Annex 3.6

Documentation of the GIS database for agricultural water management

Federal Democratic Republic of Ethiopia

Ministry of Water Resources

Food and Agricultural Organization of the United Nations

Project: Strengthening national water monitoring capacities, with emphasis on agricultural water management (GCP/GLO/207/ITA)

DOCUMENTATION OF THE GIS DATABASE FOR AGRICULTURAL WATER MANAGEMENT ETHIOPIA

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Introduction

The quality of decision making on matters of water-related information, environmental protection, exploration of natural resources, sustainable development, infrastructure, etc. largely depends on the timely availability management of adequate spatial data.

GIS in this regard provides a possibility of handling spatial and non-spatial data. It is conceived as a system for data collection, storage, analysis and presentation, which can be used as an input for planning and improved decision making processes.

With this in mind, the project, **"***Strengthening national water monitoring capacities, with emphasis on agricultural water management"* has put in place a well organized Geographic Information System (GIS) to support:

- A baseline survey on water availability, water use and water productivity in the Awash River Basin of Ethiopia. By providing analytical outputs, which in turn is decisive for planning and making improved decisions.
- Collecting and storing base data from previously carried out projects
- Standardizing and clearing the collected and stored data (same projection, extracting from large dataset to the basin boundary, correcting topological errors, etc …)
- Editing metadata for all the collected and stored spatial data
- Map making for illustration purposes
- Supporting the IT specialist by providing information about the spatial data

Location of the Project area

The Awash River basin, one of the major river basins in Ethiopia, is located in the lower part of the Rift Valley of the country. It extends from 37^0 56' 50" east to 43^0 17' 03" east and 7^0 53' 42". Though it falls within UTM zone 37 (from 360 to 420 east) and 38 (from 420 to 480 east), UTM zone 37 is used for more than 85% of the area of the basin falls with in this zone. (Refer a section '**Projection Used'** below).

1. GIS Implementation

A clear GIS approach was followed to develop spatial database for agricultural water management. With the knowledge of the state of the art and availability of digital data, in different governmental and none-governmental organizations, data collection was followed by qualifying and standardizing of the data. Filling the data gaps, organising, creating and editing metadata, and making different thematic maps were carried out. On-the-job training on "Basic of GIS and methods of Spatial Data Collection" were also provided as planned. A presentation has been prepared and presented at the training and final workshops of the project.

Software

The following GIS and Remote Sensing software packages were used:

- ArcGIS 9.3 - for the GIS part (the main software used).
- ERDAS Imagine 9.0 - to extract large scale irrigated areas from satellite images

And other software used

- Microsoft Excel 2003 – to input data for small and medium scale irrigation (this data format can be easily used in the ArcGIS package)
- Microsoft Word 2003 – used to write reports
- Microsoft Power Point – to prepare and provide presentation

Hardware

The following GIS and Remote Sensing hardware was used:

- 1 High Capacity laptop, Intel Centrino 2.0 GHz, 2GB of RAM, 80GB Hard Disk
- A Scanner. A1 Size, Resolution 300x300
- Handheld GPS (Garmin)
- A3 Printer, Colour, 600X600 DPI.

Spatial Reference System

Map Projections: The project must agree a projection in which to present results and derived products. Data can be acquired in any projection, but has to be transformed into the

agreed Projection for archiving and presentation. The data collected for the project was presented in a number of different projections, as follows:

- Ethiopian Mapping Agency Topographic Maps has, Clarke 1888 spheroid, UTM 37 North Projection, Adindan Datum.
- Latitude and longitude - GCS_Adindan, Datum D_Adinindan, Prime meridian 0
- Landsat Satellite Image UTM37N, WGS84 Spheroid
- Undefined coordinate system

Projection Used: The projection used for this project is the GCS_Adindan, UTM zone 37 North Projection for working maps and images. This projection system is used by Ethiopian Mapping Agency (EMA), a responsible governmental agency for mapping and topographic survey. This requires that an approximate relation is used for the satellite Image.

The projection parameters used for standardizing the data are as follows:

Projection**:** UTM Zone 37

Horizontal Datum: Adindan

Vertical Datum: Mean Sea Level

Spheroid: Clarke 1880 Modified

2. Methodology and Approach

A) Data acquisition and Capturing:

Though the Awash River basin is the main project study area, available data relevant on other river basins of Ethiopia were also collected. The available data has been organised and put in the database.

- By establishing collaboration with responsible departments for GIS data water and for irrigation, various spatial data sets have been collected. (Federal Democratic Republic of Ethiopia Ministry of Water resources, (Water resources information management directorate), and Ministry of Agriculture and Rural Development (Natural Resources Directorate), International Water Management Institute (IWMI).

- The collected data have been verified to fit to the GIS standards set for the project. All the collected data were mapped and checked how it fall against water sources and administrative units.
- Data gaps have been identified (by listing a basic and required spatial data type for agricultural water management i.e., . Irrigated sites and their sizes with all its attributes, water resource features, basic infrastructures like roads and settlements, climate data, agro-ecological zones, river gauging stations, administrative units, soil types, location of small scale irrigation, actually equipped areas of each irrigation, water sources types for each irrigation) and type and means of filling the gap were designed. Accordingly data on small scale irrigation has been completed from base line survey data, collected from field using hand-held GPS and questionnaires. Data for large scale irrigation has been digitized from Landsat TM satellite imagery, of January 2008. This was done by identifying irrigation areas on the satellite image and digitizing polygons over the irrigated areas.

B) Building GIS Database

The quality of collected data has been assessed. Then the collected data was converted to digital format (from the filled questioner paper a name, coordinates, water source types and locations were recorded to tabular format) and store within an appropriate filing structure (see Annex A below) and correct topology. The spatial data was stored in ArcView shape file format for ease of use and exchange with other users. Socioeconomic data, number of beneficiaries, owners, investment cost and other related attributes were linked to the spatial dataset, so as to enrich the GIS database

C) Data Analysis

- A shapefile of agro-ecological zones with administrative unit was created by combining administrative boundaries and agro-ecological zones.

D) Outputs - Information and Data

The GIS database was designed and created using ArcGIS 9.3.. Moreover the following outputs have been produced.

- ▶ Comprehensive Base Map Layers for general and topographic mapping
- ▶ Thematic maps of different scales
- ▶ Information Output: Maps and statistical reports
- ▶ Location and extent of irrigated areas and water sources
- ▶ Full GIS data descriptions are prepared (provided with the data on DVD).

For the complete list, see Annex and the spatial database DVD.

NOTE:

- The data dictionary is attached to this report to show available layer and the structure of each data
- The database on agricultural water use created under this project using MySQL can be used to update the attributes of the spatial data created in the GIS database. The major attributes include Irrigated areas, owners, number of beneficiaries, actual equipped area, and so on. To update the spatial information, data from the MySQL database should be exported to a spreadsheet or other tabular form. Then it could be imported to the GIS software (ArcGIS 9.3).

