

KNSDI NEWSLETTER

A newsletter from the KNSDI Secretariat
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No 05

The Project for Strengthening Survey of Kenya (SoK) for GIS Promotion in the Republic of Kenya

The year 2007 is coming to an end. We therefore warmly welcome you to the 5th and last edition of KNSDI Newsletter of the year. Reported in this issue are a number of activities of the various Working Groups that have taken place since our 2nd Standards Seminar in July 2007. You will also find upcoming events including JICA-Net Advanced

Survey of Kenya and JICA conducts GIS Training at AICAD

The month-long GIS training course was conducted by SoK and JICA at AICAD, Juja, from 15th October to 9th November 2007. Participants were drawn from different organizations including the private and public sectors, international organizations, Non Governmental Organizations (NGOs), the Academia etc.

In his welcoming speech the Chief Advisor of the Project, Mr. Jun Sato, explained that NSDI concept was a very broad idea which included Spatial Data, Clearing House, Law, Human Resources, etc. Many countries were establishing

GIS/Remote Sensing Training course slotted for January-February 2008 and the 3rd Standards Seminar to be held in January 2008.

You are welcome to forward relevant activities/information consistent with KNSDI goals to the secretariat for sharing with other stakeholders.

their own NSDIs and Kenya was not an exception. He urged the participants to put to good use the GIS skills they would acquire.



Participants following GIS training course

For convenience, the participants were divided into two groups of forty each:

1. Potential GIS users

This course was held from 15th to 26th October 2007 and was meant to introduce participants to GIS applications. The main topics covered were (1) Introduction to GIS (2) Quantum GIS software (3) Data capture and Data Standards and (4) GIS Applications in Utility Management.

2. Existing GIS users

The course was held from 29th October to 9th November 2007. The main topics covered included (1) ArcGIS Extensions (2) Open Source GIS: Quantum and

A certificate of attendance was issued to each participant at the end of the course.



A successful participant receiving a certificate

Integrated Land and Water Information System (ILWIS) (3) Data Sharing (4) Database Techniques (5) GIS Application in Environmental and Utility Management.



Participants following GIS training course

The Project Manager who is also the Director of Surveys, Mr. Ephantus Murage, awarded certificates to the successful participants and officially closed the training course. He encouraged the officers to spread the Gospel of GIS and data-sharing.

Report on the visit to Japan by two SoK counterparts

Two counterparts recently visited Japan to learn from the Japanese experience. They visited the National Government offices and various private and academic institutions.



Discussion with GSI staff, Tsukuba

Some of their main findings and observations were:

1. Japan has mastered the art of 'Adopt and Adapt'. The Geographical Survey Institute, (GSI) (equivalent of SoK) in conjunction with GIS users, developed and provided a profile of Metadata Standards: Japan Metadata Profile version 2.0 (JMP2.0) in accordance with ISO 19115. They adopted the Metadata Editor of the United States and adapted it to suit their needs.
2. The counterparts observed that there is a high degree of collaboration within and between the different organisations dealing with spatial information in the occurrence of large scale natural disasters such as major earthquakes, tsunamis, fires, etc, to facilitate quick and timely response to combat the situation.



A visit to the aerial photos section

3. A factor that has greatly contributed to the success of Japan's NSDI is the well established Information and Communication Technology (ICT) infrastructure. For instance, they noted that about 95% of the population (some 128 million people) have access to internet facilities, and, of these, 85% have broadband connections. This means that in Kenya, unless the trend is reversed, web-based GIS will take along time to be firmly established in the country since many people still can not access internet facilities.
4. It did not escape the attention of the counterparts that in addition to aerial photographs, GIS users in Japan can access spatial data through the internet at scales of 1:25,000 (covering the whole country) and at a scale of 1:2,500 (covering city planning areas).
5. Members of the public can purchase maps (digital/hard copy) from departmental stores/bookshops spread across the country. Of importance was reduction or elimination of

restrictions on access and availability while protecting the intellectual property rights (IPR) of data owners and the privacy of data providers.



Discussion/presentations at GSI offices

What are the challenges of a conventional GIS supply site?

The counterparts observed that for web-based GIS software, it means that:

1. The supplier of geo-information must keep both the background maps and the geographic information on its system.
2. It is very costly to build the system, develop and update the background maps
3. A big load burdens the information-supplier's server.

However, in the case of Japan's Digital Web System (called *Denshi Kokudo*), the counterparts noted that:

1. The Geographic Survey Institute provides technical information

thereby lowering the cost of building the system.

2. There is no need for the supplier of information to keep or update background maps.
3. The server load is lower because the need of the supplier of information to supply background map on its server has been eliminated.

The counterparts would like to conclude their report by saying that Japan's success story is worth emulating by other countries. Just like Japan adopted and adapted some support tools from other established NSDI, Kenya may adopt this approach and borrow only what is suitable and adapt it to suit her needs.

