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LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA



MALAYSIAN FORESTRY RESEARCH AND DEVELOPMENT BOARD (MFRDB)

LAPORAN PENGERUSI
CHAIRPERSON'S REPORT

Pertamanya, izinkan saya memanjatkan rasa syukur ke hadrat Allah swt di atas pelantikan saya selaku Pengerusi Lembaga Penyelidikan dan Pembangunan Perhutanan Malaysia (MFRDB) mulai 1 Oktober 2013 serta terima kasih yang tidak terhingga kepada Menteri Sumber Asli dan Alam Sekitar (NRE), YB Datuk Seri G Palanivel yang menaruh kepercayaan kepada saya untuk menerajui MFRDB.

Saya mengambil kesempatan ini untuk mengucapkan tahniah kepada Pengerusi MFRDB terdahulu, YB Hajah Nancy Hj Shukri yang menerajui MFRDB selaku Pengerusi (15 Julai 2010–21 Mei 2013) telah dilantik sebagai Menteri di Jabatan Perdana Menteri. YB Hajah Nancy telah berjaya memimpin MFRDB dan meletakkan FRIM sebagai institusi yang signifikan selaras dengan kemajuan dalam industri perhutanan negara dan dunia pada masa kini. Saya percaya, dengan sokongan barisan Ahli Lembaga yang berwibawa, FRIM akan terus maju dan berada di landasan yang betul dalam menyumbang kepada kemajuan negara.

Di samping itu, tahniah juga ditujukan kepada YB Dato' Sri Dr James Dawos Mamit yang dilantik sebagai Timbalan Menteri NRE yang baharu. YB Dato' Sri Dr James pernah dilantik sebagai ahli Lembaga dari Disember 2005 sehingga Januari 2010 dan merupakan Ahli Parlimen Mambong, Sarawak. Ucapan tahniah juga ditujukan kepada Datuk Hj Abdul Ghani Salleh yang dilantik sebagai Setiausaha Suruhanjaya Pilihanraya Malaysia (SPRM) mulai 19 Ogos 2013.

Telah terbukti bahawa Pengerusi-pengerusi MFRDB yang terdahulu telah meletakkan satu tanda aras yang cemerlang dan tentu sekali saya akan cuba menyamai kecemerlangan yang telah dikecapi—Insya-Allah—dengan sokongan dan bantuan semua Ahli Lembaga yang berwibawa di samping komitmen daripada semua warga FRIM yang diterajui oleh Dato' Dr Abd. Latif Mohmod.

Sepanjang tahun 2013, MFRDB telah melaksanakan sebanyak empat kali Mesyuarat Lembaga iaitu pada 2 Februari, 21 Mei, 12 September dan saya telah mempengerusikan mesyuarat terakhir pada 17 Disember. Walaupun belum setahun saya memegang tampuk MFRDB, saya



First and foremost, allow me to thank Allah swt for my appointment as the Chairperson of the Malaysian Forestry Research and Development Board (MFRDB) from 1 October 2013 and my utmost appreciation to the Minister of Natural Resources and Environment (NRE), YB Datuk Seri G Palanivel who has entrusted me to lead the MFRDB.

I would like to take this opportunity to congratulate the immediate past Chairperson YB Hajah Nancy Hj Shukri, who headed the MFRDB from 15 July 2010 to 21 May 2013, for her appointment as the Minister in the Prime Minister's Department. YB Hajah Nancy has successfully led MFRDB and placed FRIM as an institution that is significant parallel to the current developments of the forestry industry nationally and globally. I am convinced that with the full support of the Board Members, FRIM will continue to advance in the right track towards contributing to the development of our country.

In addition, my heartiest congratulations to YB Dato' Sri Dr James Dawos Mamit upon his appointment as the new Deputy Minister of NRE. YB Dato' Sri Dr James was appointed as a Board Member from December 2005 to January 2010 and was a Member of the Parliament for Mambong, Sarawak. My congratulations also to Datuk Hj Abdul Ghani Salleh who was appointed as the Secretary to the Malaysian Election Commission from 19 August 2013.

It is evident that the past Chairpersons of MFRDB had set high levels of achievements and I shall surely measure up to their excellence by the grace of Allah and with the support of all prominent Board Members besides the commitment from all



dapat melihat pencapaian FRIM yang sungguh memberangsangkan terutamanya dalam bidang teras iaitu penyelidikan, pembangunan dan komersialisasi (R, D & C) dengan memberi sumbangan penting kepada kemajuan dan pembangunan negara khususnya dalam bidang perhutanan dan keluaran hutan. Tahniah saya ucapkan kepada Ketua Pengarah FRIM, Dato' Dr Abd. Latif Mohmod yang telah memimpin FRIM dengan begitu cemerlang, sehingga berjaya mengharumkan nama FRIM di persada antarabangsa.

Sorotan prestasi

FRIM terus berusaha bagi mencapai sasarannya dalam bidang-bidang yang tertentu pada 2013. Sebagai sokongan ke atas segala usaha pelaksanaan projek penyelidikan dan pembangunan (R&D) FRIM, terutamanya kepada para saintis muda, MFRDB terus menyumbangkan dana penyelidikan bagi membiayai 12 projek penyelidikan berjumlah RM235 000 di bawah Geran Penyelidikan, Prakomersialisasi dan Penerbitan (RPP) dan sebanyak RM188 000 bagi satu projek di bawah Tabung Luar Jangka (TLJ). Pemilihan penerima geran RPP dan TLJ adalah lebih selektif bagi memastikan projek-projek penyelidikan yang dijalankan lebih signifikan dan mempunyai impak. Antara projek R&D yang dibiayai di bawah tabung RPP pada 2013 ialah *A Computerised Wood Identification Method to Expedite the Identification of Lesser Known Timber Species, Improving Forest Floor Carbon Stocks Assessment Methodology in Tropical Montane Forest for Carbon Stock Mapping, Antidiabetic Effects of Phyllanthus Pulcher Against Carbohydrate Metabolising Enzymes dan Adaptation of Australian Standard for Mechanical Testing of Timber Scaffold Plank*. Walaupun dihadkan cuma RM20 000 bagi setiap projek, saya percaya para saintis muda FRIM dapat menghasilkan penemuan-penemuan baharu untuk diketengahkan kepada pihak industri.

Dari setahun ke setahun, FRIM terus memeterai serta memperbaharu perjanjian kerjasama penyelidikan dengan pelbagai agensi luar termasuklah dengan institusi-institusi pengajian tinggi awam dan swasta serta pelbagai pihak pemegang taruh dari dalam dan luar negara. Pada 2013 FRIM meneruskan usaha menjalinkan kerjasama penyelidikan dengan pelbagai agensi. Dalam hal ini, FRIM menawarkan khidmat kepakaran teknikal kepada rakan-rakan kerjasama. Langkah untuk mengadakan pakatan strategik ini adalah penting bagi membolehkan FRIM lebih memahami serta berusaha untuk memenuhi keperluan semasa

FRIM staff led by Dato' Dr Abd. Latif Mohmod. Throughout 2013, MFRDB has had four Board Meetings on 2 February, 21 May, 12 September and I have chaired the last meeting on 17 December. Although it has been less than a year since I headed the MFRDB, FRIM has clearly made stimulating achievements particularly in the main field of research, development and commercialisation (R, D & C) with important contributions to the advancement and development of the country especially in the field of forestry and forest products. Congratulations to Director General of FRIM, Dato' Dr Abd. Latif Mohmod, who has led FRIM with such excellence and brought FRIM into the limelight of the international arena.

A glimpse on the performance

FRIM continues to strive toward achieving goals in 2013. In an effort to support the implementation of research and development (R&D) in FRIM, especially for young scientists, MFRDB has funded 12 research projects amounting to RM235 000 under the Research, Pre-commercialisation and Publications Grant (RPP) and another project for a total of RM188 000 under Tabung Luar Jangka (TLJ). Selection for recipients of RPP and TLJ was more stringent to ensure that these research projects will provide significant impacts. Among the R&D projects under the RPP in 2013 are: A Computerised Wood Identification Method to Expedite the Identification of Lesser Known Timber Species, Improving Forest Floor Carbon Stocks Assessment Methodology in Tropical Montane Forest for Carbon Stock Mapping, Antidiabetic Effects of Phyllanthus pulcher against Carbohydrate Metabolising Enzymes, and Adaptation of Australian Standard for Mechanical Testing of Timber Scaffold Plank. Although with a maximum support of RM20 000 for each project, I believe that young scientists of FRIM can produce interesting findings to be proposed to the industry.

Throughout the years, FRIM has concluded and renewed agreements for collaborative research with various agencies including public and private higher learning institutions as well as a number of stakeholders from within and outside the country. In 2013, FRIM continued her endeavours to establish cooperation with other agencies. In this regard, FRIM offers a range of technical expertise to her partners. This strategic partnership is an important means for FRIM to understand and respond to the needs of the industry. This year, there are 16 research collaborations, all but one are Memorandum of Understandings (MOU). Such collaborations will enable FRIM to exchange expertise and learn new ideas for improving



pihak industri. Tahun 2013 menyaksikan sebanyak 16 kerjasama penyelidikan dimeterai iaitu 15 daripadanya adalah dalam bentuk memorandum persefahaman. Kerjasama ini membolehkan FRIM bertukar-tukar kepakaran secara bestari dengan agensi yang berkerjasama di samping mempelajari idea-idea baharu dalam memajukan lagi industri perhutanan negara. Antara perjanjian/MoU yang dimeterai oleh MFRDB adalah dengan Universiti Teknologi Petronas (UTP), Perak; Universiti Malaysia Terengganu (UMT); Indian Council of Forestry Research and Education, India; Cancer Research Initiatives Foundation (CARIF) dan Regional Community Forestry Training Centre for Asia and the Pacific (RECOFTC).

Selain itu, pada 14 November FRIM menandatangani empat Perjanjian Persefahaman (MoU) dengan persatuan-persatuan utama dalam industri berasaskan kayu di Malaysia dalam usaha untuk mengukuhkan kerjasama dan meningkatkan daya saing mereka. Pemeteraian MoU antara FRIM dengan Majlis Perindustrian Perabot Malaysia (MFIC); Persatuan Pengeluar Produk Panel Malaysia (MPMA); Persatuan Industri Kayu Malaysia (MWIA); serta Persatuan Pengusaha Kayu-Kayan dan Perabot Bumiputera Malaysia (PEKA). FRIM bersedia untuk meningkatkan kerjasama dengan industri dalam menangani pelbagai cabaran teknikal seperti keperluan pasaran antarabangsa yang baharu dari segi ujian dan pensijilan berkaitan dengan kualiti produk, keselamatan, prestasi dan kemampanan melalui aplikasi penyelidikan dan pembangunan (R&D) dan prosedur jaminan kualiti yang sesuai. Langkah untuk mewujudkan pakatan strategik seumpama ini adalah penting kerana FRIM akan lebih memahami serta memenuhi keperluan industri yang penting ini.

Saya turut berbangga dan mengucapkan setinggi-tinggi tahniah kepada FRIM di atas pelbagai anugerah dan pengiktirafan yang diterima pada 2013. Kejayaan terbesar FRIM adalah apabila hasil R&D FRIM yang telah dimulakan sejak 2005, sistem rawatan kayu menggunakan pengeringan suhu tinggi (HTD) memenangi Anugerah Inovasi Negara 2013 bagi Kategori Produk.

FRIM juga memenangi Anugerah Buku Negara 2013 iaitu Anugerah Perdana Kategori Penyelidikan bagi buku FRIM Warisan Kebangsaan dan Anugerah Industri Buku Kategori Buku Umum Terbaik (Sains) bagi buku 99 *Spesies Buah di FRIM*. Saya difahamkan bahawa Ketua Pengarah FRIM, Dato' Dr Abd Latif Mohmod terlibat secara langsung sebagai salah seorang penyunting bagi

the forestry industry. Among the agreement / MoUs signed by the MFRDB are with Universiti Teknologi Petronas (UTP), Perak; Universiti Malaysia Terengganu (UMT); Indian Council of Forestry Research and Education, India; Cancer Research Initiatives Foundation (CARIF) dan Regional Community Forestry Training Centre for Asia and the Pacific (RECOFTC).

In addition, on 14 NovemberFRIM signed four MoUs with major wood-based industrial associations in Malaysia in an effort to strengthen collaboration and increase competitiveness. The associations that signed these MoUs with FRIM are Malaysian Furniture Industry Council (MFIC); Malaysian Panel Products Manufacturer Association (MPMA); Malaysian Wood Industry Association (MWIA); and Persatuan Pengusaha Kayu-Kayan dan Perabot Bumiputera Malaysia (PEKA). FRIM is ever prepared to elevate cooperation with the industry in addressing various technical challenges, for instance new global market demand in testing and certification of product quality, safety, performance and sustainability through R&D applications and relevant quality assurance procedures. In the light of establishing strategic partnership as mentioned, such collaborations are crucial for FRIM to understand and respond to the needs of the industry.

I am also very proud and would like to congratulate FRIM on all the awards and acknowledgements received in 2013. The biggest success was winning the National Innovation Award 2013 for Product Category by the wood treatment system using high-temperature drying. The R&D on this treatment was started in 2005.

FRIM also won the National Book Award 2013 in the Prime Award for Research Category for FRIM Warisan Kebangsaan and Book Industry Award for Public Books Category (Science) for 99 Spesies Buah di FRIM. I understand that FRIM Director General, Dato' Dr Abd Latif Mohmod, is one of the editors for both publications. All FRIM scientists should practice book writing as a culture to disseminate latest information on forestry and forest products.

I would also like to congratulate Dato' Dr Abd. Latif who was awarded the Top Research Scientist of Malaysia by the Academy of Sciences Malaysia (ASM) in recognition of his consistent contributions and efforts in mobilising forestry research. Meanwhile, Dr Saw Leng Guan, Forest Biodiversity Division Director of FRIM, was elected as the fellow of ASM for the "Plant Taxonomy and Ecology"



kedua-dua buku tersebut dan ini sewajarnya dicontohi oleh semua saintis FRIM untuk menjadikan penulisan buku sebagai suatu budaya saintis dalam menyebarluaskan maklumat-maklumat terkini khususnya dalam bidang perhutanan dan keluaran hutan.

Saya juga ingin mengambil kesempatan ini untuk mengucapkan setinggi-tinggi tahniah kepada Dato' Dr Abd. Latif yang telah menerima Anugerah Saintis Penyelidikan Terbaik Malaysia (TRSM) daripada Akademi Sains Malaysia (ASM) sebagai pengiktirafan atas sumbangan dan usaha beliau yang tekal dalam menggerakkan penyelidikan perhutanan. Manakala Dr Saw Leng Guan, Pengarah Bahagian Biodiversiti Hutan, FRIM, dilantik sebagai felo ASM bagi kategori "Taksonomi Tumbuhan dan Ekologi" di bawah bidang Biologi, Pertanian dan Sains Alam Sekitar. Segala anugerah dan pengiktirafan yang diterima menunjukkan bahawa pihak luar mengagumi dan seterusnya memandang tinggi FRIM sebagai sebuah institusi yang memiliki aset hidup dan modal insan yang amat bernilai iaitu para saintis yang berkepakaran tinggi dan berwibawa. Pihak Lembaga akan terus menyokong apa jua bidang-bidang R&D yang ingin diterokai oleh FRIM agar nama FRIM terus kejat dalam usaha memperkasakan ekonomi dan pembangunan negara.

Lembaga akan terus menyokong segala usaha FRIM dalam memartabatkan khazanah warisan negara untuk diteroka secara seimbang. Antara lain, Mesyuarat Lembaga pada 2 Februari telah bersetuju secara dasarnya untuk memberi insentif kewangan iaitu wang tunai berjumlah RM10,000 kepada ketua projek perundingan yang berjaya menjana pendapatan sebanyak RM1 juta kepada FRIM seperti yang diuar-uarkan menerusi Pekeliling Ketua Pengarah bil. 4 Tahun 2013. Ini merupakan salah satu usaha MFRDB dalam menyokong dan menggalakkan aktiviti perundingan yang membolehkan bidang kepakaran FRIM diguna pakai oleh pihak industri; di samping membantu dalam memasarkan produk FRIM dan akan memberi pulangan kewangan kepada FRIM.

Impak sumbangan kepakaran di peringkat kebangsaan dan antarabangsa

Di samping usaha untuk memperkukuh kedudukan FRIM di persada negara dan juga antarabangsa, pakar-pakar FRIM turut melibatkan diri dalam rundingan termasuklah memberikan input teknikal di forum-forum antarabangsa yang berkaitan dengan perhutanan dan alam sekitar yang memberi impak penting kepada

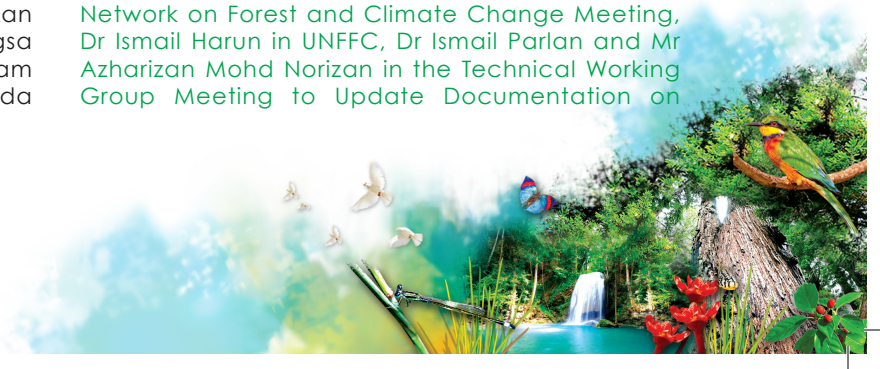
category under the Biological, Agriculture and Environmental Sciences discipline. All awards and recognitions received clearly indicate the acknowledgement of the public that FRIM is an institution with invaluable human capacity constituted of highly-qualified scientists. The Board will continually support all fields of research that will be ventured by FRIM so that FRIM will stand firm in her pursuit to enpower the economics and development of our country.

