

i-FORST

Info from Faculty of Resource Science and Technology



Sarawak Dialogue

FRST STAFF ALONG
WITH NATIONAL
PROFESSOR
COUNCIL, AND
STAKEHOLDERS



MTE 2014

FRST STAFF WIN 3
BRONZE MEDALS
AT MTE 2014



SKAM 26

THE 26TH SYMPOSIUM OF
MALAYSIA ANALYTICAL
SCIENCES



Message from The Dean

Congratulations to the editorial board for the continuing publication of i-FoRST. In 2014, we are continuing our best effort of 2013. The year 2014 began with a visit by Tan Sri Datuk Adenan Satem to FRST on 7th of January, 2014. It is indeed an honour for us to have the then future Chief Minister of Sarawak visit UNIMAS and specifically made an effort to drop by our faculty to look at the various collections in our museum.



Amongst the various activities happening at FRST, we are currently reviewing the undergraduate curriculum by programmes offered by FRST in order to be current and up to date and in line with the needs of our stakeholders. It is hoped with the review, students can experience various new approaches to teaching and learning in the faculty. This review would also require all lecturers to update and equip oneself with the current demand in the teaching and learning process.

In February, FRST welcomed undergraduate students for the Semester 2 intake. With the new intake, our current student enrolment exceeds 2200. The continued increase in the number of undergraduates and postgraduates reflects the effort and cooperation showed by all staff members of FRST in supporting the vision and mission of FRST and UNIMAS.

Keep up the good work!

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In this issue of i-FoRST... the magazine of our faculty

FRST STAFF ALONG WITH NATIONAL PROFESSORS'
COUNCIL, AND STAKEHOLDERS DURING SARAWAK
DIALOGUE - 3

FRST STAFF WIN 3 BRONZE MEDALS AT

MTE 2014, KUALA LUMPUR - 4

- 88 IS A GOOD NUMBER! - 5

- BIOFUEL FROM BIOMASS AND ALGAE - 6

- EMPURAU: SWIMMING GOLD BAR FROM
SARAWAK RIVER - 7

- FIRE INVESTIGATION:
WHY IS IT IMPORTANT? - 8

- MEMORANDUM OF UNDERSTANDING (MOU)
BETWEEN FACULTY OF RESOURCE SCIENCE
& TECHNOLOGY (FRST) UNIMAS AND THE
MALAYSIAN INSTITUTE OF CHEMISTRY (IKM) - 9

THE 7TH INTERNATIONAL SYMPOSIUM ON
KUROSHIO SCIENCE TANJUNGPURA UNIVERSITY,
PONTIANAK, WEST KALIMANTAN, INDONESIA 21-23,
NOVEMBER 2013 - 10

FROM THE FOREST TO THE SOCCER FIELD - 11

"KEMBARA ZOOLOGI" - 12 - 13

STAFF NEWS - 14

SNAPSHOT - 15

- SKAM 26 - 16

FRST STAFF ALONG WITH NATIONAL PROFESSORS' COUNCIL, AND STAKEHOLDERS DURING SARAWAK DIALOGUE

On the 12th December 2013, a dialogue session involving selected stakeholders from Sarawak government including Universiti Malaysia Sarawak, industrial agencies, community leaders, and National Professors' Council was held to discuss issues related to Sarawak's socio-economic and environmental development. The dialogue session covered issues within the the scope of environment, natural resources, and national heritage clusters. This includes issues related to Sarawak's environment, biodiversity, biological resources, socio-economic and culture. The session was led by Prof Emeritus Dato' Dr Ibrahim Komoo and was officiated by UNIMAS Deputy Vice Chancellor (Alumni and Student Affairs) Prof. Mohd Fadzil Abdul Rahman. In general the floor agreed that there are conflicts between the maintenance of biological resources and culture, with the rapid development in Sarawak.



Attendees, secretariat and the opening
ceremony by UNIMAS Deputy Chancellor
(Alumni and Student Affairs)
Prof. Mohd Fadzil Abdul Rahman.



Presenters during the question and answer session
and the closing ceremony by the Dean of FRST
Assoc. Prof. Mohd. Hasnain Md. Hussain.

