

Asian Network on Climate Science and Technology (ANCST)

The idea of a network that brings together researchers and academics on a regular and continuous basis was an outcome of the Workshop on Natural Disasters and Climate Change in Asia, held in Bangi, Malaysia from 5-7 November 2012. The workshop, organised by the Cambridge Malaysian Education and Development Trust (CMEDT) in association with the Malaysian Commonwealth Studies Centre (MCSC) of Trinity College, Cambridge and the Southeast Asia Disaster Prevention Research Initiative of Universiti Kebangsaan Malaysia, attracted the participation of researchers, practitioners and policy makers from 31 institutions in 17 countries.

In response to the call to set up a network to enable interaction among researchers in Asia, the Asian Network on Climate Science and Technology (ANCST) was established to serve the purposes of providing information as well as of developing research coordination projects led by Asian researchers. The aspects of climate and disaster resilience specific to Asian conditions and phenomena are the focus of ANCST.

On 19 November 2013, the ANCST was officially established and launched in the presence of the Vice-Chancellor and Deputy Vice-Chancellor (Academic & International Affairs) of UKM, Pro-Chancellor of UKM, YABhg. Tun Dato' Seri Dr. Ahmad Sarji Abdul Hamid, who is also the Trustee and Joint Executive Chairman of CMEDT and MCSC, and the members of the International Steering Committee of ANCST, Emeritus Prof. Lord Julian Hunt (University of Cambridge), Prof. Joy Jacqueline Pereira (Universiti Kebangsaan Malaysia), Prof. Johnny Chan (City University of Hong Kong) and Prof. J. Srinivasan (Divecha Centre for Climate Change, Bangalore, India). A signing ceremony took place under the auspices of UKM.

ANCST is hosted by Universiti Kebangsaan Malaysia with SEADPRI-UKM serving as the coordination centre, and is additionally supported by the CMEDT in association with MCSC of Trinity College, Cambridge. ANCST is dedicated solely to enhancing capacity on disaster and climate resilience research, underpinned by science, technology and innovation. It aspires to bring together academics and researchers from various disciplines to a multidisciplinary platform. The objectives are to strengthen their capacity, and at the same time, to interact with other multi-stakeholder networks, intergovernmental bodies and multilateral institutions operating in the region.

ANCST welcomes academics and researchers in Asia from various disciplines. Those interested in becoming a member of ANCST are welcome to sign up at www.ancst.org.

ASIAN NETWORK ON CLIMATE SCIENCE AND TECHNOLOGY (ANCST)



EDITORIAL BOARD

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NEWSLETTER
APRIL 2014

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Salam Sejahtera

Pusat Kajian Bencana Asia Tenggara (SEADPRI-UKM) menerbitkan Buletin dwi-tahunannya yang lazimnya merangkumi kualiti dan kuantiti latihan sumber manusia, penyelidikan, jaringan dan jangkauan program penyelidikan serta penerbitan dalam bidang-bidang yang berkaitan bencana.

Buletin ini merupakan sumber maklumat dan rujukan untuk pelbagai kajian bencana yang boleh dicapai oleh masyarakat di luar UKM. Walaupun SEADPRI-UKM adalah satu institusi yang memberi perhatian kepada penyelidikan, akan tetapi latihan tenaga manusia pakar dalam bidang bencana juga turut dititikberatkan. Justeru itu, keluaran Buletin 10 SEADPRI-UKM pada kali ini adalah berkisarkan profil penyelidikan dan hasil kajian para pelajar pascasiswazah SEADPRI-UKM yang berada di peringkat pengajian Sarjana dan Doktor Falsafah. Dengan demikian, hasrat SEADPRI-UKM untuk berkongsi ilmu dan hasil kajian berkaitan bencana dengan masyarakat luar UKM tercapai. Di samping itu, profil penyelidikan yang dibentangkan juga dapat memaparkan halatuju SEADPRI-UKM melalui bidang-bidang penyelidikan yang sedang giat dijalankan.

Adalah diharapkan Buletin yang akan datang terus memaparkan hasil kajian para pelajar pascasiswazah di SEADPRI-UKM supaya kajian mereka akan memberi manfaat kepada masyarakat sama ada di dalam dan luar UKM.

Terima kasih.

Kata Pengantar Foreword



On behalf of the National Security Council, I would like to express my appreciation to the Vice Chancellor of Universiti Kebangsaan Malaysia, Y. Bhg. Prof. Tan Sri Dato' Seri Dr. Sharifah Hapsah Syed Hasan Shahabudin, for permitting and facilitating the collaboration of SEADPRI-UKM in providing technical support for developing the National Platform and Action Plan for Disaster Risk Reduction for Malaysia. I also look forward to the continued support of SEADPRI-UKM in supporting the National Security Council in implementing the National Action Plan and fulfilling the country's obligations under the Hyogo Framework for Action, beyond 2015.