The Board will remain supportive of all efforts by FRIM in critically exploring the sustainable use and management of our forests. This include the approval by the Board on 2 February to provide financial incentives of RM10 000 in cash, as stated in the "Pekeliling Ketua Pengarah Bil. 4 Tahun 2013", to consultancy project leaders that generate an income of RM1 million to FRIM. This is an initiative of the MFRDB in supporting and encouraging consultancy activities that can be beneficial to the industry. This move is also expected to promote the commercialisation of FRIM products in the market which will generate financial income to FRIM.

Impacts of expertise contribution at national and international levels

While strengthening the position of FRIM at the national and international levels, experts in FRIM also contributed in negotiations including providing technical inputs in international fora on forestry and environment that have significant bearing to the country. A total of 22 FRIM staff were involved in developing Malaysian and international Standards on forestry and forest products. These included FRIM as an authoritative testing body for compliance to the certification schemes of Japanese Agricultural Standard and California Air Resource Board as well as in developing standard for the National Occupational Standard Skill (NOSS)—Wood Carver. Another 13 staff participated in developing national policies including reports on reducing carbon emissions through afforestation/reforestation and forest degradation for the United Nations Framework Convention on Climate Change (UNFCC).

I congratulate these experts, among others, Dr Khali Aziz Hamzah who is involved in the International Meeting on Sustainable Forest Management in CITES, Dr Shamsudin Musa and Dr Elizabeth Philip in ASEAN Regional Knowledge Network on Forest and Climate Change Meeting, Dr Ismail Harun in UNFFC, Dr Ismail Parlan and Mr Azharizan Mohd Norizan in the Technical Working Group Meeting to Update Documentation on



negara. Seramai 22 orang warga FRIM terlibat dalam membangunkan Standard Malaysia dan antarabangsa yang berkaitan bidang perhutanan dan keluaran hutan, antaranya adalah dalam menjadikan FRIM sebagai badan pengujian autoritatif untuk Skim Pensijilan Japanese Agricultural Standard dan California Air Resource Board serta dalam pembangunan standard untuk National Occupational Standard Skill (NOSS)—Wood Carver. Manakala 13 orang pakar dari FRIM telah terlibat dalam penghasilan kertas kerja yang berkaitan dengan polisi negara, antaranya termasuklah laporan berkaitan isu-isu pengurangan pelepasan karbon akibat daripada penghutanan semula dan hutan terosot untuk United Nations Framework Convention on Climate Change (UNFCC).

Syabas saya ucapkan kepada para pakar ini, antara lain, Dr Khali Aziz Hamzah yang terlibat dalam International Meeting on Sustainable Forest Management in CITES, Dr Shamsudin Musa dan Dr Elizabeth Philip dalam ASEAN Regional Knowledge Network on Forest and Climate Change Meeting, Dr Ismail Harun dalam UNFFC, Dr Ismail Parlan dan En Azharizan Mohd Norizan dalam Mesyuarat Kumpulan Kerja Teknikal bagi Mengemas kini Dokumen Program Akreditasi Skim Pensijilan Chain of Custody serta Dr Samsudin Musa dalam ASEAN Regional Knowledge Network on Forest and Climate Change (ARKN-FCC) Meeting.

Saintis FRIM turut menganggotai pelbagai organisasi di peringkat kebangsaan dan antarabangsa; sekadar menyebut beberapa nama, mereka termasuklah Dr Rahim Sudin sebagai ahli lembaga penasihat dalam 11th Pacific Rim Bio-Based Composites Symposium, Dr Rasadah Mat Ali sebagai ahli pakar ASEAN Expert Group on Herbal and Medicinal Plants, Dr Saw Leng Guan dalam Convention on Biological Diversity (CBD), Dr Noor Azlin Yahya sebagai Vice President International Federation of Parks and Recreation Administration (IFPRA) (Benchmarking and Best Practices), serta En Adnan Mohammad dan En Afendi Hussin sebagai arboris bertauliah. Kesemua ini jelas membuktikan bahawa negara kita serta dunia memandang tinggi kepakaran yang dimiliki dan saya bagi pihak Lembaga berharap agar prestasi ini dapat terus dipertingkatkan menerusi penjanaan idea-idea baharu yang dapat diketengahkan.

Impak FRIM kepada industri

Aktiviti pemindahan teknologi di FRIM pada 2013 telah berjaya melatih kira-kira 19 syarikat termasuklah latihan dalam bidang tisu kultur,



Accreditation Programme for Chain of Custody Certification Scheme, and Dr Samsudin Musa in ASEAN Regional Knowledge Network on Forest and Climate Change (ARKN-FCC) Meeting.

FRIM scientists are also members of various organisations at the national and international levels; they are Dr Rahim Sudin as advisory board member in the 11th Pacific Rim Bio-Based Composites Symposium, Dr Rasadah Mat Ali in the ASEAN Expert Group on Herbal and Medicinal Plants, Dr Saw Leng Guan in Convention on Biological Diversity (CBD), Dr Noor Azlin Yahya as Vice President International Federation of Parks and Recreation Administration (IFPRA) (Benchmarking and Best Practices), and Mr Adnan Mohammad and Mr Afendi Hussin as certified arborists, just to name a few. These are evidences that our experts have gained local and international recognition and on behalf of the Board, I hope that such achievements will be magnified further through generation of new ideas.

Impacts of FRIM on the industry

A total of 19 private companies were trained in 2013 through technology transfer activities in the fields of tissue culture, processing of herbs into capsules and development of herbal products. Another 55 projects have benefited from the testing services offered by FRIM for quality of materials such as contents of compost, contents of nutrient and phosphorus in soil, DNA sequencing research for microbes, and determination of soil fertility for landscaping.

Fortification of the institute

Towards the aim and vision of FRIM to attain the UNESCO World Heritage Site (WHS) status by 2017, MFRDB has approved the establishment of a WHS-UNESCO Programme involving FRIM Digital Project and FRIM-Graduate Employment Management Scheme (GEMS) in 2013. I hope that all FRIM staff will provide full assistance and support to the Programme Secretariat and work as a team to achieve this noble ambition as much are left to be done including documentation of facts on FRIM.

Last but not least, I take this opportunity to welcome new Board Members. They are Mr Azhar Noraini, Prof Dr Jegatheswaran Ratnasingam and Tuan Hj Sapuan Ahmad. Mr Pon Chia Hwee and Mr Ng Kay Yip have switched roles as member and alternate member from 1 October. Meanwhile, Mr Mohd Zawawi Hashim and Tuan Hj Ahmad Faizel Dato' Hj Abdul Karim are the new alternate members.

pemprosesan herba menjadi produk kapsul dan pembangunan produk herba. Manakala sebanyak 55 projek mendapat faedah daripada perkhidmatan ujian yang ditawarkan oleh FRIM untuk menentukan kualiti bahan seperti kandungan kompos, kandungan nutrien dan fosforus di dalam tanah, kajian jujukan DNA untuk mikrob serta penentuan kesuburan tanah untuk landskap.

Pengukuhan institut

Ke arah mencapai hasrat dan wawasan FRIM untuk menjulang pengiktirafan sebagai Tapak Warisan Dunia (WHS) UNESCO menjelang 2017, MFRDB telah mengesahkan penubuhan Program WHS-UNESCO yang melibatkan Projek Digital FRIM dan Program Skim Pengurusan Peningkatan Nilai Siswazah (GEMS) pada 2013. Saya menyeru agar semua warga FRIM dapat memberi bantuan dan sokongan sepenuhnya kepada Sekretariat Program ini dan bergerak sebagai satu pasukan atas nama FRIM demi mencapai cita-cita murni ini kerana masih banyak yang perlu dilaksanakan termasuklah pendokumentasian pelbagai fakta mengenai FRIM.

Akhir sekali, saya ingin mengambil kesempatan ini untuk mengalu-alukan Ahli-ahli Lembaga yang baharu iaitu En Azhar Noraini, Prof Dr Jegatheswaran Ratnasingam dan Tuan Hj Sapuan Ahmad. Manakala En Mohd Zawawi Hashim dan Tuan Hj Ahmad Faizel Dato' Hj Abdul Karim (selaku ahli silih ganti. En Pon Chia Hwee dan En Ng Kay Yip pula bertukar peranan sebagai ahli dan ahli silih ganti mulai 1 Oktober.

Di samping itu, tidak lupa saya mengucapkan berbanyak-banyak terima kasih kepada semua Ahli Lembaga yang telah tamat tempoh pelantikan iaitu Prof Dato' Dr Mohamed Isa Abd Majid, Datuk Hj Abdul Ghani Salleh, Dr Rita Manurung, Datu Hj Ali Yusop dan Dato' Dr Mohd Nazlee Kamal serta ahli silih ganti iaitu En Wan Farisan Wan Sulaiman dan Tuan Hj Hanafee Yusoff yang telah memberikan sokongan dan komitmen yang tidak berbelah bagi dalam membantu melonjakkan nama FRIM di persada antarabangsa. Saya juga berharap Ahli-ahli Lembaga yang masih kekal agar terus memberikan sokongan dan buah fikiran dalam memajukan FRIM sebagai sebuah institusi penyelidikan perhutanan tropika yang disegani.

Finally, I would also like to express my highest appreciation to all Board Members who have concluded their term of appointment. They are Mr Prof Dato' Dr Mohamed Isa Abd Majid, Datuk Hj Abdul Ghani Salleh, Dr Rita Manurung, Datu Hj Ali Yusop and Dato' Dr Mohd Nazlee Kamal as well as alternate members, Mr Wan Farisan Wan Sulaiman and Tuan Hj Hanafee Yusoff who have given their kind support and commitment to ensure FRIM stand tall, internationally. I hope that all current Board Members will continue to provide support and ideas towards developing FRIM as a renowned tropical forest research institute.



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PENGERUSI / CHAIRPERSON
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7





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(Dari 1 Oktober/From 1 October)

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EN/MR WAN FARISAN WAN SULAIMAN
(Sehingga 30 September/Until 30 September)
(Ahli silih ganti/Alternate member)
EN/MR MOHD ZAWAWI HASHIM
(Dari 1 Oktober/From 1 October)
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PUAN/MADAM HJH NORCHAHAYA HASHIM (KMN)
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Malaysian Panel Products Manufacturer's Association (MPMA)
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(Sehingga 30 September/Until 30 September)
(Ahli silih ganti/Alternate member)

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Malaysian Wood Industries Association (MWIA)
EN/MR NG KAY YIP
(Sehingga 30 September/Until 30 September)
EN/MR PON CHIA HWEE
(Sehingga 30 September/Until 30 September)
(Ahli silih ganti/Alternate member)
EN/MR PON CHIA HWEE
(Dari 1 Oktober/From 1 October)
EN/MR NG KAY YIP
(Dari 1 Oktober/From 1 October)
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Association of Malaysian Bumiputera Timber and Furniture Entrepreneurs
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TUAN HJ HANAFEE YUSOFF (SMK)
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TUAN HJ AHMAD FAIZEL DATO' HJ ABDUL KARIM
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Universiti Putra Malaysia (UPM)
7 PROF DR JEGATHESWARAN RATNASINGAM
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Sarawak Biodiversity Centre (SBC)
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(Sehingga 30 September/Until 30 September)
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Malaysian Biotechnology Corporation Sdn Bhd
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Institut Penyelidikan Perhutanan Malaysia
Forest Research Institute Malaysia (FRIM)
9 DATO' DR ABD LATIF MOHMOD (DIMP, JSM, KMN, AMN)



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(Ahli silih ganti/Alternate member)
EN/**MR** MOHD ZAWAWI HASHIM
(Dari 1 Oktober/From 1 October)
(Ahli silih ganti/Alternate member)

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(Ahli silih ganti/Alternate member)

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Malaysian Biotechnology Corporation Sdn Bhd

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(Sehingga 30 September/Until 30 September)

Jabatan Perhutanan Sarawak/ Forest Department of Sarawak

TUAN HJ SAPUAN AHMAD
(Dari 1 Oktober/From 1 October)

Jabatan Perkhidmatan Awam Malaysia
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(Dari 1 Oktober/From 1 October)

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Mesyuarat Jawatankuasa Kewangan dan Perjawatan

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1/2013: 2 Februari/February; **2/2013:** 8 April;
3/2013: 21 Mei/May; **4/2013:** 12 September;
5/2013: 17 Disember /December

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(Sehingga 30 September/Until 30 September)
(Ahli silih ganti/Alternate member)

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EN/MR NG KAY YIP
(Dari 1 Oktober/From 1 October)
(Ahli silih ganti/Alternate member)

Mesyuarat Jawatankuasa Audit/Audit Committee Meetings:

1/2013: 2 Februari/February; **2/2013:** 8 April; **3/2013:** 21 Mei/May; **4/2013:** 12 September

PANEL PENASIHAT PENYELIDIKAN
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School of Life Sciences
Tohoku University, Japan

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DR MOHAMAD JAMIL ABU HASAN
Chief Executive Officer, SPPT Engineering Sdn Bhd

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Coordinator, Plant Sciences Programme
Kulliyyah of Sciences International Islamic University Malaysia (IIUM)

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DR RUSLAN ABDULLAH
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Universiti Kebangsaan Malaysia (UKM)

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College of Forestry and Natural Resources
University of the Philippines – Los Banos

PROF DR MOHD TAJUDDIN ABDULLAH
Faculty of Resources Science and Technology
Universiti Malaysia Sarawak (UNIMAS)



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Panjab University, India

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Malaysian Technology Development Corporation

EN/MR KAMAL KORMIN
Head, Patent Examination Section (Applied Science)
Intellectual Property Corporation of Malaysia (MyIPO)

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Economy and Environment Program for Southeast Asia (EEPSEA),
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INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA (FRIM)



FOREST RESEARCH INSTITUTE MALAYSIA

LAPORAN KETUA PENGARAH
DIRECTOR GENERAL'S REPORT

Misi FRIM untuk mencapai kecemerlangan dalam penyelidikan saintifik, pembangunan dan perkhidmatan sektor perhutanan terus diperkejat pada tahun 2013 dengan pelaksanaan pelbagai aktiviti penyelidikan, pembangunan dan komersialisasi (R, D & C) serta aktiviti sokongan lain termasuklah penyebaran hasil-hasil penyelidikan dan perkongsian kepakaran menerusi penerbitan buku-buku dan jurnal, perkhidmatan teknikal seperti perundingan ikhtisas, ujian serta kerjasama pintar dengan agensi dari dalam dan luar negara.

Dengan penerapan amalan dan pengurusan berkualiti menerusi Sistem Pengurusan Kualiti (QMS) dalam kalangan warga kerjanya, FRIM berjaya mengekalkan Pensijilan Pengurusan Kualiti MS ISO 9001:2008 yang diperoleh kali pertama pada tahun 2007 dan MS ISO/IEC 17025 bagi beberapa buah makmalnya. Buat kali keempat sejak 2010, FRIM berjaya mengekalkan Pensijilan QE/5S manakala yang terbaharu pula FRIM menerima sijil Skim Pensijilan Sistem Pengurusan Maklumat (ISMS)—(ISO/IEC 27001: 2005).

Projek penyelidikan dan pembangunan (R&D) terpilih dan hasil/outputnya

Tahun 2013 menyaksikan FRIM terus menonjolkan keberhasilan R, D & C yang signifikan dengan pembangunan negara, malah relevan dengan kehendak industri. Sistem rawatan kayu menggunakan kaedah pengeringan suhu tinggi—high temperature drying (HTD) yang dibangunkan oleh FRIM telah memenangi Anugerah Inovasi Negara (AIN) 2013 bagi Kategori Produk. Saya ingin mengucapkan setinggi-tinggi tahniah kepada kumpulan penyelidik dari Bahagian Keluaran Hutan FRIM yang diketuai oleh Dr Sik Huei Shing yang berjaya merangkul Anugerah tersebut. Diharap Anugerah anjuran Kementerian Sains, Teknologi dan Inovasi (MOSTI) dan Yayasan Inovasi Malaysia ini dapat menjadi pemangkin kepada para saintis FRIM dalam mewujudkan budaya inovasi dan reka cipta menerusi usaha inovatif dan kreatif dalam menjana idea, inovasi dan produk baharu dengan memanfaatkan sains





The mission of FRIM to achieve excellence in scientific research, development and forestry sector service continues to be fortified in 2013 with various research, development and commercialisation activities (R, D & C) besides other supporting activities including dissemination of research outcomes and technology transfer through publication of books and journals, technical services including consultancy, testing as well as smart partnership with national and international agencies.