The second part of the dialogue provided opportunity for members of the floor, experts in the related field from UNIMAS including members of FRST, Prof. Dr Mohd Tajuddin Abdullah, who is also the Sarawak Dialogue's organising chairman, Prof. Dr. Andrew Alek Tuen, and industrys' representatives to the discuss relevant issues. According to the organizing chairman the results from the discussion are expected to be prepared as a policy paperwork that will be presented to the Malaysian Government through the National Professors' Council Chairman, who is also an advisor to the Malaysian Prime Minister. After the 3-hour session proceeded with multiple inputs from different parties, the session was then closed by the Dean of FRST, Assoc. Prof. Dr. Mohd. Hasnain Md. Hussain with the note that all the stakeholders play an important role in the management and preservation of Sarawak's biological, environmental and cultural diversity. The session was then continued the next day but it only involved the Sarawak State Economic Planning Unit and the National Professors' Council in a closed-door session.

- Faisal Ali Anwarali Khan, Mohd Zacaery
Khaliq, Badiozaman Sulaiman & Wakap Marni

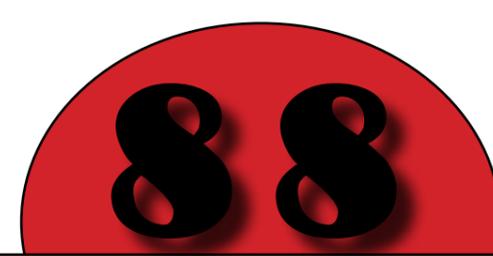
FRST STAFF WINS 3 BRONZES MEDAL AT MTE 2014, KUALA LUMPUR

Staff from FRST have once again proven their outstanding expertise in research and development at a research exposition held recently in Kuala Lumpur. They bagged three Bronze medals at the Malaysia Technology Exposition (MTE) 2014, which was held at the Putra World Trade Centre (PWTC), Kuala Lumpur from 20 to 22 February, 2014. MTE is an annual event which showcases inventions and innovations to a targeted audience of trade visitors. The Bronze medals achievements of FRST Staff were as follows:

1. Silcat 2.0: Eco-Catalysts For Efficient Biodiesel Production- Assoc. Prof. Dr. Zainab Ngaini, Faculty of Resource Science and Technology
2. AgriBioActiv-SF: Green Biological Control Agent And Biofertilizer For Total Organic Solution- Assoc. Prof. Dr. Awang Ahmad Sallehin Awang Husaini, Faculty of Resource Science and Technology
3. Magnetic Cellulose Aerogel With High Oil Absorption Capacity- Dr. Chin Suk Fun, Faculty of Resource Science and Technology



Photo by UNJMAS Official Photographer



88 IS A GOOD NUMBER!

MULTI-DISCIPLINARY ACADEMICS FRST IS CELEBRATING ITS SWEET 21ST BIRTHDAY THIS YEAR, CONGRATULATIONS!

Like a conveyor belt, students come and go, but many of us are still here. Currently, FRST has 88 multi-disciplinary academics, with diverse characters, ethnicity and staff number (some own double digits staff number, some have three digit numbers whereas the rest proudly claim their four digit numbers!). With such a large pool of academic staff, it is a huge challenge to determine who is who, especially for those who just recently joined the faculty's big family. Therefore, G6 staff took the initiative to organize a potluck lunch on Friday, 7th March 2014 to welcome the latest three FRST members, namely Dr Fazimah Bt Aziz, Dr Wee Boon Siong & Dr Chung Hung Hui. It does not matter whether the staff number is 19 or 2629 or any other numbers in between, every FRST academician should acknowledge that we need to appreciate and celebrate diversity, especially those who are found at the table during the potluck party!

Welcome on board Dr Fazimah, Dr Wee & Dr Chung!

