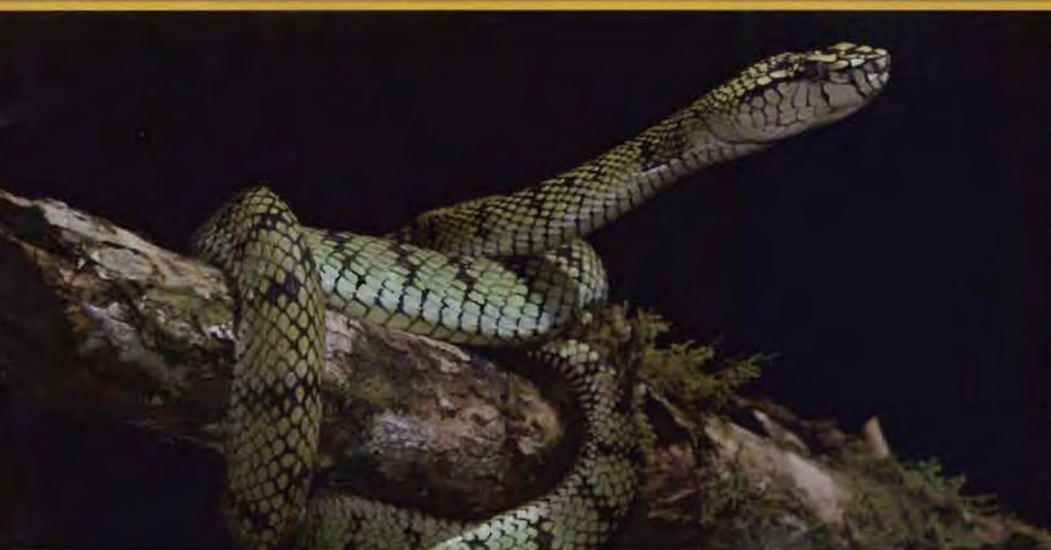


OUTREACH

UNIMAS RESEARCH BULLETIN | Vol.7 No.2 | AUGUST 2013

ISSN : 1985-2053



- UNIMAS Shines in the 1st Global Telecentre Awards at Granada, Spain.
- Centre of Excellence for Business, Economics and Finance Forecasting (BEFfore) - Latest CoE in UNIMAS
- Herpetological Assemblages along Altitudinal Transects on Gunung Penrissen, Sarawak
- EMMML-EAT: Epidemiology Markup Language (EMML) with Epidemiological Analysis Tool (EAT)

Fast Facts on UNIMAS

Date established (incorporated) 24 December 1992
Campus Site Kota Samarahan, Sarawak, Malaysia
 (about 25 km from the city of Kuching, the capital city of Sarawak)

Present Vice Chancellor Prof Dato' Dr Mohamad Kadim Suaidi

Student Enrolment (Academic Session 2012/2013)	Undergraduate	12,298
	Postgraduate	1,204
	Total	13,502

Full time staff	Academic	775
	Management	181
	Support	1,239
	Total	2,195

Faculties

Faculty of Applied and Creative Arts (FACA)
 Faculty of Cognitive Sciences and Human Development (FCSHD)
 Faculty of Computer Science and Information Technology (FCSIT)
 Faculty of Economics and Business (FEB)
 Faculty of Engineering (FE)
 Faculty of Medicine and Health Sciences (FMHS)
 Faculty of Resource Science and Technology (FRST)
 Faculty of Social Sciences (FSS)

Institutes

Institute of Biodiversity and Environmental Conservation (IBEC)
 Institute of East Asian Studies (IEAS)
 Institute of Health and Community Medicine (IHCM)
 Institute of Design and Innovation (InDI)
 Institute of Social Informatics and Technological Innovations (ISITI)

Centres

Centre for Academic Information Services (CAIS)
 Centre for Pre-University Studies (CPUS)
 Centre for Graduate Studies (CGS)
 Centre for Language Studies (CLS)
 Centre for Information and Communication Technology Services (CICTS)
 Centre for Applied Learning and Multimedia (CALM)
 Centre for Technology Transfer and Consultancy (CTTC)
 Research and Innovation Management Centre (RIMC)
 Centre for Student Development (CSD)

Centres of Excellence

Malaria Research Centre (MRC)
 Center for Water Research (CWR)
 Centre of Excellence for Rural Informatics (CoERI)
 Centre of Excellence for Renewable Energy (CoERE)
 Centre of Excellence for Image Analysis and Spatial Technologies (CoEIMAST)
 Centre of Excellence for Semantic Technology and Augmented Reality (CoESTAR)
 Centre of Excellence for Disability Studies (CoEDS)
 Center of Excellence for Sago Research (CoESR)
 Centre of Excellence for Business, Economics and Finance Forecasting (BEFfore)

International Linkages

75 International Partners Worldwide (Active)

Centre for Academic Information Services

Volume of Books	221,214
Sets of Media Materials	11,482
Journal Titles (Print and Electronic)	48,377
E-Books	1,505,398

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Highlighted events of the year.

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Introduction to this Issue



of a successful business entrepreneur and as one of UNIMAS' stakeholders. I am also pleased to announce the setting up of a new Centre of Excellence for Business, Economics and Finance (BEFfore). This marks the university's expanding endeavours and will serve as a catalyst for individual as well as the nation's economic development.

our continuous research initiatives, UNIMAS the importance of partnerships and networks at national and international levels. This year, we signed a number of Memorandum of Understandings (MoUs) with international institutions and organisations from France, Japan, Namibia, and with our local partners, such as, Malaysia Productivity Corporation (MPC), Dermaga Builders Sdn Bhd, and Universiti Tenaga Nasional (Uniten). We believe that these collaborations will create valuable opportunities for us to achieve a greater impact in our contribution towards sustainable development and social transformation.

It is my pleasure to welcome you to the August issue of Outreach. The translation of UNIMAS strategic plan into reality requires the continuous support and commitment from all UNIMAS staff. The university is conscious of its responsibility to set a clear vision and is moving towards a more ambitious goal despite some setbacks. Although we have dipped in the Top 200 QS Asian University Ranking 2013 from 161 to 181, UNIMAS has maintained its position as the 7th university in Malaysia that is listed in this ranking system. Our research endeavours continue to be acknowledged and recognised through various awards won at both national and international levels. We have also seen more publications from our academics in reputable journals, and many young academics are joining the folds of those whose research findings are cited by researchers worldwide. Undoubtedly, our researchers are making a mark in their respective fields by relentlessly pursuing answers to important questions and producing inventions to address seemingly impossible-to-solve problems. We are confident that through the continuous efforts in research, publication and innovation by more academics, we will climb in our stature as a leading university.

In this issue, I am grateful to Mr Vincent Ting, our UNIMAS alumni, for sharing with us his thoughts from the perspective

There has been an upsurge of interest in UNIMAS science and research niche areas and this interest will reach even greater heights when we approach the critical mass of active researchers. To prepare for the challenging times ahead, it takes a combination of committed researchers who persevere despite difficulties, and supportive management who are committed to the best interests of the university and the staff. This symbiosis is what we will strive hard to achieve. I would like to extend my gratitude to all our researchers for making 2013 a year in which research at UNIMAS continues to grow. I would like to thank all our collaborators and partners for their generous support in facilitating our research endeavours.