By integrating quality management and practices through Quality Management System (QMS) among her workforce, FRIM has sucessfully retained the Quality Management Certification MS ISO 9001:2008 which was first attained in 2007 and MS ISO/IEC 17025 for several laboratories. FOr the fourth consecutive time since 2010, FRIM has retained the QE/5S Certification, whereas the latest received was the Information System Management Scheme certification (ISMS)—(ISO/IEC 27001: 2005).

Selected research and development (R&D) projects and results/outputs

2013 witnessed the profound outcomes from R, D & C that were significant with the nation's development as well as being industry-relevant. Wood treatment system using high temperature drying (HTD) developed by FRIM won the National Innovation Award (AIN) 2013 for the Products Category. I wish to extend my heartiest congratulations to the research team from

dan teknologi. Projek yang telah bermula seawal 2005 ini berjaya menarik minat pihak industri kerana HTD merupakan penyelesaian kepada masalah yang dihadapi oleh industri kayu-kayan negara terutamanya pengeluar perabot berasaskan kayu getah akibat halangan serta syarat-syarat perdagangan yang ketat dikenakan oleh pelbagai negara maju dalam memastikan penggunaan produk yang lebih mesra alam. FRIM telah memperoleh paten untuk sistem HTD dari Pejabat Paten dan Cap Dagang Amerika Syarikat (USPTO) pada Mac serta dari Pendaftar Paten Perbadanan Harta Intelek Malaysia (MyIPO) pada Oktober 2013. Di samping itu FRIM turut memfailkan paten di Singapura, Thailand, Vietnam, Indonesia, China dan India.

Selain itu, projek "Identification and Production of Elite Planting Material of *Labisia pumila* for Sustainable Supply" sedang dilaksana bagi mendapatkan klon spesies yang berhasilan tinggi sebagai stok/bekalan bahan penanaman pada masa hadapan. Projek ini merupakan inisiatif Program Membaik Biak Pokok FRIM untuk menggalakkan penanaman spesies pokok kacip fatimah bagi memastikan kelestarian bekalan bahan mentah berkualiti tinggi untuk industri herba selaras dengan Program Transformasi Ekonomi di bawah bidang Ekonomi Utama Negara (NKEA) bagi menjana pendapatan para pekebun kecil. Projek yang dibiayai oleh Skim Geran Penyelidikan NKEA (NRGS) yang dijangka tamat pada 2014 ini telah menubuhkan petak-petak percubaan di Stesen Penyelidikan FRIM di Mata Ayer, Perlis dan Setiu, Terengganu manakala kerja-kerja penubuhan petak percubaan di kampus FRIM, Kepong dan SPF Maran sedang dijalankan secara berperingkat.

Pada 2013, sebanyak 13 projek R&D yang dilaksanakan oleh para penyelidik FRIM (termasuk projek HTD) bernilai kira-kira RM4.7 juta yang dibiayai oleh pelbagai agensi di dalam dan luar negara telah tamat. Saya dengan sukacitanya melaporkan bahawa projek-projek tersebut telah menghasilkan impak yang ketara sekali kepada industri perhutanan negara. Selain HTD, projek Penanaman Pokok Hutan di Sekolah Seluruh Malaysia yang dibiayai di bawah Tabung Pembangunan Industri Kayu-Kayan Malaysia (TPIKM) berjaya mengadakan bengkel penanaman pokok di 16 buah sekolah di Malaysia manakala 15 buah sekolah telah ditanam dengan pokok-pokok hutan. Ini merupakan inisiatif FRIM

Forest Products Division FRIM, led by Dr Sik Huei Shing that won the award. I also hope that the award from Ministry of Science, Technology and Innovation (MOSTI) and Malaysia Innovation Foundation will be a catalyst for FRIM scientists in nurturing an innovative culture in developing new ideas, innovations and products by benefiting from science and technology. The project which started in 2005 has stirred interests from the industry. This is because HTD provides a solution to the wood industry of our country especially for rubberwood-based exporters due to stringent commercial requirements imposed by developed countries to ensure the use of environmental-friendly products. FRIM has obtained the patent for HTD system from the United States Patent and Trademark Office (USPTO) in March and from the Intellectual Property Corporation of Malaysia (MyIPO) in October 2013. In addition, FRIM has also filed for patent in Singapore, Thailand, Indonesia, China and India.

The project on "Identification and Production of Elite Planting Material of *Labisia pumila* for Sustainable Supply" is being carried out to obtain clones with high production as planting stock in the future. This project is initiated by the Herb Breeding Program of FRIM to encourage the planting of L. pumila in order to secure sustainable supply of high quality raw materials for the herbal industry in line with the Economic Transformation Program under the New Key Economic Areas (NKEA) as income for small-scale farmers. The project, supported by the NKEA Research Grant Scheme (NRGS), which is expected to complete in 2014 has established trial plots in FRIM Research Stations in Mata Ayer, Perlis and Setiu, Terengganu. Meanwhile, the establishment of trial plots in FRIM campus, Kepong and FRIM Research Stations in Maran will be carried out in stages.

In 2013, a total of 13 R&D projects carried out by FRIM researchers (including HTD) amounting to RM4.7 million supported by various local and international agencies were completed. I am pleased to say that these projects have delivered significant impacts to forestry in our country.



dalam memberikan pendedahan kepada murid-murid sekolah mengenai spesies hutan dan pemuliharaan alam sekitar.

Di samping itu, dua prototaip berjaya dihasilkan menerusi projek "Evaluation of Polysaccharides from *Eurycoma longifolia* as Potential Ergogenic Aids" yang dibiayai oleh NRGS manakala projek "Authenticated Reference of Bamboo Occuring in FRIM" yang dibiayai oleh Lembaga Penyelidikan dan Pembangunan Perhutanan Malaysia (MFRDB) berjaya menghasilkan satu pangkalan data yang meliputi sifat-sifat buluh komersial serta membentuk koleksi buluh di FRIM yang boleh dijadikan rujukan yang sah kepada pihak yang terlibat dalam industri buluh. Selain itu, projek di bawah Tabung Luar Jangka, MFRDB bernilai RM200,000 berjaya menghasilkan cap jari kimia untuk bahan herba sebagai kawalan kualiti bagi menggalakkan penerimaan pasaran yang lebih baik; manakala data fitokimia tersedia untuk verifikasi saintifik ke atas potensi kegunaan *Eurycoma longifolia* dan *E. apiculata*.

FRIM juga telah berjaya membangunkan penanda DNA bagi lima spesies karas (*Aquilaria*) di samping meneruskan kajian ke atas tiga spesies lain dalam usaha untuk memastikan pengecaman dan pengesahan spesies dengan tepat. FRIM telah menerima permintaan daripada beberapa peladang untuk membantu dalam perkara ini sejak 2011 lagi bagi memenuhi keperluan di bawah Akta Perdagangan Antarabangsa mengenai Spesies Terancam 2008 (Akta 686). Di bawah Akta ini, penanam karas perlu mendaftar dan melaporkan maklumat spesies yang ditanam berserta sijil pengesahan spesies. Pengecaman spesies *Aquilaria* seringkali menghadapi masalah kerana sukar untuk dibezakan pada peringkat anak pokok disebabkan oleh ciri atau sifat spesies-spesies ini yang hampir sama. Saya ingin menguar-uarkan bahawa bagi menyokong pelaksanaan Akta ini serta membantu pengusaha ladang, FRIM telah mengambil inisiatif untuk membangunkan satu teknologi pengecaman spesies *Aquilaria* menggunakan pendekatan teknologi penanda DNA yang dibiayai oleh Kementerian Sains, Teknologi dan Inovasi (MOSTI).

Pemindahan teknologi

Selain melaksanakan aktiviti R&D yang merupakan teras utama, dan dalam usaha untuk menyebarkan pelbagai maklumat berkaitan R&D serta bidang kepakarannya dengan para pemegang taruh,

Other than the HTD, the project on Forest Tree Planting in Schools across Malaysia financed by the Tabung Pembangunan Industri Kayu-Kayan Malaysia (TPIKM) has organised workshop on tree planting in 16 schools in which forest trees were planted in 15 schools. This effort was initiated by FRIM to raise awareness on forest species and environmental conservation among school children.

In another project, two prototypes were developed through the project entitled "Evaluation of Polysaccharides from *Eurycoma longifolia* as Potential Ergogenic Aids," funded by NGRS. The "Authenticated Reference of Bamboo Occuring in FRIM" project supported by the Malaysian Forest Research and Development Board (MFRDB) has successfully developed a database consisting characteristics of commercial bamboos and established a bamboo collection in FRIM as reference for stakeholders in the industry. Additionally, a project carried out under the *Tabung Luar Jangka*, MFRDB totaling RM200,000 has developed chemical fingerprinting for herbal materials as a quality control measure to improve the market acceptance; meanwhile phytochemical data is available for scientific verification of potential uses of *Eurycoma longifolia* dan *E. apiculata*.

FRIM has also succeeded in developing DNA markers for five agarwood species (Aquilaria) as well as being involved in the study of three other species in a move to enhance species identification and verification. FRIM has received requests several from farmers to assist in this since 2011 to fulfill the requirements under the International Trade in Endangered Species Act 2008 (Act 686). Under this Act, agarwood planted needs to be registered and species information should be reported along with a species verification certificate. Identification of *Aquilaria* species is a challenge at sapling stage because of similar characteristics of these species. I would like to announce that in order to support the execution of the aforesaid Act as well as to provide assistance to farmers, FRIM has taken the lead to develop an Aquilaria species identification technique using DNA markers which is supported by the Ministry of Science, Technology and Innovation (MOSTI).



FRIM telah mengadakan pelbagai seminar, persidangan, dialog, bengkel dan latihan yang melibatkan penyertaan pelbagai pihak pemegang taruh dari dalam dan luar negara. Antara lain, pada 11–12 November, FRIM dengan kerjasama Jabatan Perhutanan Semenanjung Malaysia (JPSM) telah menganjurkan Persidangan Perhutanan dan Produk Hutan (CFFPR) 2013. Persidangan yang bertemakan "Perhutanan R, D & C: Memenuhi Keperluan Negara dan Global" telah berjaya mengetengahkan pelbagai isu perhutanan seperti pemuliharaan biodiversiti, perubahan iklim, pengurusan hutan secara mampan, pembangunan ladang hutan, aplikasi bioteknologi, pembangunan produk dan keluaran hutan secara semula jadi.

FRIM menganjurkan Seminar on "Plywood for the Japanese Market" pada 22–23 Oktober dan saya rasa seminar ini diadakan tepat pada masanya dan boleh dimanfaatkan oleh pihak industri terutamanya pengeksport papan lapis kerana maklumat yang diperoleh dapat membantu mereka dalam merangka pelan strategi pemasaran. Papan lapis telah menyumbangkan 25.7% daripada nilai eksport produk kayu Malaysia dan Jepun merupakan antara negara pengimport utama kayu dan produk kayu. Justeru, seminar ini bertujuan untuk memaklumkan kepada pihak industri mengenai senario, cabaran dan peluang dalam pasaran ini, serta maklumat terkini tentang kriteria Japanese Agriculture Standards (JAS). Untuk menembusi pasaran Jepun, produk perlulah mematuhi sistem piawaian JAS yang ditetapkan oleh Kementerian Pertanian, Perhutanan dan Perikanan Jepun. FRIM telah mendapat pengiktirafan sebagai Third-party Testing Organisation melalui PT Mutuagung Lestari yang merupakan Registered Overseas Certifying Body bagi Skim Pensijilan JAS. Sehubungan dengan itu, saya menyeru agar pihak pengeksport papan lapis menggunakan kemudahan ujian di FRIM kerana lokasi yang berdekatan, perkhidmatan yang baik dan lebih menjimatkan kos.

FRIM turut berkerjasama dengan Perbadanan Putrajaya menganjurkan Seminar Kebangsaan Pengurusan Kawasan Hijau pada 1–2 Oktober. Bertemakan "Kawasan Hijau dan Taman Awam: Transformasi untuk Kesejahteraan Rakyat", seminar ini telah membentangkan hasil-hasil penyelidikan berkaitan pengurusan dan penggunaan taman awam dan kawasan hijau di bawah pengurusan pihak berkuasa tempatan serta membincangkan

Technology transfer

Besides R&D activities which constitute the principle element, FRIM has organised a number of seminars, conferences, dialogues, workshops and trainings involving diverse stakeholders from Malaysia and overseas in an effort to disseminate information on R&D and share expertise. Among others, on 11–12 November, FRIM, in collaboration with the Forestry Department of Peninsular Malaysia (FDPM), has organised the Conference on Forestry and Forest Products (CFFPR) 2013. The conference themed "Forestry R, D & C: Meeting National and Global Needs" discussed a number of issues pertaining to biodiversity conservation, climate change, sustainable forest management, establishment of forest plantation, biotechnology application, product development and natural forest products.

FRIM organised a seminar on "Plywood for the Japanese Market" on 22–23 October and in my opinion this seminar is timely and can be beneficial to the industry particularly for export of plywood as the information will allow the planning of a marketing strategy. Plywood contributed to 25.7% of export of wood products in Malaysia and Japan is one of the main importers of wood and wood products. Therefore, this seminar aimed to provide the industry with the information on the scenarios, challenges and opportunities in marketing, as well as current information on the criteria of Japanese Agriculture Standards (JAS). In order to access the Japanese market, products must comply to the standards of JAS which is set by the Ministry of Agriculture, Forestry and Fishery of Japan. FRIM has been accredited as the Third-party Testing Organisation through PT Mutuagung Lestari which is a Registered Overseas Certifying Body for the Certification Scheme of JAS. As such, I hope that plywood exporters will use the testing facility in FRIM as it is located in the vicinity, provides good service and cost-effective.

FRIM also collaborated with Putrajaya Holdings in organising the National Seminar on Green Area Management on 1–2 October. Themed "Green Area and Public Parks: Transforming for Peoples' Welfare", the research results on management and utilisation of public parks and green areas



status dan pencapaian pembangunan dan pengurusan landskap dan taman awam di Semenanjung Malaysia.

Pada 20 September, FRIM menganjurkan seminar yang telah membentangkan hasil penemuan projek-projek R&D yang dilaksanakan di Hutan Penyelidikan Pasoh. Seminar ini diadakan bersempena dengan Mesyuarat Penyelidikan Bersama FRIM-National Institute for Environmental Studies (NIES)-Universiti Putra Malaysia (UPM)-Jabatan Perhutanan Negeri Sembilan (JHNS)-Universiti Teknologi Malaysia (UTM) mengenai Ekologi dan Biodiversiti Tropika.

Selain itu, Persatuan Institusi Perhutanan Asia Pasifik (APAFRI) (saya selaku Pengerusinya) telah menganjurkan seminar mengenai Pembayaran Perkhidmatan Ekosistem (PES). Seminar ini bertujuan untuk menyebarkan maklumat bagi membantu proses pembentukan dasar dan pelaksanaan PES di Malaysia. FRIM menerima dana penyelidikan dari Kementerian Pertanian dan Industri Asas Tani (MOA) untuk menjalankan penilaian perkhidmatan tadahan air hutan tropika dan seminar ini juga diadakan untuk menyebarkan penemuan penyelidikan mengenai kos, peluang dan faedah pemuliharaan hutan untuk mengekalkan perkhidmatan ekosistem tersebut.

FRIM, dengan kerjasama Forestry and Forest Product Research Institute (FFPRI) Jepun telah menganjurkan bengkel Projek Penyelidikan REDD+ di Semenanjung Malaysia untuk menggalak perkongsian, pembelajaran dan perbincangan tentang hasil penemuan penyelidikan projek REDD+ yang dilaksananakan oleh FRIM dan FFPRI. Bengkel tersebut juga mengenal pasti hasil penemuan penyelidikan yang sesuai dilaksanakan di peringkat kebangsaan. Tumpuan utama projek kerjasama ini adalah untuk membangunkan satu sistem pemantauan, laporan dan pengesahan perubahan karbon hutan yang boleh dilaksanakan dalam REDD+ di Malaysia dengan menggabungkan keadaan negara dengan keperluan antarabangsa, penyesuaian teknologi sedia ada dan pengetahuan saintifik.
Bagi menguar-uarkan kepada para pemegang taruhnya, terutamanya pihak industri, taklimat mengenai peranan FRIM sebagai Badan Pensijilan Produk Perabot serta hasrat FRIM untuk menjadi badan berautoritatif dalam pengesahan penghasilan produk berkualiti oleh

under the management of local authorities were presented in the seminar. The status and achievements in development and management of landscape and public parks in Peninsular Malaysia were also discussed.

On 20 September, FRIM organised a seminar to present the results of R&D projects carried out in Pasoh Research Forest. The seminar was organised in conjunction with the Joint Research Meeting FRIM-National Institute for Environmental Studies (NIES)-Universiti Putra Malaysia (UPM)-Negeri Sembilan Forest Department (JHNS)-Universiti Teknologi Malaysia (UTM) on Ecology and Tropical Biodiversity.

The Asia Pacific Association of Forestry Research Institutions (APAFRI) (myself as the Chairman) has organised a seminar on Payment for Ecosystem Service (PES). The seminar aimed to disseminate information to assist in policy formulation and implementation of PES in Malaysia. FRIM received research fund from the Ministry of Agriculture and Agro-based Industry (MOA) to evaluate watershed services of tropical forests. The seminar was also held to share on the findings on opportunity cost and benefits of forest conservation to continuously supply such ecosystem services.