Preface by Secretary of the National Security Council, Prime Minister's Department,
Hon. Datuk Mohamed Thajudeen Abdul Wahab in Bulletin No. 9 SEADPRI-UKM:
The First 5 Years (2013).

Greetings

The Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM), the Centre publishes her biennial bulletin, which very often contains information on the quality and quantity of human resource training, research, networking, outreach activities and publications related to the field of disaster studies.

This Bulletin is a source of information and reference for various disaster studies that can be accessed by community outside UKM. Although SEADPRI-UKM has its main function on research, the training of human capital on various fields of disaster is also given important attention. Thus, in this issue of the SEADPRI-UKM Bulletin No. 10, the research profiles and output of the graduate students of SEADPRI-UKM, both Masters and PhD, are presented. In such a way, the aspiration of SEADPRI-UKM to share information of disaster studies with communities inside and outside UKM can be achieved. Furthermore, by presenting the research profiles, the research direction of SEADPRI-UKM can be demonstrated via current research activities.

The future bulletins are expected to continue to portray the research output of graduate students so that their research will have benefits on communities inside and outside UKM.

Thank you.

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Universiti Kebangsaan Malaysia

Graduate Research

Kesiapsiagaan Menghadapi Bencana: Kajian Kes Hospital Serdang, Selangor Darul Ehsan

Ismail bin Mat Tahir | Calon Sarjana Kajian Bencana (Dasar & Pengurusan Bencana)

LATARBELAKANG

Hospital atau dikenali juga sebagai rumah sakit merupakan tempat untuk masyakat mendapatkan kemudahan perkhidmatan kesihatan yang merangkumi rawatan perubatan, penjagaan kesihatan, diagnostik, rehabilitasi dan kaunseling kesihatan. Apabila berlaku bencana, hospital akan menjadi sibuk sebagai tempat tumpuan pesakit untuk mendapatkan rawatan serta menjadi perhatian masyarakat untuk mendapatkan maklumat berkaitan dengan mangsa kejadian. Oleh kerana itu perlunya persediaan awal untuk menangani sebarang kemungkinan yang mungkin berlaku apabila berlaku bencana. Hospital Serdang dipilih sebagai lokasi kajian kerana kedudukannya yang dibina di kawasan yang mempunyai banyak tempat yang berisiko tinggi seperti Lapangan Terbang Antarabangsa, Sepang (KLIA), Pusat Atom Negara, Bangi (MINT), Pusat Pentadbiran Putrajaya, Pusat Simpanan Minyak Puchong (KVDT), keretapi KLIA ekspres, Empangan di Semenyih, Pusat tahanan penjara di Kajang, Stadium Bukit Jalil, Komuter serta kilang-kilang di kawasan Puchong dan Bangi. Semua tempat-tempat tersebut boleh menyumbang kepada bencana yang amat besar sekiranya berlaku perkara-perkara yang tidak diingini. Kajian ini adalah bertujuan untuk mengkaji sejauh mana persediaan Hospital Serdang dalam menguruskan mangsa-mangsa kejadian bencana yang berlaku dari luar hospital. Kajian ini untuk mengumpul maklumat berkaitan dengan pengetahuan kakitangan hospital Serdang dalam persediaan menghadapi bencana. Maklumat yang dikumpul akan dapat membantu dalam mewujudkan garispanduan 'Standard Operational Procedure'(SOP) serta polisi samada diperingkat hospital atau jabatan dalam membantu meningkatkan kualiti perkhidmatan.

LOKASI KAJIAN



Gambar 1: Menunjukkan lokasi Hospital Serdang di kawasan Klang Valley Wilayah Persekutuan dan Negeri Selangor.

OBJEKTIF

Mengkaji tentang kesiapsiagaan Hospital Serdang dalam menguruskan mangsa kejadian bencana daripada luar yang datang ke hospital dari aspek a) mengenalpasti sejauhmana persediaan hospital dari aspek peralatan, sistem komunikasi pengangkutan, kakitangan dan fasiliti hospital dalam menghadapi bencana, b) Menilai tahap pengetahuan, sikap dan amalan kakitangan tentang peranan mereka dalam menghadapi keadaan bencana dan c) Mencadangkan langkah-langkah untuk menambahkan sistem yang sediaada bagi menghadapi bencana.

METODOLOGI

Kajian ini dijalankan di Hospital Serdang, Selangor Darul Ehsan. Seramai 50 responden dipilih. menggunakan kaedah Purposive sampling dimana 10 sampel dipilih dari Pegawai Perubatan, 20 Penolong Pegawai Perubatan dan 20 Jururawat Terlatih. Kaedah pengumpulan data yang digunakan ialah menggunakan borang soalselidik diisi sendiri oleh responden tetapi sekiranya tidak faham kaedah temubual akan digunakan.

