

OUTREACH

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- UNIMAS Excelled at Seoul International Invention Fair 2011(SIIF 2011)
- Bridging UNIMAS to Industries
- IBEC's Sarawak Dolphin Project: Moving from Strength to Strength
- Agriculture Support System and Field Tools: Oil Palm Tree Crown

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 Datuk Dr Khairuddin Ab Hamid

Student Enrolment (Academic Session 2011/2012)	Undergraduate	9,568
	Postgraduate	939
	Total	10,507

Full time staff	Academic	764
	Management	178
	Support	1394
	Total	2,158

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 Social Informatics and Technological Innovations (ISITI)
Institute of Design and Innovation (InDI)

Centres

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

Centres of Excellence

Malaria Research Centre
Centre for Water Research
Centre for Rural Informatics
Centre for Image Analysis and Spatial Technologies
Centre for Renewable Energy
Centre for Semantic Technology and Augmented Reality
Centre for Sago Research
Centre for Disability Studies

International Linkages

61 International Partners Worldwide (Active)

Centre for Academic Information Services

Volume of Books	209,153
Sets of Media Materials	10,550
Journal Titles (Print and Electronic)	43,995

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Prof Dr Peter Songan

Editor

Prof Dr Haji Mustafa Abdul Rahman

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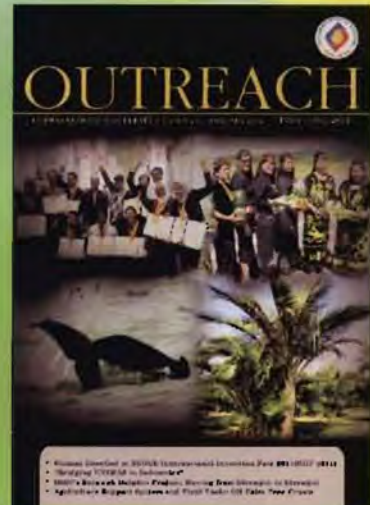
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Cover Design

Highlighted events of the year.

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Introduction to This Issue

As we begin the new year, I am pleased to welcome you to this issue of Outreach. The last half of 2011 had been very rewarding whereby our researchers, who participated in the Seoul International Invention Fair 2011 (SIIF 2011) and the International Exposition of Research and Invention of Institutions of Higher Learning 2011 (PECIPTA 2011) made UNIMAS proud by winning various awards. Furthermore, it is also my pleasure to announce that we have secured international grants during the same period, a testament of the hard work and dedication by our dynamic researchers. Congratulations!

As part of our efforts to serve the society, UNIMAS continues to be involved in community projects. These projects, such as the tourism participatory approach, the

rural electrification and the green energy island concept, highlight the endeavours to better the standard of living of the rural population. Furthermore, we are honoured to have Professor Dr Roger Harris, a Visiting Professor at the Institute of Social Informatics and Technology Innovation (ISITI) contributing a stakeholder's perspective on UNIMAS work in rural communities and among the indigenous people.

In our vision to become an exemplary university of internationally acknowledged stature and a scholarly institution of choice, it is imperative for us to work closely with our international colleagues. On this, we have successfully signed Memorandum of Understanding (MoU) with international institutions of higher learning from China, Taiwan, Japan and Indonesia. These MoUs allow exchanges of students and faculty members as well as joint research work which will be beneficial to us and our partners.

With that, I would like to take this opportunity to wish you "Happy New Year 2012" and I sincerely hope this year would be successful in our research endeavours. All the best.

Prof Dr Peter Songan

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RESEARCH NEWS

UNIMAS EXCELLED AT SEOUL INTERNATIONAL INVENTION FAIR 2011 (SIIF 2011)

The Seoul International Invention Fair 2011 (SIIF 2011) organised by the Korea Invention Promotion Association (KIPA) was held at the Korea Convention Centre, Seoul, South Korea on 1st–4th December 2011. Participating in SIIF 2011 were universities, research institutions, individual inventors and corporate companies worldwide. This year, 663 inventions from 31 countries were exhibited in the fair and 87 inventions were from Malaysia. Of this, 12 were showcased by UNIMAS researchers and all of them were awarded with a medal: 7 Gold, 2 Silver and 3 Bronze. This achievement takes UNIMAS a step closer to its aspiration to become a research university by 2015.



UNIMAS researchers with their medals and certificates at the Seoul International Invention Fair 2011 (SIIF2011).

UNIMAS AT PECIPTA 2011

UNIMAS took part in the International Exposition of Research and Invention of Institutions of Higher Learning 2011 (PECIPTA) from 13th to 15th September 2011.

PECIPTA was organised jointly by the Ministry of Higher Education and Universiti Teknologi MARA, with the theme “To bridge innovation: From academia to the business industry.” UNIMAS showcased 25 projects and attained 1 gold and 7 bronze medals. The Gold Medal was awarded to Dr Ng Giap Weng from Faculty of Cognitive Sciences and Human Development with his research entitled “Mobile ARUT Android Browser™ Version 1.0.