FRIM and Forestry and Forest Product Research Institute (FFPRI), Japan conducted a workshop on REDD+ Research Project in Kuala Lumpur to share, learn and discuss the findings of FRIM-FFPRI REDD+ research project. The workshop also identified findings that can be implemented at national level. The project mainly aimed at the development of a forest carbon change monitoring, reporting and verification system that can be applied to REDD+ in Malaysia by integrating the conditions in Malaysia in relation to the international requirements, appropriate available technologies and scientific knowledge.

FRIM conducted a talk on the role of FRIM as a wood-based furniture product certification body and on the aspiration of FRIM to become an authoritative body in the certification of quality products by local factories. FRIM can play the role of as one-stop centre in offering services from



kilang-kilang tempatan telah diadakan. FRIM boleh bertindak sebagai pusat setempat dalam menawarkan perkhidmatan pemilihan bahan mentah hinggalah kepada penghasilan produk bermutu tinggi. Berdasarkan maklum balas hasil daripada sesi taklimat tersebut, wakil-wakil dari pihak industri iaitu Persatuan Pengusaha Industri Perabot Bumiputera Malaysia (PETRA) dan Persatuan Pengusaha Kayu-Kayan dan Perabot Bumiputera Malaysia (PEKA) telah menyatakan persetujuan untuk berkerjasama dengan FRIM dalam memajukan industri perabot Malaysia.

Inovasi dan komersialisasi

Pelaburan FRIM dalam pelaksanaan aktiviti R&D ternyata memberi pulangan yang menguntungkan. Justeru, FRIM terus menyumbangkan kepakaran kepada pemegang taruhnya menerusi khidmat perundingan ikhtisas. Pada tahun 2013, FRIM mengendalikan sebanyak 46 khidmat perundingan yang bernilai kira-kira RM1.4 juta kepada kedua-dua sektor awam dan swasta. Antara syarikat/ agensi yang mendapatkan khidmat kepakaran FRIM menerusi perundingan ikhtisas pada tahun ini ialah Majlis Minyak Sawit Malaysia (MPOC), Syarikat Prasarana Negara Berhad, Lembaga Perindustrian Kayu Malaysia, Institut Penyelidikan dan Kemajuan Pertanian Malaysia (MARDI), Sabah Softwoods Berhad, Syarikat Samling Timber Sdn Bhd, Mutiara Alam Enterprise, International Tropical Timber Organization (ITTO) dan AEON Co (M) Sdn Bhd. Selain pelanggan-pelanggan baharu, banyak daripada agensi ini merupakan pelanggan yang sama sejak sekian lama, menandakan mereka berpuas hati dengan perkhidmatan yang ditawarkan oleh FRIM.

Manakala hasil penyelidikan FRIM pula berjaya memperoleh 20 pendedahan reka cipta, empat pemfailan paten dan dua pengiktirafan paten. FRIM juga telah menandatangani tiga perjanjian pelesenan teknologi bagi hasil-hasil R&D iaitu "Timber Processing Using High Temperature Drying System (HTD)", "Polysaccharide Fraction from Fruit of *Averrhoa carambola* as Cholesterol Lowering Agent" dan "Fungal Composition as Natural Biocides against MRSA". Saya menganggap bahawa ini merupakan suatu pengiktirafan pihak industri ke atas hasil R&D perhutanan tropika yang menjadi "signature" FRIM.

the selection of raw materials to the production of quality products. Representatives from the industry namely Bumiputera Furniture Industry Entrepreneurs Association Malaysia (PETRA) and Bumiputera Timber and Furniture Entrepreneurs (PEKA) have agreed to collaborate with FRIM in improving the furniture industry of Malaysia.

Innovation and commercialisation

The investment of FRIM in conducting R&D activities has evidently brought beneficial returns. Thus, FRIM continues to provide expertise to stakeholders through consultancies. In 2013, FRIM has conducted a total of 46 consultancies amounting to about RM1.4 million to both the public and private sectors. Among the companies/ agencies that have acquired the expertise of FRIM this year through consultancy are the Malaysian Palm Oil Council (MPOC), Syarikat Prasarana Negara Berhad, Malaysian Timber Industry Board, Malaysian Agricultural Research and Development Institute (MARDI), Sabah Softwoods Berhad, Syarikat Samling Timber Sdn Bhd, Mutiara Alam Enterprise, International Tropical Timber Organisation (ITTO) dan AEON Co (M) Sdn Bhd. Besides new clients, a number of these agencies have remained as our clients for some time indicating that they are satisfaction with the services provided by FRIM.

On top of that, the outputs of FRIM researches have achieved 20 invention disclosures, four patents filing and two patents granted. FRIM has also signed three agreements in technology licensing for R&D outputs namely "Timber Processing Using High Temperature Drying System (HTD)", "Polysaccharide Fraction from Fruit of *Averrhoa carambola* as Cholesterol Lowering Agent" and "Fungal Composition as Natural Biocides against MRSA". In my opinion, these are acknowledgements from the industry on the research findings of tropical forestry which is a "signature" of FRIM.



Anugerah dan pengiktirafan

Pelbagai anugerah dan pengiktirafan yang saban tahun diterima oleh FRIM telah mencetus dan seterusnya mendorong budaya kecemerlangan dalam diri warga FRIM dan pada 2013 FRIM terus mendapat pengiktirafan pelbagai pihak termasuklah di peringkat antarabangsa.

Selain AIN yang dimenangi oleh HTD, FRIM terus mengukuhkan kedudukannya dalam bidang penerbitan dengan memenangi Anugerah Buku Negara 2013 untuk tahun yang ketiga berturut-turut, iaitu buku *FRIM: Warisan Kebangsaan* untuk Anugerah Perdana bagi Kategori Penyelidikan dan buku bergambarnya yang bertajuk 99 *Spesies Buah di FRIM* bagi Anugerah Industri Buku Kategori Buku Umum Terbaik (Sains).

Syabas juga diucapkan kepada warga FRIM yang bertungkus lumus terlibat dalam menghias landskap pameran dengan kreatif menggunakan pelbagai jenis orkid yang berjaya meraih tempat ketiga Anugerah Taman Floria (Kategori Kerajaan) di Festival Bunga dan Taman Putrajaya 2013 (FLORIA Putrajaya 2013) yang bertemakan, "Orkid—Khazanah Tropika".

Saya juga berbangga dengan hasil penemuan penyelidikan FRIM ke atas penggunaan serat makanan atau fraksi kaya polisakarida daripada mengkudu atau noni (*Morinda citrifolia*) sebagai agen pengawalan kandungan gula dalam darah yang telah memenangi Pingat Emas di Ekspo Teknologi Malaysia (MTE) 2013; di samping beberapa produk inovasi dan reka cipta lain yang memenangi pingat perak dan gangsa.

Penerbitan

Dalam usahanya untuk menyebarkan hasil dan maklumat R&D, di bawah pelbagai siri penerbitannya, FRIM telah menerbitkan 32 judul penerbitan. Ini termasuklah empat jilid *Journal of Tropical Forest Science*, lima penerbitan khas (termasuk buku mewah), tiga prosiding, empat keluaran surat beritanya—*FRIM in Focus*—serta *Flora of Peninsular Malaysia Series I: Ferns and Lycophytes,* Volume 2 di bawah siri Malayan Forest Records.

Daripada 97 artikel saintifik hasil penulisan para saintis FRIM yang diterbitkan dalam pelbagai jurnal saintifik, 47 daripadanya merupakan jurnal yang mempunyai faktor impak. Manakala



Awards and acknowledgements

Each year, the awards and acknowledgements received by FRIM have sparked and continuously encouraged a culture for excelling in each FRIM staff. In 2013, FRIM continues to obtain acknowledgements from various bodies including at the international level.

Apart from AIN which was won by the HTD, FRIM continues to hold a firm grip in publication by winning the National Book Award 2013 for the third consecutive time. These publications are *FRIM: Warisan Kebangsaan* for Prime Award in the Research Category and illustrated book entitled 99 *Spesies Buah di FRIM* for the Book Industry Award in the Best Public Book Category (Science).

Well done to all FRIM staff who were involved in creating and decorating a landscape creatively with various types of orchids that bagged a third place in the Floria Garden Award (Government Category) at the Putrajaya Floral Fest and Garden 2013 (FLORIA Putrajaya 2013) themed "Orchid—Tropical Treasure".

I am also proud with the findings on the use of food fibre or polysaccharide-rich fraction from noni fruit (*Morinda citrifolia*) which is a control agent for blood sugar level that won gold medal at the Malaysia Technology Expo (MTE) 2013 besides other innovations that were awarded silver and bronze medals.

Publication

In an effort to disseminate R&D findings and information, FRIM has produced 32 titles under several series of publication. This include four volumes of the *Journal of Tropical Forest Science*, five special publications (including coffee table books), three proceedings, four issues of its newsletters—*FRIM in Focus*—as well as *Flora of Peninsular Malaysia Series I: Ferns and Lycophytes,* Volume 2 under the Malayan Forest Records series.

From a total of 97 scientific articles written by FRIM scientists that were published in various scientific journals, 47 were published in journals with impact factor. Meanwhile, 405 scientific and technical papers including posters were presented in

sebanyak 405 kertas saintifik dan teknikal termasuk poster telah dibentangkan oleh para saintis FRIM di persidangan, seminar, simposium, bengkel dan juga dialog di peringkat kebangsaan dan antarabangsa.

Aktiviti FRIM sering kali mendapat liputan oleh pihak media massa, termasuk media arus perdana. Pada 2013, sebanyak 138 artikel/rencana mengenai penyelidikan FRIM telah disiarkan di akhbar-akhbar, termasuk di Sabah dan Sarawak.

Pembangunan

Dalam usaha FRIM untuk melindungi serta memulihara kawasannya yang telah diwartakan sebagai Tapak Warisan Kebangsaan, FRIM telah melaksanakan operasi bersepadu bersama-sama pihak polis, Majlis Perbandaran Selayang dan Pejabat Tanah Daerah Gombak untuk mengosongkan tanah FRIM yang diceroboh oleh pengusaha tapak semaian swasta. FRIM terpaksa melaksanakan operasi sempadan ini yang meliputi 0.97 ha di Field 54 setelah beberapa notis amaran dikemukakan, tetapi tidak diendahkan oleh pengusaha berkenaan.

FRIM turut memasang pagar di sekitar kampusnya; di samping membuat rondaan dan pemeriksaan secara lebih kerap untuk mencegah pencerobohan dan juga menjaga keselamatan para jogger yang beriadah.

Bagi kemudahan pengunjung FRIM yang sentiasa meningkat dari semasa ke semasa, FRIM telah menyiapkan projek menaik taraf pintu masuk utamanya dengan melebarkan jalan menjadikan empat lorong manakala kapasiti parkir untuk kereta dan bas telah dinaik taraf dua kali ganda yang terletak di kawasan seluas setengah hektar di sebelah kanan pintu masuk FRIM.

Aktiviti tanggungjawab sosial korporat (CSR)

Walaupun FRIM merupakan sebuah institusi yang bertunjangkan aktiviti R, D & C, FRIM di bawah Unit Komunikasi Korporatnya terus melaksanakan pelbagai aktiviti sebagai tanggungjawab sosial korporat (CSR). Selain acara biasa yang diadakan saban tahun, antara lain, FRIM melancarkan fasa kedua kempen "Katakan Tidak kepada Plastik dan Polistirena" untuk menjadikan kawasan FRIM sebagai zon sifar sampah dengan menggalakkan warga FRIM dan pelawat menggunakan bekas

conferences, seminars, symposiums, workshops and dialogues at the national and international levels.

FRIM always received coverage from the mass media which included the main stream media. In 2013, 138 articles on FRIM research were published in newspapers throughout the nation.

Development

As part of a continuous effort in conserving FRIM area which was gazetted as a national heritage, an operation was carried out with the police force, the Selayang Municipal Council (MPS) and the Gombak Land and District Office to evict a private nursery operator. FRIM had to execute such a boundary operation which covers an area of 0.97ha in Field 54 after several warning notices issued were disregarded by the operator.

FRIM is also fencing up the area surrounding the campus in addition to more frequent security checks to avoid encroachment and as an effort to ensure the safety of joggers.

For the convenience of the increasing number of FRIM visitors, FRIM has completed upgrading the main entrance by widening the road to four lanes. Additionally, the parking capacity for cars and buses was doubled to 0.5 ha on the right side of FRIM entrance.

Activities for Corporate Social Responsibility

Although the core activities of FRIM are R,D&C, FRIM has launched a number of corporate social activities through the Corporate Communication Unit. Besides other annual events, FRIM has launched phase two of "Say no to Plastic and Polystyrene" campaign, among others, to make FRIM a zero garbage zone by encouraging FRIM staff and visitors to use recyclable food containers and to reduce garbage. The campaign can be said as successful as I saw FRIM staff taking along their food containers to the cafeteria when buying food.



makanan yang boleh dikitar semula serta mengurangkan pembuangan sampah. Saya dapat lihat bahawa kempen ini berjaya apabila terserempak dengan warga kerja FRIM membawa bekas makanan sendiri apabila membeli makanan di kafetaria.

Kira-kira 100 orang warga FRIM dan Zoo Negara bersama-sama pelajar dari Universiti Pengurusan dan Sains (MSU) menyertai program gotong-royong menanam buluh untuk makanan beruang panda yang bakal menyerikan Zoo Negara pada April 2014 kelak. Sebanyak 200 buluh siam (Thyrsostachys siamensis) ditanam di petak lereng bukit berhampiran kawasan Zoo Negara.

FRIM telah menganjurkan program "Minum Pagi Bersama Jogger" bersempena dengan sambutan Hari Alam Sekitar Sedunia peringkat FRIM. Program yang berjaya menarik seramai 200 orang jogger ini bertujuan menjadikan mereka sebagai 'sahabat' dalam memelihara khazanah hutan. Selain itu, ia juga bertujuan memperkenalkan gaya hidup sihat dan meningkatkan kesedaran orang ramai tentang kepentingan penjagaan kesihatan dan alam sekitar untuk kesejahteraan bersama.

Pembangunan modal insan

FRIM sentiasa menggalakkan warga kerjanya untuk melanjutkan pengajian lepasan ijazah. Saya mengambil kesempatan ini untuk merakamkan ucapan setinggi-tinggi tahniah kepada pegawai-pegawai FRIM yang berjaya menamatkan pengajian lepasan ijazah masing-masing. Mereka terdiri daripada Mohd Nasir Mat Arip, Mary Khoo Gaik Hong, Wan Mohd Shukri Wan Ahmad, Abdul Hamid Saleh dan Saiful Iskandar Khalit yang berjaya menamatkan dengan jayanya Ijazah Doktor Falsafah; manakala Amir Saaifuddin Kassim, Mohd Ismawee Ismail dan Zairul Amin Zabidin menamatkan Ijazah Sarjana. Diharap kejayaan mereka ini dapat mendorong warga kerja lain untuk berusaha meningkatkan keupayaan masing-masing.

Seterusnya saya mengalu-alukan dua ahli baharu dalam Mesyuarat Pengurusan Tertinggi FRIM iaitu Puan Norhara Hussein yang dilantik sebagai Pengarah Bahagian Sumber Manusia menggantikan En Imaludden Abdullah yang bersara wajib manakala Dr Khali Aziz Hamzah dilantik sebagai Pengarah Bahagian Perkhidmatan Teknikal menggantikan En Wan



About 100 staff from FRIM and the National Zoo together with students from the Management and Science University had joined a program to plant bamboo for pandas which are expected to arrive at the zoo by April 2014. A total of 200 buluh siam (Thyrsostachys siamensis) were planted along the cliff nearby the zoo.

FRIM has organised a program "Morning Tea with Joggers" in conjunction with the celebration of World Environment Day. The program attracted 200 joggers and then were invited them as 'friends' in conserving forest heritage. It was also aimed at introducing a healthy lifestyle and increase awareness on the importance of management of health and the environment for a better livelihood.

Human capital building

FRIM always encourages her staff to pursue post-graduate studies. I take this opportunity to congratulate FRIM officers who have completed their degrees. They are Mohd Nasir Mat Arip, Mary Khoo Gaik Hong, Wan Mohd Shukri Wan Ahmad, Abdul Hamid Saleh and Saiful Iskandar Khalit who graduated with PhDs and, Amir Saaifuddin Kassim, Mohd Ismawee Ismail dan Zairul Amin Zabidin who obtained their Masters. I hope their success will encourage other staff to strive in improving their capabilities.

I also welcome two new members of FRIM Top Management Meeting. They are Mrs Norhara Hussein who was appointed as the Director, Human Resources Division replacing Mr Imaludden Abdullah, and Dr Khali Aziz Hamzah who was appointed as the Director, Technical Services Division replacing Mr Wan Zahiri Wan Yaacob. I would like to express my appreciation to Mr Imaludden dan Mr Wan Zahiri who had given excellent services to FRIM in their respective works.