**note: In FRST database, Prof. Dr. Isa Ipor proudly owns the earliest staff no. 019 whereas Dr. Chung Hung Hui is the latest addition with number 2629.*



- Ruhana Hassan & Lee Kui Soon

BIOFUEL FROM BIOMASS AND ALGAE

Rapid depletion from extensive use of the natural energy resources such as petroleum and coal, have enhanced the use of alternative energy sources such as bioethanol and biodiesel. Several types of feedstock are available as an option to manufacture the first generation of biofuels. Sugar is the main feedstock for bioethanol. However, continuous pressure from the public has shifted the attention to cellulosic ethanol, which can be fuelled by plant biomass as it does not interfere with the food chain. Plant biomass, such as sago hampas (Bujang, 2011; Adeni et al., 2013), must undergo pre-treatments to release the free cellulose which can be hydrolysed to fermentable sugars.

Biodiesel can be produced from various feedstocks including edible oil-bearing plant such as coconut, sunflower, rapeseed, canola, soya bean, palm oil and jatropha – which can be planted on less fertile and marginal lands. However, the main implication is that, tropical regions of South East Asia and a huge part of Africa will be developed as the primary producers of such plants in order to meet the demand as feeders for biofuel industries of temperate or colder regions such as Europe and the northern hemisphere.

The current interest in the utilisation of algae as an efficient producer of lipid for biodiesel is the best choice since it does not interfere with food supply. Microalgae are normally selected due to their extremely efficient biomass producing ability and also the energy-rich storage lipid which is a useful product for conversion to biofuel (Hall and House, 1995).

Although an algal cultivating facility requires substantial initial capital, but on a per ton of fuel produced basis, this is lower compared to both palm and jatropha which also produces annually. Production of biodiesel from an algal farm is about 53,000L/acre, compared to oil-palm at 2,200L/acre, and jatropha at 1,100L/acre (Corden, 2006). Currently, we have four projects in our Biofuel R&D Lab at FRST, UNIMAS, culturing the algae *Scenedesmus dimorphus* for biodiesel, at different growth parameters

References: -

- Adeni, D.S.A.; Bujang, K.B.; Hassan, M.A. and Abd-Aziz, S. (2013). Recovery of Glucose from Residual Starch of Sago Hampas for Bioethanol Production. *Journal of Biomed. Research International*. Vol. 2013. Article ID 935852.
 Bujang, K.B. (2011). Potential of Sago for Commercial Production of Sugars. The 10th International Sago Symposium. Dept. of Agronomy & Horticulture. Bogor Agricultural University. Bogor. Rep. Indonesia. 28-30th October, 2011.
 Corden, R. (2006). Biodiesel Feedstock and PetroAlgae. *Cleantech*. ISSN 1756-2244. Issue 11, (1): 43.
 Hall, D.O. and House, J.J. (1995). Biomass: A Modern and Environmentally Acceptable Fuel. *Solar Energy Materials and Solar Cells*. (38):521-542.

Production of biodiesel from a microalgae farm is about 53 tons/acre, compared to oil palm at 2.2 tons/acre, and jatropha at 1.1 ton/acre (Corden, 2006)

AREA OF LAND NEEDED TO PRODUCE 1 TON OF BIODIESEL

Microalgae
150m²

Oil Palm
2,500m²

Rapeseed
15,000m²

Corn
95,000m²

- K.B. Bujang

EMPURAU:

SWIMMING GOLD BAR FROM SARAWAK RIVER

Most, if not all, Sarawakians know of the existence of empurau or scientifically known as *Tor tambroides*. Empurau is well known for its high value. In Kapit open market, it is priced at approximately RM500 per kilogram while in some seafood restaurants in Peninsular Malaysia, the price of the fish could reach up to RM1500 per kilogram depending on its weight and grade. The growth rate of this fish is rather slow at young age. According to fish farmer, empurau can only achieve a growth rate of approximately 0.5 kilogram annually. This is time consuming and less cost-effective to the fish farmer. To overcome this problem, a research project is being conducted by the Animal Biotechnology Research Group at FRST to increase the growth rate of empurau by altering the expression of the growth hormone with recombinant DNA techniques. It is hoped that this approach could pave the way for improving the growth rate of empurau and therefore, better yield could be obtained within a shorter period of time.

- Lee Kui Soon, Pang Shek Li and Bong Kee Kai

Department of Molecular Biology, FRST, UNIMAS



Flow chart shows the methods to be used to accomplish our research objectives. The first objective is to establish the expression pattern of the growth factor gene and followed by over expression studies of the growth factor gene.