LATARBELAKANG HOSPITAL SERDANG

Hospital Serdang merupakan sebuah hospital kerajaan yang dibina dengan mempunyai kapasiti 620 katil. Kedudukannya terletak dibawah jajahan daerah Dengkil dalam Negeri Selangor, Malaysia bersebelahan dengan Universiti Putra Malaysia (UPM). Hospital ini telah diserahkan kepada Kementerian Kesihatan Malaysia (KKM) oleh Jabatan Kerja Raya pada 26 Mei 2005 merupakan sebuah hospital yang beroperasi menggunakan sistem teknologi maklumat iaitu 'Total Hospital Information System' (T.H.I.S) iaitu pengoperasiannya dilaksanakan dengan menggunakan komputer. (Sumber: Laporan Tahunan Hospital Serdang, 2005-2006).

HASIL AWAL

Hasil kajian mendapati kesiapsiagaan Hospital Serdang dalam menguruskan kes-kes kejadian bencana yang berlaku merangkumi sistem yang komprehensif dari aspek peralatan, sistem komunikasi, pengangkutan, kakitangan dan fasiliti hospital.

Sistem pengurusan bencana	Ada
Hospital mempunyai pelan pengurusan bencana	√
Mempunyai pusat kawalan dan pengurusan bencana	√
Kakitangan telah mengetahui dan memahami pelan pengurusan bencana hospital	√
Mempunyai simpanan peralatan perubatan	√
Mempunyai fasiliti untuk menempatkan mangsa bencana	√
Mempunyai pengangkutan untuk proses evakuasi mangsa	√
Mempunyai sistem radio komunikasi	√
Mengadakan latihan mengenai pengurusan bencana	√

PENYELIDIK



Ismail bin Mat Tahir merupakan pelajar Sarjana Kajian Bencana (Dasar dan Pengurusan Bencana) di SEADPRI-UKM. Beliau telah mempunyai banyak pengalaman dalam bidang perubatan bencana dan terlibat dengan aktif dalam program-program latihan berkaitan pengurusan bencana samada di peringkat Kementerian Kesihatan Malaysia (KKM), ataupun agensi swasta. Beliau kini berkhidmat sebagai tenaga pengajar di Institut Latihan dibawah KKM dalam bidang perubatan.

Minat kajian dalam bidang: Perubatan kecemasan, Penjagaan Pra-hospital, Perubatan bencana, Pengurusan bencana

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Activities

Bengkel Pengurusan Risiko Bencana: Memperkukuh Pelbagai Respons di Malaysia 24-25 Oktober 2013, Puri Pujangga, UKM Bangi



Bengkel ini telah dirasmikan oleh YBrs. Tuan Ariff bin Baharom, Setiausaha Bahagian Pengurusan Bencana, Majlis Keselamatan Negara, Jabatan Perdana Menteri.

Pelbagai tindakan telah diambil bagi tujuan pengurangan risiko bencana di Malaysia oleh pelbagai pihak berkepentingan di bawah Majlis Keselamatan Negara. Melihat kepada kemunculan cabaran-cabaran baru kesan daripada urbanisasi dan pertumbuhan penduduk dan juga ketidakpastian yang berkaitan dengan perubahan iklim, tindakan dan penglibatan lebih ramai pihak berkepentingan dalam usaha meningkatkan daya tahan masyarakat amat diperlukan. Majlis Keselamatan Negara, Jabatan Perdana Menteri Malaysia mengetuai inisiatif untuk membentuk Platform Kebangsaan bagi Pengurangan Risiko Bencana dan membangunkan Pelan Tindakan Malaysia dalam Pengurangan Risiko Bencana (MyDRR). Perundingan dengan pihak yang berkepentingan ini berterusan dalam mengenal pasti langkah-langkah untuk mengukuhkan pengurusan bencana di negara ini.

Bengkel Pengurusan Risiko Bencana: Memperkukuh Pelbagai Respons di Malaysia telah dianjurkan dengan kerjasama Majlis Keselamatan Negara (MKN), Jabatan Perdana Menteri Malaysia, Akademi Sains Malaysia dan Majlis Profesor Negara, pada 24-25 Oktober 2013 yang lalu, bertempat di Puri Pujangga, UKM Bangi. Bengkel ini bertujuan untuk mengukuhkan pelbagai respons dalam pengurangan risiko bencana di Malaysia. Objektif tersebut adalah untuk: a) Menyediakan platform bagi menghimpunkan pembuat dasar, pengamal dan penyelidik yang terlibat dalam pengurusan bencana; b) Menenal pasti langkah-langkah jangka pendek, jangka sederhana dan jangka panjang bagi mengukuhkan pengurusan bencana termasuk peranan pelbagai pihak berkepentingan; dan c) Mengesyorkan penyusunan institusi yang sesuai untuk membentuk platform kebangsaan bagi pengurangan risiko bencana di negara ini. Seramai hampir 50 orang peserta menghadiri Bengkel ini, terdiri daripada agensi kerajaan, swasta, sektor korporat serta badan bukan kerajaan (NGO) yang terlibat secara langsung di dalam bidang pengurusan bencana di Malaysia.

