

## **5 SYSTEM AND NETWORK MANAGEMENT**

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## **1 System application for general users**

### **1.1 Application for system use**

When the user logs into the system, it is necessary to enter a user name and password. Therefore, before commencing use of the system, the user must submit an application to the administrator. The user completes the application form shown in Fig.1.1 and the system administrator then sets up the user environment according to the information in the application form. The contents of this form include the purpose of use, term of use, required disk space, and so on.

### **1.2 Network**

The IIMS is prepared for the internal Local Area Network (so-called LAN) in the GIS system. There are connecting network devices including the personal computer, the monochrome laser printer, the color printer, the color plotter and other network equipment. There is also the ability to expand to the four sets of personal computers with the Ethernet board and network cable. If required, the user should make the appropriate application on the form. The merits of networking are:

- To manage files between the computers.
- To transfer data without other media.
- To be able to share one file with different PC users.
- To be able to share devices such as printers, plotters, and drives.
- To expand to the Wide Area Network.

Fig.1.1 Example of Application Form

User Application Form of System for General User	
For application personnel, Organization: Name of personnel: Signature: Purpose of application: Term to use: Registration of user name: Password: Works pace: Connection of PC:	Date:           Yes / No
For system administrator, Registration of user name: Password : Name of Workspace: Term to use: PC: IP address: . . .	

## 2 System administration for the IIMS

The IIMS comprises PCs and peripherals, which are connected in a network. The PC with network board can easily be connected to the IIMS. The existing PC provided the network board in DTGC and DUA, is easy to connect to the IIMS. The system configuration of IIMS is shown in the Table 2.1 and Fig.2.1

Table2.1 List of System Configuration in DTGC

Name of Equipment	Specification of Equipment	Quantity
PC	DELL Workstation Precision 610: [Intel Pentium III 550Mhz, 512Mb RAM, 512kbCashmemory, 36GbHDD, CD-ROM (IDE), 10/100BaseT,Keyboard, mouse, etc.]	1
	DELL DMA TOOL	1
	Logiciel Norton Antivirus 2000 server 6.0(Symantec Corp.)	1
Monitor	DELL 21 inch monitor	1
ZIP	LECTEUR Zip 250 drive unit (ATPI)	1
CD-R/RW	Graveur 4/2/24 CD/RW/ROM (Sony)	1
SCSI board	ADAPTEC fast wide SCSI-2	1
	SCSI terminator	1
	SCSI cable 1m	2
Plotter	HP Designjet 750C PLUS	1
	Additional memory 32MB (EDO, SIMM Kit (1x32Mb)	1
	Internal Ethernet card 10BaseT -RJ45 HP jetdirect	1
Digitizer	CALComp Drawing board III ( 36 x 48 ), Format A0+, Cursor 16 button (Model 34480-H2) including tool kit	1
	Stand	1
SCANNER	SCANPLUS III S3510C Format A0 color (Model 510C)	1
	Pied Support SCANPLUS III 510C	1
Printer	HP LASERJET 5000N	1
	HP DESKJET 1120C A3-size colorinkjet printer	11
	HP JetDirect 300X Print Server for 10/100TX	
Network	Ethernet Hub 8 Port series RJ45 1 PORTBNC	1
	10Base-T Direct network cable	4
UPS	MGE ups Systems: Pulsar ES8+, ONDULEUR 750VA	2

Name of Software	Quantity	
GIS Software	ArcInfoNTV8.0 (ESRI Corporation)	1
	TIN module of ArcInfoNTV8 (ESRI Corporation)	1
	IDRISI32 (Clark University)	1
Mapping Software	CartaLinx (Clark University)	1
Database software	Microsoft Office97 Access97, Excel97, Word97	1
Image processing software	PhotoShopV5 (Adobe Corporation)	1