Empurau fish (approx 12 months) which is kept in our fish facility. The fish possesses shiny silver scales at the ventral region compared to the darker scales at the dorsal region. Scale bar 1: 3

FIRE INVESTIGATION

Why is it important?

Investigation of fires, burning and fire-related crimes is very crucial in answering law related questions. The investigators, applying the scientific method to the scene of fire of unknown cause, to make observations, collect data and forms as well as tests hypotheses, making fire investigation a unique area of forensic science. The gathered information will provide leads to the forensic investigation. The examination of fire debris to determine the presence of ignitable liquids makes up the vast majority of forensic laboratory support to fire investigations.

To begin with, fire is defined as an exothermic reaction between fuel and oxidant (oxidation process) to produce great amount of heat as energy, light and various other products. Fire requires four basic ingredients for it to form, namely, fuel in a suitable form, oxygen, heat and chemical oxidation and there won't be a fire without the presence of these four elements. In addition to that, accelerants such as fossil fuels (natural gas, petroleum and coal) can be used to supply more energy and accelerate the burning process. For instance, these substances facilitate the burning of the target efficiently and only traces will remain in the fire debris.

Criminal burning was mostly done to cover up homicidal death and to destroy physical evidences such as DNA from human body. In Malaysia a number of homicide cases were encountered involving the use of arson to burn the victim's body and the attempt to eradicate of all the evidences. Determining the cause of death of a burned individual is one of the first and foremost questions in forensic investigation. Investigation on the burned victim's body (eg. medical post-mortem) is needed to determine the actual cause of death. Moreover, through forensic investigation, the time duration of the crime can also be resolved. Similarly, most of the cases were committed with the purpose of eliminating the physical evidences presence at the crime scene. The examples of arson cases in Malaysia were the high profile cases of Datuk Sosilawati Lawiya and Adik Dirang (murdered).

The investigation of fire debris or the remains of combustion substrate is very useful in determining its cause and how the ignition started. This information is needed for the forensic investigator to find the leads in what happened before, during, and after the combustion. Fire debris and the remaining substrates such as human residue, burnt animal, carpet and anything that are surrounding the burning area might be useful as physical or biological evidences in court, as this evidences will link the culprit with the victims and crime scene as mentioned in Locard's Exchange Principal, "Every contact leave a trace".

In Malaysia, fire investigation is conducted by *Polis Di Raja Malaysia* (PDRM) and *Jabatan Bomba dan Penyelamat Malaysia* (JBPM). They are the key-players in investigating all criminal cases involving fire and arson. These agencies will collect evidences from the crime scene for court prosecution. With a single doubt during the investigation and prosecution, the case with all the charges will be dropped and the culprit will get away. That is why public awareness on the basic needs of crime and fire investigation is important, so we know that when there is a crime, we will take action but we must not destroy the evidences!

Mohd Zacaery Khalik & Maya Asyikin Mohd Arif



Memorandum of Understanding (MoU) between Faculty of Resource Science & Technology (FRST), UNIMAS and the Malaysian Institute of Chemistry (IKM)

Faculty of Resource Science & Technology (FRST) UNIMAS has signed a Memorandum of Understanding (MoU) with the Malaysian Institute of Chemistry (IKM) on 23 January 2014.

Present for the MoU signing was Prof Mohd Fadzil Abdul Rahman, Deputy Vice-Chancellor (Student Affairs & Alumni) of UNIMAS and Assoc. Prof. Dr. Mohd Hasnain Md Hussain, Dean of FRST while IKM was represented by Datuk Dr. Soon Ting Kueh, President of IKM and Prof Datin Dr. Zuriati, the IKM Honorary Secretary.

IKM is a professional statutory organization incorporated under the Chemist Act to regulate the practice of chemistry in Malaysia, to represent the profession of chemistry in Malaysia and to promote public awareness and appreciation, and the advancement of chemistry in Malaysia.

In the past, there have been several programs jointly which organized by UNIMAS and IKM jointly focusing on continuing education in chemistry for example, Carnival Chemistry Malaysia (K2M) and World Water Monitoring Day. With the signing of the MoU, it provides more opportunities for cooperation and collaboration between UNIMAS and IKM in promoting the advancement of chemistry and chemical profession in Malaysia. UNIMAS and IKM will be able to undertake joint programs including collaborative research, professional and curriculum development in chemistry and chemistry-related areas.