ASM Fellows' Lecture on "Disaster Risk Reduction in a Changing Climate" 24 October 2013, Puri Pujangga, UKM Bangi

ASM Fellows' Lecture series aims to provide an opportunity for Fellows to highlight their recent work and to share their expertise with ASM members, the scientific community and the general public. The inaugural lecture of Professor Dr. Joy Jacqueline Pereira, Fellow of the Academy of Sciences was delivered on 24 October 2014. It was jointly organised by the Academy of Sciences Malaysia (ASM) and the Southeast Asia Disaster Prevention Research Initiative, Universiti Kebangsaan Malaysia (SEADPRI-UKM). Besides ASM members, there were also participants from various government agencies, higher education institutions, and non-governmental organisations (NGOs). Attendees were from various backgrounds and included scientists, researchers and academics.

Professor Dr. Joy Jacqueline Pereira's lecture depicted the current scenario on disaster risk reduction and climate change in the policy and science domains in Malaysia. Emerging hazards including fast and slow onset events were highlighted in the context of a changing climate. The way forward proposed to reduce the impact of disasters on society was in advancing policy-relevant research, development and innovation.

Professor Dr. Joy Jacqueline Pereira is a Principal Fellow of the Southeast Asia Disaster Prevention Research Initiative, Universiti Kebangsaan Malaysia (SEADPRI-UKM). The Intergovernmental Panel on Climate Change (IPCC) has appointed Dr. Pereira as a Coordinating Lead Author for the Asia Chapter of its Fifth Assessment Report (AR5) on Impacts, Adaptation, and Vulnerability, which is due for release in March 2014. Dr. Pereira was entrusted by the Ministry of Natural Resources and Environment of Malaysia to lead the Policy Study on Climate Change under the Ninth Malaysia Plan, which resulted in the National Policy on Climate Change, 2009. She is currently involved in developing the National Disaster Risk Reduction Action Plan in conjunction with the National Security Council of the Prime Minister's Department. Dr. Pereira is President of the Geological Society of Malaysia and a Council Member of the Institute of Geology Malaysia. She is also a Vice-President (Research) of the Asian University Network on Environment and Disaster Management (AUEDM) and a Steering Committee Member of the Asia Pacific Adaptation Network (APAN) under the United Nations Environment Programme (UNEP). She was elected as Fellow of the Academy of Sciences Malaysia in 2012, under the Mathematics, Physics and Earth Sciences Discipline Group.



Prof. Dr. Joy Jacqueline Pereira FASc delivered her ASM Fellows' Lecture on "Disaster Risk Reduction in a Changing Climate".

Activities

Cooperation Agreement between Universiti Kebangsaan Malaysia and Cambridge Malaysian Education and Development Trust (CMEDT) & Malaysian Commonwealth Studies Centre (MCSC)

19 November 2013, Pullman Putrajaya

Koh Fui Pin

Universiti Kebangsaan Malaysia is to cooperate with an entity of the University of Cambridge to carry out research and academic activities on climate science and technology in Asia. A cooperation agreement was signed between the Cambridge Malaysian Education and Development Trust (CMEDT) in association with the Malaysian Commonwealth Studies Centre (MCSC) at Cambridge, and UKM to formalise the collaboration.



The Trustee and Joint Executive Chairman of CMEDT and MCSC, YABhg. Tun Dato' Seri Dr. Ahmad Sarji Abdul Hamid signed on behalf of the Trust while the Vice-Chancellor, Prof. Tan Sri Dato' Seri Dr. Sharifah Hapsah Syed Hasan Shahabudin represented UKM. The signing was witnessed by Emeritus Professor Lord Julian Hunt, the Visiting Fellow of the MCSC and UKM Deputy Vice-Chancellor (Academic and International Affairs) Prof. Datuk Dr. Noor Azlan Ghazali. Lord Hunt is also the Chairman of Cambridge Environmental Research Consultants Ltd., a company that carries out consultancy work on environmental research.

The cooperation agreement will establish the Asian Network for Climate Science and Technology (ANCST), which will, among others, promote disaster prevention and climate resilience in Asia through capacity building and outreach programmes. The web portal of the ANCST was also launched at the function. Tun Ahmad Sarji, who is also UKM Pro-Chancellor, said the agreement was timely as Asia experiences many of the natural disasters in the world. Referring to the recent super typhoon Haiyan which ravaged and devastated central Philippines earlier this month, he said more such disasters were expected to occur more frequently in the future. Super typhoon Haiyan is acknowledged as one of the worst ever climate disasters in the region. Tun Ahmad Sarji noted that the fifth report by the Inter-Governmental Panel on Climate Change (IPCC) in September 2013 projected that increases in rain related to monsoon was quite likely in East, South and Southeast Asia. This implied that there is potential for more disasters and therefore actions are required to address this.