Reports from the KNSDI Working Groups

Standards Team

The Geographic Information Standards team is currently working on the six (6) Draft Standards Documents which were presented at the 2nd seminar at AICAD on 4th July 2007. The participants at the seminar agreed that the Draft

Documents i.e the Kenya Profile for Geographic Information Standards (KPGIS) version 1.0, Specification for the Production of 1:50,000 scale Topographic Map and the Manual for the Creation of Spatial Data Product Specification were in order but needed a little polishing here and there.

Metadata and Networking Team

The team has been working on the Metadata profile.

The Metadata team entered data for 44 sheets at scale 1:2,500. Each sheet covers an area of 2km by 1.5 km and

each of these sheets has a total of 14 layers. Metadata input is still going on for the remaining sheets. There are 16 sheets at 1:2,500 scale and 59 sheets at 1:5,000 scale.

As soon as the clearing house is up and running, this metadata will be made available for browsing on the internet.

Map Digitizing Team

The Map Digitization team has been revising the Manual for Digitization by incorporating the classification of features according to International Organization for Standardization (ISO 19100 series) Standards. Some of their activities have been in the areas of:

1) Accuracy control measures which take place during digitizing.

2) Field work using Real Time Kinematics (RTK) GPS receiver. The field work was conducted around Thika area

3) Data Quality

Four (4) elements of data quality have been included in the Product Specification. These include Completeness, Logical Consistency, Positional Accuracy and Temporal Accuracy.

4) Thematic accuracy: this refers to thematic classification.



Navigating to a control point using hand held GPS



Data collection using RTK GPS receiver

Database Management Team

The team was constituted early October 2007 and its main mission is to create a Relational Database whereby regions in the form of shape files can be stored in a single Database. In the case of Survey of Kenya (SoK), the Database is known as *Oracle 8i* assisted by ArcSDE which is a server connection between Datasets/feature classes in ArcGIS and *Oracle 8i*.



The database management team

Already their mission is underway and

2nd ESRI Eastern Africa User Conference-Kampala, Uganda

The 2nd ESRI Eastern Africa User Conference was held in Kampala from 13th-14th September 2007. The conference was co-organized by ESRI Eastern Africa (The regional ESRI Distributor) and Geo-Information Communication (GIC) - Uganda Country Representative. Participants were drawn from Eastern and Southern African countries including Kenya, Uganda, Rwanda, Ethiopia, Sudan, South Africa and The Netherlands.

The conference was divided into two themes: Technical Workshops (Geo-Database, Data collection and Management, Geo-Processing, Cartographic Production and Publishing and Visualization) and Presentations (Environment and Natural Resources, Planning, Land Management and Economic Development, GIS Science, Technology and Education, Transport, Utilities and Public Works and Human Services and Community Development).

The conference drew sponsors from Kenya, The Netherlands and South Africa. Some of the presentations

they have already installed ArcGIS 9, *Oracle 8i*, ArcSDE and ArcSDE post installation at the KNSDI secretariat. ArcSDE acts as a bridge to enable communication between ArcGIS and *Oracle 8i*. ArcSDE conveys spatial data between GIS application and the database. The database may be any one of the supported Database Management System (DBMS), in this case, *Oracle 8i*.

included how GIS could be used to model approximate migration route location for large herbivores in East Africa. Animal migration routes could be predicted using indicators such as Normalized Difference Vegetative Index (NDVI) (which determines the density of greenness on a patch of land), relative landscape complexity etc. The presence or absence of abundant green grass could determine the phase and/ or direction of migration of the animals.

It was interesting to learn how GIS and Remote Sensing could be applied to enhance agricultural productivity. Elimination of hunger and malnutrition by attaining food security is the driving force behind enhanced agricultural production. By employing Global Positioning System (GPS), GIS and Remote Sensing, 'Precision Farming' could be achieved to enhance crop production, monitoring and data management. The integrated approach could form the basis for informed decision making and policy formulation in agriculture.

Another presentation was on the Swahili culture in Lamu. Kenya stands to lose millions of shillings if the Historical Swahili towns are left to disappear. These towns are made up of ancient urban settlements with some containing the most valuable architectural and archaeological heritage which should be preserved. Low cost methodology embracing modern technologies such as Digital Photogrammetry, GPS, Terrestrial Laser Scanning, 3D Digital surface model and GIS Database etc could be

used to document, analyse, restore and conserve the towns through integrated geospatial data.

These were some of the GIS application areas that were explored during the conference. The participants learnt and shared lots of information. It was evident that over the last few years GIS utilization has continued to grow in leaps and bounds. It has found applications in virtually every sphere of our lives.

Country report to the Technical Committee of the RCMRD

This is an excerpt of the Country Report by the Director of Surveys of the Republic of Kenya to the Technical Committee of the RCMRD held in Nairobi from 15th -16th November 2007. The Report outlines the core functions of the Ministry of Lands which include (i) Land Registration and Valuation (ii) Mapping and Land Surveys (iii) Administration of State and Trust Land (iv) Land Adjudication, Consolidation and Registration of Groups (v) Physical Planning (vi) Lands and Settlement matters.