ANNEX A

GIS Data Dictionary for "Strengthening National Water Monitoring Capacities, with Emphasis on Agricultural Water Management"

```
D:\GISDATA_Riverbasins
├──00_CountryData
├──03_Awash: GIS Data of Awash River Basin
│   ├──Administrative: contains administrative boundaries, regional, zonal and
│   │                  Wereda boundary (Polygons) , Central Statistical Agency, 2007
│   ├──Basinboundary: contains Awash river basin and sub-basin boundaries
│   │                  (Polygons)
│   │
│   │
│   ├──Infrastructure: contains infrastructure features
│   │   ├──Settlements: contains settlement names, locations, and attributes
│   │   │               data(Points), Topographic map of Ethiopia, scale 1:250,000│
│   └──Transport: contains road types alignment and attribute data (Lines)
│   │
│   ├──LandResources
│   │   ├──Geology: contains lithological data (Polygons), Geological survey of
│   │   │           Ethiopia (GSE)
│   │   ├──Landcove: contains land cover/use data (Polygons), Ministry of
│   │   │             Agriculture and Rural Development (MoARD)
│   │   ├──Landuse
│   │   ├──Minerals:
│   │   ├──Soil: Contains soil types and additional attributes (Polygons)
│   │   └──Vegetation
│   ├──Maps: Contains maps that have been compiled for this project.
│   ├──Presentation
│   ├──Topography: Contains contour lines
│   │
│   └──WaterResources
│       ├──Climate: Contains agro-ecological zones (Polygons) and location of
│       │           meteorological station (Points)
│       ├──Dams&Reservoir
│       ├──Hydrogeology
│       ├──Hydrography : Contains hydrographic features, lakes Polygons and
│       │                rivers and streams Lines)
│       └──Irrigation: Contains location of irrigation sites and their scales,
│                   i.e. Small and medium scale (points)large scale (Polygons),
│                   FAO, 2009 (this project.
│
├──06_Wabishebele: GIS Data of Wabi Shebele River Basin
│   ├──Administrative : contains administrative boundaries, regional, zonal and
│   │                    Wereda boundary (Polygons)
│   │
│   ├──Infrastructure: contains infrastructure features
│   │   │
│   │   ├──Settlements: contains settlement names, locations, and
│   │   │               attributes data(Points)
│   │   └──Transport: contains road types alignment and attribute data (Lines)
│   │
```

```
│   ├──LandResourc
│   │   ├──Farmingsystem: contains polygons showing different farming systems
│   │   ├──Forest : contains forest location areas
│   │   ├──Geology: contains lithological data (Polygons)
│   │   ├──Landcover: contains land cover data (Polygons)
│   │   ├──Landuse : contains land use data (Polygons)
│   │   ├──Minerals: contains mineral types and their location
│   │   └──Soil : Contains soil types and additional attributes (Polygons)
│   └──WaterResources
│       ├──Climate : contains location of meteorological stations
│       ├──Hydrography : Contains hydrographic features, lakes Polygons and
│       │              rivers and streams Lines)
│       ├──Hydropower
│       └──Irrigation : contains location of irrigation sites
│
├──07_Genale-Dawa: GIS data of Genale-Dawa River Basin
│   └──GDRBGIS
│       ├──basin: Contains Basin boundary
│       └──gdrb_gis
│           ├──Data
│           │   ├──basin : Contains Basin boundary
│           │   ├──support
│           │   │   ├──graphics
│           │   │   ├──logos
│           │   │   └──symbols
│           │   └──thematic
│           │       ├──agroecology : Contains Agroecological data
│           │       │   ├──gd_rainfall : Contains Location of Met stations
│           │       │
│           │       ├──communication
│           │       ├──cropproduction : contains crop production zones
│           │       ├──energy
│           │       ├──environment : contains protected areas, water quality data
│           │       ├──forestry : Contains forest location areas
│           │       ├──geology : Contains Lithological data
│           │       ├──hydrogeology : Contains hydrogeological data
│           │       │   ├──geology : Contains Lithological data
│           │       │   └──info
│           │       ├──hydromet : contains location of meteorological stations
│           │       ├──hydropower : contains dam sites and reservoir location
│           │       ├──irrigation : contains location of irrigation sites
│           │       ├──landcover
│           │       ├──mineral
│           │       ├──population
│           │       ├──powersys
│           │       ├──roads
│           │       ├──soil
│           │       ├──tourism+wildlife
│           │       └──watersupply
│           └──map250 : contains 1:250,000 scale thematic maps
│               ├──base : contains bas emap
│               ├──geol : contains geological map
│               ├──hgeo : contains hydrogeological maps
│               ├──lclu : contains land cover land use map
│               └──soil : contains soil map
│
```