The budget for the initiative will be provided by CMEDT and MCSC to mobilise partnerships among several universities and research centres in Asia. Through the cooperation agreement, UKM's South-East Asia Disaster Prevention Initiative (SEADPRI-UKM) will serve as the coordination centre for ANCST. In her welcoming remarks, Prof. Sharifah Hapsah said SEADPRI-UKM is a suitable choice to lead the national consortium of universities in conjunction with the Academy of Sciences Malaysia in carrying out research at the national level. She said the cooperation agreement was also aimed at supporting academic and research activities through exchanges and collaborations of common interest in the region.

Symposium on Climate Science & Technology for Disaster Prevention 20 November 2013, Pullman Putrajaya Lakeside

Koh Fui Pin

In conjunction with the International Conference on "Challenges of Extended Mega Urban Regions: The Changing Face of South East Asia and the World" which was held from 19 – 21 November 2013 in Putrajaya, Malaysia, the Asian Network for Climate Science and Technology (ANCST) organised its inaugural symposium on "Climate Science and Technology for Disaster Prevention". The symposium theme on climate science and technology required for disaster prevention particularly in the Asian region was strongly built around recognising the complex and special geographical characteristics of Asia that influence regional and local atmospheric and oceanographic phenomena and their interactions with the global climate. Climate variability is expected to cause more intense rainfall and typhoons which will eventually lead to more disasters associated with flooding. Its implications for the extended mega urban regions in Southeast Asia are not to be overlooked. The Symposium was convened by ANCST to identify elements of science and technology that are required to deal with the new challenges of risk management and climate adaptation for extended mega urban regions.

A total of seven papers presented by local and international scientists and practitioners provided insights into the science and challenges of climate change, and the research needed to address it. The keynote address on "Climatic and Urban Effects on Hazards and Impacts" was delivered by Emeritus Prof. Lord Julian Hunt, Trustee of the Cambridge Malaysian Education and Development Trust (CMEDT) and Visiting Fellow of the Malaysian Commonwealth Studies Centre of Trinity College, Cambridge.

Graduate Research

Bahaya Tanah Runtuh di Universiti Kebangsaan Malaysia

Norsafiah binti Sulaiman | Calon Sarjana Kajian Bencana (Bencana Geologi)

LATARBELAKANG

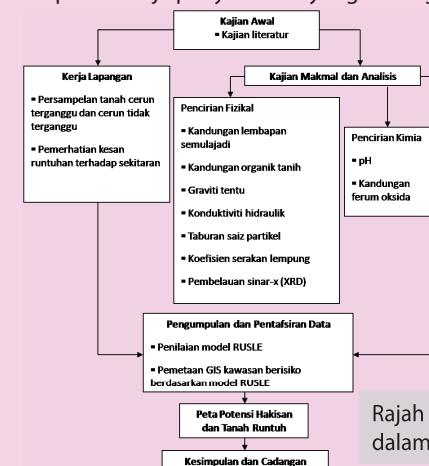
Geohazards bermaksud bahaya geologi, hidrologi atau geomorfologi yang menimbulkan ancaman pada manusia dan aktiviti-aktiviti mereka. Bahaya tanah runtuh merupakan salah satu contoh geohazards, sering terjadi di kawasan beriklim khatulistiwa seperti Malaysia. Tanah runtuh didefinisikan sebagai pergerakan tanah dan batuan menuruni cerun, dipengaruhi oleh tarikan graviti dan kegagalan ricih pada sempadan jisim yang bergerak. Tanah runtuh menjadi semakin teruk di kawasan beriklim khatulistiwa yang mengalami cuaca panas dan lembap sepanjang tahun, meningkatkan proses luluhawa yang menjadi faktor pencetus kepada kejadian tanah runtuh. Tanah runtuh yang berulang kali berlaku di kawasan yang sama memberi impak yang buruk, terutama terhadap alam sekitar dan infrastruktur sedia ada. Fenomena tanah runtuh yang semakin membimbangkan akibat peningkatan taburan hujan yang disebabkan oleh perubahan iklim mendorong para geosaintis untuk meningkatkan penyelidikan mengenai masalah tanah runtuh. Kajian mengenai tanah runtuh perlu dilakukan bagi tujuan mengurangkan kesan yang terpaksa dihadapi dan mengelakkan fenomena tersebut daripada terus berlaku. Oleh itu, Peta Potensi Tanah Runtuh UKM akan dihasilkan sebagai panduan dan persediaan dalam menghadapi kemungkinan berlaku tanah runtuh di kawasan yang berisiko mengalami kegagalan cerun.

OBJEKTIF

Dalam mengenalpasti bahaya tanah runtuh di kampus UKM, kajian dijalankan bertujuan untuk: i) membuat pengkelasan tanah runtuh di setiap stesen persampelan di kampus UKM; ii) mengkaji sifat fiziko-kimia sampel tanah di kawasan cerun terganggu dan cerun tidak terganggu di UKM; iii) mengenalpasti potensi bencana tanah runtuh dan hakisan melalui penilaian model RUSLE, LHEF dan GIS; iv) menghasilkan Peta Potensi Tanah Runtuh di UKM Bangi menggunakan pemetaan GIS.