Thank you.

Prof Dr Peter Songan

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RESEARCH NEWS

UNIMAS QS ASIAN UNIVERSITY RANKINGS 2013



Malaysian universities in 2013 QS University Rankings: Asia

Institution	2013 rank	2012 rank
Universiti Malaya	33	35
Universiti Kebangsaan Malaysia	57	58
Universiti Sains Malaysia	61	63
Universiti Teknologi Malaysia	68	75
Universiti Putra Malaysia	72	76
International Islamic University Malaysia	151-160	151-160
Universiti Malaysia Sarawak	181-190	161-170
Multimedia University	201-250	191-200
Universiti Teknologi Mara	201-250	201-250
Universiti Teknologi Petronas	201-250	201-250
Universiti Tenaga Nasional	201-250	251-300
Universiti Utara Malaysia	201-250	251-300
Universiti Malaysia Perlis	201-250	-
Limkokwing University of Creative Technology	251-300	251-300
Universiti Malaysia Pahang	251-300	-
Universiti Malaysia Terengganu	251-300	301+
Universiti Tun Hussein Onn Malaysia	251-300	251-300
Universiti Tunku Abdul Rahman	251-300	251-300

UNIMAS is still in the top 200 QS Asian University Ranking 2013. This year UNIMAS is ranked 181 in Asia, and is within the top seven universities in Malaysia. The criteria for the QS Asian University Ranking include international students exchanges and citations of publication. Therefore, this ranking is a recognition of the research effort made by UNIMAS academics serves to inform us of our position in the world.

UNIMAS R&D EXPO 2013



UNIMAS successfully organised the 6th R&D Expo 2013 from 20-21 March 2013. The theme for this year Expo is “Promoting Commercialisation through Innovative R&D”. The Expo is divided into four different clusters, namely, Pure Sciences, Technology and Engineering, Information and Communication Technology, and Social Sciences/Humanities. The exhibits include creative

designs utilising recycled materials, environmental engineering, robotic technology, medical tools, information and communication technology (ICT), augmented reality systems and soft sciences. The 6th UNIMAS R&D Expo 2013 is therefore a step towards achieving excellence in research for UNIMAS.

UNIMAS SHINES IN THE 1ST GLOBAL TELECENTRE AWARDS

eBario has won two international awards in the 1st Global Telecentre Awards. The awards ceremony, organised by Telecentre.org Foundation (TCF) and Spark, was held in Granada, Spain. The awards were received by Mr Stanley Isaac, on behalf of the Bario community and UNIMAS’ Institute of Social Informatics and Technological Innovations (ISITI). There were six different categories and “eBario Innovation Village” was selected as the Grand Winner and Global Community Choice’s (through online voting) in the Best Telecentre Innovation category. The project is funded by the Indigenous Peoples’ Assistance Facility of the International Fund for Agricultural Development (IFAD).



Mr Stanley Isaac was sponsored by the organisers to attend the Award Ceremony

UNIMAS AWARDED HONOUR OF INVENTION AT I-ENVEX 2013



The Faculty of Engineering, UNIMAS won five medals and a “Honor of Invention” Award from the World Invention and Innovation Exhibition (i-ENVEX 2013)

held at Universiti Malaysia Perlis (UniMAP) on 16-19 April 2013. The representatives comprised five undergraduate students led by Dr Mohd Danial Ibrahim. Cathy Ambrose was awarded Gold and the “Honor of Invention” for “Mobile Automated White Pepper Retting Machine Integrated with Crude Enzyme Solutions”. The product was a collaborative research with UNIMAS’ Faculty of Resource Science and Technology, led by Dr Azham Zulkharnain. Bong Sik Hsiang won Silver for “Design and Development of Pastry Shell Forming Machine for Small Cottage Industry”. Siti Noor Haizum Semait, Ting Huong Hung and Curt Henning Bartholomew won Bronze for three research inventions namely, of “Painless Needle Quadrupletip Micro-needles”, “i-Peg: Smart Clothes Air Drying Solution” and “Automated Pepper Retting Machine”, respectively.

INNOVATIVE AND OUTSTANDING PARTICIPANT AWARD

Organised by Universiti Kebangsaan Malaysia (UKM) in collaboration with Higher-Education Leadership Academy of the Ministry of Higher Education (AKEPT-KPT) and Stevens Institute of Technology, USA, this programme was held from 2-7 June at Holiday Inn Hotel, Melaka with participation from 12 higher learning institutions nationwide. At the end of the programme, teams presented their business plan to a panel of Malaysian industry experts and investors, namely, from Malaysian Venture Capital Management Berhad (MAVCAP), MyAgri Group, Malaysia Technology Development Corporation (MTDC) and Kumpulan Modal Perdana Sdn. Bhd. The UNIMAS team led by Prof Dr Mustafa Abdul Rahman with the aid of team members from UTHM, UMK and USM presented Dr Azham Zulkharnain’s “Toxic Tracker” business plan. Dr Azham was later awarded the “Innovative and Outstanding Participant” Award for an exceptional business plan presentation.



CENTRE OF EXCELLENCE FOR BUSINESS, ECONOMICS AND FINANCE FORECASTING (BEFfore) - LATEST CoE IN UNIMAS

The Centre of Excellence for Business, Economics and Finance forecasting (BEFfore) was established in UNIMAS in May 2013 and is anchored at the Faculty of Economics and Business. The Centre would be the platform and reference point for Business, Economic and Finance forecasting. With the focus on modeling and forecasting, BEFfore would be unique and stand out from the other centres in Malaysia. At present, the Centre is allocating grants for potential researchers/scholars in the Faculty of Economics and Business aiming at increasing the number of principal investigators. In this manner, BEFfore will spearhead collective research and development using the elements of forecasting. With reliable forecast results, appropriate policy making decisions would be made possible for Malaysia to maintain a sustainable economic growth and even prosper towards achieving Vision 2020.



RESEARCH HIGHLIGHTS

Herpetological Assemblages along Altitudinal Transects on Gunung Penrissen, Sarawak

Researcher: Indraneil Das

Institute of Biodiversity and Environmental Conservation, UNIMAS

The 1,329 m Gunung Penrissen dominates Western Sarawak, and forms the boundary between the state and Indonesia's Kalimantan Barat Province, and is drained mainly by Sungei Semadang and the headwaters of the Batang Kayan. The geology of this massif comprises a matrix of sandstone and karst features, rising to the rugged ridges of the Penrissen range. The first biotic inventory was conducted by Robert Shelford (1872–1912), a former Curator of the Sarawak Museum, in May 1899. Although Shelford's own interest was entomology, significant botanical and zoological material were collected, which formed the basis of research by later workers, including ferns (Brooks, 1912), insects (Cameron, 1928; Keline, 1926), amphibians and reptiles (Smith, 1925) and birds (Wells et al., 2001).

