information. Although the copyright to the secondary information processed from the primary information will be granted to the author of such secondary information, no secondary copyright shall be invested with any simply processed information with no originality. Any person or party which IGB will assign or transfer the right to use IGB's information shall appoint the manager or become the manager to have the obligation to manage the information.

On the other hand, IGB will manage the registration of the GIS basic data to be assigned or transferred to the users. The registration will be made of data name (name of map sheet in general) and its version date, date of assignment, name of the holder of the right to use the data, the organization of the holder of such right, name of manager and the organization of the manager. Change of any registered items shall be notified to IGB.

If IGB upgrades the version of any data, it will be indicated in IGB's homepage to announce the latest date of version. The holder of the right to use such data may receive the new version for an issuing fee. In this case, the corresponding registered items shall be updated.

The GIS basic data will be supplied in the form of CD-ROM media for the time being. If any secondary information is announced, the name of GIS basic data and the date of version shall be indicated.

### **5.3. Recommendations for Maintenance of 1/50,000 National topographic maps and Digital Topographic Information**

The areas covered by the 1/50,000 national topographic maps and digital topographic information will be changing with the development actions and change in the natural conditions. If the freshness of the information is lost, its value will decrease. For instance, if a new arterial road is constructed, but not drawn in the national topographic map, the utility value of the map will decline. Most of changes in the areas are due to development. In general, such as modified areas are narrow and distributed widely. Therefore, the way of dispatching a survey team to the modified areas to acquire the changed data is less efficient than the way of production of a new national topographic map.



In general, the development agencies that make changes in the national topographic maps are mostly related to road constructions, agricultural developments and urban developments. Therefore it is recommended that IGB will request the related agencies to provide development information. In the case that the national topographic maps are modified based on the provided development information, it is important that the new version of national topographic maps or GIS basic data will be supplied free of charge and that the users of information as mentioned in Agenda 21 will be the providers of such information. These measures will serve not only to reduce the modification costs but also to ensure that the national level and another level will cooperate to cope with desertification and do the joint work for the sustainable development of the country.

In addition, it is recommended that each level of development agency will participate in the updating work and will discuss with the IGB to define the type of information. Such as information which higher than a certain scale of the development activities by agricultural or livestock-raising operators will also be provided for maintenance of 1/50,000 national topographic maps and digital topographic information.

If the design maps or certified survey maps of any development agency are produced and digitized under the national survey standard, this work will ensure the highest cost performance. Therefore, it is important to make full discussions and include the results in the agreement between the development agencies and IGB.

#### **5.4. Recommendations for Nationwide Promotion of Production of 1/50,000 National topographic maps and Digital Topographic Information**

##### **5.4.1. Enhancement of information resource values in early development of nationwide maps**

The national topographic maps that cover the entire country will have a substantially high value of information in terms of quality. The administrative agencies controlling the entire country are apt to hesitate the introduction of a service system using the national topographic information that does not cover the entire country. It is because two types of service system for the covered areas and for the uncovered areas are required, resulting in making the services troublesome and the wide-area analysis over the country almost impossible. The Ministry of Elementary Education is reluctant to adopt the incomplete national topographic maps that cover a part of the country.

If the entire country is covered, any GIS application system can be used nationwide with high universality. In this sense, the utility value of the GIS basic data and the GIS application systems will synergistically be enhanced by covering the entire country for a period as short as possible.

#### 5.4.2. Period of nationwide coverage by 1/50,000 national topographic digital mapping system

The entire image of the 1/50,000 national topographic map development program of Burkina Faso is shown in Table 8 prepared based on SDCD.

**Table 8 Map sheets produced and development plan for 1/50,000 national topographic maps**

Coverage	Number of map sheets	Remarks
Map sheets produced in 1998	62	
Map sheets produced in this study	32	
Map sheets to be produced for the first priority area	62	
Map sheets to be produced for the second priority area	93	
Map sheets to be produced for the third priority area	64	
Map sheets to be produced for the fourth priority area	61	
Total	374	Produced: 94 (incl. 32 digital maps) To be produced: 280

The efficiency of production of national topographic maps in operation of the 1/50,000 national topographic digital mapping system developed in this study corresponds to the efficiency in the digital plotting process that defines the efficiency of the entire work. If one plotter provided in this study is operated for 7 hours per day, the plotting efficiency is 1.2 models/plotter/day. If the average number of models in one map sheet is estimated to be 22, 0.054 map sheet/plotter/day is produced.

If 2 plotters are operated in 2 shifts from 7 to 13 hours and from 13 to 19 hours to enhance the operating efficiency of 2 sets of plotter, 46.6 map sheets can be produced for a period of 250 days per year.

This is a simple assumption, but the map sheets to cover the entire country can be produced for a period of about 6 years.

Figure 35 Work process schedule for development of national topographic maps for the Southwestern Area

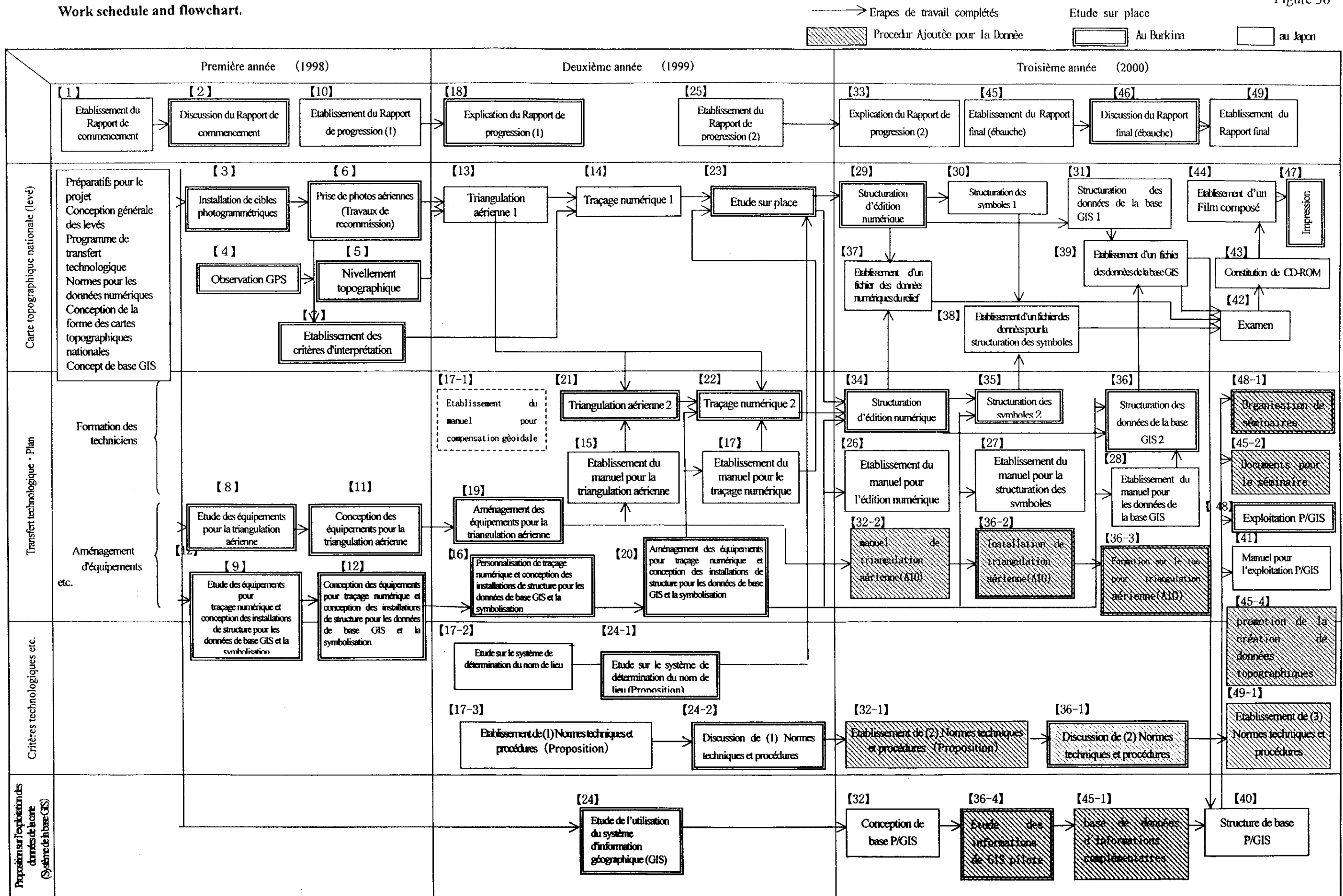
Process	1998 fiscal year	1999 fiscal year	2000 fiscal year	Remarks
	11·12·01·02·03	04·05·06·07·08·09·10·11·12·01·02·03	04·05·06·07·08·09·10·11·12·01·02	
Aerial photo signalization	■			
Control point survey	■			
Aerial photography	■			
Aerial triangulation		■	■	
Establishment of aerial interpretation standard		■		
Digital plotting		■		
Field identification		■		
Digital compilation			■	
Digital map symbol structuralizing			■	
GIS basic data structuralizing			■	
Reproduction filming and printing				

Legend= ■:IGB, in Burkina Faso    ■■■:JICA, in Japan    ■■■■■:Processing on commission



Work schedule and flowchart.

Figure 36



Work schedule and flowchart.