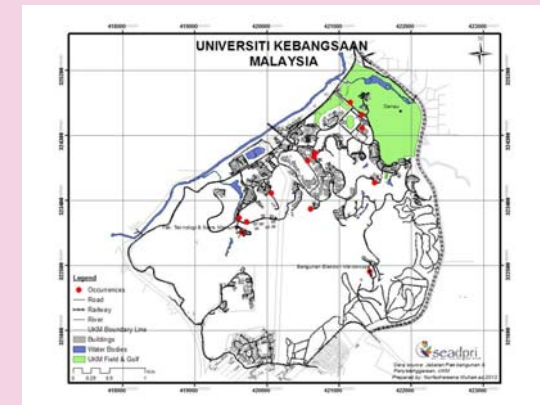
METODOLOGI

Kajian dijalankan berpandukan pada Rajah 2, dimulai dengan kajian literatur, kerja lapangan, kajian makmal dan analisis fiziko kimia sampel tanah serta diakhiri oleh pemetaan Peta Potensi Tanah Runtuh di UKM melalui pemetaan GIS. Bahagian yang bertanda biru mewakili kerja-kerja penyelidikan yang telah dilakukan dan bahagian tidak berwarna merupakan kerja penyelidikan yang sedang dijalankan.



Rajah 2: Kaedah kajian dalam penyelidikan

KAWASAN KAJIAN



Rajah 1: Pemetaan lokasi persampelan

Kajian tanah runtuh ini dijalankan di kampus induk Universiti Kebangsaan Malaysia (UKM) yang terletak di Bangi, Selangor. Topografi kawasan kampus menunjukkan keadaan permukaan tanah yang rata, beralun serta permukaan tanah yang bercerun merupakan sebahagian daripada Formasi Bukit Kenny. Kawasan kampus UKM ini terdiri daripada batuan jenis granit, metasedimen dan alluvium. Sebanyak 13 kes tanah runtuh yang dikenalpasti berlaku di sekitar kawasan kampus dipilih sebagai lokasi persampelan dan ditunjukkan menerusi Rajah 1.

HASIL AWAL

Pengkelasan dilakukan berdasarkan pemerhatian dan panduan pengkelasan tanah runtuh di Malaysia dikategorikan kepada tujuh kelas seperti yang berikut:

Kelas	Lokasi	Kawasan kejadian
Rayapan	Pusanika	
Aliran	Loji Pandu Fak, Sains dan Teknologi (FST)	
Kegagalan khas	Fak. Teknologi dan Sains Maklumat (FTSM)	
Kegagalan kompleks	Institut Alam Sekitar (EiMAS)	
Gelongsoran berganda	F. Sains Sosial & Kemanusiaan (FSSK), F. Pendidikan (FPEND)	
Gelinciran cetek	Puri Pujangga, Bgn. Wawasan, Belakang Pusanika	
Gelinciran dalam	Danau, Pusat Penyelidikan, Selekoh Zaaba, Makmal SEM	



PENYELIDIK
Norsafiah Sulaiman telah memperolehi Ijazah Sarjanamuda Sains dengan Kepujian (Sains Sekitaran) dari Universiti Kebangsaan Malaysia pada Oktober 2012 dan sedang melanjutkan pelajaran di peringkat Sarjana dalam bidang Kajian Bencana (Bencana Geologi) di Pusat Penyelidikan Kajian Bencana Asia Tenggara (SEADPRI-UKM).

Fokus Penyelidikan:
Tanah Runtuh, Hakisan, Kegagalan Cerun, Sains Tanah, Geosains

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Graduate Research

Toxicity Biosensor as an Early Warning Tool in Environmental Risk Assessment

Angeline Ooi Lia | Master of Disaster Studies (Technological Hazards) Candidate

BACKGROUND

The numbers of reports on the increase of harmful environmental pollutants detected in human habitats are sufficient cause for concern and provide good reason for devising a fast and accurate analytical technique to assist in the environmental monitoring process. A risk assessment is conventionally carried out via interpretation of laboratory animal exposure experiments and via analytical chemical analysis, both of which do not provide any toxicity information of pollutants to wildlife and humans. The biosensor is made up of a receptor which will combine with the target molecules and a signal transducing component which changes the coupling of targeted molecules into measurable signals. Its advantages as an assessment tool are that it is able to show the toxicity effects of hazardous pollutants, and enables assessments to be performed on-site and has high sensitivity. Besides, it is economical and very small-sized.

STUDY LOCATION

The study location is Universiti Kebangsaan Malaysia where samples were collected from water sources within its main campus in Bangi, Selangor. Part of the Langat River Basin will be of interest as it is an area which gathers domestic and industrial wastes. The Langat River is 78 km in length with an area of 2350 km². Langat Basin is one of the river basins in Malaysia, and has a current population density of close to 1 million. The river basin is also reported to face many environmental challenges with the massive increase in population and increased industrial development over the years.