Penrissen lies outside the protected area system of Sarawak, but is listed among the Important Bird Areas of the world by BirdLife International (www.birdlife.org). Threats to the area include resort development, poaching and habitat fragmentation. The area has a long history of agriculture, especially rice, although rubber and pepper are also grown in all except the steepest terrain. Extraction of metallic and non-metallic minerals may also comprise a threat to the landscape in the future. Major development projects commenced in the Gunung Penrissen area in the last decade, with the view of promoting ecotourism and golf-tourism, the environmental effects of which remain largely unstudied. The 2,071 hectare resort, now operational close to the summit (at ca. 950 m asl), was planned by a Hawaii-based consortium, and included an ambitious plan of development, including removal of most of the native vegetation, which was replaced with an 18-hole golf course and a 25 acre area of 'flower garden and theme parks'. On Gunung Kinabalu, Sabah, anthropogenic disturbances on low elevation areas are known to have a pronounced effect

on amphibian diversity. Baseline information on Penrissen's biodiversity is, however, meagre, the existing information stemming from Shelford's collection based on a single visit to these mountains.

We conducted intensive sampling along transects and sampling stations that was established along the mountains to collect data on the distribution and habitat use by herpetofaunal groups. Such information will be useful for the management and conservation of the area, as the stated objective of the various bodies (private land-owners and the government) is balanced economic, environmental and social development of the region. Additionally, the new information will be invaluable in formulating conservation action plans and therefore be invaluable inputs to national and international conservation documents. Transects established will remain a resource for researchers from UNIMAS and elsewhere for future use.

Important discoveries made include a population of *Ansonia latidisca*, that was reported in the British science journal, *Nature* (2011; 475:270), whose life history is being studied by IBEC graduate student, Ong Jia Jet for an M.Sc. Also collected were numerous other species of amphibians and reptiles, several of which were, surprisingly, known only from the Kinabalu-Crocker Range, over 700 km to the east, in Sabah State. Specimens as well as genetic material obtained during our studies has been, and will, for years to come, serve as resources for investigations into the ecology, systematics and phylogeography of several herpetological groups. These discoveries are expected to further highlight the rich biodiversity of Sarawak and that of Western Borneo.

This project was supported by a Shell Chair Grant, SRC/05/2010(01), from the Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak.



Figure 1: Graduate Research Assistant, Pui Yong Min, at one of many waterfalls at Gunung Penrissen



Figure 2: Cryptic speciation in cat geckos, *Aelurosalabotes felinus*, as initially revealed by silver iris in the population inhabiting the upper reaches of Penrissen (left), contrasting with the green iris in the population from the lower reaches of the same mountain (right)

Computational Modeling and Simulation of EHD Ion-Drag Pumping

Researchers: Shakeel Ahmed Kamboh¹, Jane Labadin¹, Andrew Ragai Henry Rigit², and Ling Teck Chaw³

¹Faculty of Computer Science & Information Technology, UNIMAS

²Faculty of Engineering, UNIMAS

³Faculty of Computer Science & Information Technology, University of Malaya

The theoretical modeling of EHD pumping is a complex process governed by the electrostatic and hydrodynamic partial differential equations. The exact solution of these equations is quite difficult therefore, numerical methods are used to investigate and simulate the EHD pumping. In most cases, numerical solution is obtained using available simulation packages based on the finite element methods that limit the analysis with built-in functions. A schematic diagram of an EHD ion-drag micropump is shown in Figure 1.

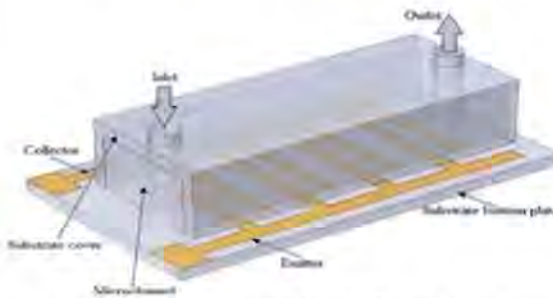


Figure 1: A schematic diagram of an EHD ion-drag micropump

In this project, the EHD Ion-Drag pumping was first simulated using COMSOL Multiphysics where a maximum pressure head of about 2350 Pa and maximum mass flow rate of 0.4 g/min at an applied voltage 1000V is achievable with the proposed design of micropump. Due to the limitation observed in analysing using the simulation package, the EHD ion-drag pumping at the microscale is then simulated by using finite difference method. A user defined code is written in MATLAB and the interactive simulation patterns for electric potential, electric field, velocity field and pressure field are obtained

and the numerical results are in agreement with the result obtained using the simulation package. The comparison of the numerical results using FDM on MATLAB and FEM on COMSOL is shown in Figure 2.

However, as these approaches run on a single processor, the execution time is found to be too long since the numerical solution becomes complex for the computationally intensive model. To reduce the computation time, a suitable parallel computing architecture is proposed. The next aim is to achieve a fast finite difference solution of electric potential in an EHD ion-drag micropump. For this, parallel numerical solution of electrostatics Poisson's equation was obtained on a cluster of low cost computers. A simple parallel computing algorithm was implemented on MATLAB distributed/parallel computing environment. The aim was to speed up the computation and to analyse the performance of the system. It was found that the system is more efficient for the larger data size and for each data size there is an optimum number of workers for obtaining the parallel numerical solution in minimum processing time. The communication time could be reduced by decreasing the inter-worker dependencies. The next focus is in reducing this communication time.

The initial work is supported by Ministry of Science, Technology and Innovation (MOSTI), Malaysia, under the eScience project 06-01-09-SF0066. The scholarship for Shakeel Ahmed Kamboh is sponsored by Zamalah Postgraduate UNIMAS. The current work is supported by University Malaya Fundamental Research Grant RG107-12ICT.

