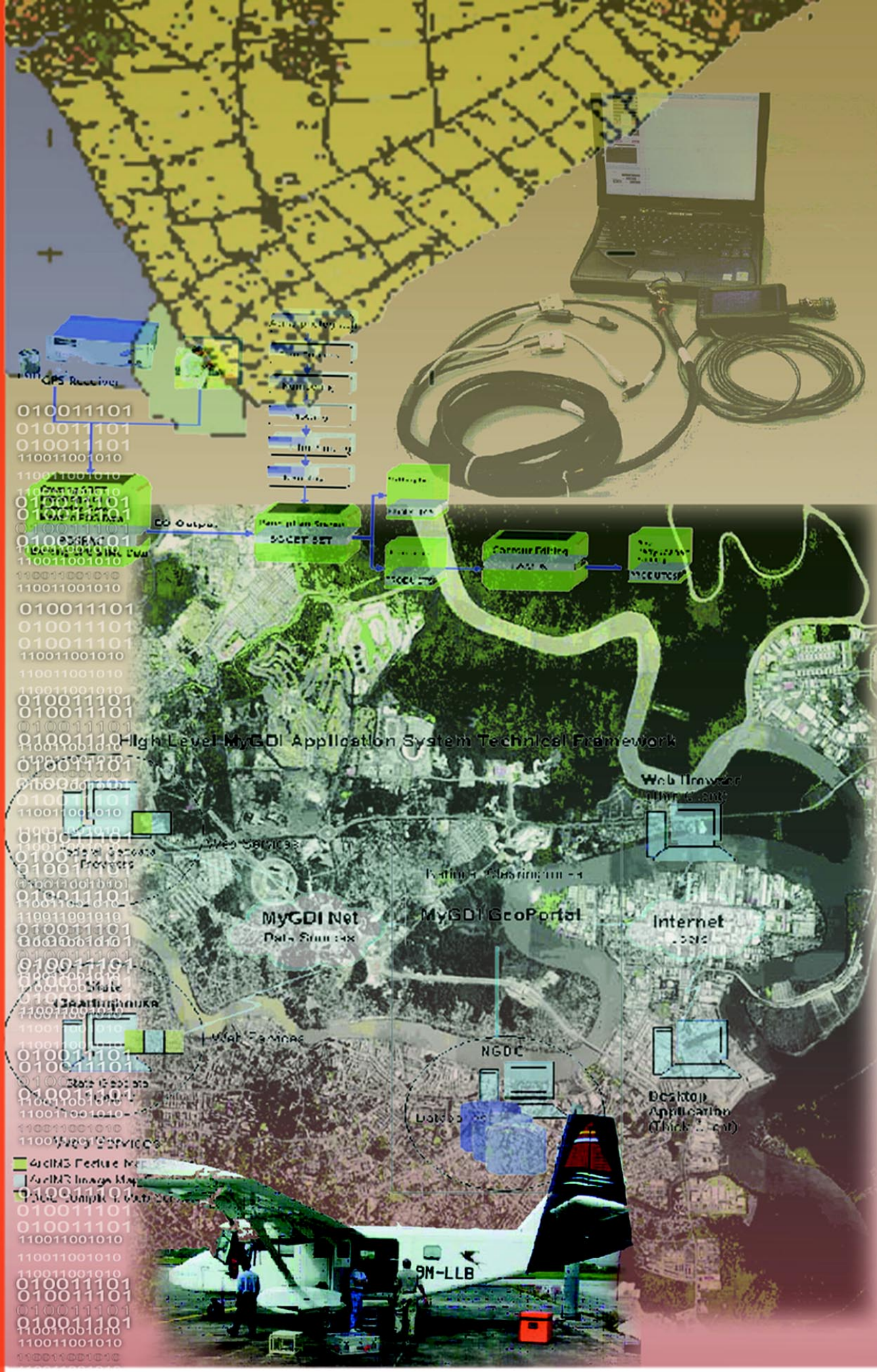
Buletin GIS



JAWATAN KUASA PEMETAAN DAN DATA SPECIAL NEGARA

BIL. 2 **2004** **ISSN 1394 _ 5505**

PENDAHULUAN

Jemaah Menteri berasaskan Kertas Kabinet No.243/385/65 bertajuk *National Mapping Malaysia* telah meluluskan jawatan dan terma-terma rujukan *"Surveyor-General Malaya and Singapore"* sebagai Pengarah Pemetaan Negara Malaysia dan mengesahkan keanggotaan serta terma-terma rujukan Jawatankuasa Pemetaan Negara pada 31 Mac 1965.

Cabutan para-para 2(b), 2(c) dan 2(d) daripada kertas kabinet tersebut mengenai keanggotaan dan terma-terma rujukannya adalah seperti berikut:

"2(b) National Mapping Committee

That a National Mapping Committee be appointed to comprise the following:

i. Director of National Mapping
ii. Director of Lands & Surveys, Sabah;
iii. Director of Lands & Surveys Sarawak;
iv. Representative of the Ministry of Defence;
v. Representative of the Ministry of Rural Development (now substituted by the Ministry of Natural Resources and Environment);
vi. Assistant Director of Survey, FARELF

2(c) The terms of reference of the National Mapping Committee to be as follows:

i. to advise the Director of National Mapping on matters relating to mapping policy;
ii. to advise the Director of National Mapping on mapping priorities.

2(d) That the Committee be empowered to appoint a Secretary and to co-opt persons who would be required to assist the Committee,"

Seterusnya pada 22 Januari 1997, Jemaah Menteri telah meluluskan pindaan terhadap nama, keanggotaan dan bidang-bidang rujukan Jawatankuasa Pemetaan Negara kepada Jawatankuasa Pemetaan dan Data Spatial Negara (JPDSN), bagi mencerminkan peranannya yang diperluaskan ke bidang data pemetaan berdigit. Keanggotaan JPDSN pada masa kini adalah terdiri daripada agensi-agensi seperti berikut:

1 . Jabatan Ukur dan Pemetaan Malaysia
2 . Jabatan Tanah dan Ukur Sabah
3 . Jabatan Tanah dan Survei Sarawak
4 . Wakil Kementerian Pertahanan
5 . Jabatan Mineral dan Geosains Malaysia
6 . Jabatan Perhutanan Semenanjung Malaysia
7 . Jabatan Pertanian Semenanjung Malaysia
8 . Jabatan Perhutanan Sabah
9 . Pusat Infrastruktur Data Geospatial Negara(MaCGDI) *(co-opted)*
10. Jabatan Pertanian Sabah
11. Jabatan Pertanian Sarawak
12. Pusat Remote Sensing Negara (MACRES)
13. Universiti Teknologi Malaysia
14. Universiti Teknologi MARA *(co-opted)*
15. Universiti Sains Malaysia *(co-opted)*
16. Jabatan Laut Sarawak *(co-opted)*
17. Jabatan Perhutanan Sarawak
18. Jabatan Perancangan Bandar dan Desa Semenanjung Malaysia *(co-opted)*

Buletin GIS ini yang diterbitkan dua kali setahun adalah merupakan salah satu aktiviti oleh Jawatankuasa Pemetaan dan Data Spatial Negara, sebagai salah satu media pendidikan dan penyebaran maklumat dalam mendidik masyarakat memanfaatkan maklumat spatial dalam pembangunan negara.

Kandungan

MESSAGE FROM THE CHIEF EDITOR

Has it not for the misfortune, our joy would have been greater in this season of Christmas and New Year celebrations. Our spirit has been deeply saddened at the great lost of lives in this region due to the Tsunami killer wave that struck on the fateful 26 December 2004. The death toll has reached a staggering 200,000 with thousands still unaccounted for. Once again we are being reminded of the frailty of the human race and the creation. There is nothing to be proud of even if we have stepped on the moon, climbed the highest mountain and reached the deepest ocean. We must be humble.

Perhaps one most pertinent question in our mind would be whether a full-fledge GIS be of any help in minimising the impact of such a disaster? Although there are various other factors that need to be considered, I personally believe that GIS can play an essential role in the prediction, monitoring, forewarning, as well as the timely dissemination of critical information on such natural disasters. Integrating with other systems, GIS can be a vital tool in almost every field that is related to such event even to the stage of planning rescue and relieve operations.

Malaysia is truly fortunate in that it was sheltered from the full force of the Tsunami by the Indonesian island of Sumatra itself, which is the origin of the earthquake. Although the northern states of Kedah, Penang and Perak were hit, the impact was minimal compare to that of Sri Lanka, India or even Thailand. Technically however, the movement of the tectonic plates that resulted in the earthquake which caused the Tsunami has dislocated all the permanent GPS tracking stations (MASS) and the RTK (Real Time Kinematic) network stations in Peninsular Malaysia as well as Sabah and Sarawak. This in turn has shaken up the GPS control points around the country and interrupted the planned implementation of the Coordinated Cadastre System (CCS). The Geocentric Datum of Malaysia (GDM2000), which was adopted by the department in 2003, will have to be redefined. As the crustal movement is yet to settle, all re-observations will have to wait until the plates are stabilised, which will normally take about 6 months.

At the regional level, the Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP), which was established under the auspices of the United Nations Regional Cartographic Conference for Asia and the Pacific (UNRCC-AP), has an augmented role to play in light of the disaster. Governments of countries that have been affected by the Tsunami wave should now seriously consider playing an active role in the activities of PCGIAP. The Committee itself should expedite the setting up of the Regional Spatial Data Infrastructure (RSDI), which will form an integral part of the early Tsunami warning system for the region.

Last but not least, I would like to wish all our readers a happy New Year. To our Muslim friends and colleagues “Selamat Hari Raya Aidiladha” and our Chinese associates “Gong Xi Fa Chai”.

Thank you.

APLIKASI GIS UNTUK PENENTUAN KESESUAIAN LOKASI TEBUS GUNA LAUT DI SEPANJANG PINGGIR PANTAI NEGERI PERLIS

Oleh
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Universiti Teknologi MARA (UiTM)

ABSTRAK

Teknologi Penderiaan Jauh dan Sistem Maklumat Geografi (GIS) kebelakangan ini digunakan dengan meluas oleh pelbagai lapisan pengguna. Penderiaan jauh dan sistem maklumat geografi telah digunakan dalam pelbagai bidang untuk pelbagai tujuan terutamanya dalam kajian alam sekitar, analisa dan sebagainya. Walaupun teknologi ini belum digunakan secara meluas di Malaysia, namun ia telah mula mendapat tempat di beberapa institusi pengajian tinggi dan badan-badan lain memandangkan kelebihan yang ada pada teknologi ini. Penyelidikan ini menerangkan tentang kajian yang dijalankan menggunakan data satelit, data jalan dan lain-lain bagi mengkaji kes tebus guna tanah di Negeri Perlis di samping menekankan penggunaan beberapa perisian untuk tujuan interpretasi imej seperti perisian ERDAS Imagine. Terdapat juga perisian lain yang digunakan seperti ArcView bagi membantu penyelidikan ini. Hasil daripada penyelidikan ini, penentuan lokasi yang sesuai untuk kerja-kerja penambakan dapat dijalankan di samping dapat menganggarkan jumlah tanah yang diperlukan untuk kerja-kerja penambakan.

PENGENALAN

Negeri Perlis merupakan salah satu negeri yang kini pesat membangun selaras dengan pembangunan dengan negeri-negeri lain. Dari aspek sejarah, Negeri Perlis ini dahulunya ditadbir oleh Negeri Kedah. Negeri Perlis kini pesat membangun dari pelbagai aspek merangkumi aspek perindustrian, penempatan kediaman, pertanian, ekonomi dan sebagainya. Dari aspek perindustrian kebanyakan tertumpu di kawasan Kuala Perlis dan Chuping kerana masing-masing terlibat di dalam bidang pengeluaran. Pembangunan infrastruktur juga memainkan peranan penting di dalam perancangan yang telah dirancang. Di Negeri Perlis, pembangunan infrastruktur kini tertumpu kepada pelbagai projek lebuh raya yang menghubungkan Negeri Perlis dengan Lebuh Raya Utara Selatan, lapangan terbang di Kepala Batas dan Thailand, pelabuhan yang terletak di Kuala Perlis menghubungkan pelabuhan yang terletak di negara Thailand dan bekalan elektrik dan air yang bina untuk disalurkan ke sektor perindustrian. Masalah penambakan tanah merupakan isu yang hangat diperkatakan beberapa bulan lalu. Kebanyakan negeri yang mempunyai keluasan yang kecil memerlukan kerja-kerja penambakan untuk memastikan kerja-kerja pembangunan dapat dijalankan. Tujuan penambakan ini adalah untuk pembangunan infrastruktur contohnya kompleks membeli-belah, bank dan sebagainya. Pembangunan ini penting memandangkan Perlis semakin berkembang maju dan memerlukan kawasan-kawasan baru yang bersesuaian untuk memenuhi tuntutan pembangunan di negeri ini. Penambakan tanah ini memerlukan perancangan yang teliti terutama untuk memilih lokasi yang sesuai untuk kerja-kerja penambakan kerana proses penambakan ini memerlukan kos yang tinggi.

OBJEKTIF

Tujuan penyelidikan ini dijalankan bertujuan untuk:-

- Menentukan kawasan yang berpotensi untuk penambakan kriteria-kriteria yang dipilih.
- Menganggarkan garisan pantai yang baru selepas kerja-kerja penambakan.
- Meramalkan isipadu tanah untuk kerja-kerja penambakan.
- Menentukan lokasi yang sesuai untuk kerja-kerja pengambilan pasir untuk kerja-kerja penambakan.