Dr Ng Giap Weng (centre) with co-researcher, Abdullah Al Jubair (left) and Prof Dr Peter, Deputy Vice Chancellor for Research and Innovation (right) showing their gold medal and certificate.

BRIDGING UNIMAS TO INDUSTRIES

The Centre for Technology Transfer and Consultancy (CTTC) has recently re-examined CTTC’s functions through brainstorming and strategic planning sessions. CTTC is now the bridge that links UNIMAS to the rest of the world and *vice versa* with a new motto: “*Bridging UNIMAS to Industries.*” Guided by this new vision, CTTC aims to transform UNIMAS pool of academicians into high quality consultants who will support development projects in our country. Secondly, CTTC will also be committed to transforming UNIMAS intellectual properties into commercialised products. Thirdly, CTTC will transform the knowledge

that resides in the intellectuals at UNIMAS into courses that provide lifelong learning opportunities for all to improve their productivity.

The branding efforts continued with the development of CTTC's new website, its corporate video and printing of CTTC's contemporary brochures. CTTC has embarked on roadshows to promote this new value to the UNIMAS communities as well as to the industries.



CTTC's Home page: www.cttc.unimas.my

INTERNATIONAL GRANT

The Open Society Institute (OSI), a Swiss charitable foundation, has recently awarded a team of researchers led by Dr Mohd Faisal Syam B. Abdol Hazis from the Faculty of Social Sciences, a grant of USD50,000 for the period from October 1, 2011 to September 30, 2012. Meanwhile, The Toyota Foundation awarded Dr Jamal Abdul Nassir Shaari and his team from the Faculty of Economics and Business a 2-year research grant worth ¥3.3 million. Their topics of research are on 'Democratic Discourse and Its Appeal in the 13th Malaysian General Elections' and 'Halal Food: Harmonizing Muslim and Non-Muslim Society through Business Strategy,' respectively. These grants will allow our researchers to make more impact in their research and provide avenues for the research findings to be shared with the international community through the network of the sponsoring bodies.

LARGE-SCALE PRODUCTION OF BIOETHANOL USING SAGO HAMPAS

Sago fibre, obtained by filtration of sago wastewater contains cellulose (30% w/w) and hemicellulose (55% w/w) – both are potentially hydrolysable into sugar as a sustainable substrate for ethanol fermentation. Among the various pre-treatment methods studied, steaming (autoclave, 15 mins) exhibited the highest lignin reduction (50%) and cellulose recovery (40%), with the advantages of lower cost and absence of chemicals in the treated fibre, which is crucial for subsequent enzymatic hydrolysis. Optimization of the steaming process revealed that 7.5% (w/w) fibre concentration generates the highest cellulose recovery (45%) and lignin reduction (50%) together with improved agitation for optimum fibre fractionation. The treated sago fibre was hydrolysed for reducing sugars using cellulase and β -glucosidase. All the sugars obtained from the disposed sago hampas are potentially fermentable in large-scale production of bioethanol, a perfect alternative to sago starch. The success of this process was highlighted earlier on 15th November 2011 in a local newspaper, The Borneo Post.



Sago hampas, separated by filtration from sago effluent.

RESEARCH HIGHLIGHTS

Serving Community through Green Energy Island Project

Researchers: Wan Azlan Wan Zainal Abidin, Azhaili Baharun, Thelaha Masri, Al-Khalid Othman and Hushairi Zen
Faculty of Engineering, UNIMAS

The Centre of Excellence for Renewable Energy (CoERE), Faculty of Engineering, Universiti Malaysia Sarawak (UNIMAS) has achieved another milestone since its formation in 2009 in becoming a leader in renewable energy. CoERE has been awarded RM605,000 to implement its Green Energy Island project as announced by the Minister of Energy, Green Technology and Water, Datuk Seri Peter Chin Fah Kui in 2010.

The Green Energy Island project involves the implementation of renewable energy in rural and remote areas that is without basic infrastructure, such as, electricity and treated water.

Headed by its Director, Associate Professor Dr Azhaili Baharun, CoERE has been given the task of identifying potential sites for sustainable micro hydro implementation in interior Sarawak, especially in the Baram area. For this project, CoERE engages researchers from different engineering backgrounds to study many off-grid areas in rural Sarawak to determine the feasibility of introducing micro-hydroelectric project that can provide electricity to underserved communities. The researchers will carry out demographic and load profiling survey at 10 predetermined sites throughout Sarawak in the first phase of the study. In the second phase, three sites out of the initial 10 will be identified for an extensive technical investigation.

One of the most important criteria apart from the technical capacity of the site is the community's acceptance of the technology and cooperation given by the community. It is also expected that a standard operating procedure will be produced for implementing Green Energy Island project in rural and remote areas that have potential for generating electricity.

CoERE is making UNIMAS proud by doing its part in serving remote communities through the Green Energy Island project.



Sceneries at Bukit Assun, Padawan.