Table2.2 The list of system configuration in DUA

Name of Equipment	Specification of equipment	Quantity
PC	DELL Workstation Precision 610: [Intel Pentium III 550Mhz, 256Mb RAM, 512kbCashmemory, 18GbHDD, CD-ROM (IDE), 10/100BaseT,Keyboard, mouse, etc.]	1
	DELL DMA TOOL	1
	Logiciel Norton Antivirus 2000 server 6.0 (Symantec Corp.)	1
Monitor	DELL 21 inch monitor	1
ZIP	LECTEUR Zip 100 drive unit (ATPI)	1
CD-R/RW	Graveur 4/2/24 CD/RW/ROM (Sony)	1
SCSI board	ADAPTEC fast wide SCSI-2	1
	SCSI terminator	1
	SCSI cable 1m	2
Plotter	HP Designjet 750C PLUS	1
	Additional memory 32MB (EDO.SimmKit (1x32Mb)	1
	Internal Ethernetnetwork card 10BaseT(RJ45) HP JetDirect	1
Digitizer	CALComp Drawing board III ( 36 x 48 ), Format A0+, Cursor 16 button (Model 34480-H2) including tool kit	1
	Stand	1
Printer	HP LASERJET 5000N	1
	HP DeskJet 1120C A3-size color inkjet printerHP JetDirect 300X Print Server for 10/100TX	11
	Printer Buffer AS-402PII 4TO2 pParallel Auto Switch	1
Network	Plastic PALM 10Base-T Ethernet Hub 8Port Series (RJ45, 1 PORTBNC)	1
	10BaseT Direct network cable	4
UPS	MGE ups Systems Pulsar ES8+, ONDULEUR 750VA	2
Software	Software name	Quantity
GIS Software	GeoConceptV4.1 (GeoConcept Corporation)	1
	Kit GeoConcept (GeoConcept Corporation)	1
	IDRISI32 (Clark University)	1
Mapping Software	CartaLinx (Clark University)	1
Database software	Microsoft Office97 Access97, Excel97, Word97	1