THE 7TH INTERNATIONAL SYMPOSIUM ON KUROSHIO SCIENCE TANJUNGPURA UNIVERSITY, PONTIANAK, WEST KALIMANTAN, INDONESIA 21-23, NOVEMBER 2013

The International Symposium on Kuroshio Science has been hosted in turn by Kochi University, National Sun Yat-sen University, and Bicol University. The 7th International Symposium on Kuroshio Science co-hosted by Tanjungpura University and Universiti Malaysia Sarawak, was held on November 21-23, 2013 in Pontianak, West Kalimantan Indonesia. The theme for the symposium was "Enhancing Management and Conservation of the Kuroshio Region through Harmony between People and Environment". This symposium have discussed the latest issues on basic research, applied research and utilization of natural resources in the Kuroshio region which includes Indonesia, Malaysia, Japan, Taiwan, Philippines, Thailand and Vietnam. A total of 13 lecturers and 23 postgraduate students in various fields from FRST have participated and presented papers in this symposium. Two postgraduate students from the Department of Plant Science and Environmental Ecology and the Department of Aquatic Sciences won the best poster presentation and also the most popular posters, respectively.



The arrival of FRST delegations at Supadio International Airport, Pontianak



Prof. H.K. Mok, (National Sun Yat Sen University, Taiwan), Prof. Akira Tominaga (Kochi University, Japan), Graduate Student (University Tanjungpura, Pontianak); Associate Prof Dr Mohd Hasnain Md Hussain (UNIMAS, Malaysia), Prof. Plutomeo M. Nieves, (Bicol University – Philippines)



Mangrove replanting programs activities with local communities at Mendalok, Pontianak



Mangrove replanting programs activities with local communities at Mendalok, Pontianak



The participants from UNIMAS, Malaysia with the dancers from Art Department, Tanjungpura University during the Cultural Night.

FROM THE FOREST TO THE SOCCER FIELD

A fieldwork in an HCV4 of Saremas 1, Wilmar oil palm plantation, near Miri was conducted between the 10th and 15th Feb 2014. Our team consists of two researchers (Assoc. Prof. Dr. Ismail Jusoh and Dr. Aida Shafreena Ahmad Puad), four research assistants (Mr. Mohd. Rizan Abdullah, Mr. Sekudan Tedong, Mr. Salim Arip and Mr. Mohd Shafiq Sahat) and three undergraduate students (Mr. Mohd Ali Darus, Ms. Cassandra Hazel and Ms. Tegaya Chapok). The Department of Zoology and the Department of Aquatic Science joined this field work as well. On the last day of our fieldwork, we were invited by the Saremas1 HCV soccer team to have a friendly match. Our team was made up of members from the Plant Science Department, the Department of Zoology, the Department of Aquatic Sciences as well as several import players from Wilmar. Our captain who is also a skillful goal keeper was Mr. Mohd Salim while Saremas1 team captain was an amazing Mr. Watson Telajan. Our high-spirited team members tried our best to beat the talented, well prepared and much younger opponent of Saremas1, however we did not win the match. We had such a great time with an unbeatable opponent. Although we lost the game, our soccer spirits were still high. Granting that we work in the forest, we can still pack a punch in a soccer match, and this is how we end our work hours. We hope the next time we meet, we'll be more prepared and bound to win. Be prepared Saremas 1 team!!!

- Aida Shafreena Ahmad Puad



"Kembara Zoologi"

The Department of Zoology, Faculty Resource Science dan Technology, Universiti Malaysia Sarawak has successfully launched its "Kembara Zoologi" Programme on the 2nd October, 2013 at Sekolah Kebangsaan Meranek, Kota Samarahan. This half-day programme was designed to approach local communities within Sarawak through knowledge transfer and sharing. This long-term programme, with the theme "Natural Resources and Environment", is targeted on primary and secondary school students, parents and teachers. Involving the community through outreach programmes as "Kembara Zoologi" will help in creating awareness on the important of preserving ecosystem and natural resources.