SKOP PENYELIDIKAN

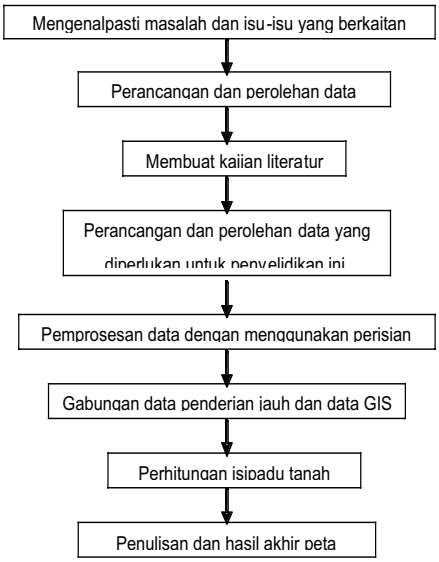
Skop penyelidikan dijalankan di kawasan kajian untuk mencapai tujuan dan objektif yang telah ditentukan seperti di atas. Skop kawasan kajian adalah sepanjang pinggir laut negeri Perlis Indera Kayangan dengan kriteria-kriteria iaitu : -

- ⊙ Jenis Guna Tanah
- ⊙ Akses Rangkaian Jalanraya
- ⊙ Kedalaman Laut
- ⊙ Sumber Pasir

METODOLOGI

Metodologi penyelidikan berdasarkan carta alir dalam Rajah 1. Bahan keperluan penyelidikan adalah seperti senarai di bawah:-

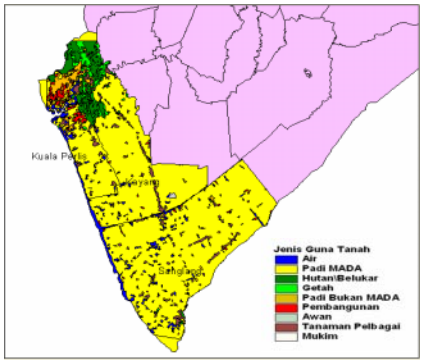
- **Data Satelit -** Data satelit SPOT XS tahun 1999
- **Peta Topografi -** Peta topografi bagi Negeri Perlis
- **Carta Batimetri -** Carta batimetri bagi kawasan pantai Negeri Perlis daripada Sanglang sehingga Kuala Perlis
- **Jadual Pasang Surut -** Jadual pasang surut Negeri Perlis
- **Peta Jalan -** Peta jalan



Rajah 1 : Carta Alir Umum Metodologi Projek

ANALISIS DAPATAN

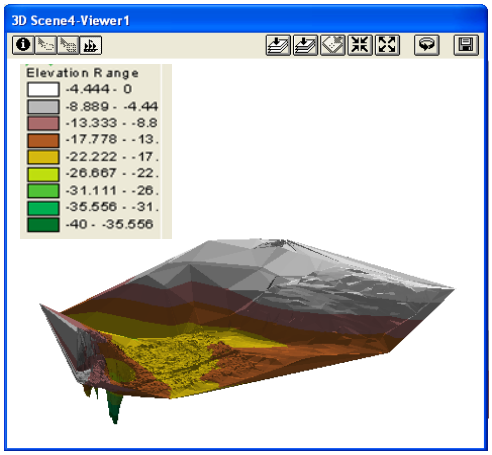
- Guna Tanah
  Jenis guna tanah di Mukim Sanglang secara majoriti adalah kawasan padi MADA. Jenis guna tanah di kawasan kajian ini sangat sesuai dimajukan kerana ia tidak dipengaruhi oleh aktiviti-aktiviti perlombongan seperti kauri. Oleh itu, pembangunan perlu dijalankan dengan teliti untuk mengelakkan masalah yang timbul seperti pencemaran dan sebagainya.



Rajah 2. : Jenis Guna Tanah

■ Kedalaman Laut

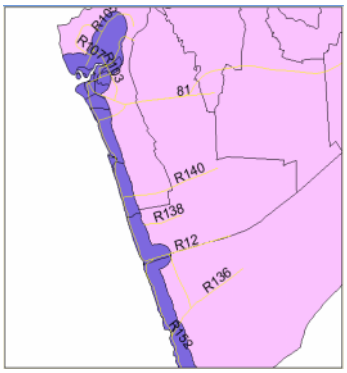
Kedalaman laut juga memainkan peranan penting di dalam menjalankan kerja-kerja penambakan. Oleh itu, analisa telah dijalankan untuk mengenalpasti lokasi yang tercetek agar kos penambakan tidak begitu tinggi. Mukim Sanglang telah dipilih kerana mempunyai paras kedalaman yang cetek iaitu kurang 1.5m.



Rajah 3. : Model 3D Kedalaman Laut

■ Akses Rangkaian Jalanraya

Jalanraya merupakan salah satu perkara penting bagi sesuatu kawasan pembangunan. Ini kerana jalanraya memainkan peranan penting untuk menghubungkan manusia dengan manusia. Di dalam penyelidikan ini, penekanan yang telah diberikan ialah dari aspek jalanraya yang sedia ada. Keutamaan diberikan kepada jalanraya tersebut kerana ia tidak memerlukan kos untuk pembinaan semula berbanding cadangan pembinaan jalan baru sebagai akses ke kawasan pembangunan baru tersebut. Di Sanglang, jalanraya yang sedia ada juga diperlukan untuk kerja-kerja penambakan dan pembinaan. Menurut rancangan struktur yang telah dicadangkan oleh Majlis Perbandaran Kangar, jalanraya yang sedia ada ini akan dinaikkan taraf sebagai lebuhraya bagi menyokong pembangunan koridor baru nanti.



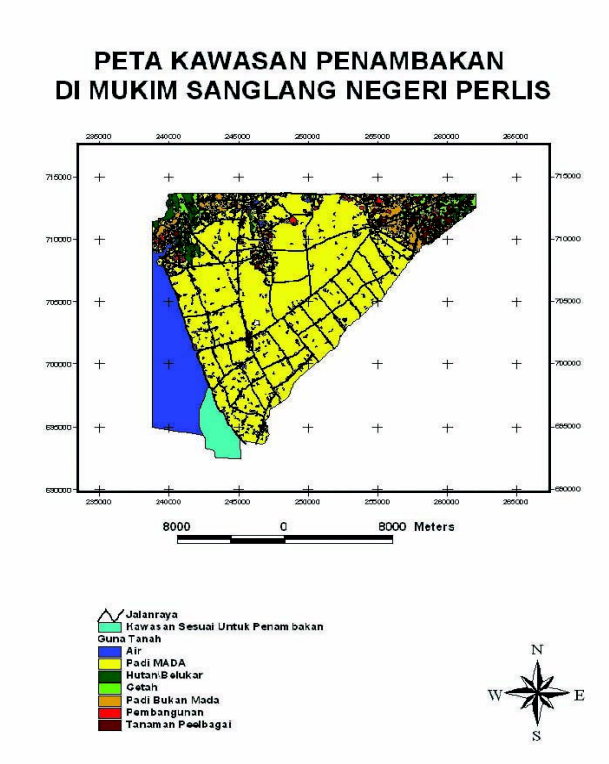
Rajah 4. : Jalan Raya Dalam Lingkungan 500m Dari Garisan Pantai

■ Sumber Pasir

Sumber pasir ini penting untuk kerja-kerja penambakan. Oleh itu perancangan yang teliti perlu dijalankan agar sumber pasir dapat digunakan secara minima. Selain itu juga sumber pasir ini mestilah mudah diperolehi dan berhampiran dengan kawasan. Daripada analisa yang dijalankan, Mukim Sanglang merupakan kawasan yang terdekat dengan sumber pasir.

Rajah 5. : Peta Lokasi Yang Sesuai Untuk Kerja-Kerja Pengorekan

Setelah pemilihan Mukim Sanglang sebagai lokasi yang berpotensi, kerja –kerja meramalkan isipadu tanah boleh dilakukan. Kerja-kerja penambakan ini dilakukan kira-kira 3.2 km daripada garis pantai kerana jarak ini merupakan jarak dalam lingkungan polisi kerajaan untuk pembangunan pada masa akan datang. Garis pantai baru dapat ditentukan dengan penambakan ini. Isipadu tanah yang perlu ditambak mestilah melebihi air pasang surut yang maksima. Oleh itu di dalam penyelidikan ini, pasang surut yang maksima bagi tahun 2001 ialah 4.01 m. Kerja-kerja penambakan akan dijalankan melebihi 2.0 m daripada paras maksima dan ketinggian kawasan yang ditambak itu ialah 6.01 m. Untuk nilai tambakan 6.0 m ia memerlukan 692.7801 hektar tanah untuk kerja-kerja penambakan. Ramalan isipadu tanah telah dilakukan secara kasar. Selain itu juga lokasi yang sesuai untuk pengambilan pasir juga dikenalpasti untuk kerja-kerja penambakan.



Rajah 6. : Peta Kawasan Penambakan Di Mukim Sanglang

KESIMPULAN

Secara keseluruhannya pemprosesan dengan menggunakan Sistem Maklumat Geografi (GIS) bagi penentuan kawasan yang berpotensi untuk kerja-kerja penambakan atau tebus guna laut adalah di kawasan Mukim Sanglang. Ini kerana kawasan ini menepati kriteria-kriteria yang telah ditetapkan.

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CREATING THE GIS DATABASE FOR 3D CITY MODELS

By

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ABSTRACT

The application of Virtual Reality (VR) and Geographical Information System (GIS) for landscape visualization and city models are getting popular due to its powerful analytical techniques. Once the initial data sets which include Digital Elevation Model (DEM) are input into the database, the GIS allows rapid experimentation with the visual environment under a variety of scenarios. Viewscape may be developed for different perspective viewing angles which could prove useful in several planning and decision making contexts particularly for the assessment of the proposed development projects.

This paper focuses the important stage of implementing VRGIS to re-construct buildings, landscape and urban settings which is applicable in urban and environmental planning. This investigation is significant in assessing the visual aspect of planned buildings and other construction projects such as roads, dams and bridges. The emphasis is placed on the use of digital photogrammetric techniques and the existing topographical map data.

Keywords: *Virtual Reality, Geographical Information System, Photogrammetry, Digital Elevation Model.*

INTRODUCTION

The applications of physical surface representation arise in the use of DEM for landscape visualisation, hydrological analyses, soil studies, civil engineering and telecommunications (see for example, Howes and Gatrell, 1993; and Floriani and Magillo, 1994). Fisher (1993) used DEM to detect the horizontal location at which the line of sight intersects the grid of the DEM. If the DEM is higher than the line of sight the target is obscured from the viewpoint. This approach also makes use of a DEM to represent final product in 3D image. In this case, GIS tools are able to provide a general impression of landscape sensitivity to development and the acceptability of alternative development layouts.

At present, there are a number of representation techniques which can be used in spatial planning. The basic elements of the landscape which need to be represented for planning purposes are terrain, buildings and major landuse information. With a properly structured database, the GIS is able to manage, analyze, and display large multidisciplinary data sets for various applications.

The efficient generation of the three-dimensional (3D) city models in GIS are improving the practice of urban environmental planning and design. Planning authorities will be able to illustrate explicit photo-textured information of what the city environment will look like after a proposed change. Photo-textured and three-dimensional models enable easy understanding. It is relatively easy to layer abstract phenomena over a detailed model. User would be able to recognize specific elements, spatial position, scale, and to relate plan details and other information within the area under investigation. The computational power of this technology to transform and instantly compare alternative representations provides decision-makers with unprecedented flexibility. When and if visualization tools and good data are widely available, one will be able to propose changes to a city without a dialogue that includes a systematic investigation of the visual implications of a design.

On the other hand, the rendering capability on personal computers is also a breakthrough. The ability to attach digital images to the polygon surfaces of real-time models has a profound improvement in the quality of visualizations. It has now becomes necessary to gather explicit textures of building facades, vegetation and other elements of the urban landscape. However, the ability to see some trends in urban land-use depends on a the availability of good quality database. This is something that digital photogrammetric techniques can contribute in order to provide required information.

3D Visualization

Three-dimensional visualization of landscape features may be achieved in GIS by superimposing, or draping, a two dimensional representation of topographic features, such as roads, rivers and land-use information onto a digital elevation model. The land-use information can be represented through remotely sensed imagery. Because of the low resolution in commercial remote sensing system, colour aerial photographic imagery is mostly preferable.

Most GIS packages are able to overlay map coverage to analyze corresponding patterns, or to operate on digital data obtained through remote sensing systems and digital map data from existing sources. There is however, a major need to be able to interpret satisfactorily the output of GIS on behalf of other people, especially decision-makers and planners. The basic information required for development planning and environmental application includes administrative boundaries, transportation networks, elevation, hydrology and land use. These data can each be included in a GIS database and thereby facilitate spatial and temporal analysis of the site variables.

With the availability of sufficient amount of data on elevation and other landscape features such as buildings or trees, a GIS can be used to calculate lines of sight and determine the viewshed of a point (i.e. what can be seen from there). This type of analysis has proved useful in several planning contexts, particularly in the mobile telecommunication industries. Further, with the complete facilities of handling and managing large quantities of spatially referenced data, a GIS is capable of accurately portraying and assessing the spatial dispersion of effects and, within scenario analysis, can be used as a basis for representing the spatial distribution of anticipated changes. In order to produce good quality and readable output, proper hardware and design criteria are needed.

3D BUILDING RECONSTRUCTION

Data Sources

Data suitable for building reconstruction may come from several sources such as, satellite images, aerial photographs and photogrammetric products such as topographical maps and orthophoto images. Satellite images are not yet useful for building reconstruction because of its low spatial resolution. Large-scale aerial photographic images have been the main data source for building reconstruction because of the high spatial resolution which enable us to discriminate important objects.

Photo-textured Database Creation

Building databases for experimentation in real-world planning and design applications need to be carried out. The creation of a good quality and flexible database for visualization is the most expensive part. This is the greatest remaining technical obstacle to overcome in the advancement of three dimensional visualization techniques in planning.

The models of the study area we were working with were composed of distinct polygonal surface areas for roads, sidewalks, parking, vegetated areas and slopes. Buildings and rooftops had been mapped using aerial photos. If explicit elevations for rooftops were not available, we assigned attributes for the number of floors in buildings and extruded these structures by an average floor-to-floor height. This system was far ahead of its time as a precedent for planning practice because it will take considerable time before the GIS systems of cities capture enough data to be useful. This study also supports the idea that photogrammetric methods gain greater exclusive value, as greater explicit detail is required.

Database Abstraction Requirements

The first requirement of a database is to include the three primary types of urban landscape (terrain, vegetation, and built form). The challenge is to make the visualization techniques effective and efficient. Three-dimensional visualization requires that each element have a geometric depiction. The second important property is the association of textual properties on the geometric surface. While, photogrammetric techniques may be used to derive the geometric descriptions, the original image data can be textured onto the surfaces or data points (in case of meshed terrain data).