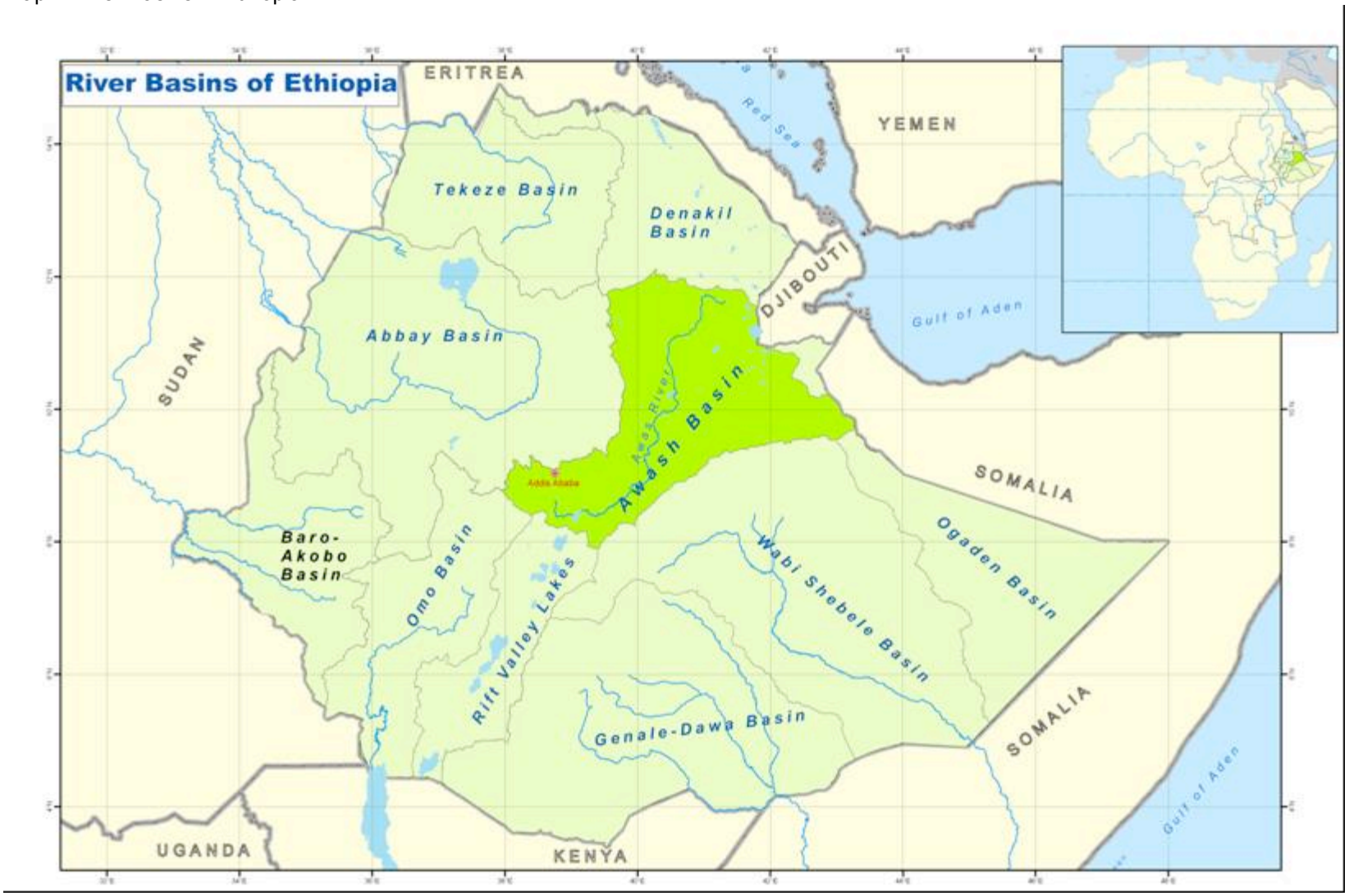
```
│
├──08_RVLB: GIS data of Rift Valley Lakes Basin
│   ├──Administration: contains administrative boundaries, regional, zonal and
│   │                  Wereda boundary (Polygons)
│   ├──Hydrography
│   │   ├──GuagingStations : Location of river gauging stations
│   │   ├──Lakes : Contains hydrographic features, lakes (Polygons)
│   │   └──Rivers : Contains hydrographic features, rivers (Lines)
│   │
│   ├──Infrastructure
│   │   ├──Roads : Contains roads (Lines)
│   │   ├──Towns : Contains Settlement Data (Points)
│   │   └──WaterSupply :
│   ├──LandResources
│   │   ├──Agroecology2005 : contains agro-ecological data from year 2005
│   │   ├──Agroecology2k :  contains agro-ecological data from year 2000
│   │   │
│   │   ├──Geology :
│   │   │
│   │   ├──Geomorpholo gy
│   │   ├──Geothermal
│   │   │   └──Geothermal
│   │   ├──Landcover
│   │   ├──Landevaluation
│   │   ├──Landsuitability
│   │   ├──MineralResources
│   │   │
│   │   └──Soils : Soil types
│   ├──Logos : contains symbols and logos
│   └──WarerResources
│       ├──Climate
│       │   │
│       │   ├──ETO_1km : Evapotranspiration data
│       │   ├──LTA_rainfall_map
│       │   ├──NEMSAdata
│       │   ├──Rainfal :
│       │   ├──SmoothedETO : Evapo transpiration data of each month
│       │   ├──specfic_yield
│       │   ├──Temprature
│       │   │   ├──aatemp
│       │   │   ├──contour_temp
│       │   │   └──info
│       │   └──Windspeed
│       ├──Dams&Reservoir
│       │
│       ├──Hydrogeology: Hydro geological Database (points)
│       │
│       ├──Hydrography
│       │   ├──GuagingStations : Location of river gauging stations
│       │   ├──Lakes : Contains Lake Features (Polygons)
│       │   └──Rivers : Contains river features,
│       │
│       ├──Hydrology
│       │   └──DroughtGIS
│       ├──Hydropower
```

```
│       │   └──Energy
│       └──Irrigation: Contains location of irrigation sites and their scales,
│                  i.e. Small and medium scale (points)large scale (Polygons)
│
├──09_OmoGibe: GIS data of Omo-Gibe River Basin
│   ├──Administrative: contains administrative boundaries, regional, zonal and
│   │                  Wereda boundary (Polygons)
│   ├──autcad files
│   │   ├──FIN250
│   │   ├──FINAL1MI
│   │   ├──FINAL50
│   │   └──FINALA4
│   │       ├──ANULHUMD
│   │       ├──CLIMFIN
│   │       └──CLIMFIN1
│   ├──Infrastructure
│   │   ├──Facilities
│   │   ├──Settlements
│   │   └──Transport
│   ├──LandResourc
│   │   ├──FarmingSystem
│   │   ├──Forest
│   │   ├──Geology
│   │   ├──Landcover
│   │   ├──Landuse
│   │   ├──Minerals
│   │   └──Soil
│   └──WaterResource
│       ├──Climate
│       ├──Dams&Reservoir
│       ├──Hydrogeology
│       ├──Hydrography
│       ├──Hydropower
│       └──Irrigation
│
├──10_Baro-Akobo: GIS data of Baro-Akobo River Basin
│   │
│   ├──Administrative: contains administrative boundaries, regional, zonal and
│   │                  Wereda boundary (Polygons)
│   ├──Feasibility
│   │   ├──Baro Feas Study Maps
│   │   │   └──Ba2 D00-D11
│   │   └──Baro Feas Study Reports
│   ├──FromCAD
│   ├──Infrastructure
│   ├──LandResourc
│   │   ├──Forest
│   │   ├──Geology
│   │   ├──Landcover
│   │   ├──Landuse
│   │   ├──Minerals
│   │   └──Soil
│   ├──Project
│   └──WaterResource
│       ├──Climate
```