Figure 36

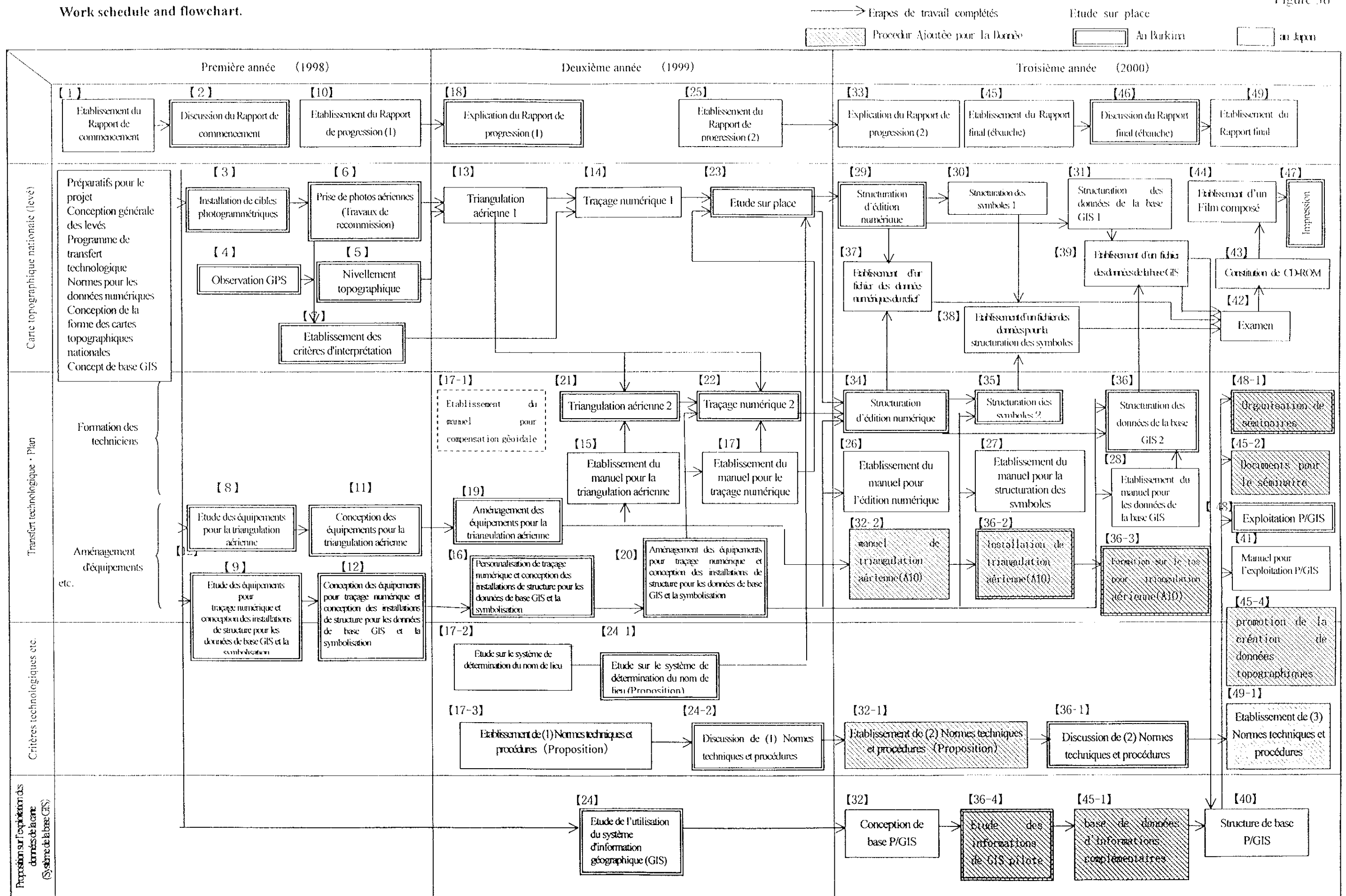


Figure 37

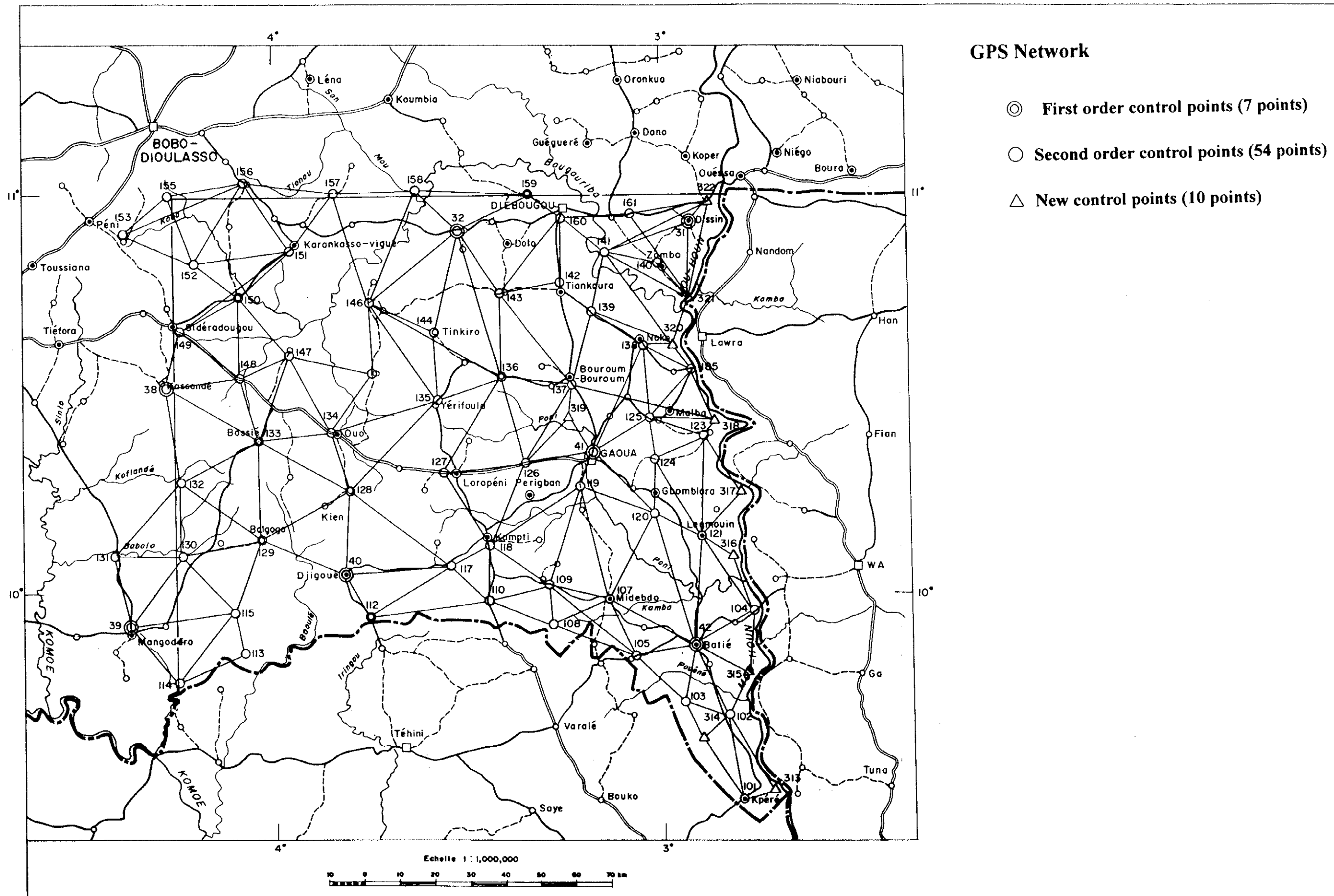
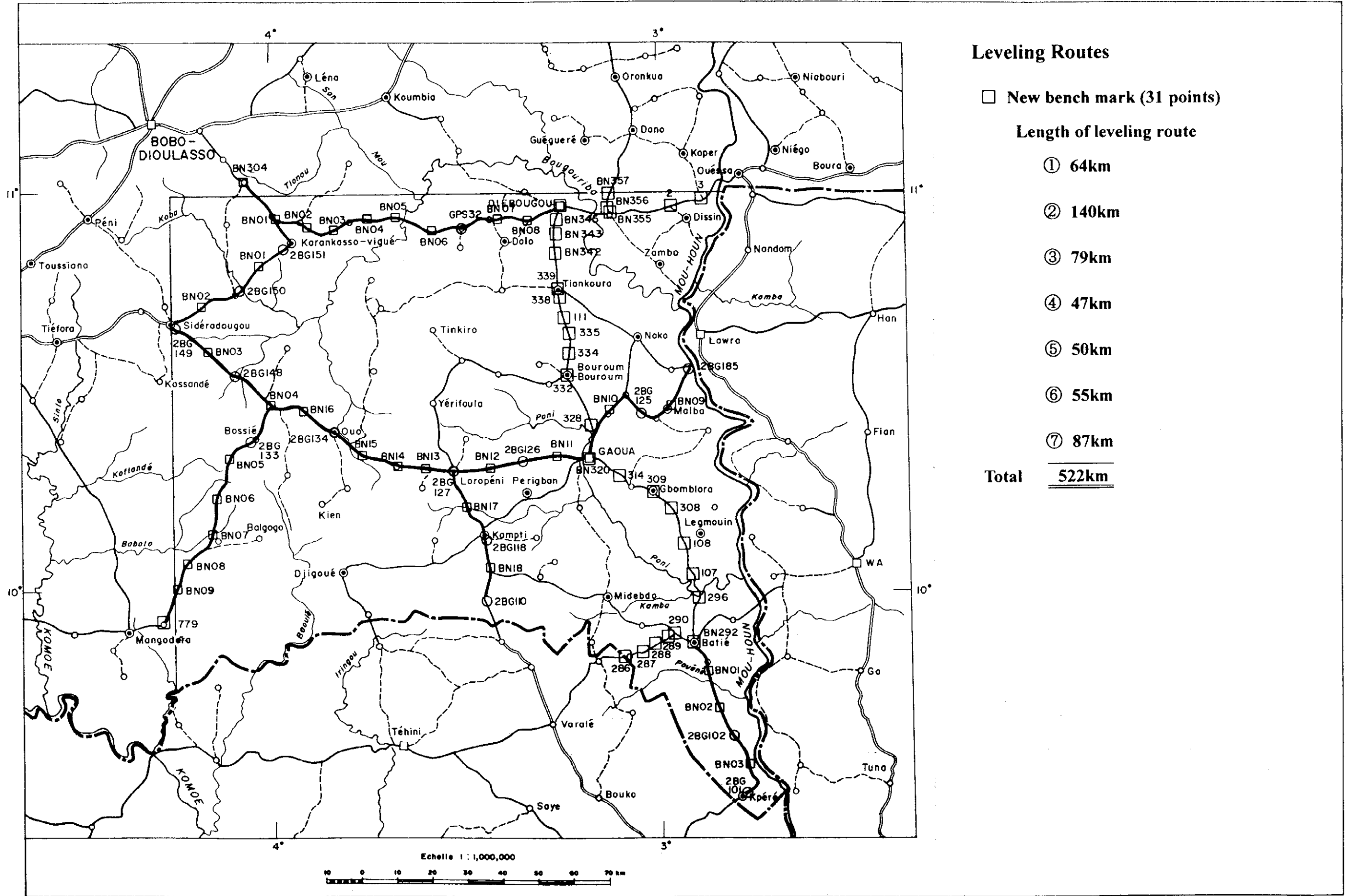
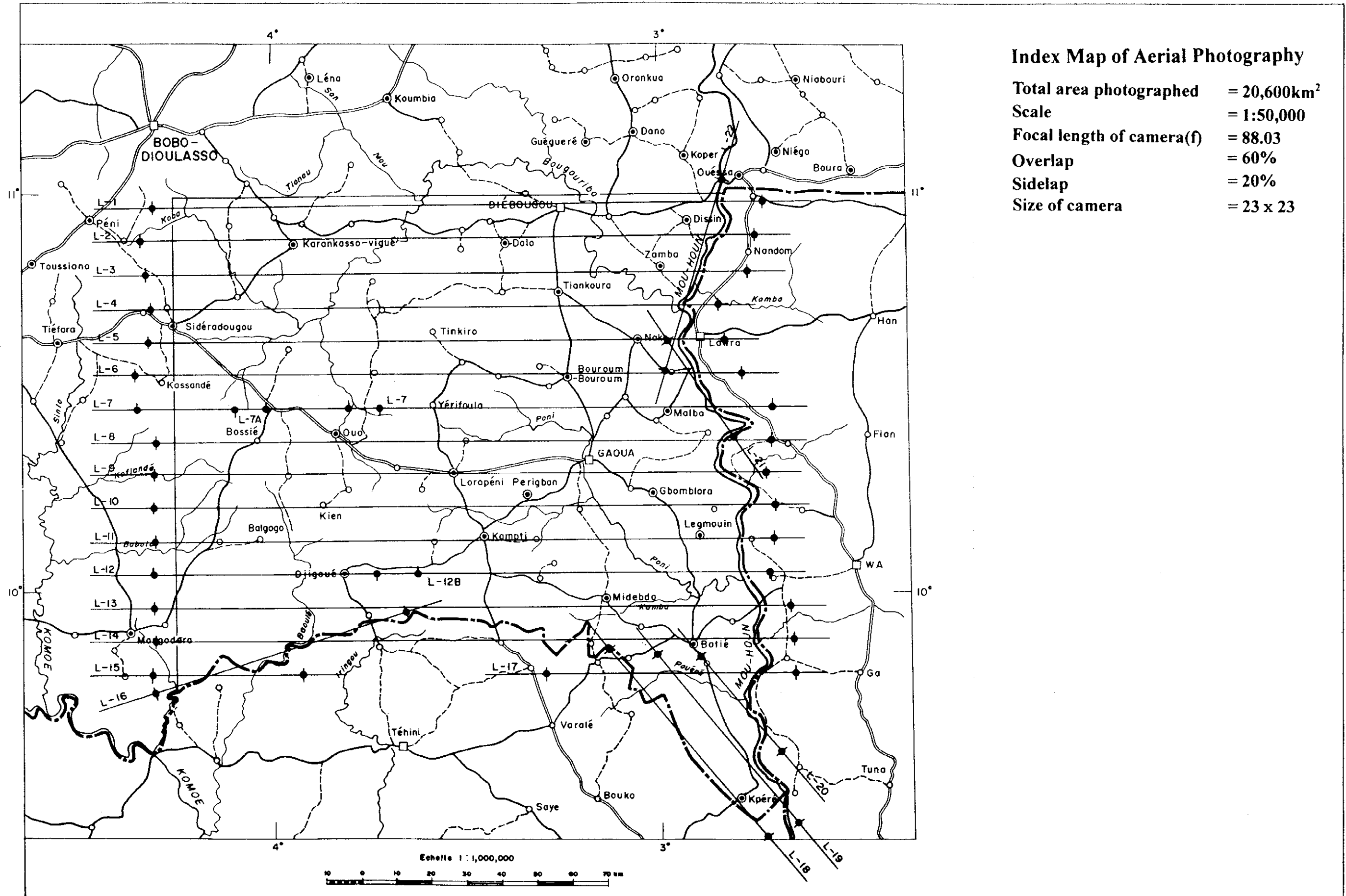