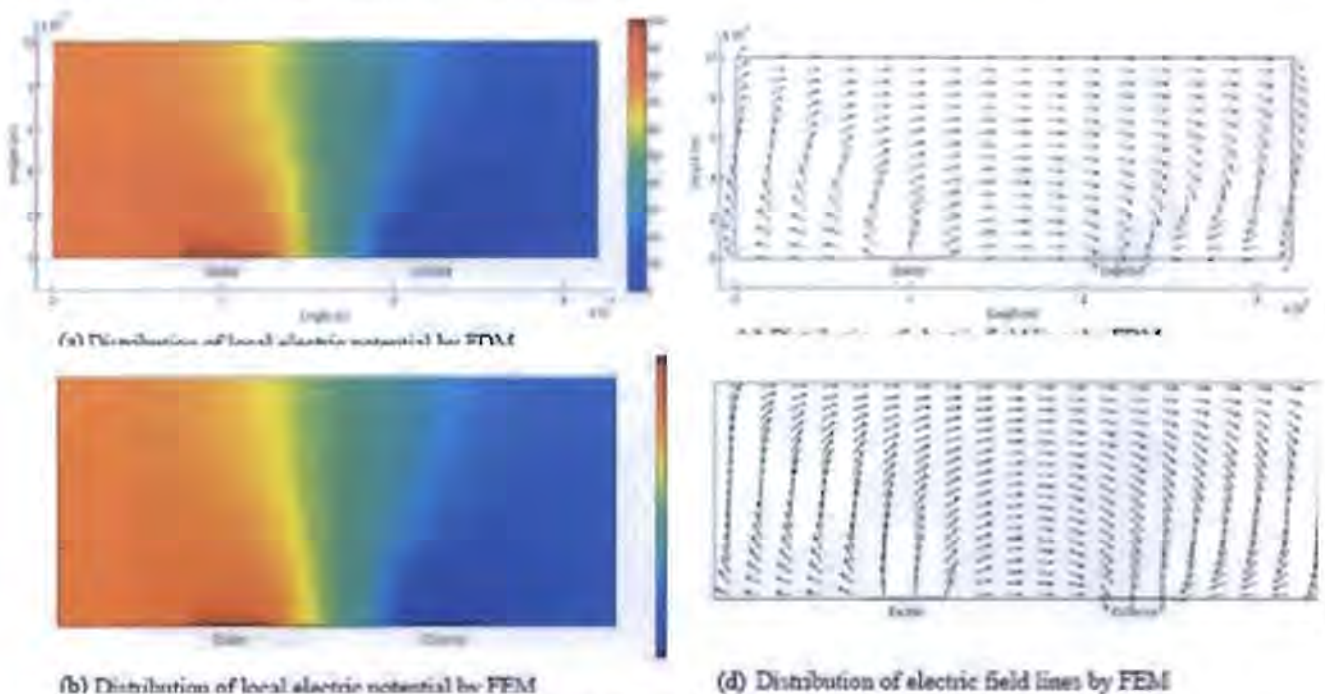


Figure 2: Comparison of the numerical results using FDM on MATLAB and FEM on COMSOL

A Study on the Utilisation of Finely Ground Waste Glass in Cementitious Materials

Researchers: Norsuzailina Mohamed Sutan¹, Ibrahim Yakub¹, Sinin Hamdan¹, Delsye Teo Ching Lee², Zainal Abidin Talib², and Saleh Jaafar³

¹Faculty of Engineering, UNIMAS

²Faculty of Science, Universiti Putra Malaysia

³Faculty of Engineering, Universiti Putra Malaysia

The disposal of waste materials presents a complex problem for many agencies worldwide therefore the need to recycle and reuse waste materials like glass is imperative. The efforts to use such non-conventional materials which are typically of local or regional origin in concrete will be boosted if there are systematic and comprehensive studies to quantify the performance of concretes containing such materials.

This study focuses on the effectiveness of using waste glass as cement replacements. Previous studies have shown that waste glass has pozzolanic characteristics that can potentially enhance the performance of cementitious materials. Glass modified mortar samples were prepared with water-to-cement ratio (w/c) of 0.5. Two types of glasses: Clear (Type I) and Green glass (Type II) were used as 10%, 20% and 30% cement replacement by weight. Samples were cured at room temperature (32° C) and 90% relative humidity. Powdered samples were prepared and tested at 28 days of hydration for pozzolanicity test using FT-IR. Cement used was Ordinary Portland Cement (OPC) (ASTM Type I recognized by ASTM C150) manufactured by Cahaya Mata Sarawak Cement Sdn. Bhd (CMS) and it exceeded the quality requirements specified in the Malaysian Standard MS 522: Part 1: 1989 Specifications for OPC.

To study the pozzolanicity of glass modified mortar, comparative physicochemical analyses were performed using Fourier

Transform Infrared Spectroscopy (FTIR). The mix proportion was set at 1:0.4:1.67 for all samples that were casted into Universal Container 30ml, 28 X 85mm for FTIR. All samples were dry-cured in the concrete laboratory with average temperature (T) of 32 °C and average relative humidity (RH) of 90%. WGM mortar samples were prepared with water to cement ratio of 0.5 and 10%, 20% and 30% of type of glass I and type of glass II cement replacement by weight.

Results in Figure 1 and 2 showed that the optimum dosage for both Type I and Type II FGWG cement replacement is 10%. The optimum dosage for the FGWG cement replacement is 10%. This applies for both Type I and Type II glass. 10% of cement replacement of FGWG in cement paste results in higher production of CSH compared to control sample. Pozzolanic reaction occurs as the production of CSH increased due to the higher surface area of FGWG particle. Besides that, the addition of FGWG also improved the hydration rate of cement paste and produced more CH in the early stage of hydration.

This research is supported by the Fundamental Research Grant Scheme, FRGS/03(07)/839/2012(73) from the Ministry of Higher Education (MOHE), Malaysia.

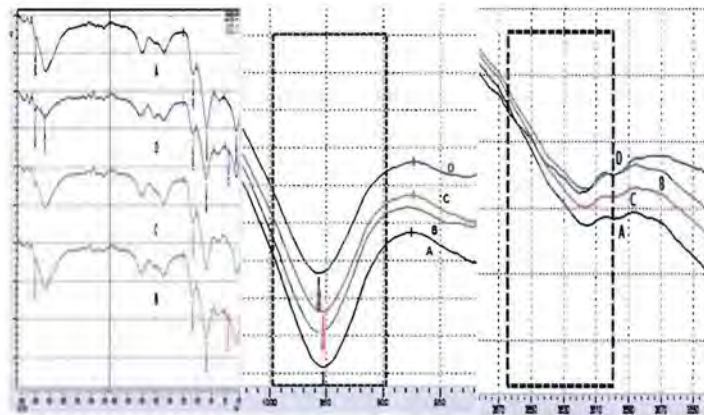


Figure 1: FT-IR Spectra of Cement Paste Sample at 28 days with (A) 10% Type I (B) 20% Type I (C) 30% Type I (D) Control

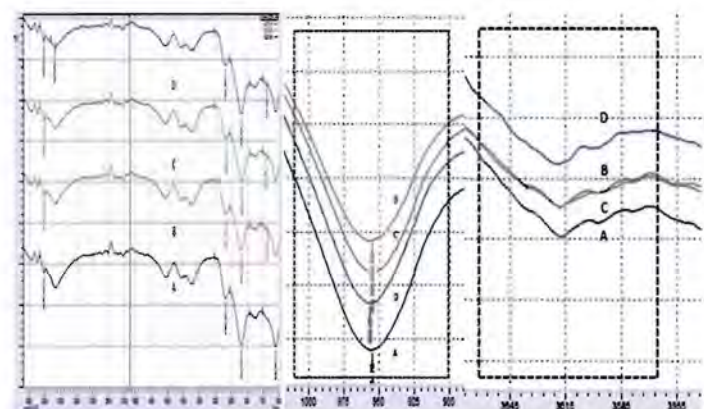


Figure 2: FT-IR Spectra of Cement Paste Sample at 28 days with (A) 10% Type II (B) 20% Type II (C) 30% Type II (D) Control

Communicating Risks of Influenza Outbreaks to Sarawak Rural Communities: What Do We Know?

Researcher: Rohaya Mohd-Nor

Faculty of Economics and Business, UNIMAS

The global threat of pandemic influenza is widely acknowledged in the literature. A study that was published in 2012 estimated that the number of death related to influenza H1N1 infection, for the first 12 months of 2009 influenza virus circulation, is between 151,700 and 575,400 people. Malaysia experienced the first H1N1 outbreak between April and September 2009. To date, there have been several more new cases of H1N1 outbreaks in Malaysia reported in the news.

The ultimate aim of this research is to develop a workable and adaptable framework that can clearly illuminate the participation of the interrelated systems within the local context. This framework will address the effective ways of communicating health information that promotes empowerment of rural communities to have an effective self-care practice, which no doubt can curb the potential spread of outbreaks. The research team comprises members from FEB, FRST and FMHS, and also, two MSc research students.