### GIS System Configuration of Social Infrastructure Information Management System in DTGC

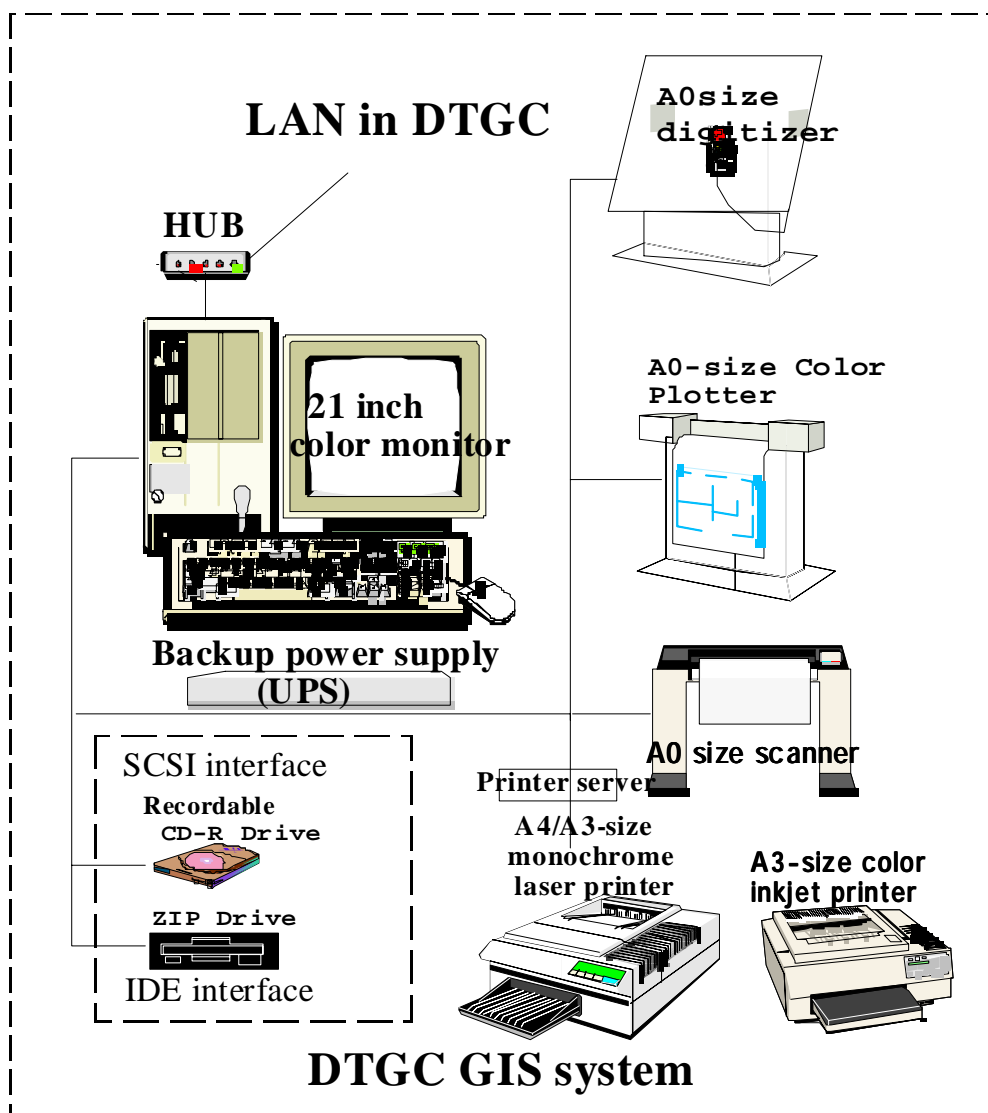


Fig.2.1 System configuration of IIMS in DTGC

### GIS System Configuration of Social Infrastructure Information Management System in DUE

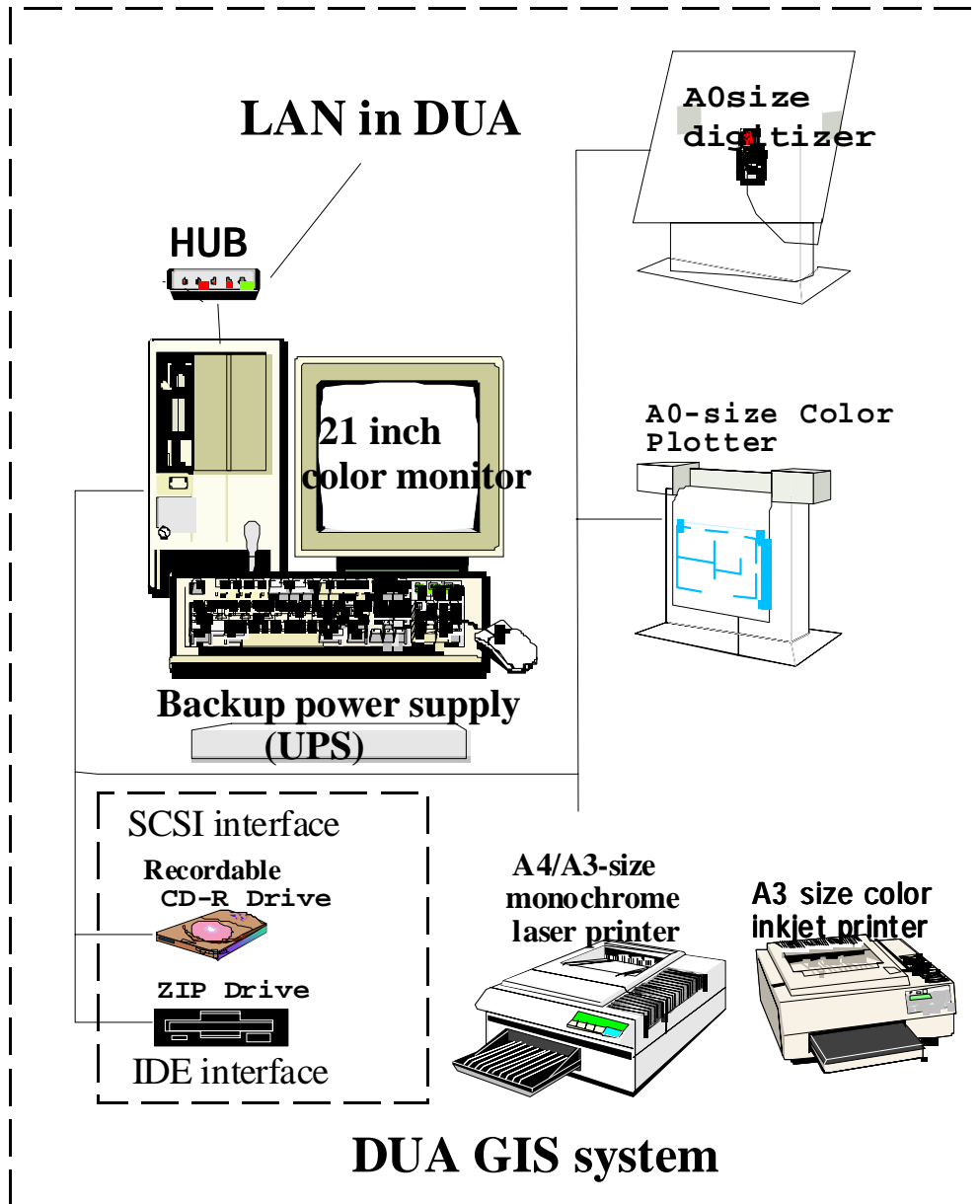


Fig.2.2 System configuration of IIMS in DUA

### 3 System and network administration for the IIMS

#### 3.1 Administration for users and p security

Users are classified into 3 types as detailed in Table 3.1. These are:

- 1) System Administrator
- 2) Staff for GIS
- 3) General User
- 4) Guest user

User management is the same as security management. The administrator controls users by providing usernames and passwords and limiting use. He protects the system from deliberate alterations and accidents. The simplified method is to use a project name instead of username.

Table 3.1 User Management and Management Items

User	Username	Management Item in User Management
Administrator	Administrator	System management, Software management, Hardware management, Network management, Data management, Comprehensive management of system
Staff	Personal name	Personnel data management
General user	Individual user name	Personnel data management
Guest user	Guest name	Personnel data management

The user registration is executed according to a module of the system administration in WindowsNT, based on the user document. The user name, password, some options on user administration and group should be input. Each user is assigned a specified folder to manage work.

The first registration of users should be limited to manage users.

- 1) Passwords should be input by users at each log-on.
- 2) Passwords should not be permitted to change
- 3) The term of validity should not be continued indefinitely.

If the term of validity is granted, based on the user application, the user cannot use the system after it has expired. The necessary items are the username, password, the option of this module and the group management. The work folder is prepared for the user and is indicated by the system administrator.

#### 3.2 Installation of network and administration

The IIMS prepared for the internal network environment connects the PC, the monochrome laser printer, the color printer, the color plotter and the other network equipment. The network list and configuration are show in Table 3.2.1, Table 3.2.2 and Fig.3.2.1.



Table 3.1 System application form

User Application Form of System for General User	
For application personnel Organization: Name of personnel: Signature: Purpose for application: Term to use: Registration of user name: Password: Workspace: Connection of PC:      Yes / No	Date:
For system administrator Registration of user name: Password : Name of Workspace: Term to use: PC:    IP address:      . . . .	