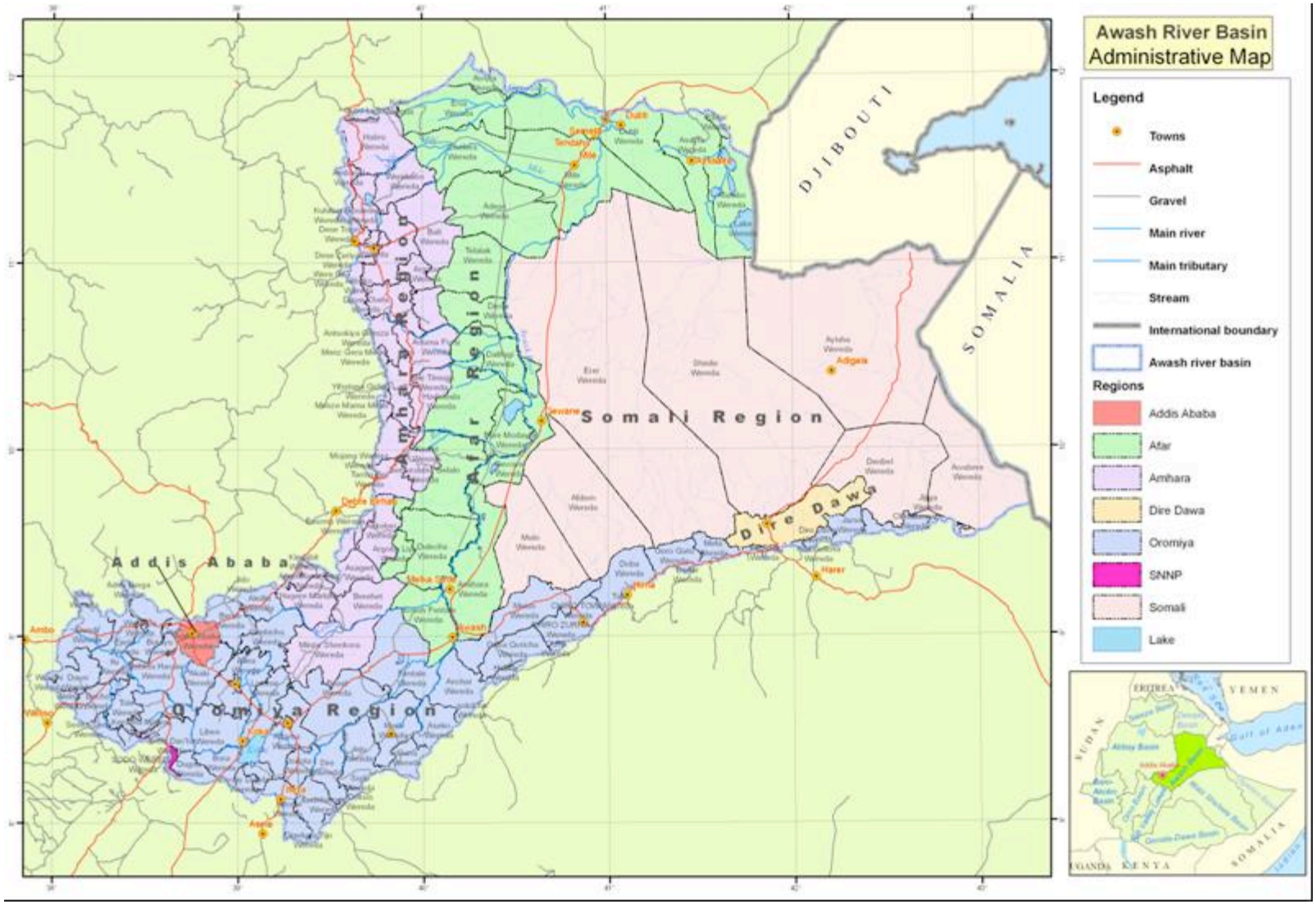
```
│        ├───Dams&Reservoir
│        ├───Hydrogeology
│        ├───Hydrography
│        ├───Hydropower
│        └───Irrigation
│
├───11_Abbay: GIS data of Abbay River Basin
│   ├───Administrative: contains administrative boundaries, regional, zonal and
│   │                   Wereda boundary (Polygons)
│   ├───Basin:
│   ├───Infrastructure:
│   ├───LandResourc
│   │   ├───Forest:
│   │   ├───Geology:
│   │   ├───Landcover:
│   │   ├───Landuse:
│   │   ├───Minerals
│   │   └───Soil:
│   ├───River Nile Discharge 1890-2000
│   └───WaterResource
│       ├───Climate
│       ├───Dams&Reservoir
│       ├───Hydrogeology
│       ├───Hydrography
│       ├───Hydropower
│       └───Irrigation
│
└───12_Tekeze: GIS data of Tekeze River Basin
    ├───Administration: contains administrative boundaries, regional, zonal and
    │                   Wereda boundary (Polygons)
    ├───info
    ├───Infrastructure
    │   ├───Facilities
    │   ├───Settlements
    │   └───Transport
    ├───Irrigable
    ├───LandResourc
    │   ├───Agroecology
    │   ├───FarmingSystem
    │   ├───Forest
    │   ├───Geology
    │   ├───Landcover
    │   ├───Landuse
    │   ├───Minerals
    │   └───Soil
    ├───Topography
    └───WaterResource
        ├───Climate
        ├───Dams&Reservoir
        ├───Hydrogeology
        ├───Hydrography
        ├───Hydropower
        └───Irrigation
```