The outcomes from the first phase, which investigated and assessed the level of awareness and attitudes of Serian and Baram communities, revealed several interesting findings. Based on the survey outcomes (Baram and Serian), we found a relatively low level of knowledge and awareness particularly about the characteristics of the illness and how H1N1 virus can transmit. A majority of the survey respondents (Baram and Serian) however reported good understanding and awareness about the effective self-care practices that can prevent the

influenza spread. In Serian, the top five sources to obtain information about the influenza were families, relatives, friends or neighbours, radio, television, newspapers, and government health talk seminars or campaigns. In Baram, only half of the respondents believed that H1N1 is an infectious disease.

The second phase of the project used data from a series of focus groups (conducted at Baram and Serian) and interviews to gain insights about how the interaction and relationship between multiple systems (family, community, healthcare agency and others) and the dissemination of health information can increase the individual understanding and awareness about the H1N1 risk and prevention. The focus group method has permitted us: to obtain useful data from the rural participants where the quantitative method such as survey is not feasible; to understand the interaction and communication styles of these communities, and to gain a deeper understanding about the impact of individual role in the family unit as well as in the community context; and to gather the rural participants who come from different ethnic group, age, gender as well as social class in the community within just a short period of time. Overall, this study engages System Theory to explore the context of rural communities in seeking, obtaining and using health information products related to pandemic influenza A H1N1 risk and prevention.

This project is supported by the Fundamental Research Grant Scheme, FRGS/05(32)/804/2011(73) from the Ministry of Higher Education (MOHE), Malaysia.



Health Talk with the Communities at Long Bedian

Isolation and Purification of Rice Tungro Viruses by Sucrose-density Ultra-centrifugation

Researchers: Magdline S.H. Sum¹, Yee Siew Fung^{1&2}, Lily Eng², and David Perera¹

¹Institute of Health & Community Medicine, UNIMAS

²Agriculture Research Centre, Semongok, Department of Agriculture, Sarawak

Rice tungro disease (RTD) is one of the most destructive diseases of rice in South and Southeast Asia, where epidemics of the disease have occurred since the mid-1960s. Outbreaks of the disease can affect thousands of hectares and in severe cases, result in 100% yield loss. RTD is caused by two viruses, an RNA virus, the rice tungro spherical virus (RTSV) and a DNA virus, the rice tungro bacilliform virus (RTBV). RTSV is grouped in the family Sequiviridae and has a single strand of polyadenylated RNA genome of about 12 kb that encodes a single large open reading frame while RTBV on the other hand, has a circular double-stranded DNA genome of 8 kb, encoding four open reading frames and is of the family Caulimoviridae. RTD is routinely detected based on visual observation of the plant.

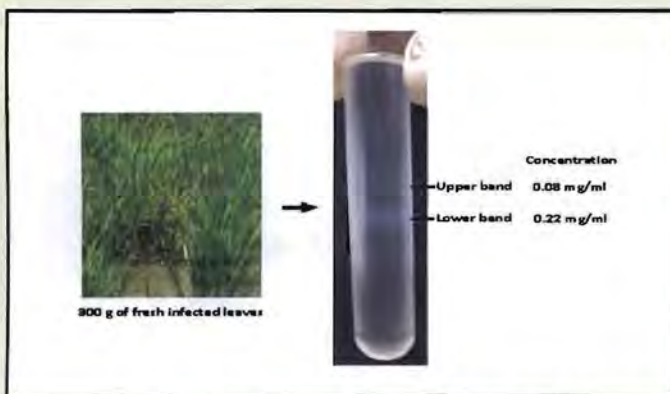


Figure 1: Sucrose gradient purification of RTSV and RTBV

However, it is not always easy to identify the disease in the field as it is often confused with other diseases or physiological disorders such as nitrogen deficiencies and water stress. In Malaysia, Sarawak is the only state that is reportedly still free of RTD. It is important therefore, for a rapid and reliable method to detect tungro viruses, for management and prevention of RTD, should the disease appear in Sarawak. A serological assay is one such method. However, the setback of a serological approach is the availability of anti-sera. In this study, we have attempted to develop a simple and effective method to purify tungro

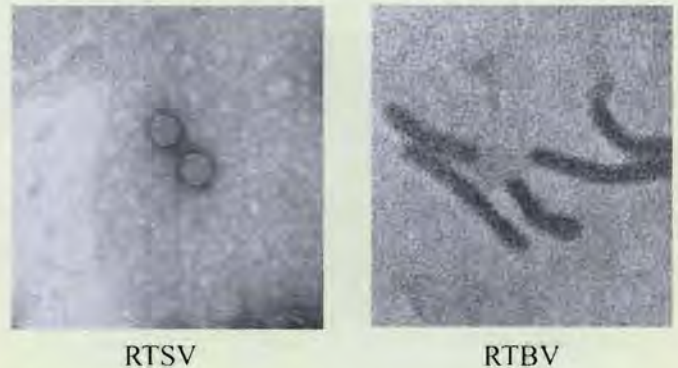


Figure 2: Electron microscope images of purified RTSV and RTBV

viruses for anti-sera production which can then be used in an ELISA based detection assay.

Using a modified sucrose-density gradient we have been able to successfully purify consistent amounts of virus particles (Figure 1). Purified particles of both RTSV and RTBV have been confirmed by electron microscopy (Figure 2).



Figure 3: ELISA detection of virus particles using rabbit anti-sera

Purified virus particles were used to immunize rabbits for anti-sera production. Initial findings have demonstrated that the anti-sera is reactive to both viruses in a preliminary ELISA based serological assay (Figure 3).

PRODUCT & TECHNOLOGY TRANSFER

EMML-EAT: Epidemiology Modeling Markup Language (EMML) with Epidemiological Analysis Tool (EAT)

Researchers: Alex Lee Choong Young and Terrin Lim
Faculty of Computer Science and Information Technology, UNIMAS

Introduction of Product

EMML is the first ever mark-up language standard for the perusal of scientists in the epidemiology community. For the first time, researchers can do away with the hassle of programming codes in MATLAB, JAVA, C++ when trying to generate data results. This product allows the researcher to focus on the model's parameters and equations.

EAT is the first ever model editor and simulator tool for the EMML standard and disease transmission modelling. Researchers can easily create compartments, parameters and equations while generating simulated results in either an easy-to-use tabular or graphical interface for faster analysis of the results.

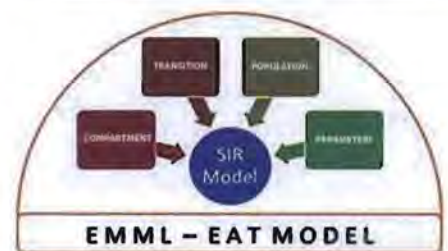
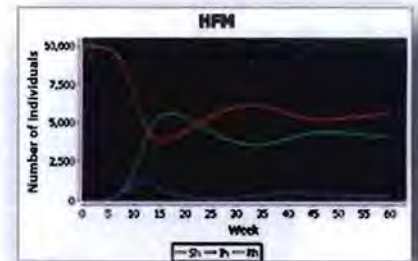
Description of Product

Based on the popular XML schema, EMML is intended to be the first common format for epidemiologists around the world to adopt when performing epidemiology modeling. EAT consists of a model editor and model simulator that is created using Java platform and has several useful functions such as creating new epidemiology models, editing existing models, configuring parameters, executing modeling simulations, and visualising the results in tabular and graphical forms.