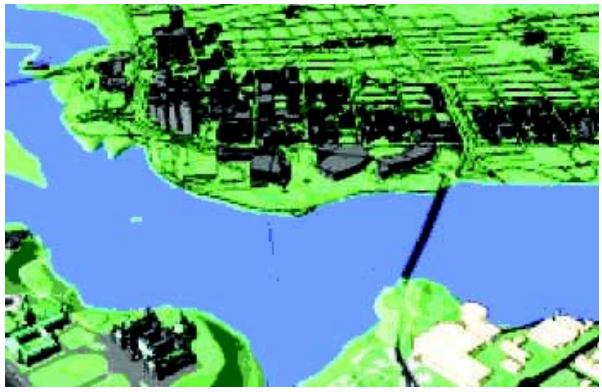

Figure 1: 3-D Model created from the existing topographic map.

Digital Elevation Model (DEM)

The generation of virtual landscapes is one main product of photogrammetry. It is derived by the overlay of a digital elevation model (DEM) and the texture of an orthophoto image. A DEM is a file of rows (x) and columns (y) corresponding to pixel locations. The value assigned to each pixel is the z value, or elevation. However, an ASCII file of z values is virtually meaningless without the ability to "visualize" the landscape. Digital image processing software makes it possible to "view" the "virtual" landscape in a variety of ways. To use DEMs in graphical 3-D programs, it is usually necessary to convert DEMs to grey scale raster images which is then corresponds to a sampled elevation point with brighter pixels representing high elevation and darker pixels portraying low elevation. DEM could also be transformed into VRML presentation format, which can then be overlayed with texture information. 3D landscapes appear more realistic and informative when aerial photographs are draped on DEM provided the image is precisely registered in GIS operations.

Digital Orthophotos

A digital orthophoto is a product which has the pictorial qualities of a photograph and the planimetric correctness of a map. It consists of picture elements which is attached a grey value to every pixel. To generate the digital orthophotos, we need to carry out digital rectification to a given raw digital image of aerial photos by transferring every single picture element from its actual position to the corrected location. The essential inputs for the process of producing orthophotos are a raw digital aerial photos, DEM and control points and exterior orientation elements. DEM may be incorporated into the rectification process in order to correct for positional distortion due to topographic relief.

3D Visualization

In order to produce realistic and informative information, digital imagery must be precisely draped over the terrain. The aerial photographs were scanned at 25 μm resolution in order to produce orthophoto with 0.125 m resolution. Although the available images are of higher resolution, for practical reasons the lower resolution of 0.5 m is used.

Draping involves finding an elevation (z) value for each x, y co-ordinate in the two dimensional representation. Values can be obtained fairly easily by extracting directly, or interpolating, the z-values from the corresponding x, y locations in the digital elevation model. The same approach can be used to attach z values to the pixels in remotely sensed imagery prior to creating a three dimensional view. Height information on shaded and draped surfaces can be enhanced sometimes by plotting annotated contour lines on the shaded surface, enabling the viewer to keep track of absolute heights.

RESULTS

The results obtained through photogrammetric techniques and related GIS operations and processes are illustrated below.

Figure 2: Building footprints and street network derived from orthophotos.

A digital photogrammetric system is used to process the aerial photographs and produce building footprints, street network and other relevant objects of the study area (see Figure 2). An orthophotograph according to Figure 3 displays the study area located within the Shah Alam city center. The shaded relief technique is used to represent the DEM of the area in Figure 4. The map classifies the height categories using colour of different tones. Figure 5 shows an isometric view of the orthophoto image draped on DEM. The difference is that this map shows the area concerned in three-dimensional view.

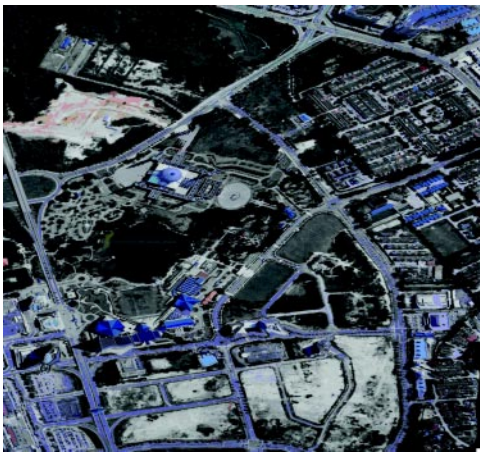

Figure 3: Orthophoto mosaic

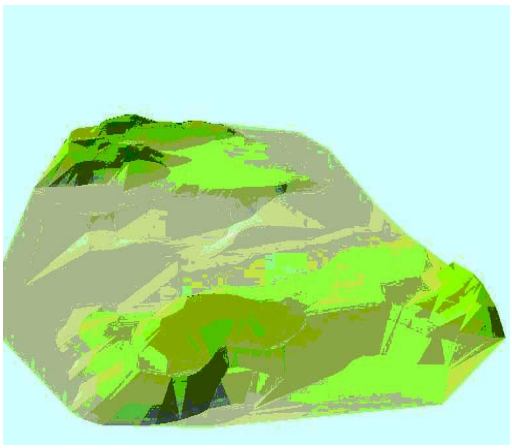

Figure 4: DEM/DTM of the study area

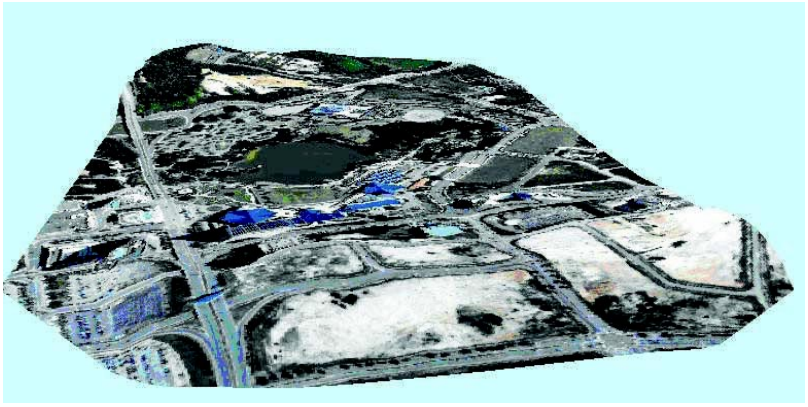

Figure 5: Orthophoto draped on DEM

3D Visualization

Visual analysis is an important component of landscape planning and its part of process which would identify the most suitable site for a development project (IEATLI, 1995). DEM, topographic, and orthophoto images were overlaid in GIS to interpret the aesthetic aspect of the study area. A general impression of landscape sensitivity to development and acceptability of alternative development layout can be seen.

Projective map provided in Figure 6 reveals the extent of visibility of the development to its surroundings, and to what extent the development is visible from its surroundings. DEM, topographic layers, and orthophoto image were overlaid in GIS which enable the interpretation of aesthetic impact.

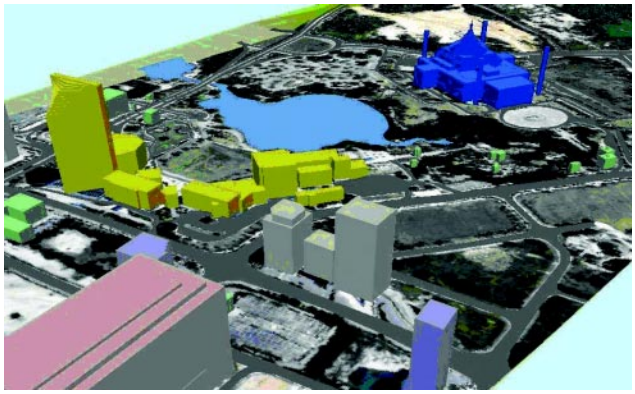

Figure 6: 3-D view of the study area

This product allows users to interpret the land-base features for themselves. The clarity and detail visible on the map depends upon the scale of the map and the resolution of an image used as backdrop. High-resolution images provide more complete, accurate, and comprehensive information than traditional vector based maps. Further analyses on visual aspects are restricted by the GIS system's capability available for this study, for example, to generate photo-textured 3-D models.

A general impression of landscape sensitivity to building construction and acceptability of alternative development layout can be seen in Figures 7 and 8. Projects, for which locations are not yet finalised, may have results analysed to select the most suitable site, since the GIS can portray the magnitude of impacts in order to ascertain the public perception.

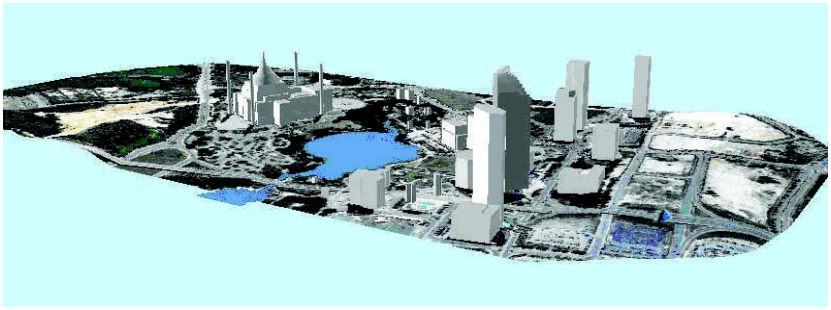

Figure 7: Perspective view without new project

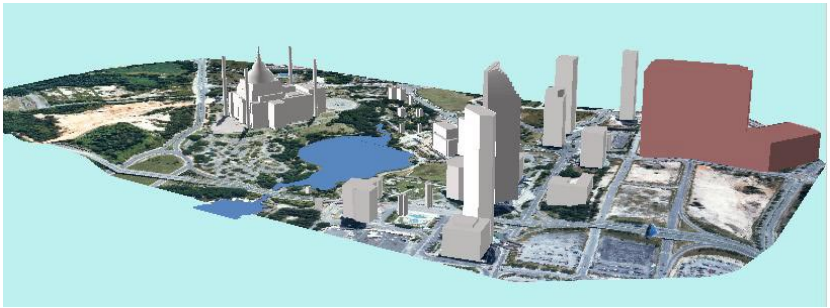

Figure 8: Proposed building (Top Right Corner)

CONCLUDING REMARKS

The visual display capability enables the explanation of the development plans or alternatives to the public. Public interest and understanding can be raised by using both graphic and image files that show the relationship between the proposed project and individual properties, neighbourhoods, local landmarks, community services, and other features.

Further analyses on visual aspects are restricted by the GIS system's capability available for this study, for example, to manage large 3D urban databases as well as the automatic database generation. In order to produce good quality and readable output, proper hardware, software and design criteria are required.

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NATIONAL GEOSPATIAL DATA CENTER (NGDC)

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INTRODUCTION

Malaysian Geospatial Data Infrastructure (MyGDI) is an initiative embarked by the government to develop a Geospatial Data Infrastructure to enhance the awareness about data availability and improve access to geospatial information by facilitating data sharing among participating agencies. It has emerge as an important single data access to geospatial information in catering the economic growth, environmental quality and stability as well as social development. MyGDI, as the National Spatial Data Infrastructure (NSDI) for Malaysia has become an important bridge among data providers and users to enable data sharing and exchange using latest on-line information technology, which facilitate the transit of spatial information from data providers to various group of users via a smart access to geospatial information.

Further to entertain the future needs for more efficient and faster data accessing, National Geospatial Data Center (NGDC) has been developed with an objective to centralize database as well as to minimize administrative management requirements which will expedite the data publishing and allow data to be accessed more efficient and faster. Hence it will shorten the data accessing wait state.

MaCGDI AS A CENTER OF EXCELLENCE

The increasing use of new technologies and the separation of regulatory functions from operational services required advance level policy, regulatory, managerial and technological expertise. Thus, MaCGDI as a center of excellent in facilitating, coordinating and managing ultimate geospatial information always initiate a move towards developing and strengthening the capability to generate the expertise among government agencies. As such, this will be carried out concurrently with the vision of the MaCGDI and inline with it role as an advisor to the Government of Malaysia in the formulation and implementation of policies regarding geospatial data as well as to act as the national centre for dissemination of geospatial data.

Responding to national and regional needs, MaCGDI has created appropriate programme in order to attain the aimed objective. The programmes are including becoming a Referral Center for agencies related to geospatial data infrastructure and become Notable Center of R&D, application and commercialization of research findings as well as to develop local expertise and researches.

NATIONAL GEOSPATIAL DATA CENTER (NGDC)

Malaysian has witnessing major reforms in the GIS industry. The pace of change and dynamics of data sharing need creates exciting challenges for MaCGDI to push the boundaries of tradition point solutions to new dimensions. Technological enablement is now delivered by massive scalability, real-time spatial querying, enhanced methods for metadata management and extensibility of integrity controls coupled with direct data accessibility to all stakeholders using a multitude of thin devices

To enhance the facilities of the existing MyGDI, NGDC was further builds to ensure geospatial data sharing activities is more efficient, multi-purpose Geodatabase and content standards to support the business of the government that requires geographic components and tools to handle and manage the geospatial data and facilitates cross-agency decision-making that involves geospatial information.

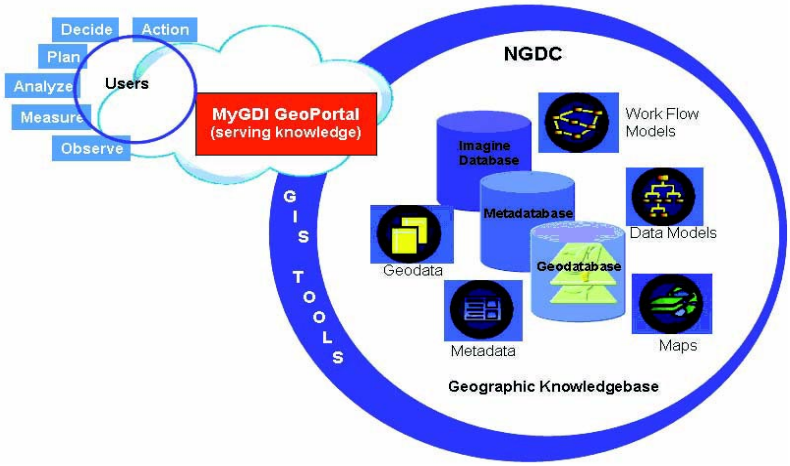

Figure 1: NGDC - Managing Geographic Knowledgebase

The establishment of NGDC will encourage greater collaboration and coordination in the use of geospatial data across all levels of users which provide a data explorer to geospatial information to be used within government, commercial and non-profit, along with the academia and the public.