Figure 38

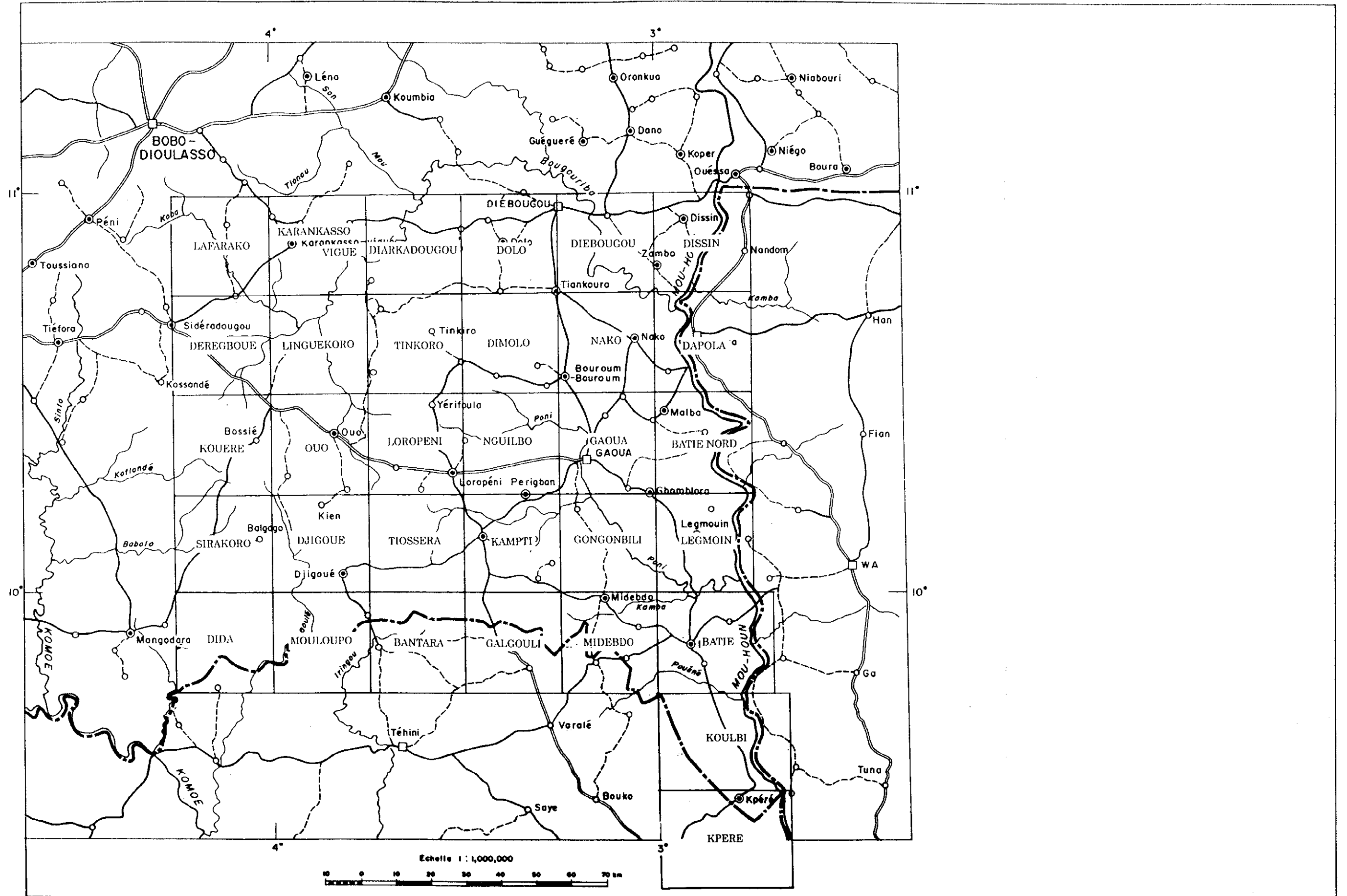






Map index of 1/50,000 national topographic map in the study area

Figure 40





Outline standards of the symbols and digital data acquisition

Attribute Code			Description	Symbol in Work File	Symbol Representation	Data Type	Acquisition Method
21	01	00	Paved road with median strip			Line	To acquire the road center (to connect)
21	02	01	Paved road (large)			Line	To acquire the road center (to connect)
21	02	02	Paved road (small)			Line	To acquire the road center (to connect)
21	03	00	Unpaved road usable at all times			Line	To acquire the road center (to connect)
21	04	00	Unpaved road with seasonal change			Line	To acquire the road center (to connect)
21	05	00	Road passable by 4WD vehicles			Line	To acquire the road center (to connect)
21	06	00	Road lined with trees			Line	To acquire the center of a row of trees as a line
21	10	00	Road under construction			Line	To acquire the road center (to connect)
21	11	00	Paved road with center median strip under construction				
21	12	00	Paved road (large) under construction				
21	13	00	Paved road (small) under construction				
21	21	00	Walking road			Line	To acquire the road center (to connect)
21	22	00	Path			Line	To acquire the road center (to connect)
21	31	00	Bridge			Line	To acquire the bridge center (to connect)
21	32	00	Invert or submersible road			Line	To acquire the road center (to connect)
21	33	00	Jetty			Line	To connect line
22	01	00	Double-track railroad			Line	To acquire the center of a railroad (to connect)
22	02	00	Single-track railroad			Line	To acquire the center of a railroad (to connect)
22	03	00	Station, depot			Line	To connect line
22	04	00	Depot			Line	To connect line
22	05	00	Sidetrack			Line	To acquire the center of a railroad (to connect)
22	06	00	Tunnel (tunnel entrance/exit)			Symbol	To acquire a direction symbol

Outline standards of the symbols and digital data acquisition

Attribute Code	Description	Symbol in Work File	Symbol Representation	Data Type	Acquisition Method
21 01 00	Paved road with median strip			Line	To acquire the road center (to connect)
21 02 01	Paved road (large)			Line	To acquire the road center (to connect)
21 02 02	Paved road (small)			Line	To acquire the road center (to connect)
21 03 00	Unpaved road usable at all times			Line	To acquire the road center (to connect)
21 04 00	Unpaved road with seasonal change			Line	To acquire the road center (to connect)
21 05 00	Road passable by 4WD vehicles			Line	To acquire the road center (to connect)
21 06 00	Road lined with trees			Line	To acquire the center of a row of trees as a line
21 10 00	Road under construction			Line	To acquire the road center (to connect)
21 11 00	Paved road with center median strip under construction			Line	To acquire the road center (to connect)
21 12 00	Paved road (large) under construction			Line	To acquire the road center (to connect)
21 13 00	Paved road (small) under construction			Line	To acquire the road center (to connect)
21 21 00	Walking road			Line	To acquire the road center (to connect)
21 22 00	Path			Line	To acquire the road center (to connect)
21 31 00	Bridge			Line	To acquire the bridge center (to connect)
21 32 00	Invert or submersible road			Line	To acquire the road center (to connect)
21 33 00	Jetty			Line	To connect line
22 01 00	Double-track railroad			Line	To acquire the center of a railroad (to connect)
22 02 00	Single-track railroad			Line	To acquire the center of a railroad (to connect)
22 03 00	Station, depot			Line	To connect line
22 04 00	Depot			Line	To connect line
22 05 00	Sidetrack			Line	To acquire the center of a railroad (to connect)
22 06 00	Tunnel (tunnel entrance/exit)			Symbol	To acquire a direction symbol