Also, these models can be imported or exported to an EMML text file for portability. The interface allows a degree of flexibility and ease-of-use for epidemiologists who are unfamiliar with programming complex mathematical equations to derive epidemiology models. With the EMML-EAT, epidemiologists can spend more time on designing and analysing their models and significantly less time on programming and simulating them while also sharing it in a common EMML format with their peers and colleagues.

Advantages of this Product

- Disease modeling can be done on the fly. It is fast and efficient in generating results, thus giving more time to researchers to focus on data output analysis.
- A standardised format means publishable results can be scrutinised and re-used by the epidemiology community for future disease transmission modelling.
- It ensures the longevity of the disease model beyond the lifespan of the software as EMML standard is the preservation of researchers' hardwork in constructing the model.



The epidemiological model uses compartmental modeling and is represented by a set of differential equations that are solved using the Runge-Kutta method

Evolution of a Traditional Rice Milling Machine

Researchers: Ervina Junaidi, Siti Noor Linda Taib, Magdalene Andrew Munot, Mahshuri Yusof and Mohd Shahril Osman
Faculty of Engineering, UNIMAS

In poor rice growing countries, a traditional rice milling machine is commonly used to mill raw paddy into rice. The use of this single step rice machine has problems which include crushed milled rice mixed with husks, high operational costs, limited mobility and pollution of the environment from paddy waste/husks. The estimated milled rice recovered is only about 55%

which is low in comparison to the standard milled recovery of 68% to 70%. As a result, the commercial rice milling sector no longer uses this traditional milling machine. There is a need to develop a cost-effective, lightweight and portable rice milling machine, particularly for domestic use. This machine can be used domestically or in a small scale industry. The present

invention uses a tube-like frame to support the components, thus reducing the weight of the machine. The absence of an electric motor makes it environmentally friendly and quiet. This project is supported by the Centre of Excellence on Renewable Energy (CoERE), UNIMAS and OSAKA Gas Research Grant.



ErPoRM1

Key Machine Components

- (1) Hopper, (2) Husk Removing Mechanism, (3) Polishing Mechanism, (4) Grain Separator Mechanism, (5) Series of Inclined Trays, (6) Starter Mechanism, (7) Adjustable Chair and (8) Tube-like frame.

Figure 1: Key Machine Components

Product Improvements

- ❖ Reduced grain breakage
- ❖ Manually operated
- ❖ Environmentally friendly
- ❖ Quiet
- ❖ Lightweight & portable

Milling Performance

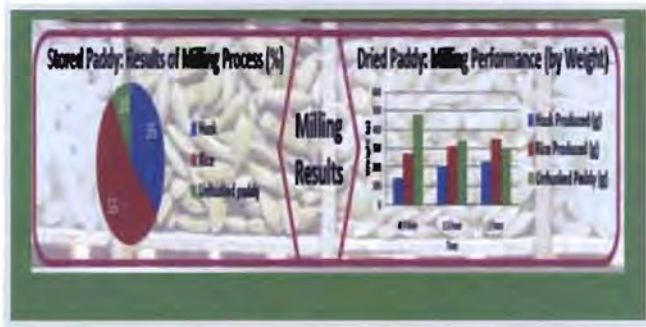


Figure 2: Rice Milling Performance

MyPeatPel: The Portable Peat Fuel Pelletizer

Researchers: Siti Noor Linda bt Hj Taib, Ervina bt Junaidi, and Mahshuri bt Hj Yusof
 Faculty of Engineering, UNIMAS

MyPeatPel or the Portable Peat Fuel Pelletizer is a device specially designed to produce pellets made of peat soil or any other type of biowaste. The aim was to find an alternative fuel source which could be used domestically, for example in cooking. Although peat is commercially used as an alternative source of energy in many countries, locally, it is considered a less desirable soil. As peat occurs in abundance it would make an ideal alternative fuel. This idea has led to the creation of MyPeatPel to assist users to prepare peat pellets for domestic use. The device has many advantages, namely, ease of operation and portability. It is also environment friendly as it requires no fuel energy to produce the pellets.

This project is supported by the Centre of Excellence on Renewable Energy (CoERE), UNIMAS, OSAKA Gas Research Grant, and 1 Menteri IPTA Grant (KeTTHA).



Figure 1: Peat Pelletizer



Figure 2: Peat Pellet in Use

NETWORKING

UNIMAS and University of Limoges, France collaborate on PhD programme



Universiti Malaysia Sarawak (UNIMAS) signed a memorandum of agreement (MoA) on a joint PhD programme with University of Limoges, France on 2 July 2013. The collaboration will see UNIMAS Engineering PhD candidate Dayang Salyani Abang Mahmud pursuing her PhD research under the joint supervision of Professor Dr Jean Claude Labbe and Dr Nicolas Glandut of University of Limoges; and Professor Dr Amir Azam Khan and Dr Magdalene Andrew Munot of UNIMAS. The MoA follows a general memorandum of understanding (MoU) signed on 17 January 2008 by French Member-HEI's (Higher Education Institutes), UNIMAS and 10 other Malaysian universities. The signing took place after the opening of the Sixth International Engineering Conference (EnCon 2013) at Hilton Hotel, Kuching. Infrastructure Development and Communication Minister Dato Sri Michael Manyin Jawong witnessed the signing. Also present was UNIMAS Deputy Vice-Chancellor (Research and Innovation), Professor Dr Peter Songan.

MoA with Dermaga Builders Sdn Bhd on Green Technology



UNIMAS signed a memorandum of agreement (MoA) with Dermaga Builders Sdn Bhd to transfer to industry and society the product of research on clean water from green technology. This collaboration binds the two organisations to a venture

in manufacturing water treatment machinery for industrial and domestic applications, explore potential engineering consultancy project in these areas by bringing together research skills and business experience, along with future development in water treatment technology and machinery. The MoA between UNIMAS and Dermaga Builders Sdn Bhd was signed by UNIMAS Vice-Chancellor Professor Dato' Dr Mohamad Kadim Suaidi and the company's executive chairman Dato Che Mat Wanik. The signing took place after the opening of the Sixth International Engineering Conference (EnCon 2013) at Hilton Hotel, Kuching.

MoA with UNITEN on Renewable Energy



UNIMAS also signed a memorandum of understanding (MoU) with Universiti Tenaga Nasional (UNITEN) after the opening of the Sixth International Engineering Conference (EnCon 2013) at Hilton Hotel, Kuching, on 2 July 2013. UNIMAS was represented by its Vice-Chancellor Professor Dato' Dr Mohamad Kadim Suaidi and UNITEN by its Vice-Chancellor Dato Seri Professor Mashkuri Yaacob. "The signing of this MoU will enable both universities to plan cooperation in renewable energy, promoting cooperation in areas such as research collaboration in Biomass, Bio-Fuel and Solar Thermal Power Generation," said Professor Dato' Dr Mohamad Kadim Suaidi. Other collaborations included joint facilitation and supervision of postgraduate studies, exchange of academic staff, joint research, teaching activities and student exchange programmes.