R&D obstacle

Even though the R&D outputs had managed to engrave FRIM's name globally, FRIM is faced with obstacles especially in getting research funding from external agencies. No doubt, FRIM has to strengthen its R&D's effort in both upstream and

Zahiri Wan Yaacob. Saya ucapkan terima kasih kepada En Imaludden dan En Wan Zahiri yang telah memberikan perkhidmatan yang cemerlang kepada FRIM dalam bidang masing-masing.

Kekangan yang dihadapi

Walaupun hasil R&D telah berjaya memacu nama FRIM di persada dunia, FRIM turut menghadapi kekangan terutama untuk mendapatkan dana penyelidikan dari agensi luar. Tidak dinafikan bahawa FRIM perlu memperkejat usaha R&D-nya dalam kedua-dua aktiviti, iaitu hiliran dan huluan. Memandangkan pihak kerajaan lebih mengutamakan hasil-hasil R&D yang berpotensi untuk dikomersialkan, FRIM perlu bekerja lebih keras untuk mendapatkan dana penyelidikan terutamanya bagi projek-projek huluan yang tidak kurang pentingnya dalam menyumbang kepada pembangunan negara.

Hala tuju

Kecemerlangan yang diraih FRIM pada 2013 begitu ketara menghasilkan pelbagai out put dan hasil yang boleh dimanfaatkan oleh para pemegang taruh termasuklah pihak industri, institusi pengajian tinggi awam dan swasta, murid sekolah serta orang awam. Selaras dengan aspirasi Perdana Menteri Malaysia yang ingin merakyatkan perkhidmatan, menjelang tahun 2014, marilah kita memperkasa R&D FRIM dengan menumpukan pada pelaksanaan aktiviti R&D yang lebih memberi impak kepada rakyat, contohnya projek memartabatkan pengetahuan tradisi Melayu ke tahap pendokumentasian yang lebih sistematik. Kita tidak boleh lagi bersikap mudah berpuas hati dengan apa yang telah dicapai kerana banyak lagi khazanah alam semula jadi di hutan tropika ini yang belum diterokai ke arah menyumbang kepada kesejahteraan sejagat. Bertindaklah dengan pantas dalam segala usaha kita agar kita terus kekal relevan dalam dunia yang semakin mencabar ini.

downstream activities. As the Government is giving priority to potentially commercialisable R&D activities, FRIM needs to work harder and put more effort to get research funding, more so for upstream projects which also contribute for the development of the nation.

Way forward

The excellence in producing various outputs and findings as achieved by FRIM in 2013 can be benefitted by stakeholders including the industry, public or private higher learning institutions, students and the general public. In line with the aspiration of our Prime Minister to improve the delivery of public services, let us strengthen FRIM R&D by focusing on activities which would have more impact on the people, for example by having a project to systematically document Malay traditional knowledge. We cannot be contempt with what have been achieved as there are many more treasures in the tropical forest with great benefits yet to be discovered. Act promptly in every effort so that we shall remain relevant to the world with increasing challenges.



DATO' DR ABD LATIF MOHMOD
DIMP, JSM, KMN, AMN
KETUA PENGARAH/DIRECTOR GENERAL FRIM









INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA (FRIM)



FOREST RESEARCH INSTITUTE MALAYSIA

PENGURUSAN TERTINGGI
TOP MANAGEMENT



Ketua Pengarah/Director General
DATO' DR ABD. LATIF MOHMOD
(DIMP, JSM, KMN, AMN)



Timbalan Ketua Pengarah
(Penyelidikan dan Pembangunan)
Deputy Director General (Research and Development)
DR MOHAMED NOR MOHD. YUSOFF (KMN)



Timbalan Ketua Pengarah
(Operasi)/Deputy Director General (Operational)
DR NORINI HARON (AMN)



Pengarah Bahagian
Biodiversiti Hutan/Director Forest Biodiversity Division
DR SAW LENG GUAN



Pengarah Bahagian
Kewangan/Director Finance Division &
Pengarah Bahagian Inovasi dan Komersialisasi
Director Innovation and Commercialisation Division
TUAN HJ MOHD. ZAMSHARI ABD. RAHMAN



Pengarah Bahagian
Keluaran Hutan/Director Forest Products Division
DR RAHIM SUDIN





Pengarah Bahagian Perancangan Penyelidikan dan Korporat
Director Research Planning and Corporate Division
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Pengarah Bahagian Perhutanan dan Alam Sekitar
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DR ISMAIL HARUN



Pengarah Bahagian Hasilan Semula Jadi/Director Natural Products Division
DR RASADAH MAT ALI (AMP)



Pengarah Bahagian Bioteknologi Perhutanan/
Director Forestry Biotechnology Division
DR NORWATI MUHAMMAD



Pengarah Bahagian Perkhidmatan Teknikal
Director Technical Services Division
DR KHALI AZIZ HAMZAH

Pengarah Bahagian Pentadbiran
Director Administration Division
EN./MR ABDUL JABBAR HJ SABLI



Pengarah Bahagian Sumber Manusia
Director Human Resource
PN/MDM NORHARA HUSSEIN

Ketua Unit Komunikasi Korporat/Head Corporate Management Unit
PN/MDM NORHAYATI NORDIN

CARTA ORGANISASI FRIM
FRIM ORGANISATIONAL CHART

KEMENTERIAN SUMBER ASLI DAN ALAM SEKITAR
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA
MALAYSIAN FORESTRY RESEARCH AND DEVELOPMENT BOARD (MFRDB)

JAWATANKUASA PENASIHAT PENYELIDIKAN
RESEARCH ADVISORY COMMITTEE (RAC)

PANEL PENASIHAT TEKNIKAL
TECHNICAL ADVISORY PANEL (TAP)

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DIRECTOR GENERAL FRIM
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  (Dr Samsudin Musa)
- KUALITI AIR
  WATER QUALITY
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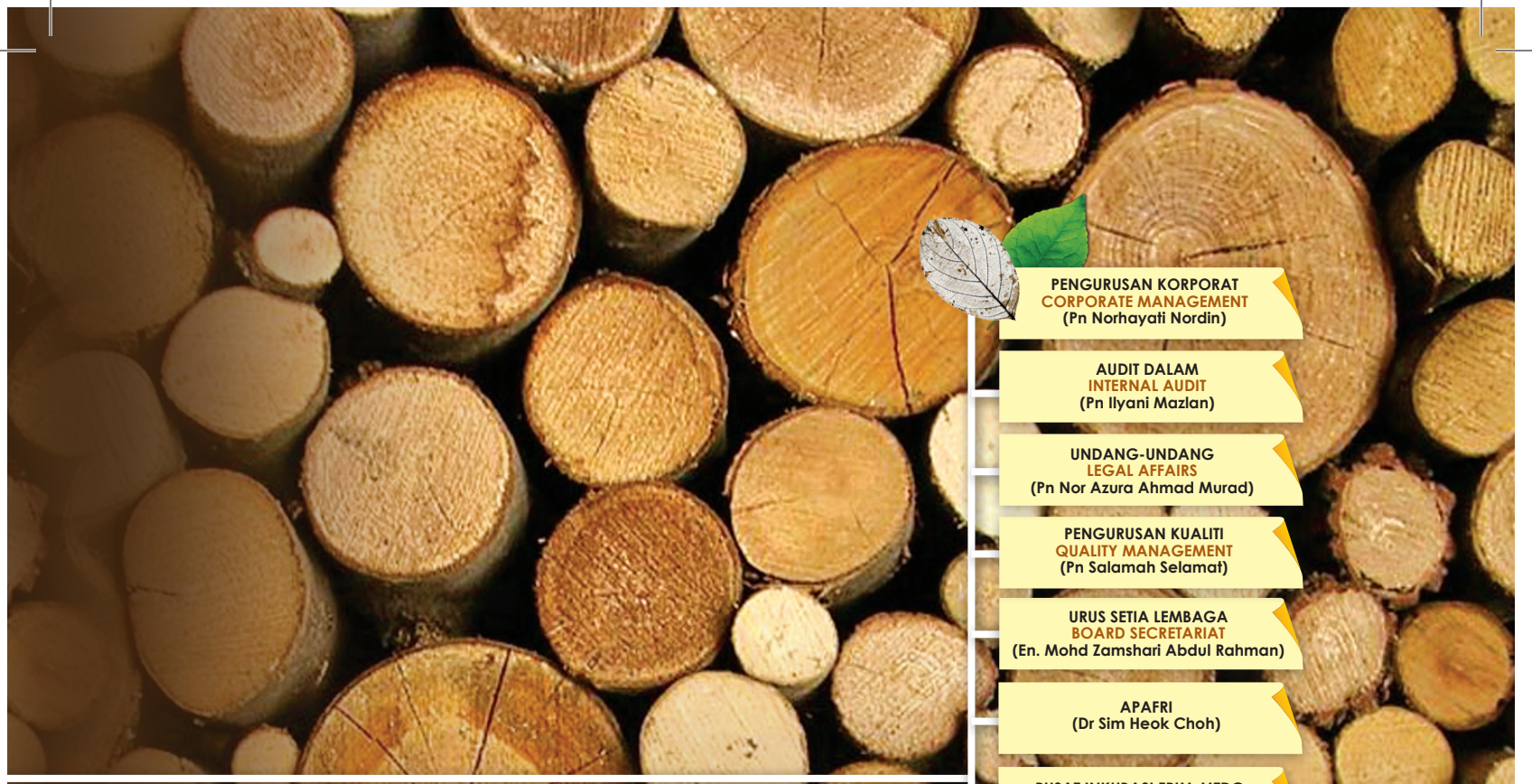
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- BIODIVERSITI FAUNA
  FAUNAL BIODIVERSITY
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  (Dr Woon Weng Chuen)
- KOMERSIALISASI & INKUBASI
  COMMERCIALISATION AND INCUBATION
  (Dr Woon Weng Chuen)
- PERUNDINGAN
  CONSULTANCY
  (Pn Izan Nor Farahni Ahmad)

LATAR BELAKANG

Institut Penyelidikan Perhutanan Malaysia (FRIM) ditubuhkan pada tahun 1929, dahulunya dikenali sebagai Institut Penyelidikan Perhutanan (IPP) di bawah Ibu Pejabat Jabatan Perhutanan Semenanjung Malaysia. Pada 1985 FRIM menjadi sebuah badan berkanun di bawah Akta 319 Lembaga Penyelidikan dan Pembangunan Perhutanan Malaysia dan diletakkan di bawah Kementerian Perusahaan Utama sebelum berpindah ke Kementerian Sumber Asli dan Alam Sekitar pada tahun 2004.

VISI

Menjadikan FRIM sebuah institusi penyelidikan hutan tropika yang bertaraf dunia

MISI

Mencapai kecemerlangan dalam penyelidikan saintifik, pembangunan dan perkhidmatan sektor perhutanan

OBJEKTIF

Objektif Umum FRIM adalah untuk:

- Menjana pengetahuan saintifik bagi pemahaman, pengurusan dan penggunaan sumber hutan
- Mencapai kecemerlangan dalam penyelidikan dan pembangunan dengan penggunaan alat saintifik terkini
- Mengkaji kepelbagaian biologi bagi menghasilkan produk berguna melalui penyelidikan dan pembangunan yang intensif
- Memajukan teknologi berkaitan bagi memenuhi keperluan industri perhutanan
- Mempakejkan hasil penyelidikan dan pembangunan untuk disebar kepada pelanggan
- Mengkomersialkan hasil penyelidikan dan pembangunan melalui pemindahan teknologi kepada pihak yang berminat
- Menyediakan perkhidmatan cemerlang untuk memenuhi kepuasan pelanggan
- Mewujudkan kerjasama strategik dengan agensi tempatan dan antarabangsa
- Meningkatkan kesedaran awam terhadap kepentingan alam sekitar dan pemuliharaan kepelbagaian biologi hutan

BACKGROUND

The Forest Research Institute Malaysia (FRIM) founded in 1929 as the Forest Research Institute (FRI) was a department under the Forestry Headquarters Peninsular Malaysia. It was not until 1985, the Institute became a statutory body under Act 319 governed by the Malaysian Forestry Research and Development Board (MFRDB) under the then Ministry of Primary Industries. Later in 2004, FRIM was administered by the Ministry of Natural Resources and Environment.

VISION

To make FRIM a world-class tropical forest research institute

MISSION

To achieve excellence in scientific research, development and forestry services

OBJECTIVES

General Objectives:

- To generate scientific knowledge for the understanding, management, conservation and use of forest resources
- To achieve excellence in research and development through the use of the latest scientific equipment
- To study biodiversity to produce useful products through intensive research and development
- To develop related technology to fulfill the needs of the forestry industry
- To package research and development findings for dissemination to clients
- To commercialise research and development findings through technology transfer to all interested parties
- To provide excellent service to fulfill client needs
- To create strategic cooperation with local and international agencies
- To raise public awareness regarding the importance of the environment and the conservation of forest biodiversity



Objektif Operasi FRIM adalah untuk:

- Menyediakan program pembangunan sumber manusia bagi melahirkan golongan saintis yang berwibawa dan kompeten
- Menyediakan suasana kerja yang kondusif bagi menggalakkan cetusan idea di kalangan saintis dan perhubungan lebih rapat dengan pelanggan
- Menyebarkan hasil teknologi, penyelidikan serta memberi perkhidmatan nasihat dan teknikal yang tepat dan profesional
- Menyediakan penyelesaian praktikal kepada masalah berkaitan pengurusan dan penggunaan sumber dan hasil hutan
- Menyediakan kemudahan dan memberi perkhidmatan profesional dalam meningkatkan kesedaran awam terhadap alam sekitar

FUNGSI

Fungsi utama FRIM adalah untuk:

- Merancang dan melaksanakan penyelidikan bagi pembangunan sektor perhutanan dan pemuliharaan sumber hutan
- Memperoleh dan menyebarkan maklumat hasil penyelidikan bagi meningkatkan pengurusan hutan dan penggunaan hasil hutan
- Mengadakan hubungan kerjasama penyelidikan dan pembangunan perhutanan dengan badan-badan dalam dan luar Malaysia

PIAGAM PELANGGAN

Kami berjanji untuk berusaha membangun dan menggalakkan penggunaan sumber dan hasil hutan secara berkekalan melalui penyelidikan, pembangunan dan penggunaannya. Bagi tujuan ini, kami memberi jaminan seperti berikut:-

- Menyediakan kontrak kerjasama perjanjian komersial dan bukan komersial dalam tempoh tiga (3) bulan setelah nota persetujuan diperoleh daripada rakan kerjasama.
- Memastikan 40% daripada penghasilan 90 artikel jurnal mempunyai faktor impak.
- Memproses pembayaran bil dan invois dalam tempoh 14 hari dari tarikh penerimaan dokumen yang lengkap.
- Memastikan 95% keputusan perkhidmatan ujian yang diberikan kepada pelanggan diserahkan dalam tempoh yang dijanjikan oleh FRIM.
- Memastikan 95% daripada perkhidmatan diserahkan kepada pelanggan dalam tempoh 14 hari dari tarikh siap perkhidmatan

Operational Objectives:

- To provide human resource development programmes to produce a class of authoritative and competent scientists
- To provide a work environment that is conducive to encourage creative thinking among scientists and a close relationship with clients
- To disseminate technological and research products as well as giving accurate and professional advice and technical services
- To provide practical solutions to problems involving management and usage of forest resources and products
- To provide facilities and professional services in order to raise environmental awareness.

FUNCTIONS

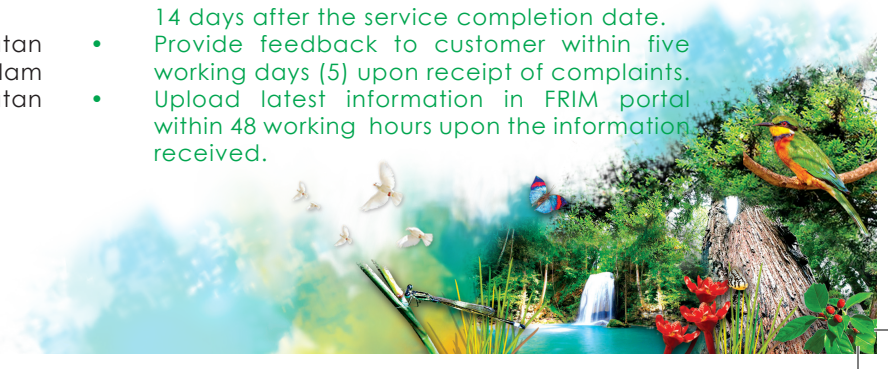
The main functions of FRIM are:

- To plan and implement research for the development of the forestry sector and the conservation of forest resources
- To obtain and disseminate research information to enhance forest management and the use of forest products
- To establish collaborative research and forest development with other bodies within and outside Malaysia

CLIENTS' CHARTER

We pledge to develop and enhance the utilisation of forest resources and products on a sustainable basis through research, development and application. For this purpose, we give our assurance as follows:

- Prepare collaborative contracts for commercial and non-commercial agreements within three (3) months after the receipt of agreement notes from collaborating partners.
- Published 90 journal articles with at least 40% in journals with impact factor (IF).
- Process payment for bills and invoices within 14 days from the date of receipt of complete documents.
- Submit 95% of service test reports to customers within the period promised by FRIM.
- Submit 95% of the service to customers within 14 days after the service completion date.
- Provide feedback to customer within five working days (5) upon receipt of complaints.
- Upload latest information in FRIM portal within 48 working hours upon the information received.