## Study Team

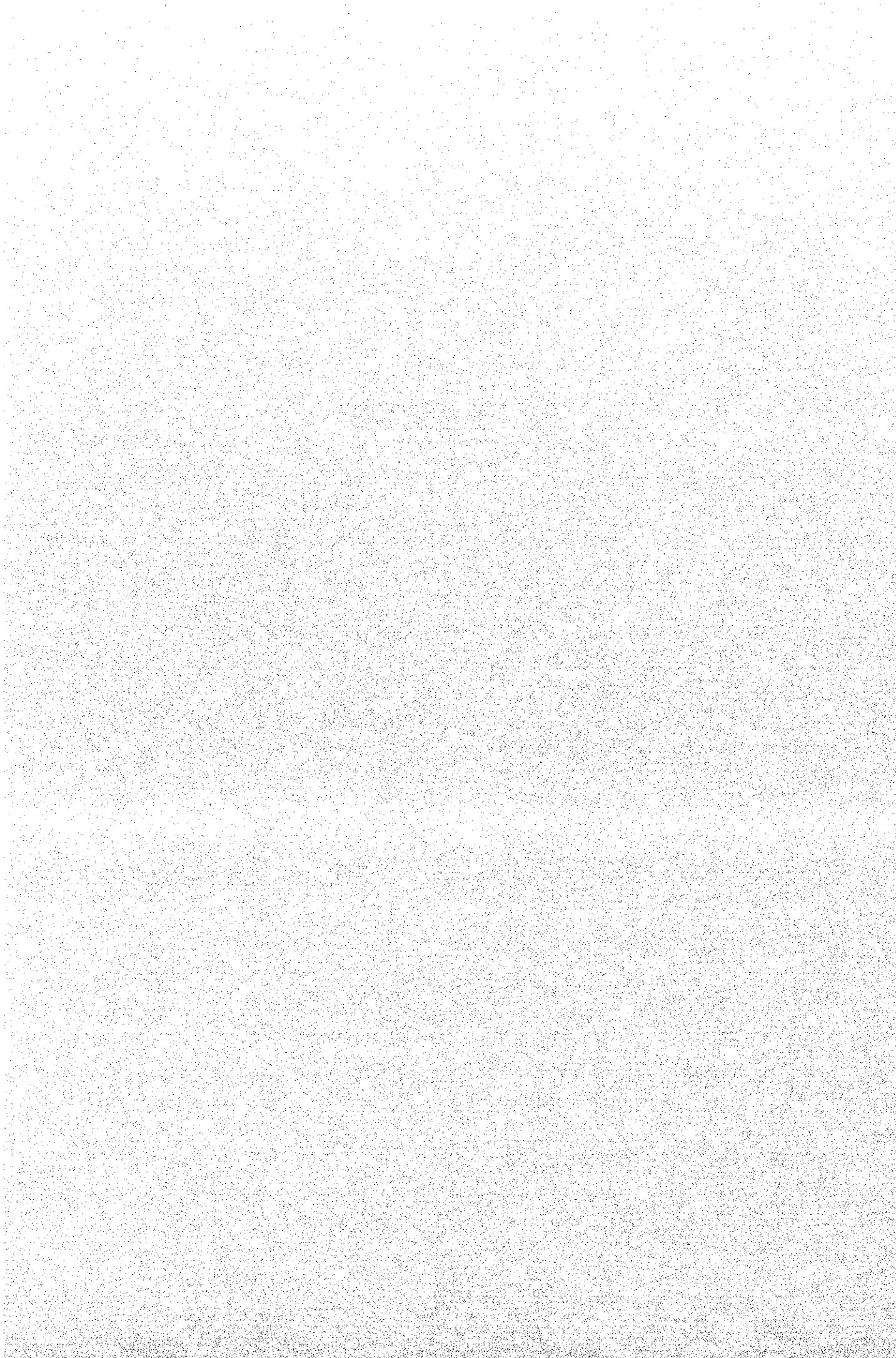
Table 9

Assignment	Name	Company
Team Leader	Kokichi Kimura	Aero Asahi Corporation
Sub-leader/subcontract control	Katsuyuki Hatakeyama	Aero Asahi Corporation
GPS observation supervision	Dr.Bandula Senakasiri	Aero Asahi Corporation
Leveling supervision	Yoshikazu Ogasawara	Aero Asahi Corporation
Preparation of interpretation keys	Kentaro Usuda	Aero Asahi Corporation
Aerial triangulation supervision	Seiji Nakanishi	Aero Asahi Corporation
Digital plotting supervision	Takashi Tomura	Aero Asahi Corporation
Field verification supervision	Kentaro Usuda	Aero Asahi Corporation
Digital compilation/structuralization supervision I	Kosuke Tsuru	Aero Asahi Corporation
Digital compilation/structuralization supervision II	Masami Yoshimoto	Aero Asahi Corporation
Instruction of GIS	Kiichiro Nishioka	Aero Asahi Corporation
DM system improvement (modification)	Hiroshi Matsushita	Eni Tech Co. Ltd.
Additional GIS survey	Takashi Yashiro	Aero Asahi Corporation
Work Coordination	Yuji Ouchi	Aero Asahi Corporation
Work Coordination	Naoki Goto	Aero Asahi Corporation
Interpretation	Tadao Maruyama	Techno Staff Co.,Ltd.

## IGB Key Persons

Name	Position
Oussény TARNANGUIDA	Gneral Director
Claude Obin TAPSOBA	Technical Director
Ernest ILBOUDO	Chief Counterpart of The Project
Salifou KABORE	Chief of Information Processing Service
Justin R.YAMEOGO	Chief of Photogrammétric Surveying Service
Ousmane DEMBELE	Chief of controle service
Jean ZONGO	Chief of Aerial Photography Section Ousséni KONATE
Ousséni KONATE	Chief of Laboratory
Lucie SOMDA	Chief of Map Compilation Section
Thierry SOUAHIBOU	Computer Engineer
Yay SANON	Chief of Topographic Service

# APPENDIX



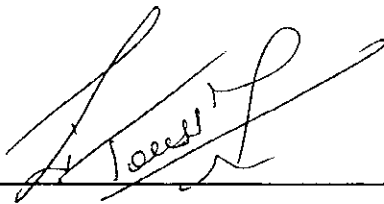


SCOPE OF WORK  
ON  
THE NATIONAL TOPOGRAPHIC MAPPING  
OF  
THE SOUTHWESTERN AREA  
IN  
BURKINA FASO

AGREED UPON BETWEEN

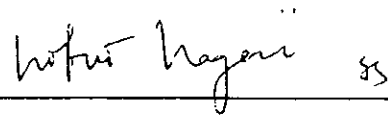
INSTITUT GEOGRAPHIQUE DU BURKINA,  
MINISTERE DES INFRASTRUCTURES, DE L'HABITAT ET DE L'URBANISME  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

OUAGADOUGOU  
August 3rd, 1998



---

Mr. Oussény TARNANGUIDA  
Directeur Général  
Institut Géographique du Burkina,  
Ministère des Infrastructures,  
de l'Habitat et de l'Urbanisme



---

Mr. Nobuo NAGAI  
Leader,  
Preparatory Study Team  
Japan International Cooperation Agency

## I. INTRODUCTION

In response to the request of the Government of Burkina Faso, the Government of Japan has decided to conduct "The National Topographic Mapping of The Southwestern Area in Burkina Faso" (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 program of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Burkina Faso.

The present document sets forth the scope of work with regard to the Study.

## II. OBJECTIVES OF THE STUDY

The objectives of the Study are

- 1) to prepare digital topographic data for regional development plans and infrastructure development projects in southwestern area, and
- 2) to transfer related technology to Burkina counterpart personnel.

## III. STUDY AREA

The digital topographic mapping shall cover the southwestern area (approximately 20,600 km<sup>2</sup>) including Gaoua region and its surroundings. The location of digital topographic mapping area is shown in ANNEX-1.

## IV. SCOPE OF THE STUDY

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

### 1) Signalization

Before starting aerial photography, signals shall be established on the necessary ground control points.

### 2) Aerial photography

Black and white aerial photos covering the study area shall be taken at the scale of 1:50,000.

SS

3) Ground control point survey

Ground control point survey with GPS survey shall be carried out by using the existing geodetic network in the study area.

4) Leveling

Leveling shall be carried out to determine the geoid model.

5) Aerial triangulation

Aerial triangulation shall be carried out to establish photo control points.

6) Interpretation criteria

The criteria shall be prepared for the interpretation of aerial photos.

7) Plotting

Plotting shall be carried out to prepare 1:50,000 scale digital topographic data with 10 m contour intervals.

8) Field identification

Field identification shall be carried out in the study area to identify natural and artificial terrain features, geographic names and boundaries which are difficult or impossible to recognize on the aerial photographs.

9) Compilation

Compilation of the plotted data shall be carried out based on the result of field identification.

10) Structurization

Topological structurization shall be carried out for completion of digital topographic data.

11) Printing of maps

Digital topographic data shall be printed at the scale of 1:50,000.

12) Technology transfer

In order to facilitate technology transfer to the counterpart personnel, a part of process of making digital topographic data shall be carried out by Burkina Faso side under the technical supervision of

61

the Study Team.

## V. STUDY SCHEDULE

The Study shall be conducted in accordance with the attached tentative schedule shown in ANNEX-2.

## VI. REPORTS AND FINAL PRODUCTS

JICA shall prepare and submit the following reports and final and intermediate products of topographic mapping works to the Government of Burkina Faso.

1. Inception Report (written in English)  
20 copies      At the beginning of the Study
2. Progress Reports (written in English)  
20 copies      At the end of the first year and the second year
3. Draft Final report (written in English and French)  
20 copies      At the end of the third year
4. Final report (written in English and French)  
20 copies      At the end of the Study
5. Final and intermediate products of topographic mapping
  - a. Negative films of aerial photos      1 set
  - b. Contact prints of aerial photos      1 set
  - c. Result of ground control point survey      1 set
  - d. Result of aerial triangulation      1 set
  - e. 1:50,000 scale topographic maps
    - films for printing      1 set
    - printed maps      500 copies
  - f. 1:50,000 scale digital topographic data
    - digital data files (eg. CD-ROM)      50 sets

## VII. UNDERTAKING OF THE GOVERNMENT OF BURKINA FASO

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

§

OT

- (1) to secure the safety of the Study Team ;
- (2) to permit the members of the Study Team to enter, leave and sojourn in Burkina Faso for the duration of their assignment therein and exempt them from alien registration requirements and consular fees;
- (3) to exempt the member of the Study Team, from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into and out of Burkina Faso for the conduct of the Study;
- (4) to exempt the member of the Study 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 Study Team for their services in connection with implementation of the Study;
- (5) to provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced into Burkina Faso 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 to acquire necessary radio frequency for the implementation of the Study ;
- (8) to secure permission for the Study Team to take all data and documents including topographic maps, original manuscripts, aerial photos related to the Study out of Burkina Faso;
- (9) to secure necessary permission for aerial photography by foreign registered aircraft for the implementation of the Study;
- (10) to obtain the necessary permission from the Government of Ivory Coast and the Government of Ghana for the execution of aerial photography by the Study Team at the area of border line; and
- (11) to provide the medical services as needed, including Air transportation. Its expenses will be chargeable on the members of the Study Team.

2. The Government of Burkina Faso 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 Study Team.

3. Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme (hereinafter referred to as "IGB") shall act as a counterpart agency to the 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, and IGB shall support the Study Team technically for the implementation of the Study .

4. IGB shall, at its own expense, provide the Study Team with the following, in cooperation with other organization concerned:

- (1) Available data and information related to the Study;
- (2) Counterpart personnel;
- (3) Suitable office space with necessary equipment in Ouagadougou ;
- (4) Vehicles with drivers; and
- (5) Credentials or identification cards.

#### 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 Burkina Faso; and
- (2) to pursue technology transfer to the Burkina counterpart personnel in the course of the Study.