International Linkage with University of Kitakyushu (UKK) in Japan and the Executive Director of Japan-Malaysia Association

A delegation from The University of Kitakyushu (UKK) in Japan and Executive Director of Japan-Malaysia Association paid a courtesy call to the Vice-Chancellor of UNIMAS, Professor Dato' Dr Mohamad Kadim Suaidi on 11 June 2013 at

NETWORKING

the Vice-Chancellor's Office. The delegation from Kitakyushu University comprised Prof Dr Takekawa Daisuke, Professor of Anthropology, Mr Yoichi Kamino, Director of International and Regional Affairs Department and Ms Yumiko Shibata, International Exchange officer. During the 30 minutes visit, Mr Yoichi Kamino gave an overview of the university and the city of Kitakyushu which was selected by OECD as the first model city for green growth in Asia. The UKK also proposed to develop partnership with UNIMAS through its project for the Promotion of Global Human Resource Development, Ministry of Education in Japan. Present during the visit were Professor Dr Kasing Apun, Head of International Affairs Division, UNIMAS, and Madam Sakai Kazue from Insar Tours & Travel, Kuching. After the courtesy visit, the delegation held further discussion with the International Affairs Division, lecturers from Centre of Language Studies, Faculty of Economics and Business and the Faculty of Resource Science and Technology. The discussion covers matters on study exchange, staff exchange, Japanese language programme, spring/summer programme for the students from UKK. Both parties agreed to further explore the possibility of formalising this partnership through a memorandum of understanding (MoU).

MoU with Malaysia Productivity Corporation (MPC)



On 4 June 2013, a memorandum of understanding (MoU) was signed between Universiti Malaysia Sarawak (UNIMAS) and Malaysia Productivity Corporation (MPC). The MoU was signed by Professor Dato' Dr Mohamad Kadim Suaidi on behalf of UNIMAS and Dato' Mohd Razali Hussain on behalf of MPC. The ceremony was witnessed by YB Dato' Sri Mustapa Mohamed, the Minister of International Trade and Industry. Besides joint consultancies, research and development collaborations, the MoU paves the way for UNIMAS' researchers to enhance their research capabilities on various competitive facets and strategies in improving

productivity and competitiveness at industry, sectoral, national and international levels. The other collaborative partners that were present during the ceremony were Universiti Sains Malaysia, Universiti Malaysia Kelantan, Institute of Marketing Malaysia, Universiti Teknologi Malaysia, Universiti Utara Malaysia, Universiti Islam Antarabangsa, Iskandar Regional Development Authority, Universiti Tun Hussein Onn Malaysia and Open University, Malaysia.

UNIMAS delegates visit Polytechnic of Namibia (PON) to promote cooperation in many fields



The Polytechnic of Namibia (PON) recently hosted a delegation from Universiti Malaysia Sarawak (UNIMAS) during a meeting in which representatives of the two institutions discussed the possibility of expanding the areas of cooperation in their existing partnership. The meeting followed the establishment of a formal relationship between the two institutions after Professor Tjama Tjivikua, PON, and the then UNIMAS Vice-Chancellor, Professor Datuk Dr Khairuddin Ab Hamid, signed a memorandum of understanding (MoU) in November 2012. Since the signing, the two institutions have primarily cooperated in the area of Information Technology, specifically the development and use of information communication technology (ICT) for use in rural communities. During the visit, Professor Datuk Dr Khairuddin Ab Hamid was accompanied by Professor Dr Peter Songan, UNIMAS Vice-Chancellor for Research and Innovation, Associate Professor Dr Alvin Yeo, Director of the Institute of Social Informatics and Technology Innovation at UNIMAS, and Datin Dayang Maryani Abang Zain. Professor Tjivikua gave a presentation on PON and said that there is a large scope for cooperation between the two institutions. Some of the areas he emphasised included renewable energy, ICT policy and regulation, wild animal tracking technology, indigenous medicine and business science. The MoU creates a platform for cooperation between the two institutions in a wide range of areas, including faculty, staff and student exchanges, collaboration in research, joint programmes of studies and exchange of academic intellectual property.

STAKEHOLDER SPEAKS



Mr Vincent Ting

The passage from the university to a professional working life is besieged with challenges. They emanate from the endeavour to marry academic, scientific and technical idealism with the constraints of society. As professionals, we seek to achieve the best cost-benefit ratio for our professional proposals and recommendations which aim to produce the most altruistic balance between the good and the bad.

My foray into environmental consultancy started in the year 2002 with the birth of Envisar Sdn Bhd, a firm in which I am now a principal. The idea of the company was forged after I completed the Master of Environmental Science (Land Use & Water Resource Management) degree at UNIMAS, under the sponsorship of what was known back then as the Danish Cooperation for Environment and Development (DANCED). My gratitude goes to UNIMAS for bringing in the programme and DANCED for the sponsorship and collaboration. Now, a decade later, Envisar Sdn Bhd, which is based in Kuching, Sarawak, is a firm founded on the principle of what was learnt in this programme. The company is one of the forerunners in environmental and natural resource works in Sarawak. It engages in both sectorial and multi-disciplinary studies and research covering all areas of resource development, be it agriculture/plantation, aquaculture/fishery, roads/infrastructure, realty (including high-rise buildings), quarry and mining projects. Envisar's projects have included soil and water quality, air and noise quality, flora and fauna, plankton, benthic and socio-economic surveys in virtually the nooks and corners of Sarawak, from Tanjung Pueh in Sematan, to Merapok in Lawas. Currently, Envisar is into areas such as laboratory work, GIS and remote sensing, safety and health, and social research.

The transition from academic learning in the university into practice is challenging particularly in a developing country like Malaysia, different people have different perceptions of what constitutes the environment. The boundary or the scope of work is often difficult to define, infused with many grey areas. The environment comprises so many parameters that are so amorphous, malleable, constantly changing and intangible, mutating with place, time and people. Different stakeholders (consultants, clients, authorities and the public) all have a different perspective of what is important and what is to be included.

Finding practical solutions to environmental problems is so often constrained by the lack of knowledge and also the lack of expertise. Such shortcomings may be due to science not being able to produce the answer, or technology being made prohibitively expensive. The scarcity of university graduates in environmental or natural sciences who can think and analyse critically, who have good communication and writing skills, who have the ability to apply academic knowledge to the real world, and who possess a genuine interest in the field, is one of the great impediments in the advancement of the environmental consultancy industry.

Human resource is an area where the university can make a contribution. The university should endeavour to produce graduates who are employable and who possess the right attitude rather than mere good grades. Research in the university should also be geared to producing results that can be applied to solve real life problems.

Insufficient standards or guidelines further hinder the development of the environmental profession. In this respect, there has been little development since the Natural Resources and Environment (Amendment) Ordinance, 1993 (Cap. 84 - Laws of Sarawak) was enacted almost 20 years ago. Consequently, environmental professionals frequently find themselves squashed between what the government wants and what the client wants.

In many instances, time also poses a constraint in meeting professional work objectives. Our services are often commissioned and sometimes back dated to placate authorities and to meet regulations and not for the sake of environmental conservation. They are often carried out too late, after all governmental approvals have been obtained, making it problematic for the consultants to make any decent and meaningful recommendations. The time frame allocated for studies is often too short, with the excuse that it will result in costly delays of projects. Environmental impact can be subtle, and disastrous consequences may only be revealed over a long period of time but continual research is time-consuming and costly and hence frequently not conducted.