IBEC's Sarawak Dolphin Project: Moving from Strength to Strength

Researcher: Gianna Minton

Institute of Biodiversity and Environmental Conservation, UNIMAS

The Sarawak Dolphin Project (SDP) was founded in 2008 through an MoU between the Institute of Biodiversity and Environmental Conservation (IBEC, UNIMAS), the Sarawak Forestry Corporation and Sarawak Shell Berhad. In July 2009, additional funding came from the Ministry of Science, Technology and Innovation (MOSTI), the Ocean Park Conservation Foundation Hong Kong and the Shell Chair for the Environment. After three and a half years, the project has grown from a small-scale initiative focusing on the collection of baseline data on dolphin distribution in three areas of the Sarawak coastline, to a project that involves four full-time staff, extensive fieldwork on different aspects of cetacean ecology and conservation, training and capacity building, community outreach and education, publications in respected scientific journals and participation in a variety of regional and international professional networks and collaborations.

The year 2011 was a particularly rewarding year. Highlights included the hosting of a regional collaborative workshop in February entitled "Determining and Quantifying Threats to Coastal Cetaceans" with 27 participants from the Asian region and international representation from the United States, Australia and Britain. The workshop was held at Permai Rainforest Resort. The Resort has provided valuable support to fieldwork in the Kuching area through the provision of accommodation and a research vessel at a reduced cost.

Boat surveys in the Kuching area between April 2010 and October 2011 covered over 4,000 kilometers and allowed the sightings of 74 groups of Irrawaddy dolphins, 38 finless porpoise groups, and 11 groups of Indo-Pacific humpback dolphins. Data on sightings along with measurements of water parameters taken during surveys, and observations of fisheries operations in the dolphins' habitat will lead to a better understanding of the population numbers, ecology, conservation status and threats of all three species. Surveys have also been conducted in the Similajau area in an effort to collect baseline data and monitor populations during the planning and construction of the port and industrial park there.

The project currently employs three full-time MSc students, one of whom is set to complete her thesis in early 2012. Over the years, the project has also provided hands-on training for Sarawak Forestry Corporation staff, staff and students from IBEC and other departments

within UNIMAS, visitors from overseas, including university students from Hong Kong University and an Iranian delegation from the NGO "Plan4theLand". The project has also received visits and expert training and advice from respected cetacean scientists from the United States and the United Kingdom.

In February 2011, the project's first scientific paper was published in Raffle's Bulletin of Zoology, and other papers are undergoing peer review. In addition to scientific reports and papers, the researchers have written articles for the popular press, and have designed education and outreach materials to help raise awareness of dolphin conservation. These include a poster informing fishermen about proper reporting procedures for entangled or stranded dolphins, and a colouring book entitled "The Adventures of Idris, the Irrawaddy Dolphin". The latter has been a big hit with school children in Sarawak, and an additional 1000 copies have just been printed at the request of the National Ocean Directorate at the Ministry of Science, Technology and Innovation for distribution during their Festival of Science held in December 2011.

The project's outreach and awareness raising efforts were further enhanced by the airing of a half-hour long documentary on 28th September 2011. The documentary was filmed by RTM1 as part of their "Simfoni Alam" series. The film crew spent time with the SDP team during the February workshop, and again during March fieldwork. The programme covered several key aspects of the team's scientific research and conservation efforts.

Funding has been secured to keep the programme running through to mid 2013, and the team has high hopes that it will be able to continue to become a permanent feature of UNIMAS's efforts to preserve and protect biodiversity in Sarawak.



Researchers on the Permai Rainforest Blue Boat, Irrawaddy dolphin near Kuching.

Enhancing Rural Communities - Tourism Participatory Approach

Researchers: Lo May Chiun¹, Abang Azlan Mohamad¹, Peter Songan² and Alvin W. Yeo³

¹*Faculty of Economics and Business, UNIMAS*

²*Faculty of Cognitive Sciences and Human Development, UNIMAS*

³*Institute of Social Informatics and Technological Innovations, UNIMAS*

Information and communication technologies (ICTs) are essential for people living in geographically isolated regions such as Bario. In addition, tourism is an important driving force in the development of rural areas. Often heritage sites run the risk of being destroyed if tourism development is not carefully managed. Therefore, smart partnerships amongst players in the tourism industry, government agencies and the local population are needed in order to ensure the success of any project. Local communities must be able to articulate their concerns and needs in relation to any development as the effectiveness of any ecotourism project will ultimately depend on their participation. This is where ICTs can assist in the implementation of such projects. With the use of ICTs, local communities are empowered to participate and make decisions. The involvement of local communities is imperative for the success of any ecotourism project.

This study focuses on the holistic planning of tourism development involving the local communities. It also takes into consideration economics, environment and socio-cultural aspects. An important finding is that the cultural values of the local participants are significant for the development of rural tourism. Although the economic benefits are important, the “softer” approach of taking the cultural values of the local community into consideration is even more important in achieving the goals of development. The use of ICTs and the internet as an approach in developing tourism in remote locations in order to improve the livelihood of the people is key to this project.

This research was supported by research grant no.: FRGS/05(30)/784/2010(65).