NGDC will represent as a National Geographic Knowledgebase which was recommended by MAMPU based on their research on "*Senarai Perakuan Kajian Pentadbiran Daerah dan Tanah Dengan Tumpuan Kepada Urusan Tanah*". It will consist of database centralized at MaCGDI and linked to virtual database outside MaCGDI comprising the *Sistem Pusat Pengumpulan Maklumat Geospatial* (SPPMG) and *Sistem Pengurusan Tanah Berkomputer* (SPTB) databases.

NGDC will also serve as one of the Asia Pacific Clearinghouse nodes and Global Spatial Data Infrastructure (GSDI). The scope has been prepared base to the required map scale of 1:250,000 for Asia Pacific Clearinghouse and 1:1,000,000 for GSDI.

3.1. Objective

The objective of establishing NGDC is to become a coordination center for data collection, management and as a centralized storage of geospatial data. In other word, the establishment of NGDC was aimed to centralize the geodatabase to improve the effectiveness of data administrative management as well as ensuring the data integrity. The system architecture will adhere to the concept that will provide a single window to all geospatial data located in central geodatabase using MyGDI Geoportal architecture to facilitate the exchange and sharing of information throughout organization. NGDC will make it easy to publish data and dramatically shorten the timeline from data collection to distribution. So that the data can be accessed faster, therefore can expedite user in research process or other relevant process pertaining to the data.

Scope of Work

Establishing the NGDC will involve various scopes of work to ensure the success of targeted goal implying the following actions:

- ß Requirements study
- ß Geodatabase, Metadatabase and Image Database designing
- ß Development of Database Management System; and
- ß Migrating an existing metadata and geospatial data to the proposed Metadatabase and Geodatabase.

The establishment of NGDC also requires a detail study which needed confirmation on diverse scopes comprising the following aspects:

- ß Reaffirm MyGDI desired future state, key rationale and assumptions based on the existing structure.
- ß Identify and understand issues and challenges faced during MyGDI pilot implementation based on the existing structure (lessons learned). A set of questionnaires is required for this study.
- ß Assess and define current state of key stakeholders: data users, data providers and Ministry of Natural Resources and Environment (NRE) itself.
- ß Define and articulate MyGDI's "target environment" for key stakeholders.
- ß Assess and identify key barriers and enabling factors to overcome the barriers and reach the future "target environment".
- ß Identify the change enablement strategies for the effective implementation of MyGDI.
- ß Develop the change enablement blueprint for the implementation of MyGDI towards the establishment of National Land Information Centre as quoted in *Perakuan 29 MAMPU* in "*Senarai Perakuan Kajian Pentadbiran Daerah dan Tanah Dengan Tumpuan Kepada Urusan Tanah*".

General Functional Requirements for NGDC

General requirements for NGDC shall include (but not limited to) the following:

- ß Database component under the NGDC will consist of database centralized at MaCGDI and linked to virtual database outside MaCGDI comprising SPPMG and SPTB databases.
- ß Data from state agencies e.g Local Authority and JPBD will be centralized at MaCGDI and replicate backup at the state clearinghouse or other places which is considered secure.
- ß NGDC will also serve as one of the Asia Pacific Clearinghouse nodes and Global Spatial Data Infrastructure (GSDI).
- ß Currently the search function in MyGDI are base to product list comprising 30 agencies, while the 6 other agencies are searched by cadastral key attributes. On the other hand, the search process in NGDC will be based to features element with reference to MS1759 Features and Attribute Codes. Hence the existing features code from 30 data suppliers need to be converted to MS1759. This is to assist MyGDI users in their GIS analysis activities.
- ß NGDC will refine an existing metadata to include more elements which conform to ISO 19115 Geographic Information/Geomatics – Metadata
- ß The Geographical Names Database Application will be included in NGDC with the first phase development base to 1:100,000 map by the end of 2005 and enhancement to 1:25,000 map on the second phase of implementation.
- ß NGDC will take into account the requirement of the next NRE's mega project, i.e. e-Tanah which is riding on the MyGDI e-Commerce and network.
- ß NGDC will centrally managed by reputable enterprise Spatial Database Engine and RDBMS software environment
- ß Accessible for authorized users
- ß Scalable database architecture to support growth of database.
- ß An Open GIS Consortium (OGC) compliance that GIS users can utilize the web services without any migration, reformatting or restructuring
- ß The proposed Spatial Database Engine and RDBMS shall be able to create both spatial indexing and textual indexing respectively to facilitate efficiency in data retrieval
- ß Ability to harvest data from distributed identified servers and web services
- ß Geo-indexing of image data (raster files) to optimize performance during retrieval and display

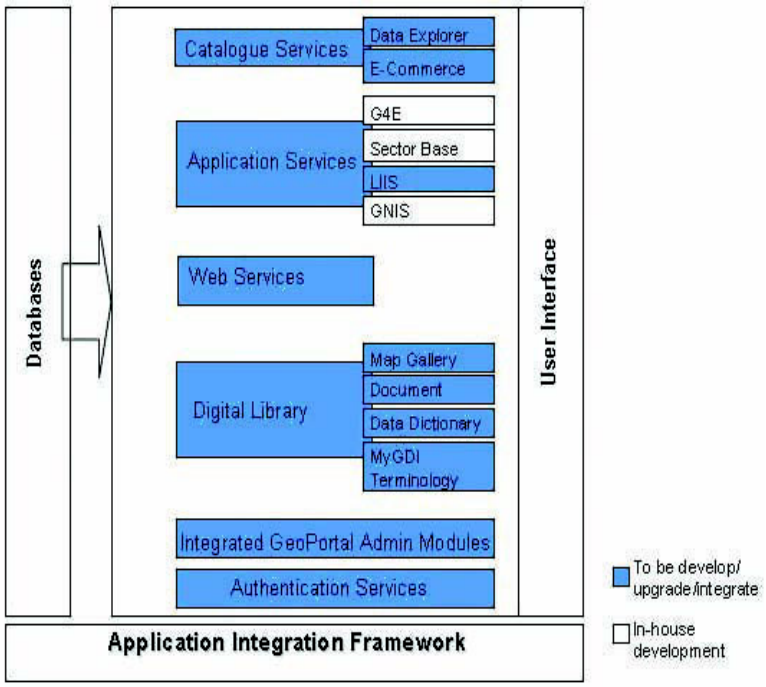

Figure 2: NGDC – High Level MyGDI GeoPortal Functional Framework Apllication Subsystem

- ß Provide tools that are capable of performing (but not limited to) the following:
  - (i) Data layer association – to tie metadata to data by allowing user to associate a record with the dataset it describes.
  - (ii) Data catalogue – bridges the gap between data and metadata to provide an unprecedented level of access, enabling a quick locate and preview of any dataset in the NGDC
  - (iii) Multi-user access – provide multi-user access to the database repository by creating user accounts with varying levels of access to data
  - (iv) Import – load any ISO-compliant metadata record in ASCII or XML format

Development of NGDC and MyGDI Geoportal

By establishing NGDC, the next central focus is the development of a Geoportal to support access to geospatial information by all levels of government and by the public in general. The *National Geospatial Portal (MyGDI GeoPortal)* will functioned as a logical extension to the MyGDI Clearinghouse Network as a geospatial data exploration, evaluation, and application within all levels of users and providers. The system is designated as a Geospatial One-Stop Portal (GOS) that provides geospatial web services to all level of users. MyGDI GeoPortal applies an open framework for geospatial data sharing. Functioning as the back bone for Malaysian NSDI, NGDC will provide access for e-commerce for all geospatial data on-line transactions which is the scope will consider the needs of e-Tanah, particularly in land transaction process

GeoPortal is a web sites that present GIS content as the primary focus in order to leverage a communities GIS investment and disseminates GIS capabilities and content to society. MyGDI Geoportal to be developed as a Functional Portal that provides spatial capabilities online and NSDI Portal as a discovery tool for spatial content.

Data Management

MaCGDI through Framework Technical Committee will identify and monitor the custodian and data provider for relevant theme to be published through NGDC. Digital geospatial data from related custodian will be channeled via on-line to the NGDC server. As a security measure, the database will be replicated and store as a backup.

Data Dissemination

Data from NGDC can be accessed on-line 24 hours per day and 7 days a week from any location. While data transaction can be done via MyGDI e-commerce.

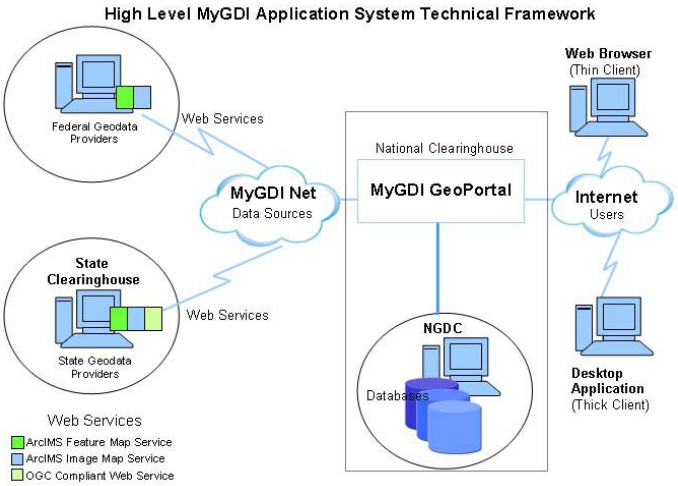

Figure 3: NGDC – High Level MyGDI Application System Technical Framework

Updating Data

The data published in NGDC will be updated by data provider to ensure the timeliness and consistency of the spatial information that are to be utilized in planning for development and management of land resources.

Implementation Strategy and RoadMap

- Immediate Planning 2004 including:
  - Carry out the survey to identify the agencies involved in data preparation
  - Study the readiness of the data at the relevant agencies
  - Forge a relationship with National Library, Research Institutes and Institution of Higher Learning

- Short Term Planning (End 2005) including:
  - Strengthen the Infrastructure and MyGDI Application
  - Training and Workshop pertaining to MyGDI Application, Metadata and database management
  - Short course on GIS to related agencies
  - Planning, identify and develop new dataset
  - Provide an analysis application base on sector

- Long Term Planning (9th Malaysian Plan) including:
  - Development of new dataset
  - Strengthen the Infrastructure
  - Develop the National GIS Portal
  - Strengthen the capacity building of data provider and user

CONCLUSION

MyGDI has established by manipulating the powerful of GIS technology to facilitate the dissemination of spatial information from data providers to various groups of user. Thus to cater the needs for more efficient and faster data access, NGDC will capitalizes on the development in geospatial information and internet technologies.

The ultimate aim of NGDC and MyGDI Geoportal development is to strengthen and upgrade the existing government agencies **delivery system** to the public. NGDC will additionally support the business of the government that requires geographic components and tools to handle and manage the geospatial data. Besides providing tools to support the common business need of the government, NGDC also facilitates a process of decision-making that involves geospatial information by providing the faster and more efficient access to the geospatial information as well as ensuring the accuracy, timeliness, correctness and consistency of the spatial information that are to be utilized in planning for development and management.

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PERLAKSANAAN PROJEK SISTEM GEORUJUKAN TERUS OLEH JUPEM

Oleh
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1. Pengenalan

Projek Sistem Georujukan Terus (Direct Georeferencing System – DGS) ini telah dilaksanakan di bawah Rancagan Malaysia Kelapan sebagai sebahagian daripada Projek Peningkatan Keupayaan Sistem CAMS yang telah dilaksanakan pada tahun 2003 dan 2004.

1.1 Objektif Projek

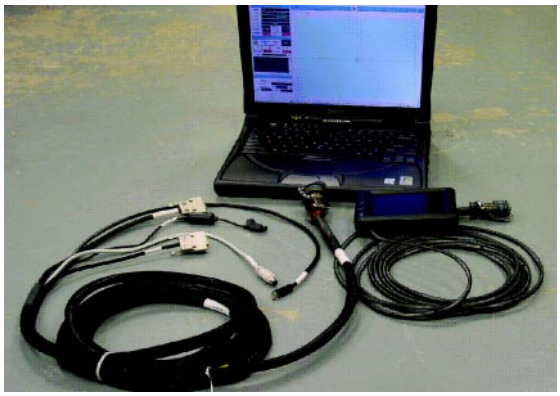
Objektif projek adalah seperti berikut:

a. Untuk mengurangkan keperluan bagi pengukuran titik kawal bumi dalam proses pemetaan;
b. Untuk membantu memudahkan proses penyegitigaan udara serta meningkatkan ketepatan peta yang dihasilkan secara fotogrametri; dan
c. Untuk mempercepatkan lagi proses pemetaan di samping menjimatkan kos keseluruhan.

1.2 Komponen Projek

Projek ini terdiri daripada 2 komponen utama seperti berikut:

a. Sistem Georujukan Terus *(Direct Georeferencing System - DGS)*; dan
b. Perisian dan perkakasan bantuan bagi pemprosesan data.



Rajah 1: Perkakasan dan perisan Sistem Pengurusan Penerbangan *(Flight Management System)*

2. Sistem Georujukan Terus

Dengan menggunakan kamera udara konvensional tanpa DGS, pengukuran titik kawal dan penyegitigaan udara perlu dilakukan bagi menghasilkan parameter orientasi luaran bagi setiap foto udara. Proses ini adalah sukar dan biasanya mengambil masa yang panjang memandangkan bilangan titik kawal yang diperlukan adalah banyak. Masalah ini akan menjadi lebih kritikal bagi kawasan yang sukar seperti kawasan pulau luar persisir pantai atau kawasan pedalaman Sabah dan Sarawak.