ANNEX B
Maps Produced

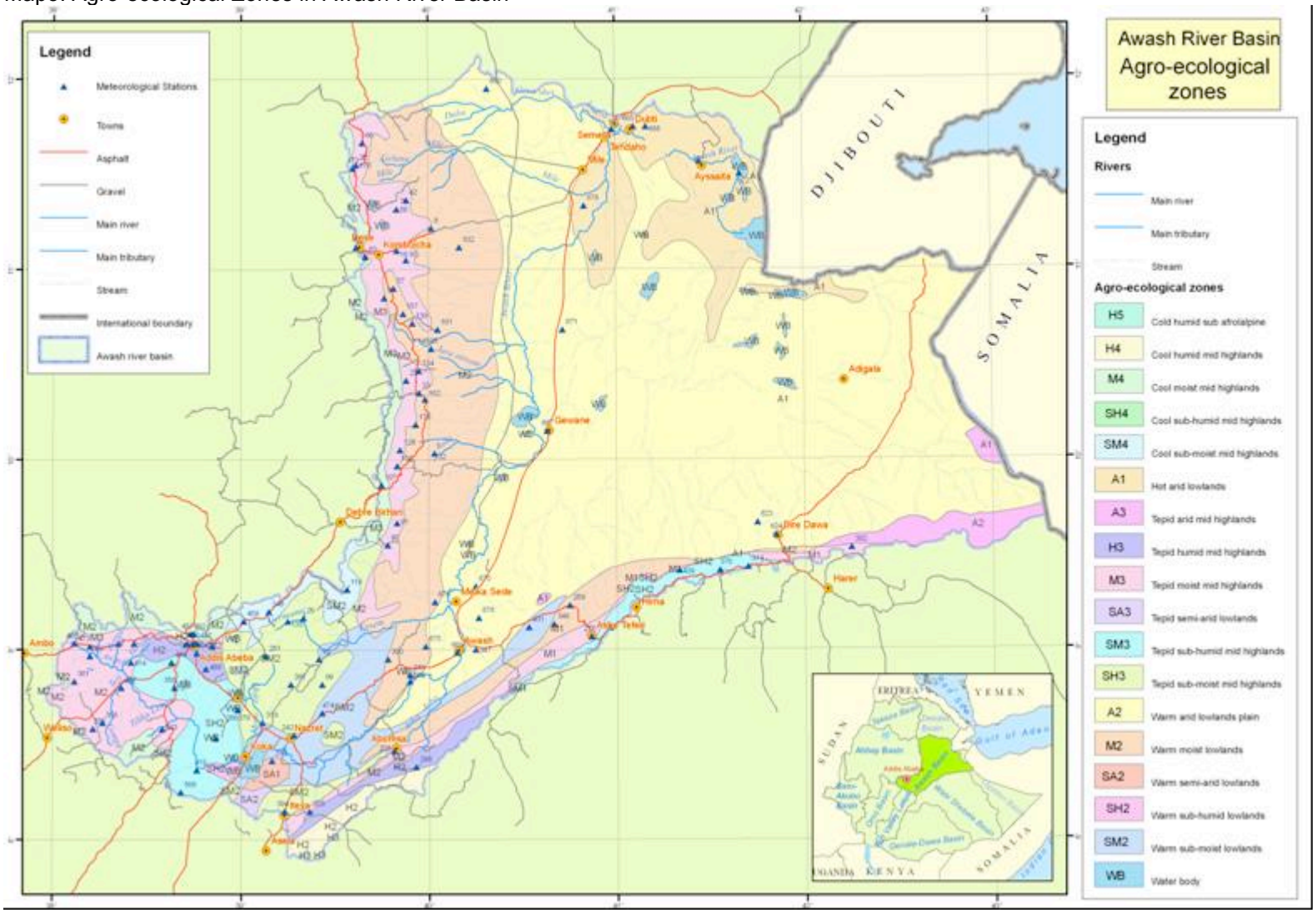
Map1: River Basins in Ethiopia



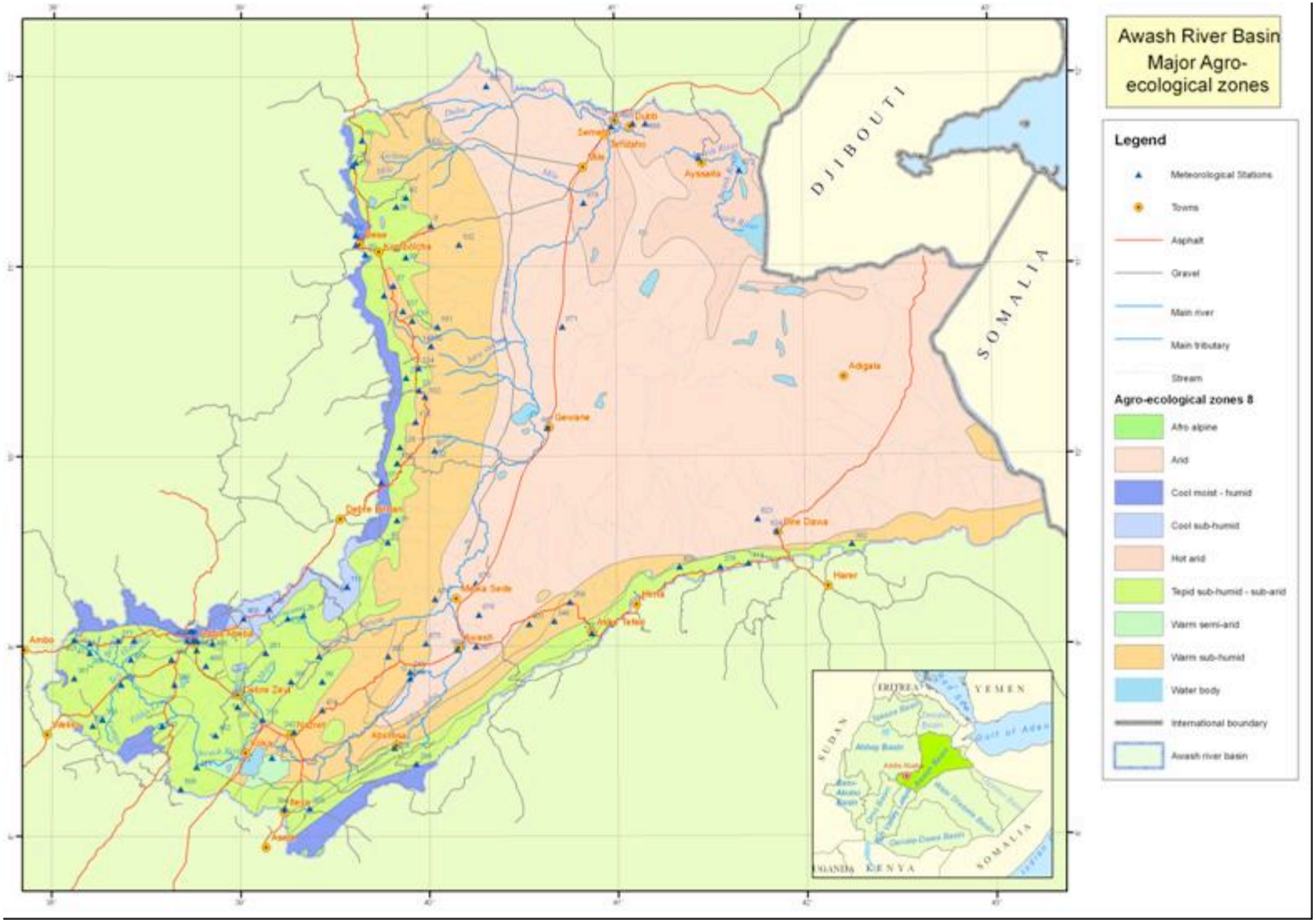
Map2: Administrative Regions in Awash River Basin



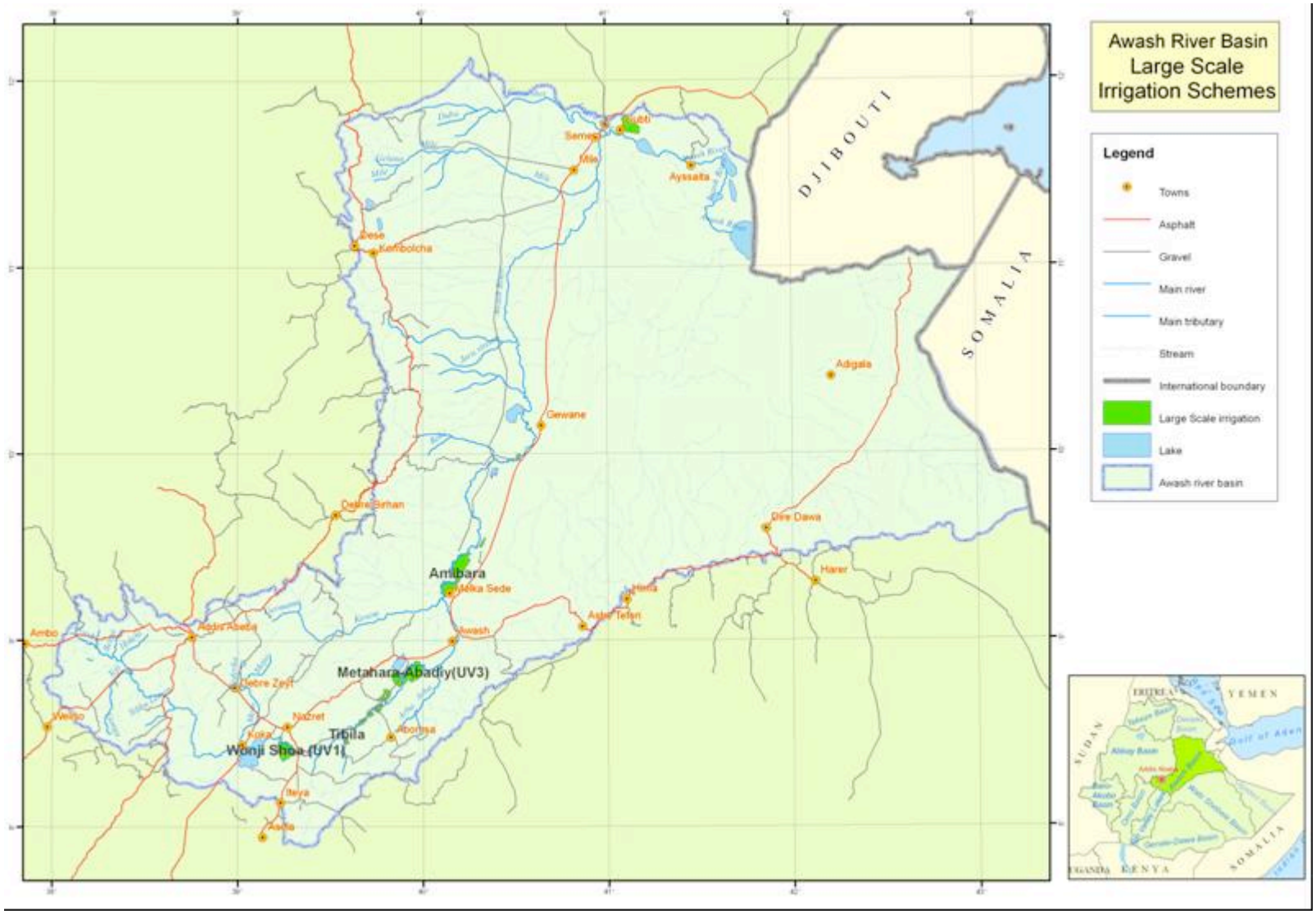
Map3: Agro-ecological Zones in Awash River Basin