Bario community showcasing their culture



Computers at the eBario Telecentre

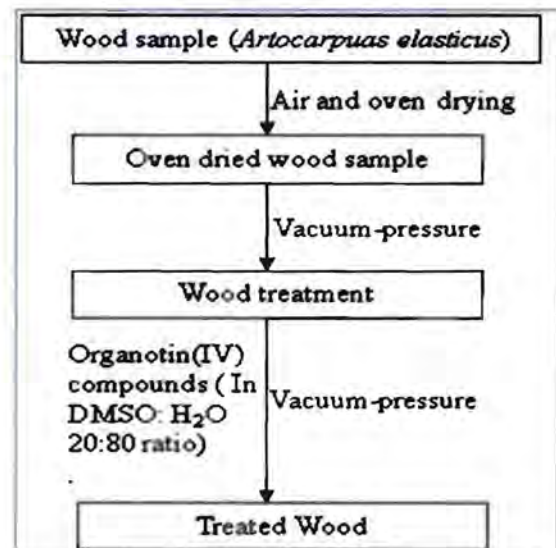
Novel Organotin (IV) Compounds for Wood Decay Resistance

Researchers: Md Abu Affan, Md Abdus Salam, Fasihuddin Ahmad and Ismail Jusoh
Faculty of Resource Science and Technology, UNIMAS

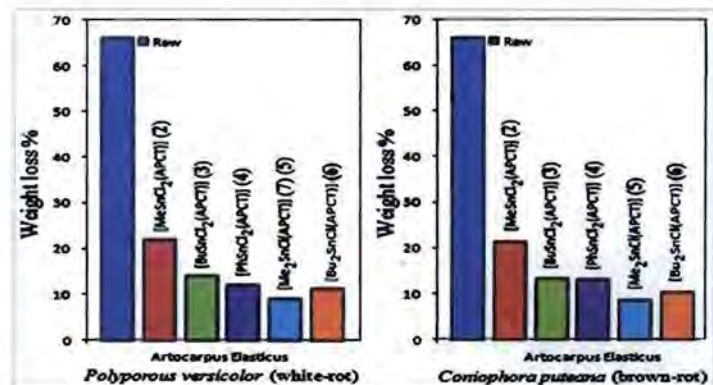
Wood preservatives are capable of destroying or repelling a wide variety of organisms and microorganisms, including bacteria, fungi, insects and mollusks. Organotin compounds are chemical compounds based on tin with hydrocarbon substituents. Organotin compounds have a range of applications as insecticides and fungicides including their use as boat paint additives to prevent attack by microorganisms. The tri-substituted organotin compounds are generally considered the most toxic. Thus, they are of the greatest concern when used in the wood based industry. Some wood preservatives are sensitizers and cannot be used for treating bleachers and seats. For these and other reasons, there is a continuing need for new and improved wood preservative agents. With this in mind, five new organotin(IV) compounds have been synthesised and fully characterised with 2-acetylpyridine-N(4)-cyclohexylthiosemicarbazone. Investigation was carried out to examine the possible chemical interaction between the organotin(IV)-thiosemicarbazone compounds and *Artocarpus elasticus* wood component and to evaluate their decay resistance. These compounds have advantages over TBTO/TBTN that they are more environmentally friendly, low priced and non-leaching. They also have advantages over chromated copper arsenic (CCA) as wood preservative in terms of free arsenic.

A wood decay resistance test was carried out against white-rot fungus (*Polyporus versicolor*) and brown-rot fungus (*Coniophora puteana*) fungi. Results showed that untreated wood was completely attacked by the test fungi with a weight loss of 65%. Newly synthesized mono- and di-organotin(IV) compounds treated wood were less affected by the fungi. Examination of weight loss revealed that dimethyltin(IV) compound (5) gave the best protection, with less than 8% weight loss. The other

compounds (2), (3), (4) and (6) showed weight loss of 21-22%, 13-14%, 12-13% and 10-11%, respectively. It can therefore be concluded that the organotin(IV) compound treated wood increased the duration of protection against biodegradation. From the results of our laboratory test, the product can be commercialised for different applications.



Flow diagram for wood treatment.



Weight loss of untreated wood and treated wood after exposure to decay fungi.

PRODUCT & TECHNOLOGY TRANSFER

Exhaust Heat-Driven Adsorption Air-Conditioning System

Researchers: Mohammad Omar Abdullah, Leo Sing Lim, Ivy Tan Ai Wei and Harunal Rejan Ramji
Faculty of Engineering, UNIMAS

Air-conditioning technology is required to evolve due to the new environmental regulations such as Montreal Protocol 1987 and European Commission Regulation 2037/2000. These regulations were put in place in response to concerns about the depletion of the ozone layer and an increase in global warming, which began a phase-out of first, chlorofluorocarbons (CFCs) then hydro-chlorofluorocarbons (HCFCs) normally employed in conventional air-conditioning systems.

An exhaust heat-driven adsorption air-conditioning system using Palm Activated Carbon-Methanol (PACM)

working pair has been developed and the overall system performance was researched. Typical temperature variation of the adsorbers during operation for the experimental and simulation is given in Figure 1 and Figure 2, respectively.