Masalah tersebut akan dapat diatasi melalui penggunaan teknologi DGS yang berupaya menghasilkan parameter orientasi luaran secara terus. Ia dapat dicapai dengan adanya peralatan GPS yang mengukur koordinat setiap titik dedahan di samping peralatan Unit Pengukuran Inertia *(Inertia Measurement Unit – IMU)* yang mengukur orientasi serta halaju platform kamera udara. Secara umumnya, bagi misi fotografi pada skala kecil dan sederhana, ia akan membolehkan paparan stereo dan proses orthorektifikasi dilakukan tanpa keperluan bagi proses penyegitigaan udara.

Keperluan *tie-point matching* dan penyegitigaan udara akan dapat dikurangkan di samping menjimatkan kos penawanan data serta masa pemprosesan. Secara optimumnya, hanya sebilangan kecil titik kawal diperlukan bagi tujuan semakan kualiti. Langkah ini akan mempercepatkan lagi proses pemetaan di samping menjimatkan kos.

3. Peralatan DGS

Sistem in terdiri dari IMU, alat penerima GPS, sistem komputer dan aplikasi perisian seperti di **Rajah 2**. IMU dipasangkan di casis kamera udara RC30 sedia ada manakala antena GPS pula dipasang di bahagian atas pesawat NOMAD.

Rajah 2: Peralatan Sistem DGS

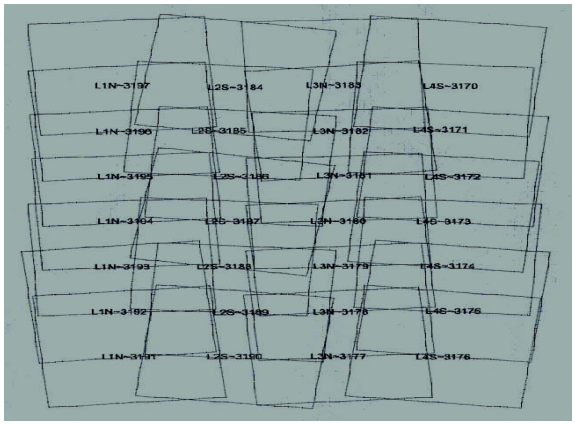
4. Pemasangan Peralatan DGS

Rajah 3: Pemasangan Sistem DGS pada pesawat NOMAD

Rajah 4: Mengukur jarak *Lever Arm* dengan menggunakan pita ukur

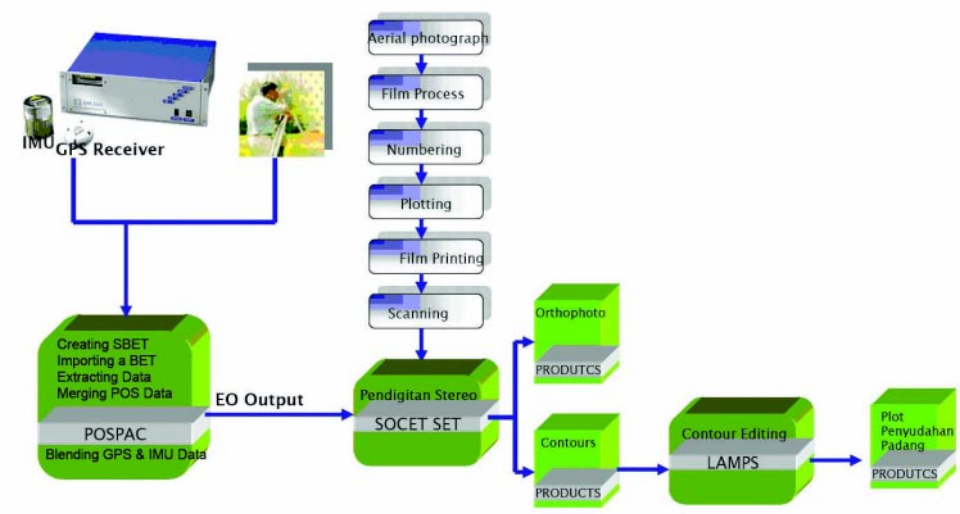
5. Kalibrasi Sistem DGS

Kawasan Kuala Lumpur telah digunakan untuk tujuan kalibrasi sistem yang melibatkan perolehan 40 titik kawal bumi.



Rajah 5: Hasil kalibrasi Sistem DGS

6. Pemprosesan Data



Rajah 6: Carta alir bagi pemprosesan data DGS

7. Analisis Statistik

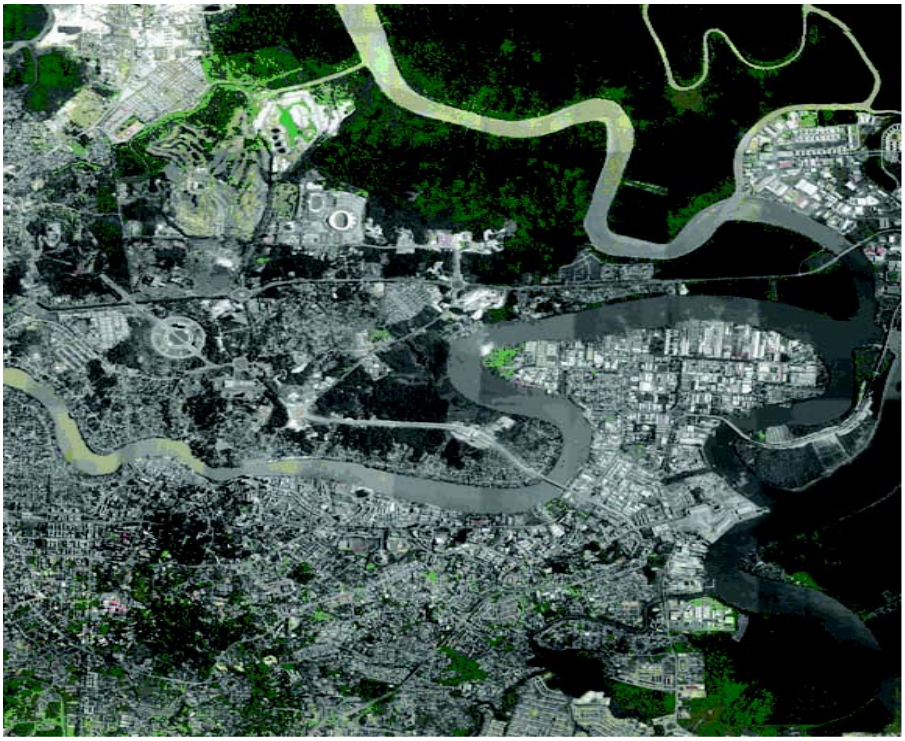
Analisis statistik yang membandingkan parameter orientasi luaran yang dihasilkan secara langsung oleh Sistem DGS dengan parameter yang dihasilkan menerusi penyegitigaan udara adalah seperti di **Jadual 1** dan **Jadual 2**. Secara keseluruhannya, perbezaan di antara hasil penyegitigaan udara dan DGS tidak begitu ketara dan boleh diterima. Namun begitu, adalah didapati hasil penyegitigaan udara adalah lebih baik memandangkan pelarasan koordinat dan agihan selisih telah dibuat. Ketepatan Sistem DGS bergantung sepenuhnya kepada ketepatan cerapan GPS ketika misi fotografi dan pelarasan kalibrasi yang telah dilakukan.

	Easting(m) (RX)	*Northing(m) (RY)*	*Height(m) (RZ)*	*Omega(deg.) (RW)*	*Phi(deg.) (RP)*	*Kappa(deg.) (RK)*
Purata blok	0.2235	-0.0054	0.0088	-0.0007	-0.0033	-0.0034
Std.dev. blok terlaras	1.3690	0.3479	0.9756	0.0488	0.0384	0.0304
RMS Titik Utama	0.4460	0.1148	0.3187	0.0152	0.0114	0.0098

Jadual 1: Ringkasan statistik perbandingan koordinat Titik Utama dan EO di antara penyegitigaan udara dan Sistem DGS

	Easting(m) (RX)	*Northing(m) (RY)*	*Height(m) (RZ)*
Purata	4.0903	2.6746	-1.1856
Std.dev. blok terlaras	2.9588	1.6006	2.9814
RMS 25 Titik cerapan	0.5917	0.3214	0.5962

Jadual 2: Ringkasan statistik perbandingan koordinat 25 Titik-Titik Jelas menggunakan penyegitigaan udara dan Sistem DGS



Rajah 7: Ortofoto Kuching dihasilkan menggunakan kamera udara RC30 sedia ada yang dilengkapi dengan Sistem Georujukan Terus (DGS)

8. Penutup

Melalui penggunaan Sistem Georujukan Terus (DGS) JUPEM kini berupaya untuk mengurangkan keperluan bagi pengukuran titik kawal bumi dan pada masa yang sama mempermudahkan proses penyegitigaan udara serta meningkatkan lagi ketepatan peta yang dihasilkan secara fotogrametri. Langkah ini secara lansung membantu untuk mempercepatkan lagi proses pemetaan di samping menjimatkan kos keseluruhan.

FOREST STRATIFICATION IN SABAH USING COMBINED REMOTE SENSING AND GIS TECHNIQUE: A CASE STUDY OF COMPARTMENT 40, DERAMAKOT FOREST RESERVE, SANDAKAN, SABAH.

By
*Rosila Anthony
Sabah Forestry Department

Sabah's forest resources have played major roles in the socio-economic development of the state. More than half of its landmass is categorized as Forest Reserves or Permanent Forest Estates. The precursor of forest management is resource inventory; that is, estimating *how much of what* exists *where.* In forest management planning, it is important to know what and where forest resources areas are located. Therefore, forest management requires updated forest resource data. One approach of updating forest resource data is forest stratification. Presently, conventional method or visual aerial photograph interpretation techniques have been deployed to stratify the forest in Sabah. However, this method was found to be costly and resource intensive (Rashid et al., 1997).

Currently, conventional method or visual aerial photograph interpretation techniques are still deployed to complement field surveys. However, due to the high information accuracy and reliability requirements of the complex vegetation interpretation tasks, the intended decision support has been occasioned by time lags, which have rendered the information as outdated, suspect and inflexible (Rashid, 1996). Therefore, managing complex and declining tropical forest resource requires up-to-date technology to ensure sustainable resource utilization. According to Tomar (1976), it is imperative to resort to advanced and sophisticated technique remote sensing for data collection and monitoring the forest changes. The significant reduction of the time and cost needed for compilation of new maps particularly resource maps from satellite imagery are the strongest benefits particularly in developing country (Kalensky, 1991).

In Sabah, forest stratification and inventories were carried out using aerial photos since 1970s. Although in 1987 inventory there was a suggestion to use SPOT image for stratifying forest, no study was undertaken on this method. This was due to the unavailability of expertise in this field as well as problems encountered on acquiring cloud free imageries particularly in the interior region. In early 1990s the Department started its computer-aided mapping using Geographic Information System (GIS) and digital image processing techniques. Although various studies in the area of image processing for vegetation classification have shown great results (Zailani, 2000; Khali, 1999), however, only few actual studies were carried out on the usage of satellite imageries for forest stratification in Sabah.

Problem Statement

In Sabah, stratification of forest into stocking classes and estimation of their volume were mostly done by conventional method using aerial photographs interpretation. However, this method is found to be tedious, time consuming and resource intensive (Rashid et al., 1997). Therefore, there is a need to find a faster and better alternative method to do forest stratification. In line with the current information technologies development, satellite based remote sensing and Geographic Information System (GIS), can provide a feasible alternative method to conventional forest stratification methods.

Although remote sensing methods have been implemented in the past, however, there is still a lack of decision on which technique or combination of remote sensing techniques to be used as an alternative to aerial photographs interpretation. Rapid development of information technology particularly the integration between the spatial analytical capabilities of the GIS and image processing is able to produce greater efficiency in data management and information advancement. Therefore, this study involves firstly, the application of the semi expert Forest Canopy Density Model (FCD) methods to stratify the forest in Sabah. Compartment 40, Deramakot Forest Reserve was chosen as the study site. Stratification of the area by aerial photographs was then conducted. The final step was to validate the accuracy of stratification in both methods using ground inventory results within a GIS environment.

* A Project Report Submitted in Partial Fulfillment of the Requirements for Master of Science (Tropical Forest Resource Management) in the Faculty of Forestry, Universiti Putra Malaysia, Serdang Selangor. (June, 2003)

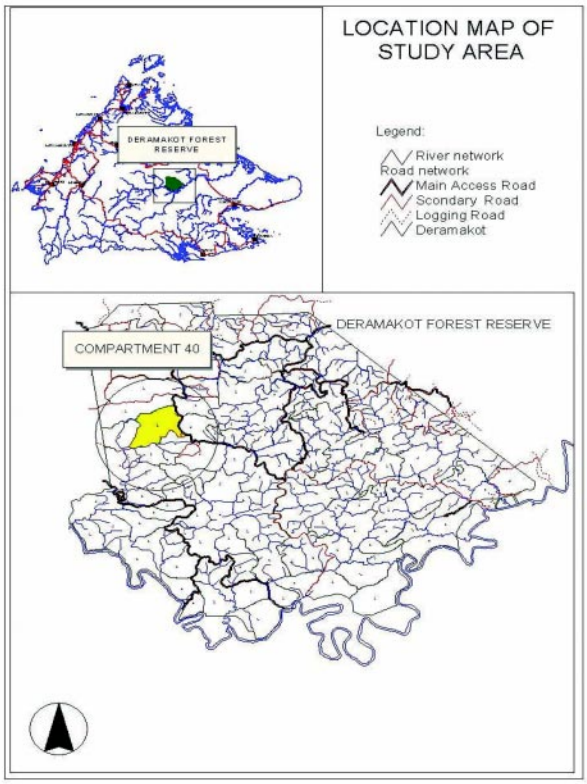


Figure 1: Location map of Compartment 40 in Deramakot Forest reserve.

Justification

The reliance on conventional methods using aerial photographs interpretation in stratifying the forest encounters problems such as availability of funds for acquisition of aerial photographs; lack of skilled manpower for aerial photo interpretation, tedious production steps in mapping from aerial photographs, time consuming and high cost. In updating forest resource maps there is a need for an alternative method for forest stratification in Sabah which is more efficient, effective and accurate.

Objectives of the Study

The objectives of this study are:

1. to apply a semi expert Forest Canopy Density (FCD) method for stratifying forest in Compartment 40, Deramakot Forest Reserve, Sabah.