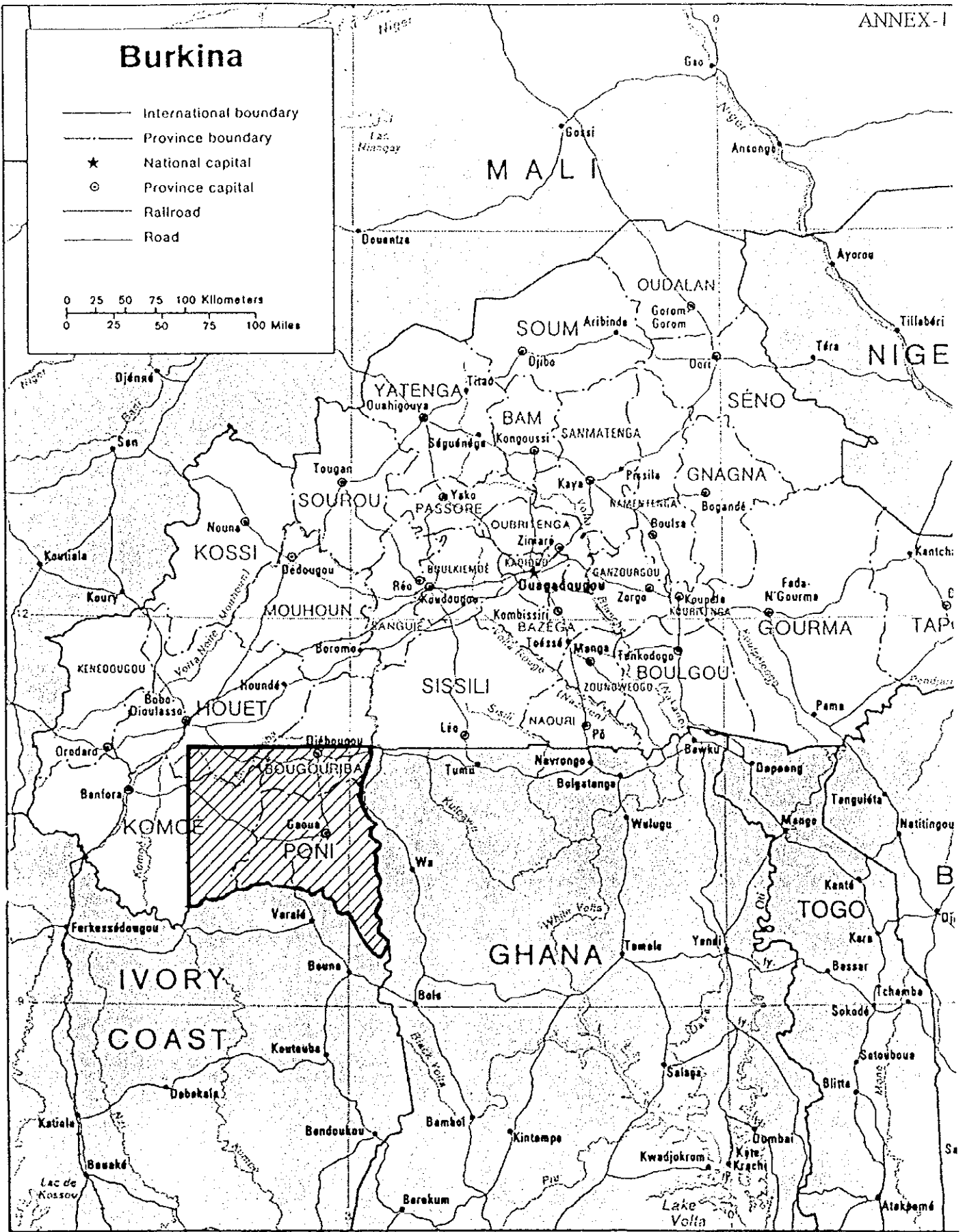
#### IX. CONSULTATION

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

2. The Scope of Work was written in English and French, and their validity should be equivalent. However, in case that any contradiction arises in writing, the English text shall be predominant.

85

01



 Study area

Base 801045

DT

TENTATIVE SCHEDULE

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Work in Burkina	[ ]				[ ]				[ ]				[ ]				[ ]															
Work in Japan	[ ]	[ ]				[ ]				[ ]	[ ]								[ ]													
Report and Final Products	△ IC/R				△ PG/R1				△ PG/R2				△ DF/R				△ F/R F/P															

IC/R : Inception Report  
 PG/R: Progress Report  
 DF/R: Draft Final Report  
 F/R : Final Report  
 F/P : Final Products

5

01



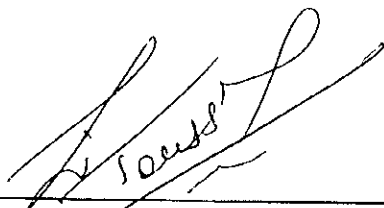
MINUTES OF MEETING  
UPON  
THE SCOPE OF WORK  
ON  
THE NATIONAL TOPOGRAPHIC MAPPING  
OF  
THE SOUTHWESTERN AREA  
IN  
BURKINA FASO

AGREED UPON BETWEEN

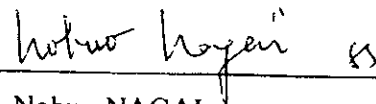
INSTITUT GEOGRAPHIQUE DU BURKINA,  
MINISTERE DES INFRASTRUCTURES, DE L'HABITAT ET DE L'URBANISME  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

OUAGADOUGOU

August 3rd, 1998



Mr. Oussény TARNANGUIDA  
Directeur Général  
Institut Géographique du Burkina,  
Ministère des Infrastructures,  
de l'Habitat et de l'Urbanisme



Mr. Nobuo NAGAI  
Leader,  
Preparatory Study Team  
Japan International Cooperation Agency

The Japanese Preparatory Study Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Nobuo NAGAI (Director of Geographical Department, Geographical Survey Institute, Ministry of Construction) visited the Burkina Faso from July 27th to August 5th, 1998 in connection with the Study on "The National Topographic Mapping of the Southwestern Area in Burkina Faso" ( hereinafter referred to as "the Study").

The Team had a series of discussions on the Scope of Work of the Study with officials of Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme (hereinafter referred to as "IGB"). A list of participants is given in Annex-1.

Through these discussions, both sides have completed the Scope of Work and confirmed the following points:

1. Both sides agreed that the title of the Study shall be "The National Topographic Mapping of the Southwestern Area in Burkina Faso".
2. Both sides agreed that following processes of the Study shall be carried out by counterpart personnel under the technical supervision of the Study Team, and IGB promised to offer five (5) persons as counterpart personnel in these processes. The Burkina Faso side shall bear the necessary expenses.
  - Signalization
  - Ground control point survey
  - Leveling
  - Aerial triangulation (partially)
  - Plotting (partially)
  - Field identification
  - Compilation (partially)
  - Structurization (partially)
3. IGB explained the necessity of leveling to determine the geoid model. The Team understood that the necessity, and both sides agreed the execution of leveling.
4. Both sides agreed that in case the aerial photography is not completed in the first year of the Study by unseasonable weather or other reasons the photographing shall be extended within the limits of one (1) year and both sides will consult with each other in respect of changing the method of the Study.

01

5. IGB explained the difficulty in providing the vehicles, and the Team promised to convey that situation to JICA Headquarters.
  
6. The Minutes of Meeting was written in English and French, and their validity should be equivalent. However, in case that any contradiction arises in writing, the English text shall be predominant.

85

01

Attendant List

Japanese Side

Mr. Nobuo NAGAI	Leader of the Team
Mr Masakatsu ABE	Member of the Team
Mr. Tomoyuki KOSAWA	Member of the Team
Mr. Sho SAITO	Member of the Team
Mr. Masao MATSUBARA	Member of the Team

Burkina Faso Side

Mr. Oussény TARNANGUIDA	Directeur Général/IGB
Mr Claude Obin TAPSOBA	Directeur Technique/IGB
Mr. Soumaïla DIALLO	Chef de Service Photogrammetrie et Télédétection/IGB
Mr. Salifou KABORE	Chef de Service Informatique/IGB
Mme Lucie SOMDA	Chef de Section Rédaction Cartographique/IGB
Mr Ousmane DEMBELE	Responsable de la cellule de Contrôle/IGB

81

01

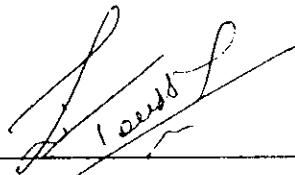
MINUTES OF MEETING  
UPON  
THE INCEPTION REPORT  
OF  
THE STUDY  
ON  
THE NATIONAL TOPOGRAPHIC MAPPING  
IN  
THE SOUTHWESTERN AREA  
OF  
BURKINA FASO

AGREED UPON BETWEEN

INSTITUT GEOGRAPHIQUE DU BURKINA,  
MINISTERE DES INFRASTRUCTURES, DE L'HABITAT ET DE L'URBANISME  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

OUAGADOUGOU

December 8th, 1998



---

Mr. Oussény TARNANGUIDA  
Directeur Général  
Institut Géographique du Burkina,  
Ministère des Infrastructures,  
de l'Habitat et de l'Urbanisme



---

Mr. Kokichi KIMURA  
Leader  
Study Team  
Japan International Cooperation Agency

The Study Team for the Study on the National Topographic Mapping in Southwestern Area of Burkina Faso (hereinafter referred as the Study Team) organized by Japan International Cooperation Agency (JICA), headed by Mr.Kokichi KIMURA as the Leader and the Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme (IGB), headed by Mr. Oussény TARNANGUIDA had a series of discussions on the Inception Report for the Study explained by the Study Team.

These discussions were carried out from 25<sup>th</sup> to 27<sup>th</sup> of November in 1998, at the head office of IGB.

The List of participants is shown in Annex 1.

After the series of discussions, both sides agreed with the Inception Report in principle and the following items.

**(1) CHAPTER2. BASIC POLICIES OF THE STUDY, 2.5 MANAGEMENT, 2.5.1 Management Council**

Both sides confirmed the constituent members which is shown in Annex-2.

**(2) CHAPTER 2. BASIC POLICIES OF THE STUDY, 2.5 MANAGEMENT, 2.5.2 Appointment of Liaison Officers**

Both sides nominated the Liaison Officers as shown in Annex 3.

**(3)CHAPTER 3. SURVEYING & MAPPING STANDARDS, 3.1 SURVEYING & MAPPING STANDARDS**

Concerning with Figure 9 NEATLINES OF TOPOGRAPHIC SHEETS, IGB requested to make an extension topographic sheets as shown in Annex -4. The Study Team agreed to investigate it after checking on specifications of printing machines in Abidjan.

EST

EST

(4) CHAPTER3 SURVEYING & MAPPING STANDERDS, 3.2 SYSTEM OF MAP REPRESENTATION

IGB promised to submit the system of map representation in the existing 1/50,000 national topographic map of Burkina Faso in order to discuss on it.

(5) CHAPTER3 SURVEYING & MAPPING STANDARDS, 3.3 ACCURACY

IGB promised to submit the technical specification concerning the accuracy of the existing 1/50,000 national topographic map of Burkina Faso in order to discuss on it.

(6)CHAPTER5 TECHNOLOGY TRANSFER PROGRAM, 5.1 OUT LINE OF TECHNOLOGY TRANSFER

IGB requested the Technology Transfer concerning the correction of geoidal undulation in GPS ground control points survey taking measures to prepare a manual and carry out OJT. Also IGB requested the Technology Transfer concerning the Pilot GIS Basic Design taking measures to give a lecture.

The Study Team agreed with these requests.

(7)CHAPTER6 STUDY PROCEDURES, 6.3 DETAILS OF STUDY IN EACH PROCESS

IGB promised to submit the Technical Specification as following process in order to discuss on it.

- 3) Aerial Photo Signal Installation
- 4) GPS Survey
- 5) Leveling
- 6) Aerial Photography

(8) CHAPTER6 STUDY PROCEDURES, 6.3 DETAILS OF STUDY IN EACH PROCESS

Both sides agreed to make an early start on the process of **[3]** Aerial Photo Signal Installation and **[6]** Aerial Photography because Harmattan season will start in a little while, even though the discussion on details of the Technical Specification has not yet been completed.



O T

(9) TRAINING IN JAPAN

1). IGB requested to be accepted a few high-class officers of IGB for technical training in Japan, because it's necessary to grasp the technical levels and its background in Japan in order to execute the study efficiently by technical cooperation.

2). IGB requested to be accepted some technical officials of IGB for Japanese domestic technical training such as JICA group training (Survey Technology II) in order that the technologies transferred through this study in Burkina Faso may continue to develop in the future.

3) The Study Team promised to convey these requests to JICA head office and the branch office in Ivory Coast.