Experimental results showed that by having a cycle time of 20 minutes, an average chilled-air temperature of approximately 22.6°C is achieved when the cooling coil temperatures fell between 9.5°C and 14.7°C. The coefficient of performance (COP) and specific cooling power (SCP) of this prototype are approximately 0.19 and 396.6 Wkg⁻¹, respectively.



Figure 1. Temperature variation of the adsorbers during operation.

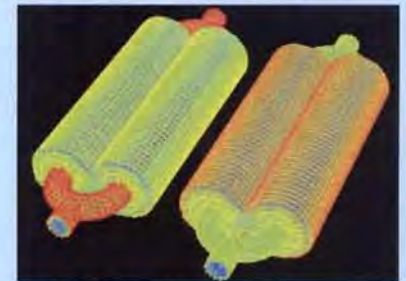


Figure 2. Typical simulated temperature variation of the adsorbers.

Novel Starch-based Gel Electrolyte (*SbGE*) Films for Electrochemical Applications

Researchers: Pang Suh Cem, Chin Suk Fun and Tay Chen Lim
Faculty of Resource Science and Technology, UNIMAS

Ionically conductive starch-based gel electrolyte (*SbGE*) films are prepared from native sago (*Metroxylon sagu*) starch as the main precursor material. *SbGE* films of uniform and controllable thicknesses are prepared by a facile, versatile and cost-effective process. *SbGE* films of optimised formulation exhibit enhanced mechanical properties and high ionic conductivity desirable for electrochemical applications.

Advantages of *SbGE* Films

(i) Native sago starch is a renewable, non-toxic, biocompatible,

biodegradable, and cheap precursor material.

(ii) The conformal nature of *SbGE* film allows direct deposition onto substrates of complex shapes.

(iii) The reel-to-reel production process can be easily adopted for scaled-up production of *SbGE* films.

Potential Applications of *SbGE* Films

Formulation of *SbGE* films can be customised and optimised for use in various electrochemical devices such as:

- Rechargeable Batteries
- Electrochemical capacitors
- PEM Fuel Cell
- Electrochromic Devices
- Sensors



SbGE films can potentially be used in the fabrication of various electrochemical devices.

Agriculture Support System and Field Tools: Oil Palm Tree Crown Delineation and Enumeration Using Ikonos Satellite Images

Researchers: Wang Yin Chai, Chai Soo See, Lee Guan Heng and Lawrence Ling
Centre of Excellence for Image Analysis & Spatial Technologies, UNIMAS

Manual interpretation of medium and high spatial resolution aerial imagery for forestry has evolved in the late 20th century. For this type of application, manual delineation and enumeration of the tree crowns in the aerial images are the main activities. In this context, a new research field aiming at fully or partly replacing human image interpreter by a “seeing computer” was born. For this new research field, the application of image processing techniques in delineating the tree crowns on the images has been greatly explored and many delineation techniques have emerged. The launching of IKONOS satellite has opened up another option of the input data. A UNIMAS project utilizing the resolution of the IKONOS satellite image for palm oil tree delineation and enumeration purposes in place of aerial images (which was once common input data for this application) has successfully produced a prototype model for tree crown enumeration. The use of this model, gave an average enumeration accuracy of 92.10% which is better than

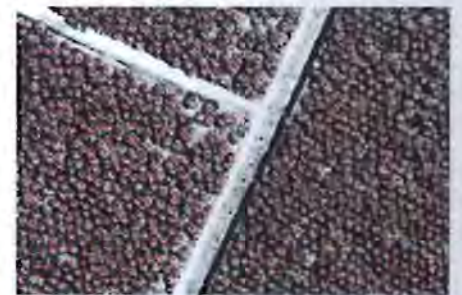
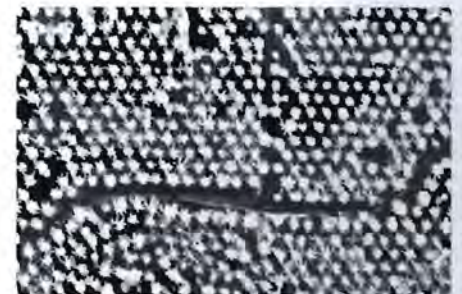
manual delineation, with the percentage of spotted tree crowns being 84.08%.

The following are advantages which are beneficial to the clients:

- reduce reliance on manpower needed to work on the estate (such as conducting a site survey).
- provide accurate and efficient data acquisition employing GIS technology.
- determine the actual size of the estates and their layout with the GIS database.
- enhance efficiency and effectiveness in oil palm estate management (productivity measurement, future planning) with the integration of satellite images and GIS technology.

The present product has further advantages of providing ease in data acquisition and accuracy in cost budgeting. Inaccuracy in gauging oil palm density, hectare measurement of planted areas and the measurement of the estate size will result in a higher loss in overall productivity and future maintenance planning will require a larger resources

allocation. We plan to market the product to Malaysia and Indonesia; countries where oil palm plantations exists. The present product was fully developed by researchers from the Centre of Excellence for Image Analysis and Spatial Technologies. The product was supported and will be commercialised by UNIMAS Holdings Sdn Bhd, a business company of UNIMAS.



Output of images from a series of processes.