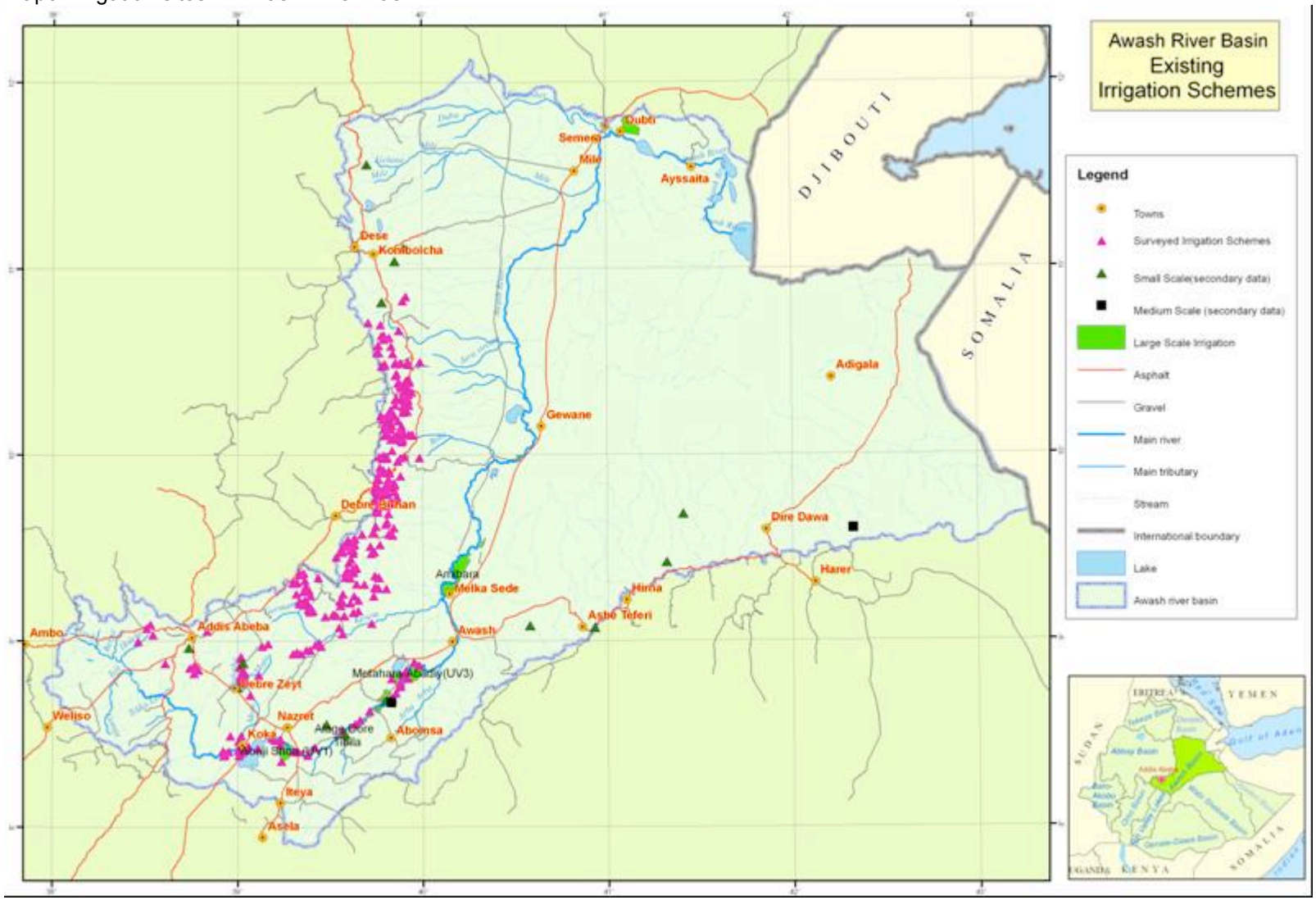
Map4: Major agro-ecological Zones in Awash River Basin



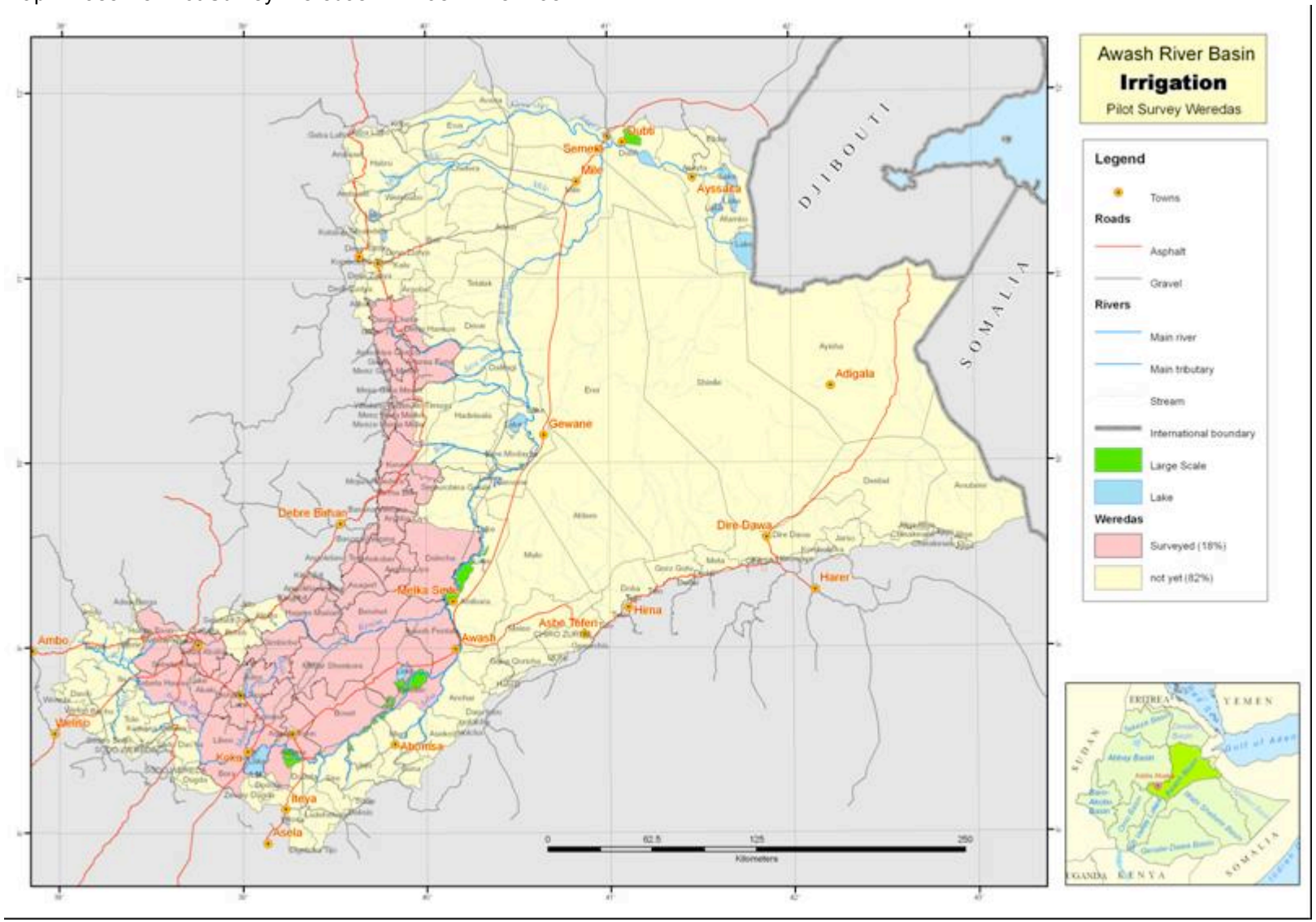
Map5: Large Scale Irrigation Sites in Awash River Basin