"Kembara Zoologi" Programme at SK Meranek involved 110 students represented by Primary 3, 4, and 6 students, around 15 to 20 teachers, supported by 32 staff and post-graduate students of Department of Zoology. This programme was also attended by three staff from *Pejabat Pelajaran Negeri Sarawak*.

Activities in this programme includes "Natural Resources and Biodiversity" slide presentation, "Ask Professor" Slot, 'Know the biodiversity' activity, 3R (Reduce-Reuse-Recycle) campaign as well as wild life specimen exhibition. During wild life specimen exhibition and 'Know the biodiversity' activity, the modules prepared use interactive games to teach students about local flora and fauna diversity, environmental conservation and other science-related matters. This community outreach programs is hope to help in spreading the appreciation for the rich variety of life that surrounds us.

**"IN THE END WE WILL CONSERVE ONLY WHAT WE LOVE. WE WILL LOVE ONLY WHAT WE UNDERSTAND. WE WILL UNDERSTAND ONLY WHAT WE ARE TAUGHT."
-BABA DIOUM**

- Wan Nurainie Wan Jsmail & Chong Yee Ling



Group photo of SK Meranek students and teachers together with UNIMAS's staff and post-graduate students, as well as staff from Pejabat Pelajaran Negeri Sarawak



"Natural Resources and Biodiversity" slide presentation given by Dr. Mohd Azlan Jayasilan, Head of Zoology Department.



Question by student during "Ask Professor" slot conducted by Professor Dr. Andrew Alek Tuen.



Small mammals-may look scary, but they are actually interesting!



Excited faces school children when introduced to the egg-laying vertebrates-the Aves.



The happy faces of our young generation who will lead the future.



Students were introduced to variety of fascinating insects!

Photo credit by Mr. Charlie Laman.

Staff News

New Appointments



Prof. Dr. Haji Kopli Bujang
Deputy Vice-Chancellor
(Research & Innovation)

Prof. Dr. Fasihuddin Badruddin
Ahmad (Director, Research &
Innovation Management Centre)



Programme Coordinators



Dr. Aazani Mujahid
(Aquatic Resource Science
& Management)

Dr. Chong Yee Ling
(Animal Resource Science
& Management)



Lecturers

Dr. Fazimah bt Aziz
(Aquatic Resource
Science & Management)
DS51



Dr. Wee Boon Siang
(Resource
Chemistry)
DS51



Dr. Chung Hung
Hui (Resource
Biotechnology) DS51



Staff Transfer

1. Assoc Prof Dr. Lim Po Teen
(Transferred to Institute of Research Management
and Monitoring, Universiti Malaya)

2. Dr. Leaw Chui Pin
(Transferred to Institute of Research Management
and Monitoring, Universiti Malaya)

3. Emelia Tambi
(Transferred to Human Capital Development
Division, UNIMAS)

4. Dayang Sharizah Abdul
(Transferred to Bursary Office UNIMAS)

5. Siti Hajar Abu Bakar
(Transferred to Centre For Information &
Communication Technology Services, UNIMAS)

6. Rosemahziane Nyirop
(Transferred from Faculty of Medicine & Health
Science)

7. Sh Mariawati Wan Kassim (Transferred from
Research & Innovation Management Centre)

8. Mohamed Suhardi b Mohamed @ Masli
(Transferred from Centre For Information &
Communication Technology Services, UNIMAS)

Retirement

Prof. Dr. Mohd Tajuddin b Abdullah



Staff With Newborns

1. Wan Nurainie Wan Ismail
2. Dayang Norafizan Awang Chee
3. Huzal Irwan Husin
4. Mohamad Norazlan b Bujang Belly

Newly Weds

1. Dahlan b Rambli



2. Dr. Chong Yee Ling



Tan Sri Datuk Amar Haji Adenan Bin Haji Satem VISIT To FRST 2014



FRST CURRICULUM REVIEW 2014



STUDENT E-VOTING 2013



"Hari Bersama Pelanggan FSTS 2013"



THE 26TH SYMPOSIUM OF MALAYSIA ANALYTICAL SCIENCES (SKAM 26)



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