NETWORKING

MoU with National Tsing Hua University (NTHU)

An MoU between National Tsing Hua University (NTHU) and UNIMAS was signed on 24th May 2011. NTHU is an established university in Taiwan which emphasizes the importance of research and outstanding teaching. The purpose of this MoU is to establish co-operation that will focus on student, academic and non-academic staff exchange between the two institutions. This MoU enhance collaboration in research project, organisation of joint activities and joint consultancies of both institutions in the future.

MoU with Universitas Syiah Kuala (UNSYIAH)

An MoU between Universitas Syiah Kuala (UNSYIAH) and UNIMAS was signed on 16th August 2011. This MoU was initiated by Professor Dr Balbir Singh of UNIMAS and Dr. Drh. Mahdi Abrar of UNSYIAH. UNSYIAH is an established research university in Indonesia with core competence in tropical agriculture and biosciences, characterised by entrepreneur value. Both institutions wish to establish co-operative relation particularly on student, academic and non-academic staff exchange, collaboration in research projects between the two organisations, and joint activities.

MoU with Universitas Tanjungpura (UNTAN)

An MoU between Universitas Tanjungpura (UNTAN) and UNIMAS was signed on 25th October 2011. UNTAN is an established university which carries out a qualified education, researches, and public services to be a centre of scientific information in West Kalimantan Province. UNTAN has developed interdisciplinary cooperation with other parties to enhance their goal. This co-operation enables UNIMAS students and staff to experience the excellence of the education and research in UNTAN. This MoU also emphasises collaboration in research project between the two institutions as well as joint consultancies and joint programmes of studies.



Vice Chancellor of UNIMAS, Professor Datuk Dr Khairuddin Ab Hamid presenting a souvenir to Professor Dr Thamrin Usman, Rector of Universitas Tanjungpura, Indonesia.

MoU with Malaysian Software Testing Board (MSTB)

Recognising software testing as a potential new industry to Sarawak, a few local parties have gathered to form the Sarawak Chapter. They are the Malaysian Software Testing Board (MSTB), UNIMAS, Swinburne University of Technology and Independent Data Services (IDS) and Sarawak State ICT Unit. These parties have signed an MoU on 12th November 2011

and was witnessed by Datuk Fadillah Yusof, Deputy Minister of Science, Technology and Innovation. The main objective is to upgrade the quality of local software products to enable local technology players to meet international standard. The signing of this MoU has signified more serious efforts in software testing in Sarawak especially in creating a wide range of new businesses and job opportunities from testing traditional software to embedded software. Through the right training and skills, a balanced ecosystem of software developers and testers in Sarawak will be mutually developed.

MoU with Shiabaura Institute of Technology (SIT)

On 22th November 2011, an MoU was signed between UNIMAS and Shiabaura Institute of Technology (SIT), Japan. With this MoU, it is hoped that reciprocal gain will be achieved via exhibition of good practices and sharing of knowledge, in the context of teaching and learning through faculty exchange. The establishment of international cooperation with foreign institutions such as SIT is one of the major keys in achieving UNIMAS' aim to become internationally recognised in teaching and research. SIT has been running cooperative joint programmes with the Malaysian government and institutions of higher learning for almost 20 years and it is anticipated that the active implementation of students and faculty exchange, and advanced research collaboration will further strengthen the relationship between SIT and UNIMAS.



MoU with EPC Synergy Sdn Bhd

UNIMAS has signed an MoU with EPC Synergy Sdn Bhd to develop drinking water infrastructure and sanitation services in rural Malaysia. Potential research and consultancy projects in areas where there is no water supply will be explored. According to Professor Datuk Dr Khairuddin Ab Hamid, the collaboration is to meet the aspirations of the rural and regional development ministry to increase water supply coverage throughout the country. It is also an initiative to supplement and support the establishment of Green Energy Island, which is an ongoing agenda for the Ministry of Energy, Green Technology and Water.



STAKEHOLDER SPEAKS



Dr Roger Harris

There are roughly 300 million people globally who are regarded as indigenous, ethnic or tribal minorities and around 70% of them reside in Asia; with an estimated 30 million in Southeast Asia alone. The indigenous peoples of Sarawak make up about 50% of the state's population, with at least 37 known groups and sub-groups.

Since its founding, researchers at UNIMAS have rightly taken a keen interest in the lives of Sarawak's indigenous peoples, as well as the natural environment in which many of them live. Of all the commendable, innovative and pioneering efforts aimed at a better understanding of the issues that affect them, perhaps none has attracted as much attention as the eBario project. From its humble beginnings as an under-funded high risk novelty it has gone on to garner national and international acclaim. Firstly, with the ensuing establishment of the Centre of Excellence for Rural Informatics (CoERI) and its corollary, the Institute for Social Informatics and Technological Innovations (ISITI), UNIMAS has taken a bold step towards propagating the benefits that the Bario project has delivered to a far wider audience. Secondly, arising from interchanges that have taken place during the equally innovative eBario Knowledge Fair, recently achieving its third instance, it is becoming apparent that indigenous peoples globally share a common set of issues, challenges and opportunities in achieving the developmental aims that they prioritize. Moreover, as a direct consequence of the research conducted by UNIMAS in and around the eBario project, we have come

to recognize that many of the core characteristics of Information and Communication Technologies (ICTs) render them as highly fitting platforms for possible solutions to this common set of issues faced by indigenous peoples. Accordingly, and coming to the third important point for UNIMAS, it is now evident that the audience for the knowledge that is being created in and around the eBario project is far wider than previously imagined; it is a global audience. What we can learn in the tiny settlements of the highlands of the Upper Baram, the fishing villages on the coast of the Celebes Sea and in the remote communities of the Crocker Range has the potential to influence events right around our planet; affecting millions of equally under-served communities and the specifics of their needs.