Map6: Irrigation sites in Awash River Basin



Map7: Baseline Pilot Survey Weredas in Awash River Basin

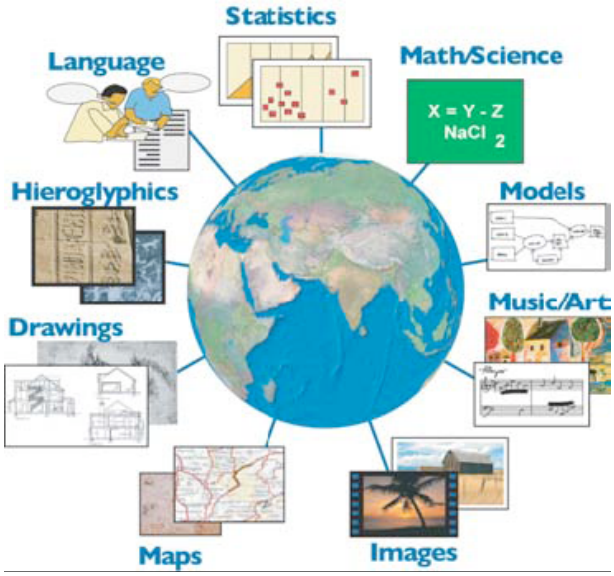


ANNEX C
Presentation and Training

The Role of GIS in assessment of Agricultural Water Requirement

Presented by: Belay Seyoum
GIS & Remote Sensing Specialist

Agricultural Water Requirement in Awash River Basin



Definition

Geographic information system (GIS) is a computer assisted system for acquisition, storage analysis, and display of geographic data.

Components of a GIS

A working GIS integrates five key components:

- **hardware,**
- **software,**
- **data,**
- **people,**
- **methods.**

Functions

- A GIS has **five** main functional subsystems. These are :

  - **A data acquisition subsystem;**
  - **a data input subsystem;**
  - **a data storage and retrieval subsystem;**
  - **a data manipulation and analysis subsystem; and**
  - **a data output and display subsystem**

Applications of GIS

- Water Resource Database and different Models
- Land use/cover Database
- Soil erosion and erosion hazard analysis and scenarios
- Infrastructure database
- Accessibility analysis and routing
- Physical risk analysis and Assessment

Applications . . .

- Mapping underground water
- etc

Agricultural Water Requirement in Awash River Basin

Main Features

Software

- Most popular and latest GIS/RS packages
- ArcGIS 9.2
- ERDAS Imagine

OBJECTIVES

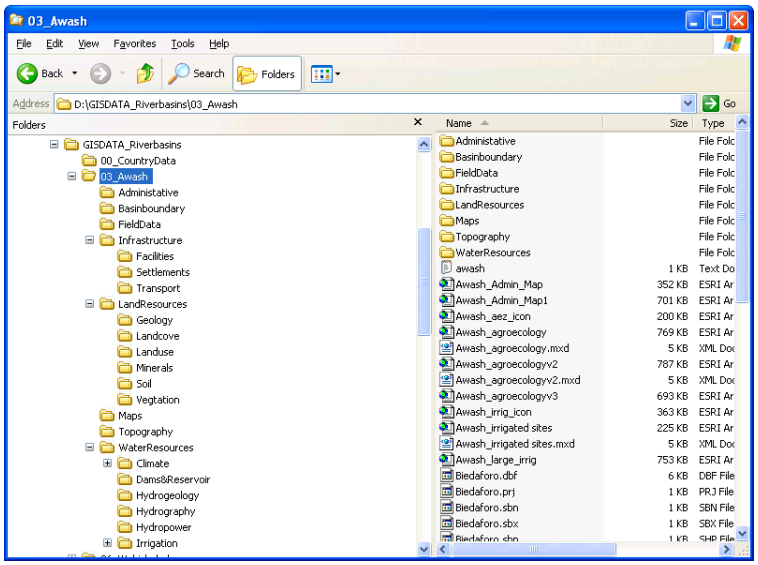
- Building spatial database
- Producing different thematic maps
- Working with database specialist

Data Collection

- Collecting relevant data to irrigation water requirement
- Base data (road network, settlement …)
- River network
- Administrative boundary
- Scheme sites (Large, medium and small)
- Agro ecological data
- Met stations (location)

Spatial database

- Data collected from different sources have been organized in file format



Spatial . . .

Awash River Basin Spatial Data Structure.

```
Drive Letter:\.
├───Administative
├───Basinboundary
│
├───Infrastructure
│   ├───Facilities
│   ├───Settlements
│   └───Transport
│
├───LandResources
│   ├─── forestry
│   ├─── Geology
│   ├───Landcoveruse
│   └───Soil
│
│
├───Maps
├───Topography
│
└───WaterResources
    ├───Climate
    ├───Hydrogeology
    ├───Hydrography
    └───Irrigation
```

1 Awash_Weredas_New.shp

1.1 Shapefile

Description	Spatial	Attributes

Keywords

Theme: Administrative boundaries
Place: Awash River Basin
Stratum: Wereda Boundaries

Description

Abstract

Comprehensive spatial information of Administrative boundaries (Woredas) of the river basin based on data from Central Statistical Agency, 2007.

Purpose

Agricultural Water Management

Status of the data

In work

Data update frequency: As needed

Time period for which the data is relevant

Date and time: 2007 at time unknown

Description:
ground condition

Publication Information

Who created the data: MoWR GIS and Metadata Division / FAO Project Strengthening National Water Monitoring Capacities, with Emphasis on Agricultural Water Management Project.