2. to evaluate and explore the accuracy of FCD method using ground inventory data and stratification results from aerial photographs intepretation.

Results

The results indicate that the coefficient of variation (Cv) between stratums provided by the FCD method is lower i.e 65.83% than the coefficient of variation (Cv) between stratums results using aerial photographs i.e 68.99%. Therefore FCD provides better stratification results between different stratums.

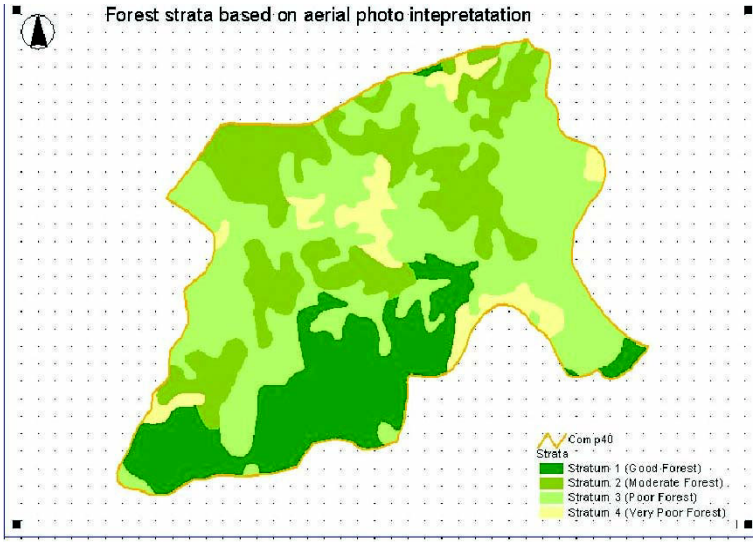


Figure 2: Forest stratum map based on aerial photos

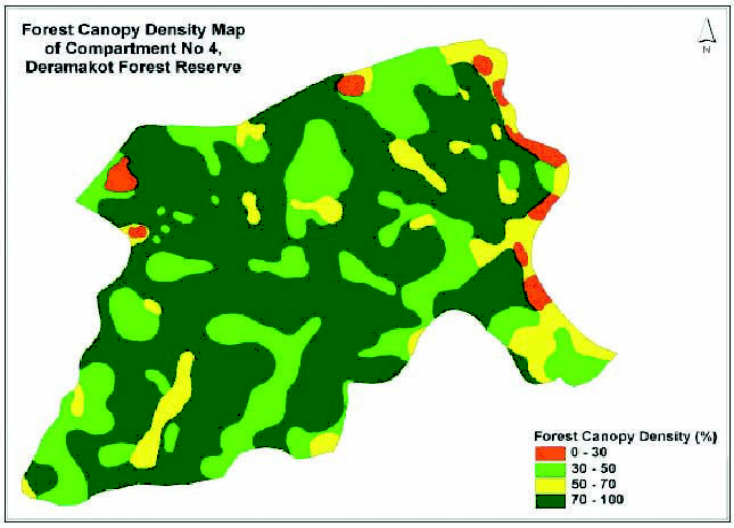


Figure 3: Forest Strata based on FCD for Compartment 40

Conclusion

Based on the finding of this study's, it is found out that forest stratification using Forest Canopy Density (FCD) method using satellite image processing techniques can be feasible method to stratify forest. It can be an alternative or complementary to aerial photo interpretation.

The coefficient of variation for tree volume between stratums using FCD method is lower (65.63) than coefficient of variation between stratums using aerial photographs (68.99). Hence FCD provides better differentiation between different stratums.

Recommendations

Based on the findings of the study, the following are recommended;

- Future research in refinement of the conventional aerial photo interpretation method should be done to increase the method's stratification accuracy.
- The FCD methods should be tested in other areas in Sabah to validate the forest stratification results obtained in this study.
- An analysis of cost effectiveness of forest stratification methods in Sabah should be conducted. A comparison of cost effectiveness using FCD method over conventional aerial photo interpretation method should also be carried out.

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REPORT ON THE WORKSHOP ON ADMINISTERING THE MARINE ENVIRONMENT - THE SPATIAL DIMENSIONS

BY
Ahmad Fauzi Nordin
Department of Survey and Mapping
Malaysia

Introduction

The Department of Survey and Mapping Malaysia (JUPEM), in collaboration with the University of Melbourne, Australia organised a four-day workshop, from 4th until 7th May 2004, on "Administering the Marine Environment – The Spatial Dimensions in Asia and Pacific region". The workshop, which was under the auspices of PCGIAP (Permanent Committee on GIS Infrastructure for Asia and the Pacific) was conducted at the Renaissance Hotel, Kuala Lumpur, and was attended by 102 participants from 11 countries, i.e. Australia, Brunei Darussalam, Cambodia, Canada, Fiji, India, Indonesia, Ireland, Kiribati, Malaysia and Thailand.

Objective of Workshop

The objective of the workshop was to better understand the spatial dimensions of administrating marine environment in the Asian and Pacific region and particularly to facilitate:

- *understanding of the needs of an SDI in the marine context;*
- *better understanding and appreciation of the administration of marine rights, restrictions and responsibilities and to agree on a terminology; and*
- *documentation of issues in establishing a marine dimension as a key component of National SDIs.*

Official Opening

As part of the official opening ceremony, JUPEM's Director General, Dato' Hamid bin Ali delivered the welcoming address and highlighted some important reasons for developing marine cadastre and administrating the marine environment and the role of spatial data in this context. Dato' Hamid mentioned that much of the current world's population is located around the coastal regions and that human activities are exceptionally high in these areas. He emphasised that those activities do not simply stop at the land-sea interface and suggested that coastal states need to have a consistent SDI whereby the rights, restrictions and responsibilities are administered and managed effectively in a similar manner to the land environment.

An opening address and official opening was subsequently made by the Hon. Deputy Minister of Natural Resources and Environment, Mr. S. Sothinathan on behalf of the Hon. Minister of Malaysian Natural Resources and Environment, Dato Sri Hj. Adenan Hj. Satem. The importance of marine resources and administrating these resources were key points of the opening address. The Hon. Mr S. Sothinathan mentioned that assessment, administration and management of the marine environment require information about boundaries and rights, restrictions and responsibilities in the said environment; therefore it is vital to understand the different challenges encountered in such a case, to appreciate the complexity of marine cadastre and marine SDI.

Keynote Address

The workshop began with a keynote address by Prof Ian Williamson, the Chair of PCGIAP-WG3. Prof Williamson explained that the workshop is part of the PCGIAP-WG3 (2002-2004) work plan and was designed following the success of the Cadastral Template Project which was developed through the 16th United Nations Regional Cartographic Conference for Asia-Pacific (UNRCC-AP) in Okinawa, Japan in 2003. He also highlighted the importance of the coastal zone to sustainable development, a critical policy issue that is increasingly recognised by most countries in the region.

Reports

Dr Abbas Rajabifard, the Research Coordinator of PCGIAP-WG3, reviewed and presented the WG3-workplan and progress in the development of the marine country report template followed by future plans to complete the template by all countries in the Asia and Pacific region. He also discussed the strategy for processing and publishing the results followed by an overview of the future plan and activities of WG3.

Two invited reports were presented on the outcomes of related conferences and meetings held over the past year. Mr Patrick Tan Hock Chuan, Director for Strategic Communication of the Department of Environment, Malaysia presented a report on the outcomes of the International Conference on Sustainable Development of the Seas of East Asia organised by the Partnerships in Environmental Management of the Seas of East Asia (PEMSEA) in Putrajaya, Malaysia, 8-12th December 2003. His presentation focused on Conference Resolutions which were put to Ministers of the 12 participating PEMSEA nations. Another invited report, which was presented by Mr. Michael Sutherland, from the University of New Brunswick (UNB), Canada and Deputy Chair of the International Federation of Surveyors (FIG) Commission IV, focused on the outcomes of the UNB-FIG Meeting on Marine Cadastre in Fredericton, Canada in September 2003.

A special session was also allocated to the presentation of Country Reports on marine administration activities by participant countries. In this session, 7 countries reported on their marine activities (details as follows), whereby each country identified and reported on the most important issues and challenges affecting their marine activities.

No.	Country	Presenter	Organisation
1.	Australia	Bill Hirst	Geoscience Australia, Department of Industry, Tourism and Resources, Australia.
2.	Malaysia	Ahmad Fauzi Nordin	Department of Survey and Mapping, Malaysia
3.	Canada	Michael Sutherland	University of New Brunswick, Canada
4.	Cambodia	Khun Borin	Royal Cambodian Navy, Cambodia
5.	Fiji	Peni Racava	Department of Land and Surveys, Fiji
6.	Indonesia	Prof Jacob Rais	Coastal Spatial Planning Specialist, Indonesia
7.	Ireland	Darius Bartlett	University College Cork, Ireland

Papers

The first invited paper presentation was by Mr. Darius Bartlett, from the University College Cork, Ireland. Mr. Bartlett's presentation was on "Extending Spatial Data Infrastructures into Marine Environments: A Work in Progress", concentrating on the issues present within Ireland and Europe as a whole followed by an overview of the concept and history of SDI initiatives around the world and the importance of the marine dimension in any such initiative.

Dr. Phillip Collier from the University of Melbourne, Australia then presented the "Current Status and Future Direction of Australian Marine Cadastre Research", concentrating on developments at the University of Melbourne. Dr Collier reported on the current activities and research projects within University of Melbourne followed by some concluding issues for future activities on marine SDI and marine Cadastre research.

A background paper discussing the "Issues in Developing Marine SDI" was presented by Prof Williamson. He highlighted the key environmental, social and economic factors and issues driving the development of Marine SDI. He also pointed out that whilst access to spatial data aids in effective decision-making to achieve sustainable development, the majority of SDI initiatives stop at the land-sea interface. This encourages marine data to be held in various formats, at various accuracies within 'data silos'. He concluded by stressing the need to assess current systems in order to identify technical, legal and institutional arrangements hindering coordination and effective management of the marine environment. This includes understanding the link between land and marine environments (they cannot be treated in isolation) and the need for cooperation between nations as maritime actions transcend national boundaries.

The final invited paper was from Ms. Jude Wallace, also from the University of Melbourne, who talked about the Registration of Marine Interests. Ms. Wallace discussed that the primary function of a marine register is as a tool to assist in the management of resources in the marine areas and the administration of interests in these resources. This will in-turn facilitate informed policy making. She highlighted the differences between land and marine registers.

Discussion

Three Working Groups were formed to discuss matters relating to the different aims and objectives of the workshop, as well as the formulation of the workshop resolutions, i.e. as follows:

WG1: Issues in administering the marine environment
WG2: Definition of marine SDI and marine cadastre
WG3: Administration of marine rights, restrictions and responsibilities

As a result of the breakout session discussion, each Working Group reported to an open forum and plenary session and rigorous discussions were undertaken on the outcomes and the suggested resolutions of the session, concentrating on issues in the region and particularly the role of Marine SDI, GIS and Cadastre in aiding more effective marine administration.

Some of the major points highlighted during the discussion session on the outcomes of the WGs included:

- The environmental, socio-economic and technical issues for administering marine activities
- Importance of including a marine component within the SDI policies as part of countries obligations to UNCLOS
- SDI and cadastre are different and cadastral data can be a subset of SDI, and that the cadastre can be a process based on SDI
- SDI should facilitate access, management and sharing of spatial data in both the marine and land environments at any jurisdictional or political levels
- The marine cadastre can include components of the land-based cadastre and in addition it must take into consideration the fuzzy nature of boundaries as well as a 3D (volume) and sometimes 4D (temporal) nature of the interests in the marine environment
- Importance of collaboration between FIG, Commission 4 and PCGIAP, Working Group 3 of PCGIAP on issues relating to marine SDI and marine cadastre
- Lack of a single organisation capable of coordinating issues on marine environment
- Importance of institutional reform and capacity building in administering marine rights, restrictions and responsibilities
- The Marine SDI should relate to natural boundaries as well as administrative boundaries.

Technical Visit

A technical visit to PETRONAS which owns, manages and adds value to the petroleum resources of Malaysia was made on 6th May 2204. Briefings were given by PETRONAS personnel, including their gas and petroleum exploration and production activities in the sea. The petroleum blocks allocated by PETRONAS for such activities relate to issues of marine SDI and the management of rights, restrictions and responsibilities in the concerned marine spaces.

Resolution

The participants discussed and agreed to the following resolutions, which would serve as one of the main outcomes of the workshop:

RESOLUTION 1 – SPATIAL DIMENSION OF SDI

The Workshop, noting that most countries within the Asia Pacific region have developed their own National Spatial Data Infrastructure (NSDI) initiatives to facilitate sustainable development,

Recognising the importance of sustainable development and the principles agreed by the International Conference on the Sustainable Development of the Seas of East Asia and the Ministerial Forum of the Sustainable Development of the Seas of East Asia (2003) under the GEF/UNDP/IMO Partnerships in Environmental Management for the Seas of East Asia (PEMSEA),

Further noting that the vast majority of NSDI initiatives are only related to the land environment,

Recalling that most countries in the region have an extensive marine jurisdiction and related administrative responsibilities,

Further recalling the essential international dimensions of many marine processes and activities,

Acknowledging that the marine environment and particularly the coastal zone are critically important for food production and sustainable development within each country,

Recommends that all countries in the Asia-Pacific region with an extensive marine jurisdiction and administrative responsibilities be encouraged to include a marine dimension in their NSDI as part of their obligation to meeting their responsibilities under the United Nations Convention on the Law of the Sea (UNCLOS).

And further recommends that they cooperate with other countries to ensure technical, operational and policy consistency in the marine elements of NSDIs developed in the Asia-Pacific region.

RESOLUTION 2 – PCGIAP-FIG COLLABORATION

The Workshop, recognising the work program of Working Group 3 (Cadastre) of the PCGIAP on the spatial dimension of administering the marine environment,

Further recognising the ongoing work plan of the International Federation of Surveyors (FIG) on marine cadastre and ocean governance through its Commission 4 (Hydrographic Surveying) and Commission 7 (Cadastre and Land Management),

Acknowledging the successful co-operation between PCGIAP and the FIG in developing and undertaking the Cadastral Template Project to provide a comparative analysis of the role of cadastral systems in spatial data infrastructures,

Recommends that PCGIAP and FIG collaborate through their respective work plans on marine cadastre, marine SDI, marine administration systems and ocean governance and encourages the FIG to participate in the Marine Cadastre Template Project.