I am therefore greatly honoured to be counted among the ISITI team, as a Visiting Professor, and to have the unique opportunity to participate in achieving the fullness of the Institution's potential. If it hasn't already done so, UNIMAS is on the threshold of carving out a knowledge niche that will be capable of propelling the University into a position of substantial global renown. It will accomplish this by focusing on the deployment of *contemporary* technologies in a *forward looking* fashion to the common set of issues faced by the world's indigenous peoples, working with its community-based partners in Sarawak and Sabah, engaging with policy-makers and their advisers and demonstrating the *value of innovation with technology* for indigenised development; whereby indigenous people are instrumental in designing and implementing development schemes which they desire rather than projects from outsiders that do damage to their environment, livelihoods and well-being.

The final point arising from the eBario experience that should be acknowledged in order to ensure a position of global significance

Indigenised Development in Action: Radio Bario



Radio Bario is Malaysia's first community radio station, going on air in November 2011. It was established by eBario Sdn Bhd, with international funding from the International Fund for Agricultural Development. The organisation took over the operation of the eBario telecentre after UNIMAS handed it over to the people of Bario. Radio Bario is operated by and for the Kelabit people living in and around Bario and it broadcasts in the local Kelabit language, one of many minority languages now facing extinction. One aim of the radio station is to slow down and even reverse the decline in the use of the language.

In a direct response to the research conducted in Bario and the application to the government by eBario Sdn Bhd for a broadcasting license, the government licensing authority amended its policy to make it possible to set up community broadcasting facilities in Malaysia. However, the concept and the policy remain fragile and further research is required to fully establish the value of community broadcasting in Malaysia, especially insofar as it can be used to address the issues faced by the Nation's Indigenous peoples.

for UNIMAS is that the approach has always been action-oriented; research for a purpose that extends beyond just publishing the results. I consider my future role in ISITI to include encouraging the orientation of the Institute's research towards the achievement of impact that is both social as well as academic, in particular influencing the formulation of evidence that can be used in support of the processes of national policy-making and programme design that will lead to a better future for those whose societies, economies and cultures are different from others.

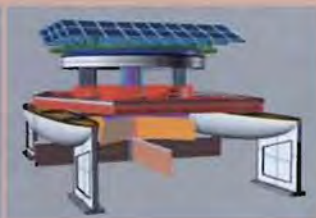
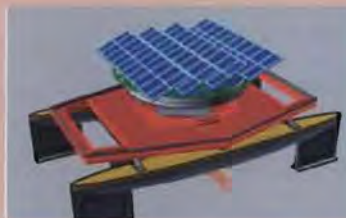
RESEARCH & CONSULTANCY

Centre of Excellence for Renewable Energy (CoERE): Rural Electrification through Small Scale Hydro Power

Micro-hydroelectricity is an energy form produced at a considerable low cost especially in rural Sarawak. A micro-hydro power system uses the flowing water of a stream to turn a turbine-generator to produce electricity. Micro-hydro power refers to hydro electric installations with a power output between 2kW and 300kW. Depending on its size, a micro-hydro power system may provide a small, remote community with adequate electricity to power at least some basic electrical appliances such as light bulbs, radios and televisions.

Based on the successful implementation of 30kW micro-hydroelectric at Abok Mawang in 2006 and the establishment of CoERE in 2009, more research grants and funds were

received for the development of physical infrastructure such as Semulong Ulu in Sri Aman and Nanga Sengaih in Julau. These two sites are funded by Ministry of Rural and Regional Development. Another micro-hydro project known as JARIMAS was began in 2010 in collaboration with Department of Public Works (JKR). This project is on the development of horizontal in-stream turbine micro-hydroelectricity in Kapit for school electrification. Recently in 2011, a grant from Ministry of Energy, Green Technology and Water was awarded to CoERE to study, investigate and select potential sites for the development of micro-hydroelectricity in rural Sarawak.



CoERE activities on development of micro-hydro electricity.