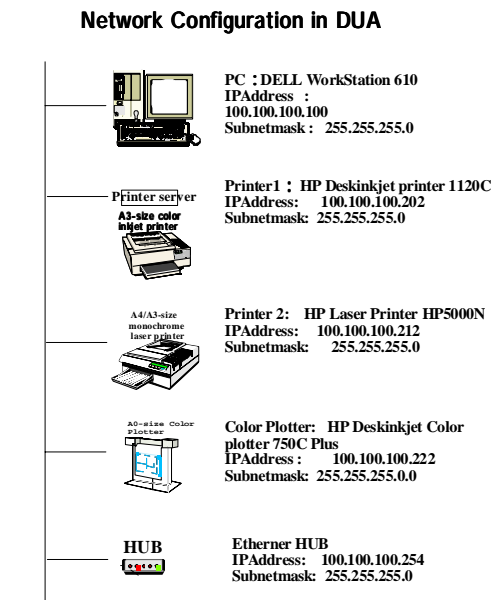
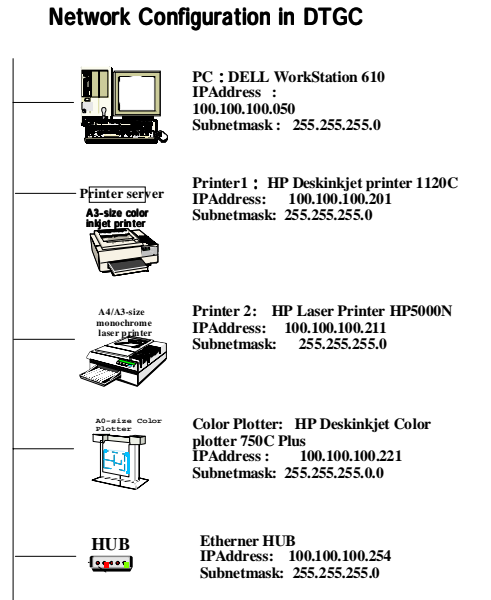
Table 3.2.1 List of IP Addresses of the Network Configuration in DTGC System

Network Protocol	TCP/IP	
Equipment	IP address:	Subnet Mask
PC : DELL WorkStation 610	100.100.100.050	255.255.255.0
Printer:		
HP Desk inkjet printer 1120C	100.100.100.201	255.255.255.0
HP Laser Printer HP5000N	100.100.100.211	255.255.255.0
HP Desk inkjet Color plotter 750C Plus:	100.100.100.221	255.255.255.0
Etherner HUB	100.100.100.254	255.255.255.0

**Table 3.2.2 List of IP Addresses of the Network Configuration in DUA System**

Network Protocol	TCP/IP	
Equipment	IP address:	Subnet Mask
PC : DELL WorkStation 610	100.100.100.100	255.255.255.0
Printer :		
HP Laser Printer HP5000N	100.100.100.202	255.255.255.0
HP Desk inkjet printer 1120C	100.100.100.212	255.255.255.0
HP Desk inkjet Color plotter 750C Plus:	100.100.100.222	255.255.255.0
Etherner HUB	100.100.100.254	255.255.255.0

Fig.3.2.1 The table to manage of instruments



The network is set up using TCOIP protocol. The configuration chart shown in Fig.3.2.2 should first be prepared to manage the components of the network. The IP address is temporary because the LAN has not been built yet in either DTGC or DUA and there is no DNS server.

There is capacity for expansion to connect up to 4 sets of PC via network board and cable. When the user connects the PC, the system administrator prepares for the set up environment according to the application form.

The procedure to set up the network is as follows:

- 1) According to the table for the management of system components, set the IP address to consist of network and prepare the system configuration as shown in Fig.3.2.1.
- 2) Add the TCP/IP protocol in the property of the network.
- 3) Set up the following configuration of TCP/IP:
  - IP Address
  - Subnet Mask Address ( default 255.255.255.0 )
  - Gateway Address
- 4) Set IP address of peripherals, such as Printer or Plotter.
  - Use HP direct to add the IP address of the network printer and plotter.
  - Add Network Port of HP according to add printer port.
  - Add the network port of HP in the property of the printer. Install attached instruments used to set IP address.
  - Set up the Potage and permit use by another user or PC.
  - Set network printer additionally in the setting of printer.