- Memberi maklum balas kepada aduan pelanggan dalam masa lima (5) hari bekerja dari tarikh aduan diterima.
- Mengemas kini maklumat terkini di portal FRIM dalam tempoh 48 jam waktu bekerja selepas maklumat diperoleh.
- Memberi maklum balas permohonan latihan sangkut daripada IPTA/IPTS dan agensi dalam tempoh tujuh (7) hari bekerja dari tarikh permohonan diterima.
- Memastikan permohonan tempahan sewaan ruang dan kawasan diluluskan dalam tempoh lima (5) hari bekerja dari tarikh permohonan lengkap diterima.

DASAR KUALITI

FRIM komited dalam menyediakan perkhidmatan penyelidikan dan perkhidmatan sokongan dengan cekap dan berkesan bagi memenuhi keperluan pelanggannya. Ini dilaksanakan berasaskan Piawaian MS ISO 9001:2008. FRIM akan melaksanakan penambahbaikan berterusan bagi meningkatkan keberkesanan sistem berkaitan.

SLOGAN KUALITI

Kualiti teras kecemerlangan, Inovasi kunci keunggulan

SLOGAN PERSEKITARAN BERKUALITI

Persekitaran berkualiti pemangkin kecemerlangan produktiviti

PELAN STRATEGIK FRIM 2011–2020

Strategi 1:	Penjanaan Pendapatan
Strategi 2:	Strategi-strategi R&D
Strategi 3:	Komersialisasi Out Put R&D
Strategi 4:	Ekopelancongan
Strategi 5:	Aplikasi dan Perkhidmatan ICT
Strategi 6:	Pembangunan Sumber Manusia
Strategi 7:	Perkhidmatan Teknikal
Strategi 8:	Komunikasi dan Promosi R&D

- Respond to enquiry regarding industrial training from the institutions of higher learning and/or other agencies within seven (7) working days from the date of receipt.
- Approve application for rental of space and area within five (5) working days

QUALITY POLICY

FRIM is committed to providing effective research and related supporting services to fulfill its clients' needs. This is carried out in accordance with MS ISO 9001:2008 Standards. FRIM will carry out continuous improvements to enhance the effectiveness of related systems.

QUALITY SLOGAN

Quality is the pillar for excellence, Innovation is the key to preeminence

QUALITY ENVIRONMENT SLOGAN

Quality environment as catalyst to excellence in productivity

FRIM STRATEGIC PLAN 2011–2020

Strategy 1:	Income Generation
Strategy 2:	R&D Strategies
Strategy 3:	Commercialisation of R&D Output
Strategy 4:	Ecotourism
Strategy 5:	ICT Application and Services
Strategy 6:	Human Resource Development
Strategy 7:	Technical Services
Strategy 8:	Communication and Promotion in R&D



STESEN-STESEN PENYELIDIKAN FRIM (SPF)
FRIM RESEARCH STATIONS

FRIM menawarkan pelbagai kemudahan untuk menjalankan penyelidikan termasuk sembilan buah stesen penyelidikan yang terletak di beberapa buah negeri yang mewakili pelbagai jenis hutan di Semenanjung Malaysia seperti berikut:

1. Stesen Penyelidikan Pasoh/Pasoh Research Station, Negeri Sembilan:
   - Stesen penyelidikan FRIM yang pertama ditubuhkan pada tahun 1970 di bawah Man and Biosphere Programme, Universiti Malaya.
   - Dipindah hak milik kepada Institut Penyelidikan Perhutanan (FRI) pada tahun 1978.
   - Terletak di Hutan Simpan Penyelidikan Pasoh yang meliputi kawasan seluas 1,840 ha yang telah diwartakan untuk tujuan penyelidikan dan pendidikan yang diuruskan oleh FRIM.
   - Mendapat perhatian seluruh dunia dari saintis dan ahli ekologi hutan tropika, serta pendidik dan penggemar alam sekitar tempatan.
   - Terdapat sebuah petak ekologi kekal seluas 50 ha, arboretum seluas 2 ha, denai alam berpandu sepanjang 2 kilometer dan sistem menara titian kanopi segi tiga diperbuat daripada aluminium dan aloi yang pertama seumpamanya di negara ini.
   - Hutan Simpan Penyelidikan Pasoh ini merupakan hutan pamah tropika yang paling menyeluruh dikaji di rantau Asia Tenggara.

Sila hubungi: Program Hutan Asli
Tel: +03-6279 7638/7177
E-mail: cdfletch@frim.gov.my

2. Stesen Penyelidikan Mata Ayer
   - Ditubuhkan pada tahun 1974, stesen ini terletak di kawasan seluas 455 ha dalam Hutan Simpan Mata Ayer.
   - Pusat rujukan untuk penubuhan ladang hutan jati.
   - Penanaman pertama dijalankan pada tahun 1953.
   - Mempunyai kawasan seluas 300 ha yang ditanam dengan jati dari pelbagai lokasi di Semenanjung Malaysia serta

FRIM offers a wide range of facilities for conducting research including nine (9) research stations in different states to represent various forest types in various parts of Peninsular Malaysia, namely:

1. Pasoh Research Station, Negeri Sembilan:
   - FRIM's oldest research station, established in 1970 under the Man and Biosphere Programme, University of Malaya.
   - Handed over to the Forest Research Institute (FRI) in 1978.
   - Located in the Pasoh Research Forest Reserve (FR), covering a total area of 1,840 ha gazetted for research and educational purposes managed by FRIM.
   - Receives worldwide attention from tropical forest ecologists and scientists, as well as local educators and naturalists.
   - Comprises a 50-ha permanent ecology plot, a 2-ha arboretum, a 2-km nature trail and a 30-metre three-tower-canopy walkway system made of aluminum alloy, the first of its kind in the country.
   - The Pasoh Research FR is the best studied lowland tropical forest in Southeast Asia.

Contact: Natural Forest Programme
Tel: +03-6279 7638/7177
E-mail: cdfletch@frim.gov.my

2. Mata Ayer Research Station, Perlis:
   - Established in 1974, the station sits on 455-hectare area in Mata Ayer Forest Reserve.
   - A referral centre for teak plantation establishment.
   - First planting took place in 1953.
   - Comprises a 300-ha area planted with teak provenances from various parts of Peninsular Malaysia, Thailand, Indonesia, India, Papua New Guinea, Trinidad and Sabah.
   - Offers facilities for eco-tourism and environment education activities including a canopy walkway, accommodation and camping site.

Contact: Tree Improvement Programme
Tel: 03-6279 7101
E-mail: zaky@frim.gov.my



dari Thailand, Indonesia, India, Papua New Guinea, Trinidad dan Sabah.
- Dilengkapi dengan kemudahan untuk aktiviti-aktiviti pendidikan ekopelancongan dan alam sekitar termasuk titian silara, kemudahan penginapan dan tapak perkhemahan.

Sila hubungi : Program Membaik Biak Tumbuhan
Tel: 03-6279 7101
E-mail: zaky@frim.gov.my

3. Stesen Penyelidikan Jengka:
- Ditubuhkan pada tahun 1982, berkeluasan 0.9 ha dan berfungsi sebagai pusat penyelidikan pengurusan hutan semula jadi.
- Fokusnya adalah untuk penyelidikan dan pembangunan pengurusan secara lestari hutan bukit dipterokarpa.
- Stesen ini digunakan secara meluas oleh para penyelidik tempatan dan ahli sains asing. Ia merupakan tapak penyelidikan untuk beberapa projek yang telah berjaya dilaksanakan dalam bidang pembalakan, dirian hutan yang tinggal dan pembangunan pertumbuhan semula, rawatan silvikultur, tanaman mengaya, hidrologi, sains tanah, zoologi dan ekologi hutan.
- Percubaan tanaman mengaya telah dilaksanakan untuk menentukan spesies-spesies yang sesuai untuk ditanam mengikut barisan atau secara berkelompok.

Sila hubungi: Program Hutan Asli
Tel: 03-6279 7091 / 7478
E-mail: harfendy@frim.gov.my

4. Stesen Penyelidikan Segamat

- Ditubuhkan pada tahun 2003, stesen ini merangkumi kawasan seluas 292.2 ha.
- Berfungsi sebagai pusat rujukan untuk penyelidikan terhadap perladangan spesies campuran, dengan tumpuan khas kepada karas.
- Sebanyak 93 ha telah ditanam dengan karas, jelutong, merawan, *Khaya ivorensis*, nyatoh, meranti temak nipis dan sentang.

Sila hubungi: Program Membaik Biak Tumbuhan
Tel: 03-6279 7101
E-mel: mohdnoor@frim.gov.my

3. Jengka Research Station, Pahang:
- Set up in 1982 and sits on a 0.9-ha land and serves as a natural forest management research centre.
- Focus on R&D of sustainable management of dipterocarp hill forest.
- Widely used by locals as well as foreign scientists, serving as a base for several successful research projects on logging impacts, residual stand and regeneration development, silvicultural treatments, enrichment planting, hydrology, soil sciences, zoology and forest ecology.
- The enrichment planting trials tested suitable species under line-planting or group-planting.

Contact: Natural Forest Programme
Tel: 03-6279 7091 / 7478
E-mail: harfendy@frim.gov.my

4. Segamat Research Station, Johor:
- Set up in 2003 and covers a total of 292.2 ha.
- Serves as a referral centre for research on mixed species plantations, with special focus on karas.
- Some 93 ha of the area have been planted with karas, jelutong, merawan, Khaya ivorensis, nyatoh, meranti temak nipis and sentang.

Contact: Tree Improvement Programme
Tel: 03-6279 7101
E-mel: mohdnoor@frim.gov.my

5. Setiu Research Station, Terengganu:
- Situated in a 53-ha land, leased by the state government to FRIM, in 1996.
- The original vegetation includes *Syzygium* spp., *Malaleuca cajuputi, Shorea metarialis, Rhodomyrtus tomentosa, Melastoma malabathricum, Baeckea frutescens, Casuarina equistifolia* and a few other secondary species.
- Conduct research activities and share information on tree planting on BRIS soil, identify potential forest species that can be grown on BRIS soil, promote use of BRIS soil for planting commercial forest species and develope cost-effective tree planting techniques.
- Among species planted: *Acacia hybrid, Khaya ivorensis, Hopea odorata, Eurycoma longifolia* and *Jatropha curcas.*



5. Stesen Penyelidikan Setiu

- Terletak di kawasan seluas 53 ha yang dipajakkan kepada FRIM oleh Kerajaan Negeri pada tahun 1996.
- Tumbuhan asal terdiri daripada kelat (*Syzygium* spp.), gelam (*Malaleuca cajuputi*), balau pasir (*Shorea metarialis*), kemunting (*Rhodomyrtus tomentosa*), senduduk (*Melastoma malabathricum*), chuchur atap (*Baeckea frutescens*) dan ru pantai (*Casuarina equistifolia*).
- Untuk menjalankan aktiviti penyelidikan dan menyebar maklumat berkenaan penanaman pokok di atas tanah BRIS, mengenal pasti spesies pokok hutan ladang yang berpotensi ditanam di tanah BRIS, mempromosi penggunaan tanah BRIS dengan tanaman spesies pokok hutan yang bernilai komersial dan membangunkan teknik yang menjimatkan kos bagi penanaman pokok di tanah jenis bermasalah ini.
- Antara spesies yang telah ditanam: Akasia hybrid (*Acacia hybrid*), *Khaya* sp. (*Khaya ivorensis*), merawan siput jantan (*Hopea odorata*), tongkat ali (*Eurycoma longifolia*) dan jarak (*Jatropha curcas*).

Sila hubungi : Program Hutan Ladang
Tel: 03-6279 7091
Email: rosdi@frim.gov.my

6. Stesen Penyelidikan Maran:

- Ditubuhkan pada tahun 2000, stesen yang meliputi kawasan seluas 50 ha ini berfungsi sebagai pusat rujukan untuk penubuhan ladang herba.
- Kerja penanaman *Eurycoma longifolia* (tongkat ali), *Ortosiphon stamineus* (misai kucing) dan *Morinda citrifolia* (mengkudu) telah mula dilaksanakan pada tahun 2000.
- Penanaman seterusnya yang dijalankan pada tahun 2003 melibatkan *Labisia pumila* (kacip fatimah), *Mentha arvensis* (pudina), *Elephantopus scaber* (tutup bumi) dan *Curcuma domestica* (kunyit) di ladang kelapa sawit.
- Setakat ini, kawasan seluas 20 ha telah ditanam dengan pelbagai tumbuhan ubatan seperti *Tinospora crispa* (patawali), *Aquilaria malaccensis* (karas), *Parkia speciosa* (petai), *Hopea odorata* (merawan siput jantan), *Khaya senegalensis* (African mahogany),

Contact: Forest Plantation Programme
Tel: 03-6279 7091
Email: rosdi@frim.gov.my

6. Maran Research Station, Pahang:

- Established in 2000, the station covers an area of 50 ha and acts as a referral centre for the setting up of a herbal plantation.
- Planting began with *Eurycoma longifolia* (tongkat ali), *Ortosiphon stamineus* (misai kucing) and *Morinda citrifolia* (mengkudu) in open area.
- Subsequent planting in 2003 included *Labisia pumila* (kacip fatimah), *Mentha arvensis* (pudina), *Elephantopus scaber* (tutup bumi) and *Curcuma domestica* (kunyit) in oil palm plantations.
- Some 20 hectares of the area have been planted with various plants such as *Tinospora crispa* (patawali), *Aquilaria malaccensis* (karas), *Parkia speciosa* (petai), *Hopea odorata* (merawan siput jantan), *Khaya senegalensis* (African mahogany), *Peperomia pellucida* (ketumpangan air), *Cinnamomum zeylanicum* (kayu manis), Centella *asiatica* (pegaga), *Citrus hystrix* (limau purut), *Citrus aurantifolia* (limau nipis), *Cymbopogan citradus* (serai makan), *Cymbopogan nardus* (serai wangi), *Vitex negundo* (legundi), *Neolamarckia cadamba* (kelampayan) and *Garcinia atroviridis* (asam gelugur).

Contact: Program Sumber Biologi
Tel: + 03-6279 7330
Email: zamree@frim.gov.my

7. Bidor Research Station, Perak:

- Leased by the Perak State Government to FRIM in 1996.
- Covers 121.5 ha of ex-mining land.
- Research site for international and national research projects on afforestation, biodiversity, forest influences, phytoremediation and eco-toxicity.
- Serves as a model forest, recognised as an international educational site for rehabilitation of ex-tin tailings.
- Developed over five years in line with the "Bidor Research Station Strategic Plan 1997–2002".

Contact: Forest Plantation Programme
Tel: +03-6279 7103
Email: anglh@frim.gov.my



Peperomia pellucida (ketumpangan air), *Cinnamomum zeylanicum* (kayu manis), *Centella asiatica* (pegaga), *Citrus hystrix* (limau purut), *Citrus aurantifolia* (limau nipis), *Cymbopogan citradus* (serai makan), *Cymbopogan nardus* (serai wangi), *Vitex negundo* (legundi), *Neolamarckia cadamba* (kelampayan) dan *Garcinia atroviridis* (asam gelugur).

Sila hubungi : Program Sumber Biologi
Tel: + 03-6279 7330
Email: zamree@frim.gov.my

7. Stesen Penyelidikan Bidor
   - Kawasan tanah bekas lombong merangkumi 121.5 ha ini dipajakkan kepada FRIM oleh Kerajaan Negeri Perak pada tahun 1996.
   - Merupakan tapak kajian bagi projek-projek penyelidikan kebangsaan dan antarabangsa yang berkaitan dengan penanaman semula hutan, biodiversiti, pengaruh hutan, fitoremediasi dan ekotoksisiti.
   - Merupakan model hutan yang diiktiraf sebagai tapak pendidikan antarabangsa untuk pemulihan kawasan bekas lombong bijih timah.
   - Dibangunkan dalam masa lima tahun selaras dengan "Bidor Research Station Strategic Plan 1997–2002".

Sila hubungi : Program Hutan Ladang
Tel: +03-6279 7103
Email: anglh@frim.gov.my

8. Stesen Penyelidikan Jeli:
   - Ditubuhkan pada tahun 2008 dengan kelulusan Kerajaan Negeri.
   - Meliputi kawasan seluas 200 ha.
   - Terletak di Mukim Belimbing, Daerah Batu Melintang, Jajahan Jeli.
   - Merupakan tapak penyelidikan pemuliharaan kepelbagaian biologi, pemuliharaan buluh asal (*Gigantochloa scortechinii*) dan ladang hutan termasuk Eucalyptus.
   - Terdapat juga sebuah pusat rujukan dan pemprosesan herba.

Sila hubungi : Program Hutan Ladang
Tel: +03-6279 7093
Email: emlee@frim.gov.my

9. Stesen Penyelidikan Selandar:
   - Ditubuhkan pada tahun 2009 di atas kelulusan Kerajaan Negeri dan Jabatan Perhutanan.

8. Jeli Research Station, Kelantan:
   - Established in 2008 with the state government approval.
   - Covers an area of 200 ha.
   - Located in Mukim Belimbing, Batu Melintang District, Jajahan Jeli, Kelantan.
   - Site for research on biodiversity conservation, conservation of natural bamboo stands (*Gigantochloa scortechinii*) and forest plantation including eucalyptus.
   - Houses a herbal referral and processing centre.