Manganese Slag: Making a Schedule Waste as Raw Material for Useful Products

Researchers: Lau Seng, Ng Chee Khoon, Khairul Aidil Azlin Abdul Rahman, Zainab Ngaini, Delsye Teo Cheng Lee, Sim Siang Fong, Tay Meng Guan, Awangko Hamdan Awang Arshad and Mohd. Zamhari Abol Hassan

Asia Minerals Ltd., a metal smelting company based in Hong Kong, is setting up a plant to extract manganese (Mn) from its ores at Samalaju Industrial Park, Bintulu, Sarawak. It is expected that the production of Mn will begin in 2013 with estimated of 10 ton Mn produced per month. The smelting process will generate an equal ratio of Mn and its slag. In Malaysia, under the Environmental Quality Act (EQA) 1987, waste material from an industrial process is classified as Schedule Wastes and required to be disposed by a license operator. Due to the amount of slag generated, it would not be economical to dispose the slag as schedule wastes. With this in mind, Asia Minerals Ltd is keen to use the slag from its Mn plant for similar applications.

However, based on the EQA 1987, all schedule wastes are not for reuse. Hence the slag from the Mn plant will not be permitted to be reused unless it is declassified from the schedule waste. In this respect, Asia Minerals Ltd wishes to conduct a scientific study on the properties of the slag and to determine

the environmental safety of the slag. The Centre for Technology Transfer and Consultancy, Universiti Malaysia Sarawak, has been invited to assist Asia Minerals Ltd. in this study.

The main objective of the study is to evaluate the environmental safety of using the slag in the construction industry. Specifically, this study aims to:

- determine the chemical compositions of the slag from Asia Minerals Ltd Mn smelting plant.
- determine the leachability of the chemical constituents from the slag under neutral, acidic and alkaline conditions.
- explore the possibilities of using the Mn slag in concrete, pavement, tiles, bricks, wave-breaker, reef balls and fertilizer.
- determine the environmental safety of products developed from the slag.



Pictures of Mn slags which underwent different firing conditions.

SEMINARS & CONFERENCES

Asia Pacific Marketing and Management Conference 2011

The Faculty of Economics and Business, UNIMAS hosted the Asia Pacific Marketing and Management Conference 2011 from 9th November to 11th November 2011 at Merdeka Palace Hotel, Kuching, Sarawak. The aim of the Conference was to provide opportunities for professionals, practitioners and academicians to share their insights on the development and challenges in all areas related to the fields of marketing and management. This conference was a platform for academics and business communities to discuss and share knowledge on current issues relating to the marketing and management efforts in the Asia Pacific region. Through stimulations of cross-disciplinary and cross academic-practitioner discussions and networking, participants could further enhance and enrich their knowledge on the dynamism of marketing and managing business environment. The theme for this conference was "Asia Pacific Region in an Era of Global Uncertainties: Issues, Opportunities and Challenges".

eBario Knowledge Fair

The eBario Knowledge Fair (eBKF) is a regular conference, held in Bario, Malaysia, which showcases the use of ICTs for rural development. It was conducted in conjunction with the local community, bringing together researchers, practitioners and policy makers with the residents of Bario and the wider Kelabit ethnic community. eBario organised the Knowledge Fair with the Institute of Social Informatics and Technological Innovations (ISITI-CoERI) of UNIMAS. The eBario Knowledge Fair was also an IFIP Working Group 9.4 (Social Implications of Computers in Developing Countries) Supported Event. The Third Knowledge Fair adopted the theme of Indigenous Technological Innovation for Malaysia's Indigenous Peoples. This year, it attracted more than 120 participants, including academic researchers, practitioners and community representatives. The Knowledge Fair was also a showcase for the projects under the IFAD Indigenous Peoples Assistance Facility by bringing them together



Professor Datuk Dr Khairuddin giving his keynote during the launching of the 3rd e-Bario Knowledge Fair 2011 at Bario.

to share their experiences and knowledge against the background of the achievements of their telecentres. A workshop funded by the Economic Planning Unit, Prime Minister Department was also held in the eBKF, where 28 Orang Asli from West Malaysia also took part in the workshop.

Conference on Elections and Democracy 2011 (E&D 2011)

The Department of Politics and International Relations, Faculty of Social Sciences has recently organised the Elections and Democracy in Malaysia 2011 (E & D 2011) conference on the 9th to 10th November 2011. The conference attracted over 100 local and international participants, inclusive academics, the public and students. The conference was graced with the presence of prominent political scientist, Professor Dr Francis Loh Kok Wah, as the keynote speaker. More than fifty papers were presented across 5 concurrent sessions encompassing a wide range of topics including elections and voting behavior; by-elections; media, women and elections; Islam and ethnicity in elections; and more importantly, elections, youth and leadership.

2nd International Symposium on Zoonoses and Emerging Infectious Diseases (EID)

The Second International Symposium on Zoonoses and Emerging Infectious Diseases (EID) was successfully organised by the Faculty of Resource Science and Technology, UNIMAS on the 15th to 16th December 2011 at DeTAR PUTRA, UNIMAS. The opening ceremony was graciously officiated by Professor Dr. Peter Songan, Deputy Vice Chancellor (Research and Innovation), UNIMAS. The goals of 2nd ZEID were to: (1) review and disseminate current knowledge of potentially zoonotic disease and EID, and (2) provide ecological perspective on potentially zoonotic organism and EID. To meet these goals, oral and posters presentations were organized in conjunction with the symposium theme, "Zoonoses Environment and Wildlife Ecological Dynamics".



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