RESOLUTION 3 – DEFINING THE SPATIAL DIMENSION OF THE MARINE ENVIRONMENT

The Workshop, recognising that a range of terms are used to describe the spatial dimension of the administration of the marine environment including marine cadastre, marine SDI, marine GIS and marine administration systems,

Further recognising the need for a common terminology in administering the spatial dimensions of the marine environment,

Noting that marine cadastre and marine SDI are different with the two being related in so much as cadastre can be a data-set of SDI as well as a component of a marine administration system,

Further noting that the marine environment is administered through a hierarchy of levels from local, state, national government to regional and global levels,

Acknowledging that the administration of rights, restrictions and responsibilities in the marine environment is based on often overlapping parcels or objects with the boundaries being both natural and geographically defined,

And further acknowledging that the SDI concept focuses on management, access and sharing of spatial data in both the marine and terrestrial environments while the cadastral concept focuses on management and identification of the respective rights, restrictions and responsibilities related to parcels or objects, often overlapping with 3D and sometimes with a temporal dimension,

Recommends that the term "marine administration system" is adopted for the administration of rights, restrictions and responsibilities in the marine environment, which the spatial dimension facilitated by the Marine SDI,

And further recommends that a marine cadastre is defined as a management tool which spatially describes, visualises and realises formally and informally defined boundaries and associated rights, restrictions and responsibilities in the marine environment as a data layer in a marine SDI, allowing them to be more effectively identified, administered and accessed.

RESOLUTION 4 – REQUIREMENT FOR FURTHER DEVELOPMENT OF GUIDELINES AND TOOLS TO ADMINISTER THE SPATIAL DIMENSION OF THE MARINE ENVIRONMENT

The Workshop, recognising the Workshop identified the need for a marine component of a spatial data infrastructure and an associated marine administration system in order to support sustainable development and the PEMSEA principles in the marine environment,

Noting that while this Workshop clarified the need for a marine component within a spatial data infrastructure and associated marine administration systems, many other issues still need to be investigated and resolved,

Recommends that PCGIAP further investigates and develops guidelines and tools for administering the spatial dimension of the marine environment.

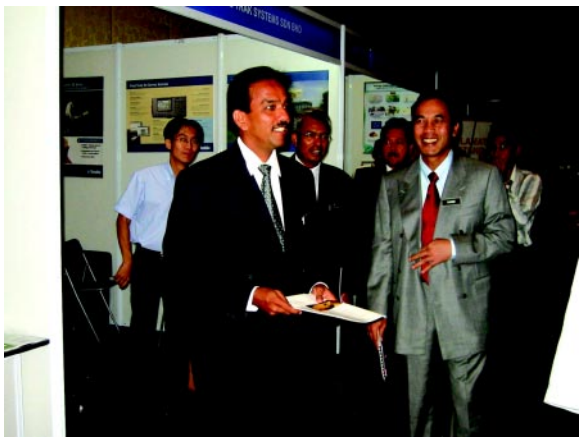
RESOLUTION 5 – EXPRESSION OF GRATITUDE TO THE HOST GOVERNMENT

The Workshop, expresses its sincere gratitude to the Government of Malaysia, the Minister of Natural Resources and Environment and the Director General of the Department of Survey and Mapping Malaysia, for the kind hospitality and gracious support extended to all participants at the International Workshop on Administering the Marine Environment - The Spatial Dimensions, held in Kuala Lumpur.

Workshop Conclusion

The workshop was concluded by Prof Williamson, who thanked the Malaysian Government, particularly JUPEM for their contribution towards the organisation and support of the Workshop, as well as all participants and delegates from the different countries. Mr Ahmad Fauzi bin Nordin officially concluded the workshop on behalf of JUPEM by thanking all those who attended the workshop and who contributed to its success.

Some of the key players of the workshop



Mr. S. Sothianathan the Deputy Minister of National Resources and Environment visiting the exhibition

LAPORAN TAKLIMAT PENGEMASKINIAN DATA TOPOGRAFI BAHAGIAN PEMETAAN JABATAN UKUR DAN PEMETAAN MALAYSIA (JUPEM)

Oleh
Balya Amin bin Yusoff @ Che Man
Seksyen Perkhidmatan Pemetaan, JUPEM

1. TUJUAN

Kertas ini bertujuan untuk melaporkan tentang perjalanan Taklimat Pengemaskinian Data Topografi yang telah dilangsungkan sebanyak 4 sesi iaitu sesi pertama di Taiping pada 22-26 November 2004, sesi kedua di Kuantan pada 29 November sehingga 3 Disember 2004, sesi ketiga di Kota Kinabalu pada 6-10 Disember 2004 dan sesi keempat di Kuching pada 13-17 Disember 2004.

2. LATAR BELAKANG

2.1 Taklimat ini diadakan susulan daripada Mesyuarat Majlis Bersama Jabatan (MBJ) bagi Bahagian Pemetaan, JUPEM Bil. 2/2004 yang telah diadakan pada 19 Mei 2004 antara lainnya telah dibangkitkan mengenai keperluan untuk diadakan satu taklimat khas kepada pegawai dan kakitangan yang terlibat dalam kerja-kerja menggunakan *'Computer Assisted Topographic Mapping System'* (CATMAPS) terutama bagi Seksyen Topografi Semenanjung, Sabah, Sarawak dan Seksyen Penawanan Data (SPD) serta Seksyen Pangkalan Data (SPgD). Ini kerana banyak kelemahan yang dikesan melibatkan kakitangan baru yang kurang mahir dalam pengendalian data topografi menggunakan CATMAPS.

2.2 Taklimat Pengemaskinian Data Topografi ini bertujuan untuk menyelaras konsep dan prosedur kerja kepada kakitangan kerja luar dan pejabat Topografi, kakitangan SPD dan SPgD supaya saling memahami data yang dihasil dan diterima untuk diproses mengikut spesifikasi masing-masing sejajar dengan penggunaan CATMAPS. Secara keseluruhannya taklimat ini dapat membantu perancangan Jabatan untuk menyiapkan Pangkalan Data Topografi dan Kartografi Kebangsaan di mana data-data topografi amat diperlukan oleh pengguna untuk tujuan perancangan, pembangunan, keselamatan dan GIS secara menyeluruh.

2.3 Taklimat ini telah berlangsung selama 5 hari bagi setiap sesi. Setiap sesi seramai 30 orang peserta telah diambil untuk menyertai taklimat ini. Pada hari pertama dan kedua peserta telah didedahkan dengan perjalanan kerja sebenar di SPD dan SPgD serta proses pemetaan mengikut ISO terbaru. Pada sesi ini semua pemasalahan yang berkaitan dengan seksyen tersebut diperbincangkan dan difahami untuk mencari jalan penyelesaian. Pada hari ketiga peserta didedahkan dengan perjalanan kerja di seksyen Topografi, dan hari keempat pula peserta telah pergi ke padang untuk membuat latihamal pengumpulan data di lapangan. Pada hari keempat dan kelima peserta diajar dan dimahirkan dengan kerja pemprosesan dan suntingan hasil kerja di lapangan. Sesi taklimat ini berakhir dengan ruang perbincangan dan maklum balas dan pada sebelah petangnya pula dengan majlis penutup dan penyampaian sijil.

3. SESI TAKLIMAT

3.1 Sesi Pertama di Hotel Seri Malaysia, Taiping Perak :
22-26 November 2004

Sesi pertama di Taiping berjalan lancar termasuk semasa pendaftaran dan taklimat perjalanan kursus. Tiada masalah yang dihadapi dan semua taklimat berjalan mengikut masa yang ditetapkan. Para peserta diberikan nota dan *folder* supaya susunan nota lebih teratur dan senang dijadikan rujukan kerja. Penyertaan peserta dari SPD, SPgD dan

Seksyen Topografi dalam taklimat ini amat bermakna sekali, ini kerana mereka dapat duduk bersama serta berbincang dan bertukar pendapat mengenai kerja masing-masing. Di samping itu para peserta juga dapat berkongsi pengelaman dan bersama-sama memahirkan diri selaras dengan perlaksanaan CATMAPS.

Para peserta mendengar taklimat pada sesi pertama yang diadakan di Hotel Seri Malaysia Taiping, Perak

3.2 Sesi Kedua di Hotel Seri Malaysia, Kuantan Pahang :
29 November sehingga 3 Disember 2004

Sesi kedua di Kuantan berjalan seperti biasa dan seperti yang dijadualkan. Pada sesi kali ini kaedah pengajaran dan perjalanan taklimat lebih berkesan. Ini kerana cadangan dan komen taklimat ini diambil daripada borang penilaian yang diadakan di Taiping. Para peseta di Kuantan juga turut disertai oleh kakitangan SPD, SPgD dan Seksyen Topografi.

3.3 Sesi Ketiga di Hotel Tang Dynasty, Kota Kinabalu Sabah :
6-10 Disember 2004

Sesi ketiga di Kota Kinabalu melibatkan penyertaan peserta dari Seksyen Topografi Sabah dan peserta dari wilayah-wilayah Kota Kinabalu, Sandakan dan Tawau. Pada sesi kali ini tanpa penyertaan peserta dari SPD dan SPgD. Walaubagaimanapun taklimat pada sesi kali ini menunjukkan minat yang mendalam dari kalangan peserta. Hubungan komunikasi dua hala diantara peserta dan penceramah amat baik sekali. Para penceramah yang dibawa khas dari SPD, SPgD dan Topo Semenanjung yang merupakan pakar dalam bidang masing-masing menerangkan cara perjalanan kerja yang betul dan pemasalah yang sering timbul berkenaan data topografi yang diterima.

Para peserta sedang mendengar taklimat sesi ketiga di Hotel Tang Dynasty Kota Kinabalu, Sabah.

3.4 Sesi Keempat di Hotel Harbour View, Kuching Sarawak :
13-17 Disember 2004

Sesi keempat di Kuching melibatkan penyertaan peserta dari Seksyen Topografi Sarawak dan peserta dari wilayah-wilayah Kuching, Miri dan Sibu. Begitu juga di Kuching tanpa penyertaan peserta dari SPD dan SPgD. Pada sesi taklimat kali ini pengajaran dan latihamal lebih ditekankan. Ini kerana Seksyen Topografi Sarawak amat ketinggalan dalam perlaksanaan CATMAPS. Sepanjang perjalanan taklimat ini peserta dari Sarawak nampaknya menunjukkan minat yang mendalam dan bertambah yakin untuk mengendalikan peralatan dalam latih amal pengumpulan data di lapangan. Secara keseluruhannya taklimat pada kali ini di Sarawak bertepatan sekali pada masanya, ini kerana pada peserta yang merupakan kakitangan Seksyen Topografi Sarawak perlu memahirkan diri dan lebih bersedia untuk menerima *real job* pada tahun hadapan.

Para peserta sedang mendengar taklimat pada sesi keempat di Hotel Harbour View, Kuching Sarawak.

3.5 Oleh kerana pelaksanaan CATMAPS di JUPEM masih di peringkat awal, penekanan modul Taklimat ini lebih menjurus kepada proses kerja di Seksyen Topografi antara lainnya seperti di bawah :

a. *Workflow* proses kerja secara keseluruhan.

Peserta telah didedahkan dengan proses kerja sebenar di mana bermula dengan penerimaan data dari TopoHQ *(Shape file)* dan dilaksanakan pengemaskinian data hingga dihantar balik ke Topo Ibu Pejabat dalam format *Shape.*

b. Pengenalan kepada perisian Map500.

- Peserta telah diberi pendedahan dan gambaran bagaimana perisian Map500 berperanan dalam proses pengemaskinian data Topografi.

- Kebaikan dan kelemahan perisian ini juga telah dimaklumkan kepada peserta.

c. Pengoperasian perisian Map500.

- Pengoperasian perisian ini telah ditunjukkan bagaimana data Topografi dikemaskini samada dengan menggunakan GPS ProXRS, *Laser range finder* dan pendigitan.

- Konsep pengemaskinan data *attribute* dan spatial telah diterangkan dengan jelas.

- Pembezaan data lama dengan data baru dan juga data yang telah tiada dengan menggunakan konsep *New Layer* dan *deleted Layer*.

d. Latihamal pengumpulan data di lapangan.

- Semua sesi telah dibahagikan kepada lima (5) kumpulan dimana setiap kumpulan mengandungi lima (5) hingga enam (6) orang.

- Setiap kumpulan telah membuat latihan pengemaskinian data Topografi disekitar kawasan hotel berkenaan.

- Intergasi peralatan GPS ProXRS dan *laser range finder* dengan perisian Map500 bagi pengumpulan data baru seperti jalan, bangunan dan sebagainya.

- Kesemua kumpulan ini telah berjaya membuat latihan pengemaskinian data Topografi mengikut konsep yang telah diterangkan.

- Data yang telah dibuat pengemaskinian di lapangan ini telah di*export* ke *shape file* dan di baca ke dalam perisian LAMP2 melalui FME.

Amali latihamal pengumpulan data di lapangan sedang dijalankan. Lokasi ini adalah di sekitar Hotel Seri Malaysia, Taiping Perak.

En. Zainal sedang memberi ceramah semasa Taklimat ini diadakan di Hotel Tang Dynasty Kota Kinabalu, Sabah

En. Mustaffa sedang memberi ceramah ketika taklimat ini berlansung di Hotel Harbour View Kuching, Sarawak

Sesi perbicangan dan maklum balas sedang berlansung. En. Hamdan selaku ketua koordinator bersama tenaga pengajar En. Fairuzam dan En. Mustaffa sedang menjawab persoalan yang ditimbulkan oleh peserta

En. Othman memberi penerangan mengenai suntingan hasil kerja di lapangan diperingkat Ibu Pejabat Seksyen Topografi

4. KESIMPULAN

4.1 Secara keseluruhan modul ini telah dapat memberi gambaran yang jelas kepada peserta berkenaan proses pengemakinian data topografi di lapangan. Proses ini perlu diperkemaskan lagi dengan menumpukan kepada peserta dari cawangan wilayah sahaja supaya keberkesananya terserlah. Ini dapat diwujudkan jika sesi kedua diadakan khusus untuk pegawai dari Topo Ibu Pejabat dan pegawai dari cawangan wilayah.