Contact: Forest Plantation Programme
Tel: +03-6279 7093
Email: emlee@frim.gov.my

9. Selandar Research Station, Melaka:
   - Established in 2009, with approval from the state government and state forestry department.
   - Covers a total of 30 ha and located in Mukim Selandar, Jasin District.
   - A five-hectare area has been cleared for herbal garden.
   - Species to be planted: *Ortosiphon stamineus* (misai kucing), *Eurycoma longifolia* (tongkat ali), *Labisia pumila* (kacip fatimah), *Ficus deltoidea* (mas cotek) and *Garcinia atroviridis* (asam gelugur).
   - Additional tree species include *Santalum album, Aquilaria malaccensis, Endospermum malaccense* and *Eucalyptus* sp. as part of field trials of planting materials from FRIM Tissue Culture Laboratory.
   - For forest plantation research and ex-situ conservation of selected species.
   - Serves as model for mixed forest of high quality species and as an attraction for tourists in the state.

Contact: Forest Plantation Programme
Tel: +03-6279 7093
Email: zuhaidi@frim.gov.my



- Terletak di Mukim Selandar, Daerah Jasin.
- Kawasan seluas lima hektar telah dibersihkan untuk penanaman tumbuhan herba.
- Antara spesies yang dipilih: *Ortosiphon stamineus* (misai kucing), *Eurycoma longifolia* (tongkat ali), *Labisia pumila* (kacip fatimah), *Ficus deltoidea* (mas cotek) dan *Garcinia atroviridis* (asam gelugur).
- Merupakan tapak penyelidikan hutan ladang dan pemuliharaan ex-situ spesies terpilih.
- Tanaman spesies pokok termasuklah *Santalum album, Aquilaria malaccensis, Endospermum malaccense* dan *Eucalyptus* spp. sebagai tanaman ujian bahan tanaman yang dikeluarkan oleh Makmal Tisu Kultur FRIM.

Sila hubungi : **Program Hutan Ladang**
Tel : +03-6279 7093
Email : zuhaidi@frim.gov.my











INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA (FRIM)



FOREST RESEARCH INSTITUTE MALAYSIA

SOROTAN AKTIVITI UTAMA

18 Januari

FRIM melancarkan fasa kedua kempen "Katakan Tidak kepada Plastik dan Polistirena" untuk menjadikan kawasan FRIM sebagai zon sifar sampah dengan menggalakkan warga FRIM dan pelawat menggunakan bekas makanan yang boleh dikitar semula serta mengurangkan pembuangan sampah.



Gegantung kempen sifar sampah fasa kedua yang dihasilkan dalam tiga bahasa

The second-phase campaign buntings produced in three languages

HIGHLIGHTS OF ACTIVITIES

18 January

FRIM launched the second phase of its "Say No to Plastic Bags and Polystyrenes" campaign on 18 January, aiming to make its main campus in Kepong and all its research stations zero-litter zones by encouraging all staff and visitors to go for recyclable food containers and reduce waste material.



22 Februari

Majlis Pelancaran Pejabat Sekretariat WHS-UNESCO dirasmikan oleh Ketua Pengarah FRIM. FRIM menubuhkan Program WHS-UNESCO untuk menjayakan hasratnya menjulang pengiktirafan sebagai Tapak Warisan Alam Semula Jadi (WHS) UNESCO menjelang tahun 2017. Program WHS-UNESCO yang mula beroperasi semenjak 3 September 2012 ini diketuai oleh Dr Shamsudin Ibrahim.

22 February

The launching of the WHS-UNESCO Secretariat Office was officiated by FRIM Director General. FRIM has set up its WHS-UNESCO Programme to work towards attaining the UNESCO World Heritage Site (WHS) status for FRIM by 2017. The WHS-UNESCO Programme, which began operations on 3 September 2012 is headed by Dr Shamsudin Ibrahim.



(Dari kiri) Dr Shamsudin meletakkan papan tanda "Program WHS-UNESCO", sambil diperhatikan oleh pegawai penyelidik, Noorsiha Ayob, KP FRIM dan Pengarah Bahagian Perancangan Penyelidikan dan Korporat, Dato' Dr Marzalina Mansor

(From left) Dr Shamsudin placing the "Program WHS-UNESCO" signage on the door of the secretariat office at Block D4, while research officer Noorsiha Ayob, FRIM DG, and the Research and Corporate Planning Division Director, Dato' Dr Marzalina Mansor looked on

23 Mac

Lebih 500 orang telah menyertai sambutan Hari Hutan Antarabangsa 2013 peringkat FRIM dengan menanam pokok dan mengambil bahagian dalam pelbagai aktiviti di Taman Botani Kepong, Kepong.

23 March

More than 500 people joined FRIM to celebrate the International Day of Forests 2013, by planting trees and participating in various activities at the Kepong Botanical Garden (KBG).

19 Mac

FRIM melancarkan buku mewah yang bertajuk "The Malaysian Herbal Heritage" yang memaparkan tentang 50 spesies tumbuhan ubatan di Semenanjung Malaysia termasuk kegunaan serta amalan tradisional yang berkaitan untuk penjagaan kesihatan dan kesejahteraan. Majlis pelancaran disempurnakan oleh Pengerusi Puspanita Peringkat Kebangsaan, Datin Sri Dato' Rohani Abdullah. Ia ditulis oleh 13 orang penyelidik dari Bahagian Hasilan Semula Jadi FRIM dan disunting oleh Dr Vimala Subramaniam.

19 March

FRIM launched another coffee table book, entitled "The Malaysian Herbal Heritage" which describes 50 medicinal plants found in Peninsular Malaysia including their common uses and related traditional practices for maintaining health and wellness. The launching of the book was officiated by the National Level Puspanita Chairperson, Datin Sri Dato' Rohani Abdullah. It is written by 13 researchers from the FRIM Natural Products Division and edited by Dr Vimala Subramaniam.



Datin Sri Dato' Rohani (kiri) mengucapkan tahniah kepada Dr Vimala dan Dr Rasadah
Datin Sri Dato' Rohani (far left) congratulating Dr Vimala and Dr Rasadah



Buku "Malaysian Herbal Heritage" dijual di Kedai Buku FRIM
The Malaysian Herbal Heritage available at FRIM Bookshop

16 April

Hampir 100 orang warga FRIM dan Zoo Negara bersama-sama pelajar dari Universiti Pengurusan dan Sains (MSU) menyertai program gotong-royong menanam buluh untuk makanan beruang panda yang bakal menyerikan Zoo Negara pada hujung tahun ini. Sebanyak 200 buluh siam (*Thyrsostachys siamensis*) ditanam di petak lereng bukit berhampiran kawasan Zoo Negara. Pasukan sukarelawan FRIM terdiri daripada 42 orang peserta diketuai oleh Ketua Pengarah, Dato' Dr

16 April

Almost 100 FRIM and Zoo Negara staff including some volunteers from the Management and Science University (MSU) participated in a gotong-royong programme to plant bamboo for the giant pandas expected take up residence there end of this year. Two hundred polybags of buluh siam (*Thyrsostachys siamensis*) were planted along a hillside plot located adjacent to the Zoo Negara compound. The FRIM team made up of 42 volunteers was led by the Director General.

Abd Latif Mohmod. FRIM dipertanggungjawabkan untuk membantu persediaan bekalan pemakanan pasangan panda dari China, khususnya dalam mengenal pasti spesies buluh tempatan yang boleh dimakan oleh haiwan tersebut dan membantu dalam penanaman spesies yang sesuai.

The Institute is tasked to look into the food requirements of the giant pandas, specifically in the identification of edible local bamboo species and to assist in the cultivation of suitable species.



Sukarelawan FRIM dan peserta lain di tapak penanaman
FRIM volunteers and other participants at the site

21 Mei

FRIM telah menyiapkan projek menaik taraf pintu masuk utamanya yang telah dimulakan sejak 2012. Jalan dilebarkan daripada dua lorong kepada empat lorong dengan satu laluan khusus untuk membelok ke kiri. Parkir untuk kereta telah dinaik taraf dengan kapasiti dua kali ganda menjadikan sebanyak 30 tempat letak kereta dan dua untuk bas di kawasan seluas setengah hektar di sebelah kanan pintu masuk FRIM. Kerja-kerja pengubahsuaian ini bertujuan untuk memudahkan pelawat serta mengurangkan kesesakan lalu lintas terutama pada waktu puncak. Pembinaan jalan baharu yang berisiko banjir merentasi kolam dari Jalan Bukit Baru dan Jalan Abdul Rahman Ali juga telah siap pada masa yang sama.

21 May

FRIM has completed its main entrance facelift project which started in 2012. The road system was expanded from two to four lanes with a dedicated left turn. The half-hectare parking area was upgraded to accommodate up to 30 cars and two buses. The project was undertaken to help ease congestion at the main entrance especially during peak hours. In addition, the reconstruction of a road across a flood prone area from Jalan Bukit Baru and Jalan Abdul Rahman Ali was also completed at the same time.



Tempat letak kereta di pintu masuk utama FRIM
Parking space at the right of FRIM's main entrance

28 Mei

YB Dato' Sri Dr James Dawos Mamit telah mengadakan lawatan rasmi ke FRIM buat kali pertamanya sebagai Timbalan Menteri NRE yang baharu. Dato' Sri Dr James pernah dilantik sebagai ahli MFRDB dari Disember 2005 sehingga Januari 2010.

28 May

YB Dato' Sri Dr James Dawos Mamit, made his first official visit to FRIM in Kepong on 28 May as the new Deputy Minister of NRE. He had served as a member of the MFRDB from December 2005 until January 2010.



Timbalan Menteri NRE (no. 7 dari kanan) bersama-sama pegawai-pegawai kanan FRIM
NRE Deputy Minister (no. 7 from right) with FRIM top officials

11 Jun

FRIM telah mengadakan taklimat mengenai FRIM sebagai badan pensijilan produk perabot berasaskan kayu bagi kontrak pusat sistem panel pada di Auditorium FRIM. Taklimat ini diadakan untuk memaklumkan pihak industri mengenai peranan FRIM sebagai Badan Pensijilan Produk Perabot, hasrat FRIM untuk menjadi badan autoritatif dalam pengesahan penghasilan produk berkualiti yang dihasilkan oleh kilang-kilang tempatan dan "one-stop solution provider" dalam menawar perkhidmatan dari segi pemilihan bahan mentah hinggalah kepada penghasilan produk perabot bermutu tinggi.

11 June

FRIM organised a briefing on its role as a wood-based furniture product certification body for the Central Contract Panel System on 11 June at the FRIM Auditorium, Kepong. The objective of the programme was to notify the industry of FRIM's role as furniture product certification body, and its plan to serve as an authoritative body in the certification of quality production by local factories. FRIM will also act as a "one-stop solution provider" offering services from the selection of raw material to the production of high quality furniture.

29 Jun

Seramai 200 orang telah menyertai program "Minum Pagi bersama Joggers" yang dianjurkan FRIM bersempena dengan sambutan Hari Alam Sekitar Sedunia peringkat FRIM. Program ini bertujuan untuk menyampaikan hasrat FRIM agar dapat berganding bahu dengan para joggers sebagai 'sahabat' dalam memelihara khazanah hutan. Selain itu, program ini juga bertujuan memperkenalkan gaya hidup sihat dan meningkatkan kesedaran orang ramai tentang kepentingan penjagaan kesihatan dan penjagaan alam sekitar untuk kesejahteraan bersama.



Jurupandu, (bertopi merah) memberi penerangan kepada pengunjung semasa lawatan berpandu
Nature guide, (red hat) pointing out some fascinating facts of the forest during the guided nature walk session

29 June

Two hundred people joined FRIM "Morning Tea with Joggers" programme, held in conjunction with FRIM-level World Environment Day celebration on 29 Jun. The aim of the programme was to get joggers in FRIM to be more involved in its efforts to ensure cleanliness and protection of FRIM forest resources. Apart from that, the celebration was also aimed at promoting healthy lifestyle and increasing public awareness on the importance of caring for their health and the conservation of the environment for mutual benefits.

19 Julai

FRIM telah melaksanakan Operasi Bersepadu bersama pihak polis, Majlis Perbandaran Selayang (MPS) dan Pejabat Tanah Daerah Gombak untuk mengosongkan tanah FRIM yang diceroboh oleh pengusaha tapak semaian swasta. Operasi Sempadan ini dilaksanakan setelah beberapa notis serta amaran untuk mengosongkan kawasan yang meliputi 0.97 hektar di Field 54 yang dihantar kepada pengusaha tersebut sejak Julai tahun lepas tidak diendah oleh beliau.

19 July

FRIM evicted a private nursery operator for encroaching on the Institute's land covering 0.97 ha in Field 54 after several notices and warnings issued over the past one year were ignored. The operation, dubbed Operasi Sempadan, was jointly carried out by FRIM, the police, the Selayang Municipal Council (MPS) and the Gombak Land and District Office.

6 Ogos

FRIM mula melaksanakan projek pembinaan pagar konkrit di sekeliling kawasan kampus utamanya di Kepong, Selangor, pada bulan September untuk mencegah pencerobohan dan kemasukan secara haram. FRIM telah memaklumkan secara lisan dan mengingatkan penduduk Taman Selayang Utama dan Taman Bidara yang terlibat supaya mengosongkan kawasan pencerobohan. FRIM juga telah mengeluarkan notis peringatan pada 2 Julai kepada penduduk yang terlibat untuk mengosongkan kawasan yang diceroboh dalam tempoh 30 hari. Pada 23 Julai, FRIM telah mengadakan sesi perbincangan dengan wakil-wakil Persatuan Penduduk Taman Selayang Utama Fasa II untuk memaklumkan mereka mengenai langkah-langkah yang telah dan akan diambil oleh FRIM bagi mendapat kerjasama pihak penduduk. Mesyuarat yang diadakan di FRIM dan dipengerusikan oleh Ketua Pengarah FRIM, Dato' Dr Abd Latif Mohmod, dihadiri oleh Dato' Ahmad Bahari A. Rahman, Pua Kah Ho, Tan Kim Lai, Teoh Chai Hin, Lim Chai dan Lee Ah Huat yang mewakili pihak penduduk. Turut hadir ialah wakil-wakil daripada Majlis Perbandaran Selayang (MPS), Pejabat Tanah Daerah Gombak, Balai Polis Gombak dan beberapa pegawai pengurusan tertinggi FRIM termasuk Timbalan KP (Operasi), Dr Norini Haron, dan Pengarah Bahagian Pentadbiran, Abdul Jabbar Sabli. FRIM perlu memelihara dan melindungi kawasannya daripada pencerobohan kerana ia telah memperoleh hak milik kekal daripada Kerajaan Selangor dan juga merupakan Tapak Warisan Kebangsaan serta sedang berusaha ke arah menjadi Tapak Warisan Dunia UNESCO. NRE telah meluluskan peruntukan untuk pemasangan

6 August

FRIM began the construction of a concrete wall in September to protect its area from encroachment and illegal entry. The Institute has verbally informed and reminded residents of Taman Selayang Utama and Taman Bidara who would be affected by the fencing project to clear the encroached areas. FRIM has issued a reminder notice on 2 July for the residents to do so within 30 days. FRIM also met with representatives of the Taman Selayang Utama Fasa II Residents' Association on 23 July to notify them of the steps taken by FRIM and to seek their cooperation. The meeting, held at FRIM and chaired by FRIM Director General, was attended by Dato' Ahmad Bahari A. Rahman, Pua Kah Ho, Tan Kim Lai, Teoh Chai Hin, Lim Chai and Lee Ah Huat who represented the residents. Also present were representatives from the Selayang Municipal Council (MPS), Gombak Land and District Office, Gombak Police and other FRIM top officials including FRIM's Deputy DG (Operations) Dr Norini Haron and Administration Division Director Abdul Jabbar Sabli.



Abd Latif (paling kanan) semasa perbincangan bersama wakil-wakil penduduk terlibat pada 23 Julai

Abd Latif (far right) speaking to the residents' representatives at the meeting held on 23 July

FRIM needs to safeguard and protect its area against intrusion as it has obtained the freehold land title from the Selangor State Government, declared as a national heritage site and working towards attaining the UNESCO world heritage status. The NRE has approved its plan to build the



tembok batu setinggi 7 kaki di sempadan Taman Selayang Utama dan Taman Bidara. FRIM akan melaksanakan operasi bersepadu dengan kerjasama MPS, PTD Gombak dan Polis Gombak untuk mengosongkan kawasan yang diceroboh dan rumah/tembok penghuni yang melepasi kawasan tanah FRIM juga akan diroboh.

concrete wall of 7 ft in height. FRIM will conduct a joint operation with MPS, PTD Gombak and the police to clear any structure found to have encroached into its area.

27–29 September

Setiap tahun semenjak 2010, Stesen Penyelidikan FRIM (SPF) di Hutan Simpan Penyelidikan Pasoh, Simpang Pertang, Negeri Sembilan memberi peluang kepada orang ramai untuk menyertai aktiviti-aktiviti berkaitan hutan dan alam sekitar. Acara pada tahun ini disertai oleh 70 orang pelajar dari Sekolah Agama Rakyat (KAFA Integrasi) FRIM dan Universiti Sains Islam Malaysia (USIM), Negeri Sembilan.