Date and time:: Published 2010 in the information system of agricultural water management

Data storage and access information

File name: Awash_Weredas_New.shp

Type of data: vector digital data

Location of the data:

- \\E$\GISDATA_Riverbasins\03_Awash\Administrative\

Data processing environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2, v.2096; ESRI ArcCatalog 9.3.0.1770

Accessing the data

Size of the data: 1.626 MB

Data transfer size: 1.626 MB

Constraints on accessing and using the data

Access constraints: None

Use constraints:
None

Details about this document

Contents last updated: 20100526 at time 16582100

Who completed this document

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Standards used to create this document

Standard name: FGDC Content Standards for Digital Geospatial Metadata

Standard version: FGDC-STD-001-1998

Time convention used in this document: local time

Metadata profiles defining additonal information

- ESRI Metadata Profile: http://www.esri.com/metadata/esriprof80.html

2 Awash_Towns_utm.shp

2.1 Shapefile

Description	Spatial	Attributes

Keywords

Theme: Water resources and agricultural water requirement
Place: Awash River Basin
Stratum: Major Towns in the basin

Description

Abstract

Comprehensive spatial information of towns in the river basin based on data from topographic map of Ethiopian Mapping Agency, 1990.

Purpose

For the assessment of Agricultural water Management

Status of the data

In work
Data update frequency: As needed

Time period for which the data is relevant

Date and time: unknown
Description:
ground condition

Publication Information

Who created the data: MoWR GIS and Metadata Division / FAO Project Strengthening National Water Monitoring Capacities, with Emphasis on Agricultural Water Management Project.
Date and time:: Published 2010 in the information system of agricultural water management

Data storage and access information

File name: Awash_Towns_utm.shp

Type of data: vector digital data

Location of the data:

- \\E$\GISDATA_Riverbasins\03_Awash\Infrastructure\

\\GISDATA_Riverbasins\03_Awash\Infrastructure\Settlements\

Data processing environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2, v.2096; ESRI ArcCatalog 9.3.0.1770

Accessing the data

Size of the data: 0.001 MB

Data transfer size: 0.001 MB

Constraints on accessing and using the data

Access constraints: None

Use constraints:
None

Details about this document

Contents last updated: 20100526 at time 17051800

Who completed this document

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Standards used to create this document

Standard name: FGDC Content Standards for Digital Geospatial Metadata

Standard version: FGDC-STD-001-1998

Time convention used in this document: local time

Metadata profiles defining additonal information

- ESRI Metadata Profile: http://www.esri.com/metadata/esriprof80.html

3 Awash_agro_ecology_utm.shp

3.1 Shapefile

Description	Spatial	Attributes

Keywords

Theme: Water resources and agricultural water requirement
Place: Awash River Basin
Stratum: Agro-ecological Zones

Description

Abstract

Comprehensive spatial information of agroecological zones of the river basin based on data from Ministry of Agriculture and Rural Development, 2005.

Purpose

Agricultural Water Management

Status of the data

In work

Data update frequency: As needed

Time period for which the data is relevant

Date and time: unknown

Description:
ground condition

Publication Information

Who created the data: Ministry of of Agriculture and Rural Development

Date and time: Unpublished Material

Data storage and access information

File name: Awash_agro_ecology_utm.shp

Type of data: vector digital data

Location of the data:

- \\E$\GISDATA_Riverbasins\03_Awash\WaterResources\climate\

Data processing environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2, v.2096; ESRI ArcCatalog 9.3.0.1770

Accessing the data

Size of the data: 0.122 MB

Data transfer size: 0.122 MB

Constraints on accessing and using the data

Access constraints: None

Use constraints:
None

Details about this document

Contents last updated: 20100526 at time 16532500

Who completed this document

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Standards used to create this document

Standard name: FGDC Content Standards for Digital Geospatial Metadata

Standard version: FGDC-STD-001-1998

Time convention used in this document: local time

Metadata profiles defining additonal information

- ESRI Metadata Profile: http://www.esri.com/metadata/esriprof80.html

4 Awash_rivers_utm.shp

4.1 Shapefile

Description | Spatial | Attributes

Keywords

Theme: Agricultural Water Management
Place: Awash River Basin
Stratum: Rivers

Description

Abstract

Comprehensive spatial information of irrigated areas in the upper Awash Basin, Amhara and Oromia regions based on data from the pilot baseline survey: The pilot woredas which are covered by the survey can be found in map. Reference Year: 2008.

The data contains digitized rivers.

Purpose

For the assessment of Agricultural water Management

Status of the data

In work

Data update frequency: As needed

Time period for which the data is relevant

Date and time: unknown

Description:
ground condition

Publication Information

Who created the data: Obtaind from Ministry of Water Resources

Date and time: Unpublished Material

Data storage and access information

File name: Awash_rivers_utm

Type of data: vector digital data

Location of the data:

- \\E$\GISDATA_Riverbasins\03_Awash\WaterResources\hydrography\

Data processing environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 2, v.2096; ESRI ArcCatalog 9.3.0.1770

Accessing the data

Size of the data: 1.448 MB

Data transfer size: 1.448 MB

Constraints on accessing and using the data

Access constraints: None

Use constraints:
None

Details about this document

Contents last updated: 20100526 at time 16254500

Who completed this document

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Standards used to create this document

Standard name: FGDC Content Standards for Digital Geospatial Metadata

Standard version: FGDC-STD-001-1998

Time convention used in this document: local time

Metadata profiles defining additonal information

- ESRI Metadata Profile: http://www.esri.com/metadata/esriprof80.html

5 Awash_irrigated_sites_utm.shp

5.1 Shapefile

Description | Spatial | Attributes

Keywords

Theme: Agricultural Water Management
Place: Awash River Basin, Ethiopia
Stratum: Irrigated Areas in Pilot Woredas in Upper Awash Basin
Temporal: 2008

Description

Abstract

Comprehensive spatial information of irrigated areas in the upper Awash Basin, Amhara and Oromia regions based on data from the pilot baseline survey: The pilot woredas which are covered by the survey can be found in map. Reference Year: 2008.

The data contains small and medium scale schemes as well as large scale schemes which are digitized from Landsat images

Purpose

For the assessment of Agricultural water Management

Status of the data

The map contains comprehensive information on small scale irrigation schemes in the pilot woredas only.

Data update frequency: Recommended frequency: 5 years

Time period for which the data is relevant

Date and time: unknown at time unknown

Description:
ground condition

Publication Information

Who created the data: MoWR GIS and Metadata Division / FAO Project Strengthening National Water Monitoring Capacities, with Emphasis on Agricultural Water Management Project.

Date and time: Published 2010 in the information system of agricultural water management

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Data storage and access information

File name: Awash_irrigated_sites_utm.shp

Type of data: vector digital data

Location of the data:

- \\E$\GISDATA_Riverbasins\03_Awash\WaterResources\Irrigation\

Data processing environment: Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 3; ESRI ArcCatalog 9.3.0.1770

Accessing the data

Size of the data: 0.011 MB

Data transfer size: 0.011 MB

Constraints on accessing and using the data

Access constraints: None

Use constraints:
None

Details about this document

Contents last updated: 20100526 at time 12352500

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Standards used to create this document

Standard name: FGDC Content Standards for Digital Geospatial Metadata

Standard version: FGDC-STD-001-1998

Time convention used in this document: local time

Metadata profiles defining additonal information

- ESRI Metadata Profile: http://www.esri.com/metadata/esriprof80.html
- ESRI Metadata Profile: http://www.esri.com/metadata/esriprof80.html