(10) ATTACHED MATERIALS

THE INCEPTION REPORT OF THE STUDY



① (



LIST OF PARTICIPANTS

A. BURKINA FASO SIDE

(Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme )

Mr. Oussény TARNANGUIDA	Directeur Général
Mr. Claude Obin TAPSOBA	Directeur Technique
Mr. Ernest T. ILBOUDO	Chef du Projet Cartographie du Sud-Ouest

B. JAPAN SIDE

(The Study Team)

Mr. Kokichi KIMURA	Leader
Mr. Katsuyuki HATAKEYAMA	Deputy Leader
Dr. Bandula SENAKASIRI	Surveyor
Mr. Yuji OUCHI	Coordinator
Mr. Tadao MARUYAMA	Interpreter
Mr. Sho SAITO	Basic Map Plan Advisor



List of Management Council Constituent Members

A. BURKINA FASO SIDE

(Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme )

Mr. Oussény TARNANGUIDA	Directeur Général
Mr. Claude Obin TAPSOBA	Directeur Technique
Mr. Ernest T. ILBOUDO	Chef du Projet Cartographie du Sud-Ouest
Mr. Yaya SANON	Chef du Service Géodesie Topographie
Mr. Jean SAWADOGO	Responsable Traverses GPS
Mr. Justin YAMEOGO	Chef du Service Photogrammétrie
Mr. Salifou KABORE	Chef du Service Informatique

B.JAPAN SIDE

(The Study Team)

Mr. Kokichi KIMURA	Leader
Mr. Katsuyuki HATAKEYAMA	Deputy Leader
Dr. Bandula SENAKASIRI	GPS survey, Aerial Photo Signalization
Mr. Yoshikazu OGASAWARA	Leveling
Mr. Kentaro USUDA	Field Identification, Photo Interpretation
Mr. Seiji NAKANISHI	Aerial Triangulation
Mr. Takashi TOMURA	Digital Plotting
Mr. Kosuke TSURU	D/M System Design
Mr. Masami YOSHIMOTO	Digital Compilation
Mr. Kiitiro NISIOKA	Pilot GIS
Mr. Yuji OUCHI	Coordinator
Mr. Naoki GOTO	Software Customization
Mr. Tadao MARUYAMA	Interpreter

51

*EB*

LIST OF LIAISON OFFICERS

A. BURKINA FASO SIDE

(Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme )

Mr. Earnest T.ILBOUDO                                      Chef du Projet Cartographie du Sud-Ouest

B. JAPAN SIDE

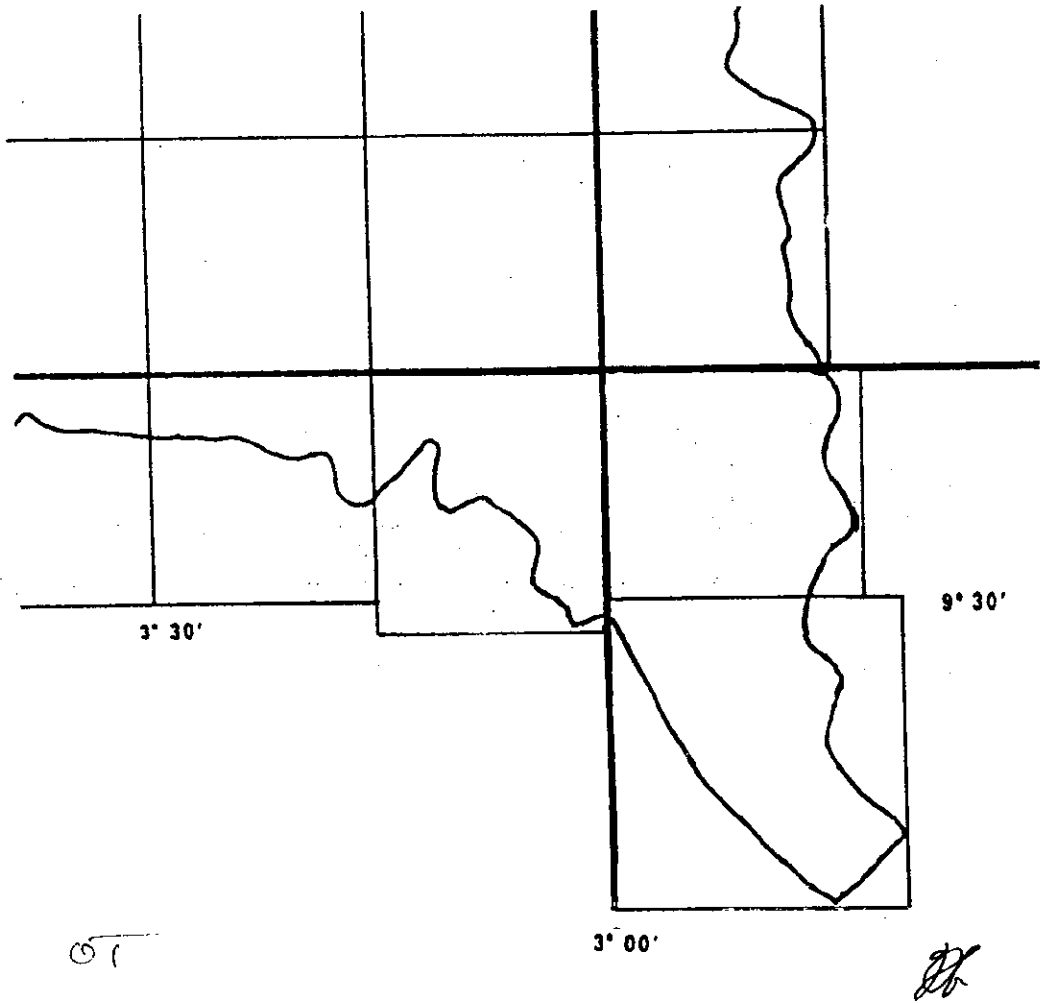
(The Study Team)

Mr. Katsuyuki HATAKEYAMA	Deputy Leader
Dr. Bandula SENAKASIRI	GPS survey, Aerial Photo Signalization
Mr. Yoshikazu OGASAWARA	Leveling
Mr. Kentaro USUDA	Field Identification, Photo Interpretation
Mr. Seiji NAKANISHI	Aerial Triangulation
Mr. Takashi TOMURA	Digital Plotting
Mr. Kosuke TSURU	D/M System Design
Mr. Masami YOSHIMOTO	Digital Compilation
Mr. Kiihiro NISIOKA	Pilot GIS
Mr. Yuji OUCHI	Coordinator
Mr. Naoki GOTO	Software Customization
Mr. Tadao MARUYAMA	Interpreter



Annex- 4

# Topographic sheets

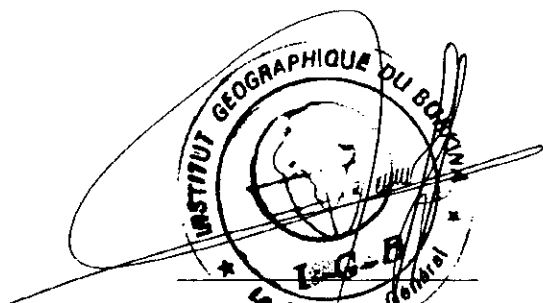


MINUTES OF MEETING  
OF  
THE STUDY  
ON  
THE NATIONAL TOPOGRAPHIC MAPPING  
IN  
THE SOUTHWESTERN AREA  
OF  
BURKINA FASO  
AGREED UPON BETWEEN

INSTITUT GEOGRAPHIQUE DU BURKINA,  
MINISTERE DES INFRASTRUCTURES, DE L'HABITAT ET DE L'URBANISME  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

OUAGADOUGOU

MARCH 17 th, 1999



Mr Claude YAPSOBA  
Directeur Général P.I.  
Institut Géographique du Burkina  
de l'Habitat et de l'Urbanisme

Mr Kokichi KIMURA  
Leader  
Study Team  
Japan International Cooperation Agency

The Study Team for the Study on the National Topographic Mapping in Southwestern Area of Burkina Faso (hereinafter referred as the Study Team) organized by Japan International Cooperation Agency (JICA), headed by Mr Kokichi KIMURA as the Leader and the Institut Géographique du Burkina, Ministère des Infrastructures de l'Habitat et de l'Urbanisme (IGB), headed by Mr. Claude Obin TAPSOBA had a series of discussions on the Study.

These discussions were carried out on 16 th of march in 1999, at the head office of IGB.

The List of participants is shown in Annex 1.

After the series of discussions, both sides agreed with the following items.

1. IGB requested to study and prepare the technical standard such as system of map representation and technical specifications of 1/50.000 national topographic digital mapping.
2. IGB requested to study and propose the system of naming geographical place.
3. The Study team promised to convey these requests to JICA head office and the branch office in Ivory Coast.

*cont.*



## Annex 1

### List of Participants

FIRST NAME	LASTE NAME	OFFICE
TAPSOBA	Claude Obin	Directeur Général par intérim
KABORE	Salifou	Service Informatique
YAMEOGO	R. Justin	Service Photogrammétrie et Topographie
ILBOUDO	T. Ernest	Project Headmaster
SAWADOGO	N. Jean	G.P.S.
KONATE	Ousseyni	Laboratoire
SAWADOGO	S. Mohamed	PVA (aerial photography)
Mme SOMDA	Lucie	Cartographie (Mapping)

### JICA

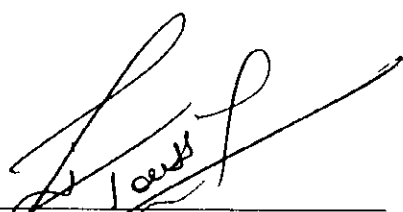
KIMURA	Kokichi	Leader
HATAKEYAMA	Katsuyuki	Deputy Leader
OUCHI	Yuji	Coordinator
MARUYAMA	Tadao	Interpreter
OGASAWARA	Yoshikoru	Team member
USUDA	Kentaro	Team member


CoT.



MINUTES OF MEETING  
UPON  
THE PROGRESS REPORT(1) AND THE INTERIM REPORT(1)  
OF  
THE STUDY  
ON  
THE NATIONAL TOPOGRAPHIC MAPPING  
IN  
THE SOUTHWESTERN AREA  
OF  
BURKINA FASO  
AGREED UPON BETWEEN  
INSTITUT GEORAPHIQUE DU BURKINA,  
MINISTERE DES INFRASTRUCTURES, DE L'HABITAT ET DE L'URBANISME  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

OUAGADOUGOU  
July 28th, 1999

  
Mr. Oussény TARNANGUIDA  
Directeur Général  
Institut Géographique du Burkina,  
Ministère des Infrastructures,  
de l'Habitat et de l'Urbanisme

  
Mr. Kokichi KIMURA  
Leader,  
Study Team,  
Japan International Cooperation Agency



The Study Team for the Study on the National Topographic Mapping in Southwestern Area of Burkina Faso (hereinafter referred as the Study Team) organized by Japan International Cooperation Agency(JICA), headed by Mr.Kokichi KIMURA as the Leader and the Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme (IGB), headed by Mr. Oussény TARNANGUIDA had a series of discussions on the Progress Report(1) and the Interim Report(1) for the Study explained by the Study Team.

These discussions were carried out on the 28<sup>th</sup> day of July in 1999, at the head office of IGB.

The List of participants is shown in Annex-1.

After the series of discussions, both sides agreed on the Progress Report(1) and the Interim Report(1) in principle and the following item.

- (1) On the bases of CHAPTER 2 BASIC POLICIES OF THE STUDY, 2.5 MANAGEMENT, 2.5.3 Formation of a Consultative Body of Related Organizations for Use of GIS Basic Data (Tentative naming) in the Inception Report, both sides will invite the members of the related organizations for use of GIS Basic Data, on the 10<sup>th</sup> of August in 1999, in order to discuss about the formation of the consultative body.