4.2 Disamping itu taklimat ini juga telah memberi penjelasan dan pengetahuan mengenai keseluruhan kerja-kerja pengemaskinian data Topografi termasuk dari seksyen-seksyen yang terlibat. Modul taklimat antaranya meliputi konfigurasi CATMAPS termasuk *'hardware'* dan *'software'* serta penerangan mengenai Sistem Maklumat Pengurusan (MIS), aliran kerja CATMAPS dan kerja-kerja di lapangan. Taklimat ini juga memberi penerangan, penjelasan dan pengetahuan serta meningkatkan tahap kefahaman kepada peserta taklimat berkaitan kaedah dan prosedur kerja bagi kompilasi dan Penyediaan/ Suntingan Dataset Topografi. Para peserta terdiri daripada Pembantu Teknik Ukur dan Juruteknik Ukur yang terlibat secara langsung dalam kerja pengemaskinian data dan peta Topografi.

4.3 Secara tidak langsung taklimat ini akan membantu perancangan Jabatan untuk menyiapkan Pangkalan Data Topografi dan Kartografi Kebangsaan di mana data-data topografi amat diperlukan oleh pengguna untuk tujuan perancangan, pembangunan, keselamatan dan GIS secara menyeluruh. Walau bagaimanapun kelancaran sistem ini banyak bergantung kepada keselarasan proses kerja yang dijalankan oleh pihak Seksyen Topografi, SPgD dan SPD, yang perlu bagi memastikan agar data-data yang dibekalkan adalah mengikut spesifikasi yang ditetapkan.

4.4 Sepanjang perjalanan taklimat ini telah wujud hubungan komunikasi dua hala yang baik di antara tenaga pengajar dan peserta dan seterusnya permasalahan yang timbul sebelum ini di Seksyen Panawanan Data (SPD), Seksyen Pangkalan Data (SPgD) dan Seksyen Topografi dapat dibincangkan dan diusahakan untuk mencari jalan penyelesaiannya. Selain dari itu peserta juga dimaklumkan mengenai proses pemetaan mengikut ISO terbaru supaya perjalanan proses pemetaan lebih teratur , berkesan, selamat dan bersih.

4.5 Kerjasama di antara pihak urusetia, tenaga pengajar, peserta dan cawangan-cawangan seksyen Topografi amat baik sekali sehingga taklimat ini berjaya diadakan. Semua yang terlibat ini memberi komitmen yang tinggi memandangkan Bahagian Pemetaan terutamanya bahagian kerjaluar Topografi berada pada masa peralihan dari konventional ke digital sepenuhnya. Susulan dari itu pihak urusetia mendapat cadangan dari pihak yang terlibat supaya diadakan lagi taklimat mahupun kursus sedemikian dari masa kesemasa untuk mempertingkatkan lagi kemahiran dan kecekapan kakitangan kerjaluar.

PERSIDANGAN *"1st NATIONAL GIS CONFERENCE AND EXHIBITION"*

By
Abdul Manan bin Abdullah
Malaysian Center for Geospatial Data Infrastructure (MaCGDI)

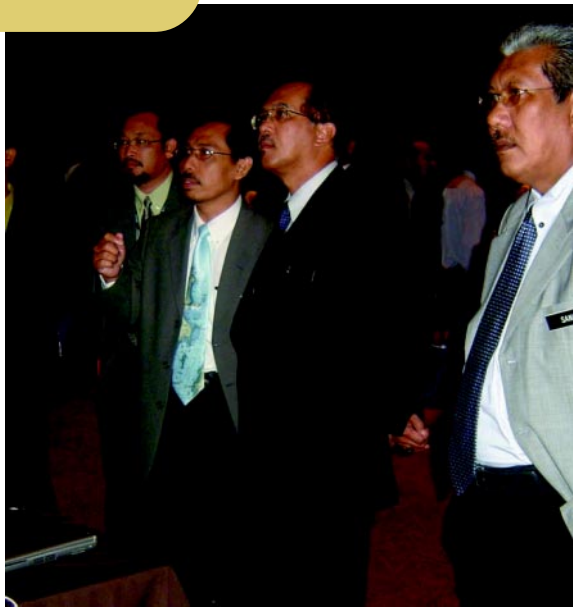
Sekitar Persidangan 1st National GIS Conference and Exhibition 2004
Pusat Dagangan DuniaPutra (PWTC)
29-30 November 2004

Sepanjang tahun 2004 telah menyaksikan banyak aktiviti besar yang dianjurkan dan disertai oleh Pusat Infrastruktur Data Geospatial Negara (MaCGDI) dalam usaha memperkenal dan mengetengahkan fungsi MaCGDI kepada semua peringkat pengguna sama ada kepada sektor awam, swasta dan juga kepada orang ramai. Antara program yang amat penting dan telah berjaya di laksanakan ialah menganjurkan persidangan "*1st National GIS Conference and Exhibition"* yang julung kali diadakan. Persidangan GIS di peringkat kebangsaan ini telah berlangsung di Dewan Tun Hussein Onn, Pusat Dagangan Dunia Putra, Kuala Lumpur pada 29 hingga 30 November 2004 dan di rasmikan oleh Setiausaha Parlimen Kementerian Sumber Asli dan Alam Sekitar iaitu Y.Bhg. En. Sazmi Miah.

Persidangan tersebut yang bertemakan ***" GIS as a Strategic Tool for Decision Making and Good Governance "*** adalah bertujuan untuk menggalakkan perkongsian pengetahuan dan pengalaman praktikal di antara pengguna dan pakar-pakar GIS dalam memberikan pandangan yang lebih jelas tentang pengaplikasian GIS ini dapat digunakan secara efektif dan efisyen. Persidangan ini disasarkan kepada peserta dalam negara meliputi agensi-agensi pengguna serta agensi-agensi yang terlibat dengan penggunaan sistem GIS. Pengisian persidangan yang pertama ini meliputi pembentangan ucaptama, kertas-kertas kerja daripada pelbagai sektor aplikasi GIS, perbincangan panel serta pameran produk dan aplikasi GIS oleh sektor awam dan swasta. Menerusi sudut pameran pula, para peserta berpeluang melihat keupayaan teknologi GIS yang telah dimajukan oleh MaCGDI khususnya dan beberapa agensi kerajaan lain serta syarikat-syarikat swasta dalam dan luar negara yang menjadi peneraju dalam teknologi GIS masakini.

Sekitar Hari Qualiti di Perkarangan Jabatan Ukur dan Pemetaan Malaysia (JUPEM) 12 Oktober 2004

**Sekitar SeminarMyGDI
Negeri Sembilan
(Hotel Royal Adelphi
Seremban)
20 Disember 2004**



Sekitar Seminar
MyGDI di Negeri Sabah
(Hotel Shangri-La Sabah)
29 Disember 2004

KALENDAR GIS 2005

TARIKH	TAJUK	LOKASI	PENGANJUR	TALIAN PERTANYAAN
7 hingga 10 Mac 2005	Pameran ICT bersama Pusat Sains Negara (PSN) di Sarawak	Akan ditentukan	MaCGDI dan PSN	Encik Abdul Manan bin Abdullah Tel : +03 26921556 ext. 8873 Fax : +03 26934941 E-mail : manan@macgdi.gov.my
14 hingga 15 Mac 200515	Jawatankuasa Pemetaan dan Data Spatial (JPDSN) ke 56	Hotel Equatorial Akan ditentukan Pulau Pinang	Bahagian Pemetaan, JUPEM	Encik Teng Chee Boo Tel : +03 26924034 Fax : +03 26970140 E-mail : cbteng@jupem.gov.my
15 Mac 2005	Seminar Sehari MyGDI di Terengganu	Akan ditentukan	MaCGDI	Encik Abdul Manan bin Abdullah Tel : +03 26921556 ext. 8873 Fax : +03 26934941 E-mail : manan@macgdi.gov.my
28 Mac 2005	Seminar Projek F2F dan Ukur Hakmilik	Dewan Perdana FELDA	Bahagian Kadaster, JUPEM	Dr. Teng Chee Hua Tel : +03 26170615 Fax : +03 26912757 E-mail : tengcheehua@jupem.gov.my
9 hingga 12 Mei 2005	Pameran ICT bersama Pusat Sains Negara (PSN) di Perak	Akan ditentukan	MaCGDI	Encik Abdul Manan bin Abdullah Tel : +03 26921556 ext. 8873 Fax : +03 26934941 E-mail : manan@macgdi.gov.my
12 hingga 13 Mei 2005	Pelancaran & Seminar Geoid Map & Real-Time Kinematic(RTK) Network	Shangri-La Putrajaya	Seksyen Geodesi, JUPEM	Dr. Samad bin Abu Tel ; +03 26929930 Fax : +03 26912757 E-mail : samadabu@jupem.gov.my
23 Mei 2005	Seminar MyGDI di Selangor	Akan ditentukan	MacGDI	Encik Abdul Manan bin Abdullah Tel : +03 26921556 ext. 8873 Fax : +03 26934941 E-mail : manna@macgdi.gog.my
24 hingga 26 Mei 2005	Sambutan Ulang Tahun ke-120 JUPEM (Pameran & Hari Terbuka)	JUPEM	JUPEM	Encik Ahamad bin Zakaria Tel : +03 26170821 E-mail : ahamad@jupem.gov.my
24 Mei 2005	Seminar aktiviti Ukur dan Pemetaan	JUPEM	JUPEM	Dr. Samad Bin Abu Tel : +03 26929930 Fax : +03 26912757 E-mail : samadabu@jupem.gov.my
14 Jun 2005	Jawatankuasa Kebangsaan Nama-nama Geografi (JKNG)	Akan ditentukan	Bahagian Pemetaan, JUPEM	Encik Teng Chee Boo Tel : +03 26924034 Fax : +03 26970140 E-mail : cbteng@jupem.gov.my
21 hingga 23 Jun 2005	7th Surveyor's Congress	Sheraton Hotel, Subang Jaya, Selangor	Institution of Surveyors, Malaysia (ISM)	ISM Secretariat 3rd Floor, Bangunan Juruukur 64-66, Jalan 52/4 46200 Petaling Jaya Selangor Darul Ehsan Tel : +03 79569728/79548358 Fax : +03 79550253 E-mail : secretariat@ism.org.my/ Katherine@ism.org.my

KALENDAR GIS 2005

TARIKH	TAJUK	LOKASI	PENGANJUR	TALIAN PERTANYAAN
20 hingga 23 Jun 2005	Pameran ICT bersama Pusat Sains Negara (PSN) di Pahang	Akan ditentukan	MaCGDI	Encik Abdul Manan bin Abdullah Tel : +03 26921556 ext. 8873 Fax : +03 26934941 E-mail : manan@macgdi.gov.my
27 Jun 2005	Seminar Sehari MyGDI di Pulau Pinang	Akan ditentukan	MaCGDI	Encik Abdul Manan bin Abdullah Tel : +03 26921556 ext. 8873 Fax : + 26934941 E-mail : manan@macgdi.gov.my
11 hingga 14 Julai 2005	Pameran ICT bersama Pusat Sains Negara (PSN) di Melaka	Akan ditentukan	MaCGDI	Encik Abdul Manan bin Abdullah Tel : +03 26921556 ext. 8873 Fax : +03 26934941 E-mail : manan@macgdi.gov.my
26 Julai 2005	Seminar Projek Sistem Kadater Berkordinat (CCS)	Melaka	Bahagian Kadaster, JUPEM	Dr. Teng Chee Hua Tel : +03 26170615 Fax : +03 26897114 E-mail : tengcheehua@jupem.gov.my
8 hingga 11 Ogos 2005	Pameran ICT bersama Pusat Sains Negara (PSN) di Kedah	Akan ditentukan	MaCGDI	Encik Abdul Manan bin Abdullah Tel : +03 26921556 ext. 8873 Fax : +03 26934941 E-mail : manan@macgdi.gov.my
29 hingga 30 November 2005	National GIS Conference and Exhibition	PWTC	MaCGDI	Encik Abdul Manan bin Abdullah Tel : +03 26921556 ext. 8873 Fax : +03 26934941 E-mail : manan@macgdi.gov.my
Disember 2005	Program *GIS Week* bersama Universiti Teknologi Malaysia (UTM), Skudai	Akan ditentukan	UTM	Encik Abdul Manan bin Abdullah Tel : +03 26921556 ext. 8873 Fax : +03 26934941 E-mail : manan@macgdi.gov.my

SUMBANGAN ARTIKEL/ CALL FOR PAPER

Buletin GIS diterbitkan dua (2) kali setahun oleh Jawatankuasa Pemetaan dan Data Spatial Negara. Sidang Pengarang amat mengalu-alukan sumbangan sama ada berbentuk artikel atau laporan bergambar mengenai perkembangan Sistem Maklumat Geografi di Agensi Kerajaan, Badan Berkanun dan Institusi Pengajian Tinggi.

Panduan Untuk Penulis

1. Manuskrip boleh ditulis dalam Bahasa Malaysia atau Bahasa Inggeris

2. Setiap artikel yang mempunyai abstrak mestilah condong *(italic)*

3. Format manuskrip adalah seperti berikut:

Jenis huruf	: Arial
Saiz huruf bagi tajuk	: 12
Saiz huruf	: 10
Langkau	: *Single*
Margin	: Atas, bawah, kiri dan kanan= 2.5cm
Justifikasi teks	: Kiri
Satu *'column'* setiap muka surat	

4. Sumbangan hendaklah dikemukakan dalam bentuk *softcopy* dalam format Microsoft Word. Semua imej grafik hendaklah dibekalkan secara berasingan dalam format .tif atau .jpg dengan resolusi 150 dpi dan ke atas.

5. Segala pertanyaan dan sumbangan bolehlah dikemukakan kepada:

Ketua Editor
Buletin GIS
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Jabatan Ukur dan Pemetaan Malaysia
Tingkat 3, Bangunan Ukur
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