OBJECTIVE

The objective of the study is to fabricate a sensitive ecotoxicity biosensor to detect hazardous environmental pollutants. It also explores the potential of the fabricated biosensor as an early warning tool in environmental risk assessment.

METHODOLOGY

The research methodology is divided into two major parts. The first part is fabrication of ecotoxicity biosensor. This involves the culturing and harvesting of targeted bacterial cells, immobilization of bacterial cells on selected matrices and also the optimization of significant parameters of the biosensor. The second part is on environmental risk assessment with ecotoxicity biosensor. This involves the exposure of the biosensor to existing pollutants in real environments, particularly in wastewater. The dose-response data of the ecotoxicity biosensor will be interpreted to provide water toxicity information of the targeted water sources.

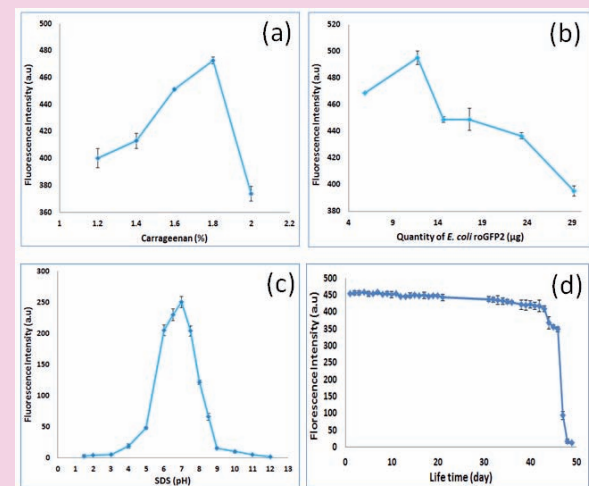
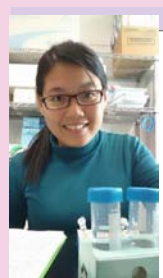


Figure 2: (a) Optimization of immobilization matrix percentage; (b) Optimization of bacterial cell density; (c) Optimization of pH of analyte (sodium dodecyl sulfate); (d) Life time study of fabricated toxicity biosensor.

PRELIMINARY FINDINGS

The toxicity biosensor has been fabricated with immobilized Escherichia coli roGFP2 on κ-Carrageenan matrix. Parameters such as matrix concentration, pH of suspension buffer, cell density and working pH range have been optimized. The life span of the fabricated toxicity biosensor has been studied (Figure 2). The toxicity biosensor has been exposed to surfactant (Sodium dodecyl sulphate, SDS), metal ions (Copper and Cadmium) and metalloids derivatives (Arsenate, Tellurite, Tellurate and Selenite). SDS is a very widely used surfactant either in household or industrial applications. It is hazardous to wildlife and humans either acutely or chronically in high concentrations. The metals and metalloids selected are major pollutants in water resources which raise poisoning and toxicity issues of the users in many countries. The fabricated toxicity biosensor showed high sensitivity to the selected pollutants, and shows potential for use as an early warning tool in environmental risk assessment, especially in water monitoring.



THE RESEARCHER

Ooi Lia obtained her Bachelor of Science (Genetics) with Honours from the Universiti Kebangsaan Malaysia in 2007. In her previous career, she worked on gene hunting, DNA sequencing of orthopaedic patients and also parasites in livestock. She is now pursuing her Master of Disaster Studies (Majoring in Technological Hazards) at the Southeast Asia Disaster Prevention Initiative (SEADPRI), Universiti Kebangsaan Malaysia.

Research Interests:

Toxicity biosensor, environmental monitoring, hazardous chemical detection, risk assessment.

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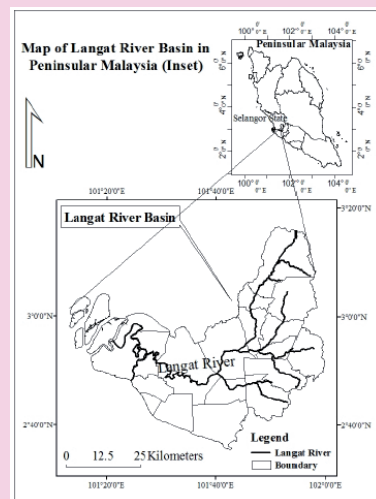


Figure 1: Map of Langat River Basin

Graduate Research

Geospatial Technology as a Tool to Support Decision-Making in Reducing Risk of Disasters