*Dr.*

*O. T.*

LIST OF THE ATTENDANCE

A. BURKINA FASO SIDE

(Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme)

Mr. Oussény TARNANGUIDA	General Director
Mr. Claude Obin TAPSOBA	Technical Director
Mr. Salifou KABORE	Chief of Information Processing Service
Mr. Justin R. YAMEOGO	Chief of Photogrammetric Surveying Service
Mr. Ousmane DEMBELE	Chief of controle service
Mr. Jean ZONGO	Chief of Aerial Photography Section
Mr. Ousséni KONATE	Chief of Laboratory
Mrs. Lucie SOMDA	Chief of Map Compilation Section
Mr. Thierry SOUAHIBOU	Computer Engineer

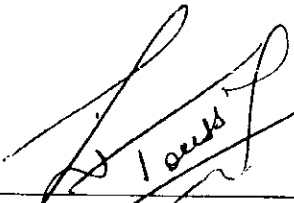
B. JAPAN SIDE  
(the Study Team)

Mr. Kokichi KIMURA	Leader
Mr. Seiji NAKANISHI	Aerial Triangulation
Mr. Kiitiro NISHIOKA	Pilot GIS
Mr. Hiroshi MATSUSHITA	Remodelling of Plotting Mechanism
Mr. Yuji OUCHI	Coordinator
Mr. Tadao MARUYAMA	Interpreter



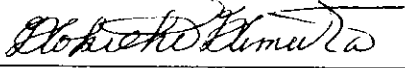
MINUTES OF MEETING  
UPON  
THE PROGRESS OF THE PROGRAM  
OF  
THE STUDY  
ON  
THE NATIONAL TOPOGRAPHIC MAPPING  
IN  
THE SOUTHWESTERN AREA  
OF  
BURKINA FASO  
AGREED UPON BETWEEN  
INSTITUT GEORAPHIQUE DU BURKINA,  
MINISTERE DES INFRASTRUCTURES, DE L'HABITAT ET DE L'URBANISME  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

OUAGADOUGOU  
August 16th, 1999



---

Mr. Oussény TARNANGUIDA  
Directeur Général  
Institut Géographique du Burkina,  
Ministère des Infrastructures,  
de l'Habitat et de l'Urbanisme



---

Mr. Kokichi KIMURA  
Leader,  
Study Team,  
Japan International Cooperation Agency

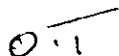
The Study Team for the Study on the National Topographic Mapping in Southwestern Area of Burkina Faso (hereinafter referred as the Study Team) organized by Japan International Cooperation Agency(JICA), headed by Mr.Kokichi KIMURA as the Leader and the Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme (IGB), headed by Mr. Oussény TARNANGUIDA had a series of discussions on the progresses of the program for the Study.

These discussions were carried out on the 16<sup>th</sup> day of August in 1999, at the head office of IGB.

The List of participants is shown in Annex-1.

After the series of discussions, both sides made the minutes of the following items.

- (1) Both sides agreed to sign and send the report to the related organizations for Use of GIS Basic Data. that report is concerning to the formation of the consultative body.
- (2) Both sides confirmed that the remodeling of the stereo plotters and the process of [19] Aerial Triangulation Equipment had been completely finished.
- (3) Both sides agreed to forward the technical cooperation about the processes of [21] Aerial triangulation 2, [24] Study of GIS application, [24-1] Study of the system of geographical name decision, [24-2] Discussion of the technical standard and the specification(1) after they accepted the interim reports and discussed them.



LIST OF THE ATTENDANCE

A. BURKINA FASO SIDE

(Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme )

Mr. Oussény TARNANGUIDA	Gneral Director
Mr. Claude Obin TAPSOBA	Technical Director
Mr. Salifou KABORE	Chief of Information Processing Service
Mr. Justin R. YAMEOGO	Chief of Photogrammétric Surveying Service
Mr. Ousmane DEMBELE	Chief of controle service
Mr. Jean ZONGO	Chief of Aerial Photography Section
Mr. Ousséni KONATE	Chief of Laboratory
Mrs. Lucie SOMDA	Chief of Map Compilation Section
Mr. Thierry SOUAHIBOU	Computer Engineer

B. JAPAN SIDE

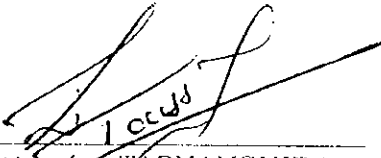
(the Study Team)

Mr. Kokichi KIMURA	Leader
Mr. Seiji NAKANISHI	Aerial Triangulation
Mr. Kiitiro NISHIOKA	Pilot GIS
Mr. Tadao MARUYAMA	Interpreter



MINUTES OF MEETING  
UPON  
THE PROGRESS OF THE PROGRAM  
OF  
THE STUDY  
ON  
THE NATIONAL TOPOGRAPHIC MAPPING  
IN  
THE SOUTHWESTERN AREA  
OF  
BURKINA FASO  
AGREED UPON BETWEEN  
INSTITUT GEORAPHIQUE DU BURKINA,  
MINISTERE DES INFRASTRUCTURES, DE L'HABITAT ET DE L'URBANISME  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

OUAGADOUGOU  
January 31<sup>ST</sup>, 2000

  
Mr. Oussény FARNANGUIDA  
Directeur Général  
Institut Géographique du Burkina,  
Ministère des Infrastructures,  
de l'Habitat et de l'Urbanisme

  
Mr. Kokichi KIMURA  
Leader,  
Study Team.  
Japan International Cooperation Agency

The Study Team for the Study on the National Topographic Mapping in Southwestern Area of Burkina Faso (hereinafter referred as the Study Team) organized by Japan International Cooperation Agency(JICA), headed by Mr.Kokichi KIMURA as the Leader and the Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme (IGB), headed by Mr. Oussény TARNANGUIDA had a series of discussions on the progresses of the program for the Study.

These discussions were carried out on the 20<sup>th</sup> day and the 31<sup>st</sup> day of January in 2000, at the head office of IGB.

The List of participants is shown in Annex-1.

After the series of discussions, both sides made the minutes of the following items.

(1) General evaluation concerning the study in the second annual

Both sides confirmed that all the study processes in the second annual had accomplished the target of the plan by friendly technical cooperation.

However, it was also confirmed to have to study two additional processes based on the result of the second annual study about the aerial triangulation method and the pilot GIS construction method.

(2) Aerial triangulation method

Based on the first class stereo plotter WILD A10 had been repaired, IGB strongly requested the method to use the first class stereo plotter WILD A10 in the measurement of the stereo model coordinates on the aerial triangulation, in order to achieve the expenditure decrease of the ground control point survey process by accuracy improvement of aerial triangulation.

Moreover, IGB requested to maintain the aerial triangulation program of the latest version.

The JICA study team promised to convey these requests to the JICA Ivory Coast office and the JICA headquarters.

(3) Construction method of the pilot GIS

As a result of the GIS situation study, the numeric data which the related each ministry public government office had not enough in order to construct the pilot GIS. In consideration of the request of the GIS user conference, IGB requested the additional study process necessary for constructing agricultural ministry jurisdiction "Regional agricultural development master plan support pilot system" and elementary education ministry jurisdiction "Elementary school management support pilot system". Moreover, IGB requested the technical training concerning the design of GIS and the operation of pilot GIS to the member of the GIS user conference.

The JICA study team promised to convey these requests to the JICA Ivory Coast office



and the JICA headquarters.

(4) Digital compilation, map symbolization and GIS basic data structurization

Compared with OJT experience in the second annual, the amount of OJT work of process number 【35】 【36】 【37】 is a lot so that it will be able to cause the lack at the education time. Both sides agreed to decrease the amounts of OJT work in these processes.

(5) Execution of the seminar

IGB requested to held the seminar with the map use organization and the GIS use organization, etc. so that might promote effective use for the numeric geographical information resource constructed in this study.

The JICA study team promised to convey this request to the JICA Ivory Coast office and the JICA headquarters.

(6) Technical training in Japan

IGB requested to participate in two kinds of technological training executed in Japan. One of them is a technical training concerning the design and the construction technique of GIS which uses the GIS basic data. Another one is a technical training on "Planning and Management of National Mapping and Surveying Course" in order to train the engineers who achieves maintenance, management, and a continuous improvement of national base map system which is transformed in this study.

The JICA study team promised to convey this request to the JICA Ivory Coast office and the JICA headquarters.

(7) Expansion of the neatlines

Both sides agreed about the processing of expansion of the neatlines as shown in Annex-2.





ANNEX 1

ATTENDANT LIST

IGB

Mr. Oussény TARNANGUIDA	Directeur Général
Mr. Claude Obin TAPSOBA	Directeur Technique
Mr. Salifou KABORE	Service Informatique
Mr. Amadou BOLLY	Service Informatique
Mis Lucie SOMD	Rédaction Carto
Mr. Amadou OUEDRAOGO	Prise de Vues Aériennes
Mr. Désiré COMPAORE	Photogramétrie
Mr. Yaya SANOU	Service Topographie
Mr. Jean SAWADOGO	Cellule de Contrôle
Mr. Ousmane DEMBELE	Cellule de Contrôle
Mr. Ousseyni KONATE	Laboratoire Photo et Carto

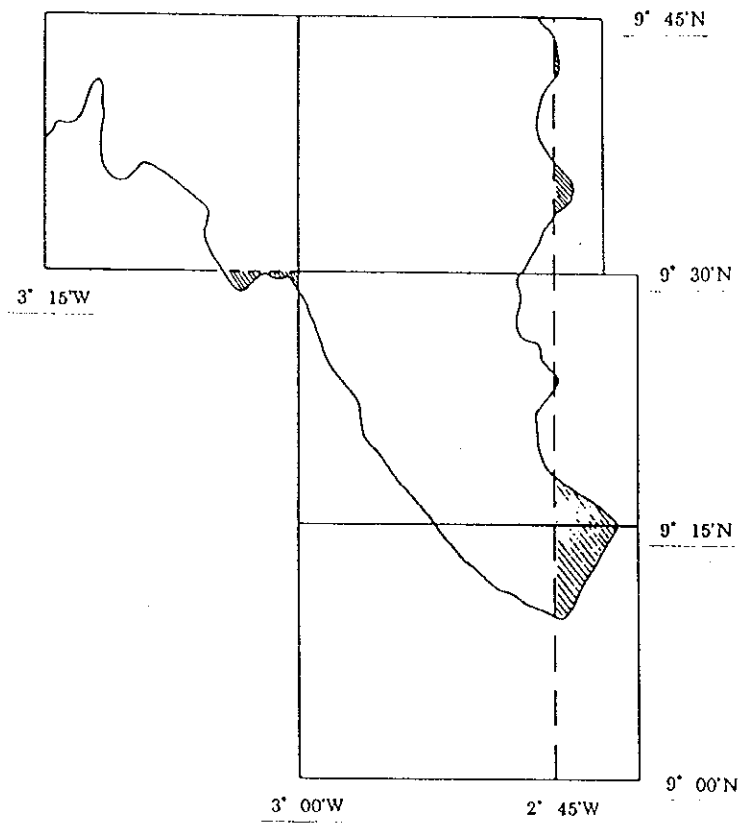
JICA

Mr. Kokichi KIMURA	Team Leader
Mr. Kentaro USUDA	Identification
Mr. Yuuji OUCHI	Coodinater
Mr. Tadao MARUYAMA	Interpreter



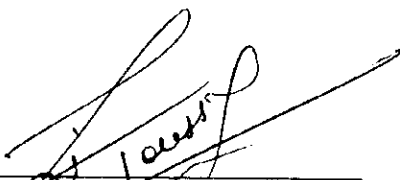
Annex 2

Expansion of the neatlines



MINUTES OF MEETING  
UPON  
THE PROGRESS OF THE PROGRAM  
OF  
THE STUDY  
ON  
THE NATIONAL TOPOGRAPHIC MAPPING  
IN  
THE SOUTHWESTERN AREA  
OF  
BURKINA FASO  
AGREED UPON BETWEEN  
INSTITUT GEORAPHIQUE DU BURKINA,  
MINISTERE DES INFRASTRUCTURES, DE L'HABITAT ET DE L'URBANISME  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

OUAGADOUGOU  
July 3<sup>rd</sup>, 2000

  
Mr. Oussény TARNANGUIDA  
Directeur Général  
Institut Géographique du Burkina,  
Ministère des Infrastructures,  
de l'Habitat et de l'Urbanisme

  
Mr. Kokichi KIMURA  
Leader,  
Study Team,  
Japan International Cooperation Agency

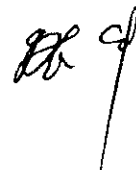
The Study Team for the Study on the National Topographic Mapping in Southwestern Area of Burkina Faso (hereinafter referred as the Study Team) organized by Japan International Cooperation Agency(JICA), headed by Mr.Kokichi KIMURA as the Leader and the Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme (IGB), headed by Mr. Oussény TARNANGUIDA had a series of discussions on the progresses of the program for the Study.