There are five (5) Departments that make up the Ministry of Lands: (1) Survey Department (2) Land Adjudication and Settlement (3) General Administration and Planning (4) Physical Planning and (5) Lands. The Department of Survey (Survey of Kenya, SoK) is the Government's sole agency for surveying and mapping and its activities are well defined in the Survey Act Cap. 299 of the Laws of Kenya. Some of these activities include maintenance of National Spatial Data Infrastructure (NSDI), production and distribution of accurate geographical data, mapping, preparation and

maintenance of Registry maps to support land registration and controls, etc. To accomplish these functions, SoK is divided into seven (7) Technical Divisions. These are: Mapping, Hydrographic Surveys, Cadastral, Adjudication, Geodetic and Geo-Information System, Administration and Kenya Institute of Surveying and Mapping (KISM).

The division of KISM deals with training of survey and mapping professionals in the field of Geo-Information capture, analysis, visualization and presentation. The institute has continued to offer its regular training programmes in surveying and mapping, cartography, photogrammetry and map reproduction at diploma and higher diploma levels. KISM conducts Third Country Group Training Courses which is one of JICA's cooperation schemes where a counterpart country transfers technology obtained through a JICA programme to neighbouring countries under the financial and technical support of JICA and the Government of Kenya. The institution also conducts short term courses in Information

Technology, GIS and Remote Sensing to meet the needs of the country.

geographical data to ensure security of land tenure and territorial integrity of the nation.

The Department's mission is to produce, maintain and distribute accurate

Upcoming events

JICA-Net Video conference: GIS/ Remote Sensing Training Course

The KNSDI secretariat in conjunction with JICA is pleased to invite applicants for the following advance course in **Remote Sensing and GIS**. The annual JICA-Net Video Conferencing course will be held at JICA offices, The Rahimtulla Tower, Upper Hill Road. The weekly training course is scheduled to take place from 24th January to 26th February 2007. The complete time table is shown below.

1	24 th Jan 07	09:00am-12:00pm	R S course-1 st Lecture	Prof. MURAI
2	31 st Jan 07	09:00am-12:00pm	R S course-2 nd Lecture	Prof. MURAI
3	7 th Feb 07	09:00am-12:00pm	GIS course-1 st Lecture	Prof. FURUHASHI
4	12 th Feb 07	09:00am-12:00pm	GIS course-2 nd Lecture	Prof. FURUHASHI
5	26 th Feb 07	09:00am-12:00pm	Project Management course	Prof. LAL

Remote Sensing (RS) course by Prof. MURAI

January 24th – 1st Lecture

This course mainly focuses on satellite Remote Sensing and Space Mapping

- 1) ***Demand for satellite information and observation systems*** (50 min)
- 2) ***Mapping capability of High Resolution Satellite Imagery (HRSI)*** (50 min)

+) *Question and Answer session*

January 31st – 2nd Lecture

This course mainly focuses on airborne Digital Photogrammetry and Laser Scanning

- 3) ***Aerial photogrammetry with digital cameras*** (50 min)
- 4) ***Airborne Laser Scanner and its applications*** (50 min)

+) *Question and Answer session*

GIS course by Prof. FURUHASHI

'Collaboration of the Digital Earth, Web Mapping and Geographic Information System-Business of spatial information technology by use of low-cost software and dataset.'

February 7th – 1st Lecture

The main focus will be on Digital earth and Web Mapping services

- 1) How to use the Digital Earth?** (60 min)
- ex. *Google Earth, NASA World Wind, ArcGIS Explorer etc*
- 2) Web Mapping Service** (60 min)
- ex. *Google Earth, Map Server, Yahoo Maps etc*

+) Question and Answer session also attended by Prof. MURAI

February 12th – 2nd Lecture

This course mainly focuses on GIS software and data formats

- 3) Major software of GIS** (30 min)
- 4) Open Source, OSGeo, OGC, Low cost GIS** (60 min)
- 5) GIS forecast, in the future of ten years** (30 min)

+) Question and Answer Session also attended by Prof. MURAI

Geoinformatics Project Management course by Prof. LAL

February 26th

This is a three-hour lecture including question and answer sessions. It is expected that this lecture will be conducted in three sessions including the following:

- 1) Project Management Overview** (40 min)
Here the discussion will be on the project, definition of project management, management functions, project cycle, project planning, implementation, monitoring and closing.
- 2) Best practices for successful Geoinformatics implementation** (40 min)
Requirements for successful projects, Geoinformatics and other projects, mistakes that lead to failures will be discussed.
- 3) Case study: Regional Land Use Planning using Geoinformatics** (40 min)
Project carried out in Thailand will be discussed. Discussion will start from project planning, data collection, data integration and data analysis targeting various sectorial requirements for developing a regional master plan.

+) question and answer session also attended by Prof. MURAI

3rd Standards Seminar (January 2008)

The KNSDI secretariat is planning to organize the 3rd Standards Seminar in January 2008 at AICAD, Juja. More information will be communicated in due course.

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The KNSDI secretariat wishes to take this earliest opportunity to wish you all a

Merry Christmas and a Prosperous New Year 2008

For more information please, contact the undersigned.

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