A review of existing environmental policies and frameworks in Sarawak is urgently required in order to improve the environmental system and processes in the State. Thus far, the picture is messy like ill-fitting pieces of puzzle shoved together resulting in gaps, overlaps, distortions and inconsistencies. There is a pressing need to better define where environmental assessment should fit in the overall project planning process. It should not be treated like a trash can where things that do not belong anywhere else are discarded. Such a move is necessary to improve social acceptability of recommendations.

Even though environmental solutions may be costly at times, the use of life-cycle cost analysis may change that perspective. Project proponents usually see only immediate cost but have no interest in the overall cost to the community. This problem can be mitigated by the government engaging consultants in the pre-project stage, and this cost can be later charged to the party interested in carrying out the project. For example, Environmental Impact Assessment (EIA) should be regarded as a planning tool, to be engaged right from the conception of the project rather than mere paperwork to satisfy regulations at a much later stage.

Environmental solutions are often about taking a middle or moderate path for the greater good of our community given what we know, and can achieve and afford. Uplifting the environment through a better management system is a little like catching fish; each stakeholder must raise the net together in tandem in order to get the harvest. We must not rely on any single stakeholder. Last but not least, political will must also be there without which we are just deceiving ourselves in our pursuit of a better and more enlightened world.

RESEARCH & CONSULTANCY

Market Demand Analysis for Sibujaya Housing Development Project

Researchers: Ernest Cyril de Run, Liew Khim Sen, Puah Chin Hong, and Mohammad Affendy Arip
Faculty of Economics and Business, UNIMAS

An initial discussion was held between UNIMAS and Sarawak Housing Development Cooperation (HDC) on market demand study. After much discussion, HDCamp Sdn Bhd, a joint venture company with HDC, has commissioned UNIMAS Holdings Sdn Bhd to conduct a study for a market demand analysis for its Sibujaya housing development project. The study commenced in May 2013 and is expected to be completed by the end of August 2013. The scope of work includes site visit to the housing site, consultations with management of the joint venture company (HDCamp) and other persons of interest, data collection

vis-à-vis in-depth interview and survey studies in Sibujaya, Kanowit, Selangau, Sarikei and Meradong; data key in, analysis and write up; and presentation of the findings. This project is one of the many consultancy works that has been carried out by the members with HDC. The study identified market demand for the various proposed types of medium cost housing development project in Sibujaya. The researchers also developed various recommendations with the aim of a successful sale of the houses to be developed in Sibujaya. The team of researchers from UNIMAS visited Sibujaya and interviewed various persons of interest and a large scale data

gathering was carried out where 1896 respondents were obtained. A comprehensive time based development of the Sibujaya project by types of houses was also developed. The researchers also looked at why eligible persons did not want to purchase houses at Sibujaya and came out with proposed marketing plans to overcome these issues. Presentations of the findings and our recommendations were made to the Board and were well accepted. UNIMAS is committed to provide high quality consultancy services and with this experience, we are one of the experienced housing development forecasting and market demand analysis teams in Sarawak.



Research sites

SEMINARS & CONFERENCES

Conference on Contemporary Issues in Accounting and Finance 2013 (CoCIAF 2013)



The Faculty of Economics and Business, Universiti Malaysia Sarawak (UNIMAS) has successfully organised the Conference on Contemporary Issues in Accounting and Finance 2013 (CoCIAF), on 11-12 April 2013. With the theme of "Bridging the Gap between Theory and Practice", CoCIAF 2013 has been a platform for academicians, researchers, practitioners, policy makers to interact and exchange viewpoints and research findings on contemporary issues in accounting and finance.

6th International Engineering Conference (EnCon2013)



Engineering Conference (ENCON) has been and still is the flagship of international conference organised by the Faculty of Engineering, Universiti Malaysia Sarawak (UNIMAS) for the last several years. After the success of its 5 previous ENCON's held since 2007 to 2012, ENCON is now organised annually. This year, the 6th International Engineering Conference (ENCON 2013) was held at Hilton Hotel, Kuching on 1-4 July 2013. The theme of ENCON 2013 was "Energy and Environment" which is in line with the major regional and global issues of green technology and sustainable development. The conference is co-organised by Institute of Engineers, Malaysia (Sarawak Branch), Quaid-e-Awam University of Science and Technology (QUEST), Pakistan, and Centre of Excellence in Renewable Energy (CoERE), UNIMAS.

8th Conference on Information Technology in Asia (CITA2013)



The Conference on Information Technology in Asia (CITA) is an international event organised bi-annually by the Faculty of Computer Science and Information Technology, Universiti Malaysia Sarawak (UNIMAS). In 2013, the 8th CITA was held at Four Points by Sheraton Hotel in Kuching. With the theme "Smart Devices Trend: Technologising Future Lifestyle", the conference was focusing beyond creation and technology trends in smarter

devices that are intuitive and innovative and yet non-intrusive in the lives of citizens. CITA is a multiple tracks conference that includes workshops, keynote speakers, invited speakers as well as oral and poster presentations. The conference act as a forum for research group, academics, computer scientists, engineers and practitioners to present recent results, computer applications and promising future directions in smart devices.

1st Borneo Research Education Conference (BREC 2013)



The 1st Borneo Research Education Conference (BREC 2013), co-organised by Swinburne University Sarawak, Universiti Teknologi Mara (UiTM) Sarawak, and Universiti Malaysia Sarawak (UNIMAS), was held on 20-21 August 2013 at Swinburne Campus, Kuching. This is the first in a series of events organised by the participating institutions in order to enhance research education in the Borneo region. It was intended to be a regular event that would eventually grow to involve other universities from all parts of the Borneo Island. Two key aspects of research education, which are developing as a researcher and the culture of sharing, were the focus of this conference.

9th International Conference on Cognitive Science (ICCS 2013)

The International Conference on Cognitive Science (ICCS 2013) was held in Kuching, Sarawak on 27-30 August, 2013. ICCS 2013 was the 9th international academic event of the International Association for Cognitive Science (IACS). This conference was the continuation from the great success of previous ICCS in Seoul (1st ICCS 1997) to ICCS 2010 in Beijing. The conference brought together researchers from various disciplines of Cognitive Science, including Anthropology, Artificial Intelligence, Education, Linguistics, Neuroscience, Philosophy and Psychology, in both academia and industry, to discuss the latest research, application and development in the field.

Asia Pacific Marketing & Management Conference (APMMC2013)

The Asia Pacific Marketing & Management Conference (APMMC2013), hosted by the Faculty of Economics & Business, Universiti Malaysia Sarawak (UNIMAS), will be held in Kuching on 20-22 November 2013. The theme for the conference is "Sustainable business strategies: Shaping the future of Asia Pacific Region". This conference will be a gathering platform for academics and business communities to discuss and share knowledge on current issues relating to the marketing and management effort in the Asia Pacific region. The participants can further enhance and enrich their knowledge on the dynamism of marketing and managing business environment through stimulations of cross-disciplinary and cross academic-practitioner discussions and networking.

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