These discussions were carried out on the 14<sup>th</sup> day of June and the 3<sup>rd</sup> day of July in 2000, at the head office of IGB.

The List of participants are shown in Annex-1.

After the series of discussions, both sides made the minutes of the following items.

- (1) Both parties examined the second annual progress report (2) which the JICA study team submitted, and agreed about the evaluation of the study at the second annual and the proposals to the study at the third annual.
- (2) Both parties examined the third annual interim report (2) which the JICA study team submitted, and agreed the basic policy of the study and the contents of the study of each process at the third annual.
- (3) Both parties agreed to establish the execution committee for the process [48-1] execution of the seminar as shown in Annex 2.



LIST OF THE ATTENDANCE

A. BURKINA FASO SIDE

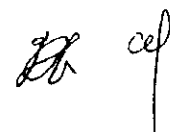
(Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme )

Mr. Oussény TARNANGUIDA	Gneral Director
Mr. Claude Obin TAPSOBA	Technical Director
Mr. Ernest ILBOUDO	Chief du projet cartographique de base de la région du Sud - Ouest
Mr. Salifou KABORE	Chief of Information Processing Service
Mrs. Lucie SOMDA	Chief of Map Compilation Section
Mr. Désiré COMPAORE	Chief of Photogrammétric Surveying Service
Mr. Ousmane DEMBELE	Chief of controle service

B. JAPAN SIDE


( The Study Team)

Mr. Kokichi KIMURA	Leader
Mr. Kosuke TSURU	Aerial Triangulation
Mr. Masami YOSHIMOTO	Numeric Compilation
Mr. Takashi YASHIRO	Pilot GIS
Mr. Tadao MARUYAMA	Interpreter



MINUTES OF MEETING  
UPON  
THE FINAL MISSION OF THE PROGRAM  
OF  
THE STUDY  
ON  
THE NATIONAL TOPOGRAPHIC MAPPING  
IN  
THE SOUTHWESTERN AREA  
OF  
BURKINA FASO  
AGREED UPON BETWEEN  
INSTITUT GEORAPHIQUE DU BURKINA,  
MINISTERE DES INFRASTRUCTURES, DE L'HABITAT ET DE L'URBANISME  
AND  
JAPAN INTERNATIONAL COOPERATION AGENCY

OUAGADOUGOU  
February 15<sup>th</sup>, 2001



---

Mr. Oussény TARNANGUIDA  
Directeur Général  
Institut Géographique du Burkina,  
Ministère des Infrastructures,  
de l'Habitat et de l'Urbanisme



---

Mr. Kokichi KIMURA  
Leader,  
Study Team,  
Japan International Cooperation Agency

The Study Team for the Study on the National Topographic Mapping in Southwestern Area of Burkina Faso (hereinafter referred as the Study Team) organized by Japan International Cooperation Agency(JICA), headed by Mr.Kokichi KIMURA as the Leader and the Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et de l'Urbanisme (IGB), headed by Mr. Oussény TARNANGUIDA had a series of discussions on the final mission of the program for the Study.

These discussions were carried out from the 25<sup>th</sup> day of January and the 15<sup>th</sup> day of February in 2001, at the head office of IGB.

The List of participants are shown in Annex-1.

After the series of discussions, both parties made the minutes of the following items.

- (1)Both parties discussed with the following reports which the Study Team submitted, and agreed with the contents of the reports basically.
  - (a) The draft final main report (English version)
  - (b) The draft final main report (French version)
  - (c) The draft final summary report (English version)
  - (d) The draft final summary report (French version)
- (2)Both parties agreed with that the map printing process will be executed in Japan, in considering of the situation in Ivory Coast country.
- (3)IGB requested to dispatch the expert who will support the transferred technology in the study. The Study Team promised to convey the request to the JICA headquarters and JICA Ivory Coast branch office.
- (4)Both parties expressed their gratitude of amiable cooperation concerning this study mutually. In addition, they hoped that an amiable relation between Japan and Burkina Faso will increase in the further.



LIST OF THE ATTENDANCE

BURKINA SIDE (Institut Géographique du Burkina, Ministère des Infrastructures, de l'Habitat et l'Urbanisme)

M. Oussény TARNANGUIDA	Directeur Général
M. Salifou KABORE	Directeur Technique Intérim
M. Amadou BOLLY	Directeur de l'Etude, de la Recherche et du Contrôle
M. Ousmane DEMBELE	Directeur Commercial
M. Noufou OUATTARA	Directeur des Affaires Administratives et Financières
M. Drissa YAGO	Chef de Service de la Cartographie et Télédétection
M. Paul TAPSOBA	

JAPANESE SIDE( The Study Team)

M. Kokichi KIMURA	Leader
M. Katsuyuki HATAKEYAMA	Deputy Leader
M. Kichiro NISHIOKA	Pilot GIS
M. Kosuke TSURU	Digital Compilation
M. Yuji OUCHI	Coordinator
M. Tadao MARUYAMA	Interpreter





CONVENTION POUR LA MISE EN PLACE D'UN GIS PILOTE

ENTRE

L'IGB

et

Les structures utilisatrices des données  
GIS au Burkina Faso

## MOTIVATION

Le GIS ou Système d'Information Géographique (SIG) est un outil de gestion et de soutien à la prise de décision très important pour les organes décisionnels du monde fortement informatisé d'aujourd'hui.

Dans la pratique, l'augmentation des informations géographiques qui s'ajoutent aux informations d'ordres divers, économiques, financiers et autres, facilitera la prise de décisions.

Conscient de son apport à la réussite du plan de développement du Burkina Faso, la standardisation et la normalisation des données sont indispensables dans un monde en pleine évolution. La création d'un tel outil vient à point nommé pour une organisation plus efficiente et un échange rationnel d'informations géographiques et descriptives (alphanumériques).

De même, dans le cadre de la réalisation d'un GIS pilote au Burkina Faso, l'IGB et l'Equipe d'étude de la JICA ont entrepris une concertation avec les utilisateurs nationaux des données GIS pour faciliter sa mise en place, son utilisation et son développement.

Le GIS permettra de renforcer de créer une passerelle entre divers organismes mais également entre les divers niveaux de décision.

## TERMINOLOGIE

Données de base GIS : données géographiques numériques de la carte 1/50.000 structurées pour être la charpente du GIS.

GIS Pilote : GIS développée dans des domaines d'applications sélectionnés en vue de mesurer l'adhésion des utilisateurs.

## Chapitre 1 - Généralités

### (Objectif de la convention)

Article 1 : Cette convention a pour objectif de promouvoir l'utilisation efficiente du GIS pilote en tant qu'infrastructure d'information du Burkina Faso, pour ainsi rendre plus efficaces et plus avancées les activités des structures utilisatrices du GIS au Burkina Faso.

### (Conférence des utilisateurs GIS)

Article 2 : Une conférence des utilisateurs GIS, constituée de membres des structures utilisatrices des données GIS et de l'IGB, sera mise en place en vue de réaliser les objectifs de la présente convention.

### (Fonctions de la Conférence des utilisateurs GIS)

Article 3 : Les fonctions de la conférence des utilisateurs GIS seront comme suit :

1. Discussion concernant les normes et la fourniture des données de base GIS
2. Par l'intermédiaire de la réalisation du GIS pilote, étude, recherche, discussion sur la création du GIS utilisant les données de base GIS, et rapport aux organismes concernés.
3. Diffusion du GIS pilote et sensibilisation des services publics et privés à son utilisation

## Chapitre 2 : Mise en place du GIS pilote

### (Portée de la construction du GIS pilote)

Article 4 : Le GIS pilote au Burkina Faso sera mise en place dans le cadre du Projet de Cartographie de base au 1/50.000 dans la région du sud-ouest au Burkina Faso.

### (Système de la mise en place du GIS pilote)

Article 5 : La mise en place du GIS pilote se fera de manière conjointe. La répartition des tâches seront discutées entre les organismes concernés sur la base des normes de répartition indiquées dans le tableau ci-dessous.

Eléments de la répartition	Organismes concernés
Conception	Structures utilisatrices des données GIS, IGB
Moteur fondamental	Structures utilisatrices des données GIS
Personnalisation des logiciels	Structures utilisatrices des données GIS, IGB
Données de base du GIS (référentiel carto)	IGB
Données (thématiques) d'attribut	Structures utilisatrices des données GIS
Données d'étude complémentaires	Structures utilisatrices des données GIS, IGB

(Conseillers techniques)

Article 6 : L'équipe d'étude de la JICA est le conseiller technique de la conférence des utilisateurs GIS.

### Chapitre 3 - Application du GIS pilote

(Organisme d'application du GIS pilote)

Article 7 : L'organisme d'application du GIS pilote sera la structure traitant le thème concerné.

(Coopération avec l'organisme d'application)

Article 8 : En cas de besoin l'organisme d'application du GIS pilote coopérera la diffusion du GIS pilote dans la mesure où cela ne constituera pas une entrave particulière.

(Rapport d'application au GIS pilote)

Article 9 : L'organisme d'application au GIS fera un rapport périodique à l'IGB sur l'état de fonctionnement du GIS pilote. Il fera également un rapport à chaque grande modification intervenue dans le système.

(Notification de correction des données de base GIS)

Article 10 : Le Directeur de l'IGB informera les structures utilisatrices des données GIS pilote en cas de mise à jour des données de base GIS.

#### **Chapitre 4 - Fonctionnement**

##### **(Sélection du président)**

Article 11 : Le président de la conférence des utilisateurs GIS sera élu au sein des membres de la conférence.

##### **(Secrétariat)**

Article 12 : Le Secrétariat permanent de la conférence des utilisateurs des données GIS sera installé au sein de l'IGB, qui assurera le travail administratif.

#### **Chapitre 5 - Dispositions transitoires**

##### **(Président de la conférence)**

Article 13 : La conférence des utilisateurs du GIS pilote sera présidée par le Directeur de l'IGB jusqu'à la mise en place d'une organisation définie en son sein.

##### **(Signature de la Convention)**

Article 14 : Cette convention sera signée par les membres individuels de la conférence des utilisateurs.

(Participation à la conférence des utilisateurs)

Article 15 : Les organismes souhaitant participer à cette conférence des utilisateurs devront faire parvenir le nom de leur représentant à l'IGB.

(Saisie en continue de la convention)

Article 16 : L'IGB sera chargé du suivi de la ratification de la présente convention et de son application.

Fait à Ouagadougou le

Le Directeur Général  
de l'IGB

Membres de la conférence

Mr.....Adresse

Mr.....Adresse

Mr.....Adresse

Mr.....Adresse

Mr.....Adresse

Mr.....Adresse

JICA