Nurfashareena Muhamad | Doctor of Philosophy (Climatic Hazards) Candidate

BACKGROUND

Development of slopes and hilly areas may be prone to landslide hazards and result in significant losses to the community, damage to infrastructure and degradation of the environment. The risk of landslide disasters, however, can be reduced if development is planned and carried out systematically, by carrying out various stages of site investigation so that construction is planned according to land suitability and constraints; and if there is effective management before and after construction. Therefore, proper systematic development entails great attention and planning to develop and manage the risks associated with minimizing any potential negative impacts. The advancement of Geographical Information System (GIS) technology plays a role towards this purpose by integrating land information to support planning. Generally, the capacity and potential of GIS is often utilized for mapping and processing spatial data and visualizing meaningful information. Maps have a strong visual impact and are an ideal way to visualize pre-construction, ongoing, or post-construction and disaster risk assessments as well as to assist in making decisions that have immense capabilities to explain scientific evidence and facts for policy considerations. In fact, GIS provides solutions and also evaluates different aspects of a particular problem in order to produce endpoints that are supportive of a management decision.

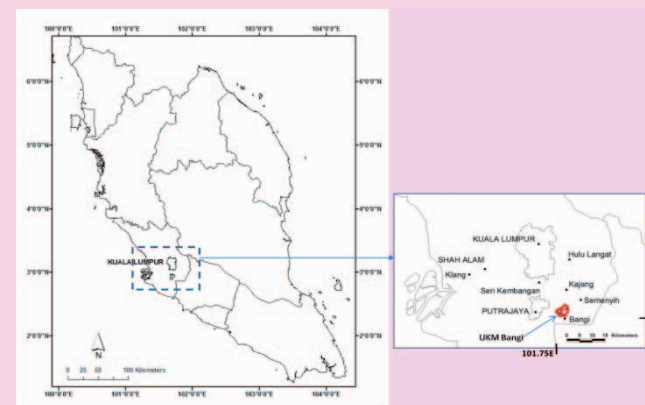


Figure 1: Location of UKM.

STUDY LOCATION

This study was carried out in Universiti Kebangsaan Malaysia. There have been a series of landslides of various intensities, causing damage to buildings and infrastructure in the university. About 16 locations that have been affected were identified. Clearly, there is need to design a proper disaster management strategy for this campus to reduce the risks of landslides, and to prevent this hazard from turning into fatal disasters.

OBJECTIVE

The aim of the study is to highlight the usability and potential of geospatial technology for disaster management. The study also aims to demonstrate more clearly how GIS can be used as a supporting tool in decision-making on disaster management.

METHODOLOGY

Methods employed in this study comprise an analysis of geological terrain, fieldwork, hazard assessment, and classification of priority zones for proper disaster management.

PRELIMINARY FINDINGS

The findings delineated four zones of priority that are prone to landslide hazards. These are a) FSSK Zone with the Faculty of Social Sciences and Humanities in it, b) FTSM Zone with the Faculty of Information Science and Technology, c) Ungku Omar Residential College Zone, and d) PERMATA Pintar Zone (Figure 2). Information about these priority zones can be used by the Development and Maintenance Department of UKM to aid their decision-making process in development planning. This is an example of the usefulness of the method in developing a decision support system for disaster risk reduction. This information can also assist in developing programmes to enhance disaster preparedness of the community. The findings of the study support the promotion of a sustainable campus where the community is resilient, the infrastructure well-maintained and the environment well-managed. The study has provided scientific documentation on how modern geospatial technology such as GIS serving as a decision support tool in managing disasters, where the method employed can be expanded to a larger spatial region to address disaster-induced problems.

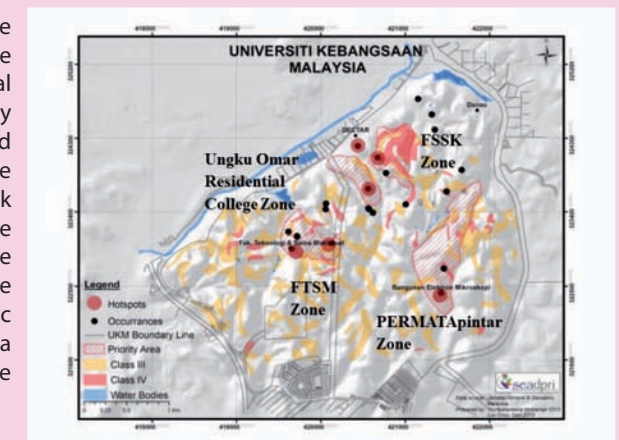
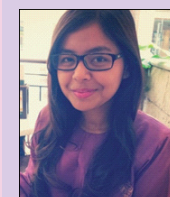


Figure 2: Priority Zones of UKM.



THE RESEARCHER

Nurfashareena completed her B. Sc. in Remote Sensing (Honours) from the University of Technology Malaysia in 2012. She is currently pursuing a PhD in Disaster Studies majoring in Climatic Hazards at the Southeast Asia Disaster Prevention Research Initiative (SEADPRI), Universiti Kebangsaan Malaysia.

Research Interests:

Research interests: Geographic Information System (GIS), Remote Sensing, Disasters, Disaster Risk Reduction

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