It is necessary for the HP1120C color printer to use the printer server to LAN. IP The address of the printer server is also necessary. This is the same for the monochrome laser printer of HP 5000N, and the color plotter of DeskJet Color plotter 750CPlus.

### **3.3 Administration for the system**

#### **(1) Administration for software**

The partition of the root drive is limited to 2MB in Windows NT, therefore software should be installed in another drive. The swap domain should be occupied in a root drive. The application software and the utility software should be installed in the E drive of the PC as much as possible. The software for inclusion by DTGC and DUA, is shown in Table 3.3.1 and Table 3.3.2. It is proposed to manage the software according to this list. If the hard disc drive crashes due to virus contamination, the administrator should re-install software after reformatting the hard disc drive.

Table 3.3.1 OS and Software List for DTGC in IIMS

Software name	Installed Drive	Note
OS WindowsNT4.0 Service Pack4	C	Supported by JICA
ArcInfo8.0	E	Supported by JICA
GeoConcept4.1	E	Owned by DTGC
GeoXplorer	E	Supported by JICA
MicroSoft Office97	E	Supported by JICA
IDRISI32	E	Supported by JICA
CartaLinx	E	Supported by JICA
Wide Image SCAN	E	Supported by JICA
PhotoShop	C	Supported by JICA
Tablet Works V.S.2.OPC	E	Supported by JICA
CDR software	C	Supported by JICA
Norton Anti Virus Server	E	Supported by JICA

Table 3.2.2 OS and Software list of DUA in IIMS

Software name	Installed Drive	Note
OS WindowsNT4.0 Service Pack4	C	Supported by JICA
GeoConcept4.1	E	Supported by JICA
GeoXplorer	E	Supported by JICA
MicroSoft Office97	E	Supported by JICA
IDRISI32	E	Supported by JICA
CartaLinx	E	Supported by JICA
Tablet Works V.S.2.OPC	E	Supported by JICA
CD-R software	E	Supported by JICA
Norton Anti Virus 2000 Server 6	C	Supported by JICA

(2) Installation of Software

The software should be installed in accordance with the designated procedure of the installer. Important notes for installing software are shown in Table 3.3.3.

Tab.3.3.1 Installation of Software

ArcInfo8.02:	The sentinel and keycode including the license is necessary to install the software. The installation is processed by the installer. Updating of keycode should be done by the installation program.
GeoConcept4.1:	The installation is processed by the installer with the license code. Set up the IDAPI driver in the BDE administrator in the menu of Control Panel on Windows. Check the MSACCESS driver to use driver for WIN32. Refer to the manual of GeoConcept in detail.
GeoXplorer :	The installation is processed by the installer.
MicroSoft Office97:	The custom installation should be used to avoid errors. (see below).
IDRISI32:	The installation is processed by the installer with the license code.
CartaLinx:	The installation is processed by the installer with the license code.
Wide Image SCAN:	The installation is processed by the installer with the license code.
PhotoShop:	The installation is processed by the installer with the license code.
Tablet Works:	The installation is processed by the installer.
CD-R software:	The installation is processed by the installer.
Norton Anti Virus Server:	The installation is processed by the installer with the license code.
Bug:	A bug exists in ODBC driver in Microsoft Office on WINDOWS NT
Phenomenon:	The standard installation fails on WindowsNT because of the mis-matching of the ODBC dBASE for FoxPro.
Solution:	The custom installation was selected.
Memo random:	The IIMS was prepared for Microsoft Office97 in the system design to avoid mis-matching of the relational database in GIS software.

### 3.4 Back-up of Database

The database should be backed up periodically i.e. every Friday evening. Habitually creating a back up is strongly recommended. The CD-RW or ZIP is very useful for recording the large capacity in the database. The back up can use the recordable media for the short time, and CD-ROM in the longer term such as when one a project is completed. Two sets of back up files should thus be prepared to eliminate potential problems.

### 3.5 Maintenance of the System

#### (1) Back up of the System

The operating system should be back up periodically (every two weeks is advised). Windows NT can carry out self-repair on system problems. Appropriate administrator experience and knowledge is also necessary to solve problems and a back-up file should always be prepared.

#### (2) Update Pattern File of Viruses

The pattern file of viruses should be updated every one or two weeks.

(3) Maintenance for hardware

Hardware should be maintained periodically to ensure in good working condition.

### 3.6 Trouble-shooting

The administrator maintains a document to record condition and treatment. When problems are encountered, the administrator should complete a log document as shown in Fig. 3.6. Such records are useful for evaluating the situation of system management. The ability to solve troubles will gradually expand.

Fig.3.6 LOG File for Trouble-shooting

Number of log	
Date of problem (mm : dd : yy)	
Organization Name of System Administrator	DTGC Mr./Ms
Type of problem	OS: Software: Hardware ( PC, Plotter, Printer, Digitizer, etc.____): Other:
Description of problem	
Reason for problem: (If there are many records, attach the contents below).	
Solution Method: (If there are many records, attach the contents to below).	
Contents of service: Name of distributor Contact person TEL: The contents of service: (If there are many contents or some reports of service and maintenance fee, attach a copy to the below).	
Other : (Describe any other relevant information in detail).	

TOPIC: Data Exchange and Meta Data

Meta data is useful for managing GIS data and exchanging GIS data between software media or agencies. The contents includes the following items:

- I. METADATA FILE
- I. General description of data set for METADATA FILE
  - (1) Name and kind:
    - Name : show the title of data source ( for ex. Administrative Units of Communes d'Arrondissement)
    - Geographic level : Regional level
    - Lat/Long Region Boundaries
      - NW-X : 23000m,
      - SW-X : 23000m
      - NW-Y : 1623000m,
      - SW-Y : 1620000m
      - SE-X : 26000m,
      - NE-X :
      - SE-Y :
      - NE-Y :
    - Keywords : Administrative boundary
    - Other Keywords :
  - (2) Date and product organization:
    - Primary Data Acquisition Period: When to be produced ?
    - Start Date:
    - End Date:
    - Supplier: DAT
    - Contributor: DAT
    - Publication Reference:
    - Documentation(Overview) :
    - Notice :
  - (3) data format
  - (4) data quality
  - (5) Organization
  - (6) Data acquisition:
    - Contact Person :
    - Name :
    - Organization :
    - Address :
    - Phone and FAX :
    - Email :



II. Detailed description of data set (member)  
 Data set type: for ex. GeoConcept vector  
 Description: for ex. ADMIN500 - Administrative units  
 File Size: for ex. GeoConcept export file: 17,045 KB  
 Access: for ex. Free access, unregistered or limited  
 Copies: (available sites)  
 For ex. CD-ROM - distributed by GRID- Arendal  
 World Wide Wave(WWW),  
 URL - [http://www.yyyy.xxx /](http://www.yyyy.xxx/)

III. Technical information about GIS data  
 Source Data set : What is Data set ?  
 Map Scale / Resolution : Show map scale  
 1 : **XX, XXX**

Feature Type : ( polygons, lines, points )  
 Number of feature :  
 Projection Name : Lambert Azimuthal Equal Area UTM zone no. : 28 n  
 Projection parameters : Show the datum as follows:  
 Units in map : meters, miles, ?  
 Spheroid : Clarku1880  
 Radius :  
 Longitude of center projection : -15.00.00  
 Latitude of center projection : 00.00.00  
 False Easting : 0  
 False Northing : 0

Projection boundaries coordinates : Show the map area of the lower and the upper coordinates.  
 Xmin : Xmax :  
 Ymin : Ymax :

Attributes: Brief description. Show the contents of GIS database as follows:

Field name	Byte	Format type	(Numeric(x .y), Character, Date)	Brief description
1. Area	12	12	n 6	Area of polygon
2. Perimeter	14	14	n 6	Perimeter of polygon
3. Unit_ID	6	6	n 0	
4. County	25	25	c 0	
5. Total_pop	12	12	n 0	