27–29 September

Every year since 2010, the FRIM Research Station (SPF) in the Pasoh Forest Reserve, Simpang Pertang, Negeri Sembilan, provides opportunity to the public for some forest- and environmental-related activities. The event was participated by some 70 students from FRIM integrated religious school (KAFA) in Kepong, Selangor and Universiti Sains Islam Malaysia (USIM) in Nilai, Negeri Sembilan.

10 November

Seramai 247 orang peminat catur dari seluruh negara menyertai Kejohanan Catur Rekreasi Alam Sekitar 2013 di kampus FRIM. Kejohanan yang julung-julung kalinya diadakan di dalam persekitaran hutan tropika ini dianjurkan bersama dengan Kelab FRIM dan Cerdik Catur Enterprise dengan sokongan daripada Kementerian Pelancongan dan Kebudayaan (Selangor), Bank Rakyat, Koperasi FRIM Berhad, Forestra, Bio-Nature Formula Sdn Bhd, Nature Profusion Sdn Bhd, Nestlé, Adabi dan Ayamas. Ketua Pengarah FRIM, Dato' Dr Abd Latif Mohmod merasmikan kejohanan ini.

10 November

A total of 247 chess enthusiasts from all over Malaysia gathered at FRIM's main campus to compete in the FRIM Eco-Recreational Chess Tournament 2013. The tournament, the first of its kind to be held in a tropical forest environment was co-organised with Kelab FRIM and Cerdik Catur Enterprise with support from the Ministry of Tourism and Culture (Selangor), Bank Rakyat, Koperasi FRIM Berhad, Forestra, Bio-Nature Formula Sdn Bhd, Nourish Care Sdn. Bhd, Nature Profusion Sdn Bhd, Nestlé, Adabi and Ayamas. FRIM Director General officiated the launching of the tournament.



ANTARA BERITA TENTANG FRIM DALAM MEDIA CETAK
SELECTED NEWS ON FRIM IN PRINTED MEDIA

TARIKH/DATE	TAJUK/TITLE	AKHBAR/NEWSPAPER
20 Disember/December	Couple turn their passion for fruits into book	The Star
18 Disember/December	HTD Rubberwood	Nanyang Siang Pau
9 Disember/December	Kanger launches IPO	Malay Mail
7 Disember/December	10 top spots for wedding shoot	The Star
	Kanger eyes RM20m from IPO to fund overseas expansion	New Straits Times
5 Disember/December	FRIM sasar produk buluh ganti kayu getah	Utusan Malaysia
23 November	Preserving a slice of heritage	The Star
23 November	UTP, FRIM meterai perjanjian kerjasama pulihara spesies terancam	Utusan Malaysia
20 November	Tnah Lee Hong from FRIM gets AFFRC Youth Research Award	Nanyang Siang Pau
15 November	Kanger plans R&D plant	The Star
9 November	MoU FRIM dan MPOB	Berita Harian
	Chess tournament in nature	The Star
7 November	UMT, FRIM kerjasama kaji kawasan hutan	Berita Harian
4 November	Kerjasama UMT-FRIM pulihara hutan	Utusan Malaysia
23 Oktober/October	BioNexus Awards	Nanyang Siang Pau
19 Ogos/August	Pacu teknologi sensor	Utusan Malaysia
4 Ogos/August	Set up body for endangered flora	New Straits Times
3 Ogos/August	230 plant species face extinction	New Straits Times
2 Ogos/August	Lets fly a kite at FRIM	China Press
29 Julai/July	Koleksi 99 spesies buah di FRIM	Utusan Malaysia
15 Julai/July	Manfaat 99 spesies buah tempatan dalam sejilid buku piktorial	Harian Ekspres (KK)
11 Julai/July	Getting in touch with nature	The Star
8 Julai/July	Teknologi rawat kayu	Utusan Malaysia
29 Jun/June	Jog for nature	The Star
26 Jun/June	FRIM invited people to enjoy morning tea on June 29th	Sin Chew Daily
10 Jun/June	FRIM patents green wood treatment	Malay Mail
8 Jun/June	FRIM paten teknologi HDT	Berita Harian
4 Jun/June	FRIM tawar khidmat ujian formaldehid CARB	Sinar Harian
3 Jun/June	Hasilkan rayon daripada kenaf	Utusan Malaysia
20 Mei/May	FRIM dokumentasi pengetahuan tradisi orang asli	Utusan Sarawak
19 Mei/May	Feel the nature in FRIM	Sin Chew Daily
14 Mei/May 13	FRIM studying legal aspect to protect Orang Asli's traditional knowledge rights	New Sarawak Tribune
	FRIM kenal pasti herba rawat diabetes	Utusan Sarawak
27 April	Kerjasama MARDI FRIM bangunkan industri herba	Utusan Malaysia
16 April	FRIM kongsi hasil kajian pembuatan kerangka pintu	Sinar Harian
11 April	Towards a greener FRIM	The Star
26 Mac/March	FRIM menang emas di MTE 2013	Sinar Harian
21 Mac/March	Public invited to plant trees at FRIM	New Straits Times
17 Mac/March	FRIM to celebrate International Forest Day on March 23	Nanyang Siang Pau
12 Mac/March	City Hall gets FRIM's help to green the capital	New Straits Times
11 Mac/March	MoU DBKL, FRIM bagi program penghijauan	Utusan Malaysia
12 Februari/February	Bengkel interaktif herba FRIM-SBC	Sinar Harian
11 Februari/February	FRIM hasilkan biodiesel	Utusan Malaysia
21 Januari/January	FRIM terbit buku	Utusan Malaysia
17 Januari/January	Zoo Negara gets ready for pandas	New Straits Times
	National Zoo to build panda house in June	Nanyang Siang Pau
	Zoo Negara to house pandas	The Star







PETUNJUK PRESTASI UTAMA
KEY PERFORMANCE INDICATORS

PENCAPAIAN/TAHUN **ACHIEVEMENT/YEAR**	**2012**	**2013**
1. PENGURUSAN PENYELIDIKAN/RESEARCH MANAGEMENT		
Projek penyelidikan (bilangan)/Research projects (number)	184	186
Dana penyelidikan (RM juta)/Research funds (RM million)	24	29
Kertas kerja dalam jurnal/Papers in journals	118	152
Kertas kerja dalam jurnal (dengan faktor impak) Papers in journals (with impact factor)	45	47
Buku mewah/Coffee table book	2	4
Buku rujukan/Reference book	5	43
Kertas teknikal dan saintifik (bukan jurnal) Technical and scientific papers (non-journals)	468	531
Kertas teknikal dan saintifik yang dibentangkan Presented technical and scientific papers	220	405
Penerbitan rasmi FRIM (bilangan)/Official publications (number)	30	32
Pendedahan reka cipta/Invention disclosure	30	15
Menandatangani MoU/perjanjian/MoU/Agreement signed	19	16
2. AKTIVITI PROMOSI/PROMOTIONAL ACTIVITIES		
Pameran/Exhibitions	14	28
Penghasilan artikel/rencana media massa Mass media articles/features produced	184	138
Penganjuran seminar/persidangan/bengkel/dialog/pemindahan teknologi Organising of seminars/conferences/workshops/dialogues/technology transfer	86	10
3. AKTIVITI KOMERSIALISASI/COMMERCIALISATION ACTIVITIES		
Hasil/output penyelidikan/Research outcomes/outputs	20	15
Menandatangani pelesenan pemindahan teknologi Signing of technology transfer licensing	6	3
Pemfailan paten/Patent filing	11	6



PENCAPAIAN/TAHUN **ACHIEVEMENT/YEAR**	**2012**	**2013**
4. PERKHIDMATAN/SERVICES		
Ujian/Testing	112	1596
Perundingan ikhtisas/Profesional consultancies	59	59
Latihan industri kepada pelajar IPT dalam bidang perhutanan Industrial training in forestry to students of higher learning institutions	203	213
Menganjurkan bengkel/dialog/pemindahan teknologi/program latihan kepada orang awam/industri dalam bidang-bidang kepakaran FRIM Organising workshops/dialogues/technology transfer/training programs to the public/industries according to FRIM experties	16	71
5. PENDAPATAN/INCOME	(RM)	(RM)
Ujian/Testing	1.3 juta/ million	1.9 juta/ million
Perundingan ikhtisas/Profesional consultancies	4.3 juta/ million	2.4 juta/ million
Ekopelancongan/Eco-tourism	1.4 juta/ million	1.5 juta/million
Penjualan bahan/Sales of materials	0.39 juta/ million	0.47 juta/ million
Perkhidmatan bukan teknikal (seminar, latihan dll) Non-technical services (seminars, trainings etc.)	1.4 juta/ million	0.80 juta/ million
Royalti dan yuran pelesenan/Royalty and licensing fee	3,000	3,139
6. PELAWAT **VISITORS**	683,946	707,297
7. PENGIKTIRAFAN **RECOGNITIONS**		
Makmal yang mendapat pengiktirafan antarabangsa (Akreditasi ISO/ IEC 17025/CARB/*ift*/FIRA)/Number of laboratories obtained international recognitions (ISO/IEC 17025/CARB/*ift*/FIRA accreditations)	14	14
CUMBS yang mendapat pengiktirafan kebangsaan/Number of CUMBS obtained national recognition(GMP/SOM/HALAL/BioNexus/IKM)	11	13
Pensijilan agensi/Agency certification (IOS/IEC 27001 (ISMS), 9001, QE/5S)	3	3



PENCAPAIAN/TAHUN **ACHIEVEMENT/YEAR**	2012	2013
8. SUMBANGAN KEPAKARAN DI PERINGKAT KEBANGSAAN DAN ANTARABANGSA/ EXPERTIES CONTRIBUTIONS AT THE NATIONAL AND INTERNATIONAL LEVELS		
Penghasilan kertas kerja melibatkan polisi negara Number of working papers produced related to national policies	9	14
Penglibatan dalam rundingan termasuk input teknikal di forum antarabangsa yang berkaitan dengan perhutanan dan alam sekitar yang memberi impak kepada negara Involvement in negotiations including providing technical inputs related to forestry and environment in international forums with impact to the country	66	20
Sumbangan dan keanggotaan dalam organisasi kebangsaan/antarabangsa yang berkaitan dengan perhutanan dan alam sekitar Contributions and memberships in national/international organisations in FRIM areas of experties	30	80
Penjawat awam yang terlibat dalam membangunkan standard Malaysia dan antarabangsa berkaitan dengan bidang perhutanan dan keluaran hutan Staff involved in developing Malaysian and international standards on forestry and forest product fields	b*	17
9. KECEKAPAN/EFFICIENCY	(%)	(%)
Mencapai sasaran 95% penjawat awam yang mengikuti sekurang-kurangnya tujuh (7) hari latihan dalam setahun Percentage of civil servants attending seven days of training yearly	97.51	99%
Memberi maklum balas aduan pelanggan 100% tidak melebihi lima (5) hari bekerja/Provide feedback to customer complaints in less than five working days	100	100
Indeks kesejahteraan pelawat Visitors' well-being index	84	76



PENCAPAIAN/TAHUN **ACHIEVEMENT/YEAR**	**2012**	**2013**
10. IMPAK KEPADA INDUSTRI/ IMPACT TO INDUSTRIES		
Kilang/Industri/Ladang yang ditubuhkan hasil inisiatif FRIM Mills/Industries/Plantations established by FRIM initiative	b*	0
Kilang/Industri/Ladang yang dibantu oleh FRIM Mills/Industries/Plantations assisted by FRIM	b*	0
Usahawan yang dilatih oleh FRIM Entrepreneurs trained by FRIM	b*	19
Orang awam dan peserta industri yang mendapat manfaat daripada pemindahan teknologi melalui pelaksanaan latihan/bengkel dalam bidang perhutanan/Public and participant from industries benefited from technology transfer through trainings/workshops in forestry	b*	309
Industri yang mendapat manfaat daripada pemindahan teknologi melalui perlaksanaan latihan/bengkel dalam bidang perhutanan Industries benefited from technology transfer through trainings/workshops in forestry	b*	32
Projek mendapat faedah daripada perkhidmatan ujian Projects benefited from testing services	b*	55
Organisasi/Syarikat/Kilang yang mendapat faedah daripada perkhidmatan ujian/Organisations/Companies/Mills benefited from testing services	b*	253
Organisasi/Individu mendapat faedah daripada perkhidmatan perundingan ikhtisas/ Organisations/Individuals benefited from consultancy services	b*	45
Organisasi yang mendapat faedah daripada aktiviti ekopelancongan Organisations benefited from eco-tourism activities	b*	296
Organisasi/Individu yang mendapat faedah daripada fasiliti di FRIM Organisations/Individuals benefited from FRIM facilities	b*	98
Organisasi yang terlibat CSR di FRIM/Organisations participated in FRIM CSR programmes	b*	33
Sampel ujian/Testing samples	b*	7,638
Penglibatan FRIM dalam aktiviti CSR di organisasi luar/FRIM participation in CSR activities with other organisations	b*	1
Organisasi/Syarikat/Kilang yang mendapat faedah daripada pembekalan perkhidmatan/Organisations/Companies/Mills benefited from supply of services	b*	104

Nota:
b* =KPI yang baru diperkenalkan pada 2013/New KPIs introduced in 2013



ANUGERAH DAN PENGIKTIRAFAN
AWARDS AND RECOGNITIONS

1. Ekspo Teknologi Malaysia

Hasil penemuan penyelidikan FRIM ke atas penggunaan serat makanan atau fraksi kaya polisakarida daripada mengkudu atau noni (*Morinda citrifolia*) sebagai agen pengawalan kandungan gula dalam darah telah memenangi Pingat Emas di Ekspo Teknologi Malaysia (MTE) yang diadakan dari 21 hingga 23 Februari. Dua produk makanan kesihatan berasaskan fraksi polisakarida mengkudu telah dibangunkan, iaitu biskut serat berkhasiat dan minuman kopi putih Le' Natura, oleh syarikat Nourish Care Sdn Bhd yang ditubuhkan pada 2008 di bawah Program Pembangunan Bio-Usahawan Siswazah FRIM-MTDC (FMBioSis ™).

Pingat-pingat lain yang dimenangi ialah:

- Hibrid venir kayu palma beralur (ChyPaWV)—kumpulan penyelidik diketuai oleh Dr Abdul Hamid Saleh (perak);
- Pembuatan pulpa dan kertas dari batang kenaf Malaysia—diketuai Dr Rushdan Ibrahim (perak);
- Indeks pengukuran ketenangan minyak gaharu—diketuai Sahrim Lias (perak);
- Ekstrak piawai cucur atap (*Baeckea frustescens*) untuk Gout—diketuai Dr Fadzureena Jamaludin (gangsa); dan
- Venir kayu palma terjurutera (EPAWV) — Dr Abdul Hamid Saleh (gangsa).

1. Malaysian Technology Expo

The Forest Research Institute Malaysia's (FRIM) findings on the use of dietary fibre or non-starch polysaccharide-rich fraction of *Morinda citrifolia* (mengkudu or noni) as a potential agent for controlling blood sugar level in diabetic people has won Gold Medal with compliments from the panel of jury at the Malaysian Technology Expo (MTE) 2013. Two products were developed based on the finding, namely Le' Natura fibre biscuits and white coffee produced by Nourish Care Sdn Bhd, established 2008 under the FRIM-MTDC Graduate Bio-Entrepreneur Development Programme (FMBioSis™).

Other medals won by FRIM:

- Corrugated hybrid palm wood veneer (ChyPaWV)—research led by Dr Abdul Hamid Saleh (silver);
- Producing pulp and paper from the Malaysian kenaf stalk— led by Dr Rushdan Ibrahim (silver);
- Gaharu relaxation indexer—led by Sahrim Lias (silver);
- Anti-gout standardized extract (SEBF) from *Baeckea frustescens*—led by Dr Fadzureena Jamaludin (bronze); and
- Engineered palm wood veneer (E-PAWV)—led by Dr Abdul Hamid Saleh (bronze).



Dr Nik Musa'adah(tengah) bersama-sama ahli kumpulannya
Dr Nik Musa'adah (middle) with some of the team members

2. Konvensyen Mini ICC

Pasukan Generasi Budaya Saing dari Bahagian Hasilan Semula Jadi FRIM yang diketuai oleh Mohamad Jemain Mohamad Ridhwan yang merupakan johan Pertandingan Kumpulan Inovatif dan Kreatif (KIK) di peringkat FRIM pada 2012 telah mengharumkan nama FRIM dengan memenangi anugerah emas di Konvensyen Mini ICC yang dianjurkan oleh Perbadanan Produktivi Malaysia (MPC) yang berlangsung pada 2 April di Petaling Jaya.



Kumpulan GBS dengan sijil kemenangan
The GBS group with their winning certificate

2. ICC Mini Convention

The FRIM-level Innovative and Creative Circle (ICC) winner for 2012, Generasi Berdaya Saing from the Natural Products Division, led by Mohamad Jemain Mohamad Ridhwan has made the Institute proud by winning Gold at the ICC Mini Convention on Team Excellence (Central Region) 2013 organised by the Malaysian Productivity Corporation (MPC) on 2 April in Petaling Jaya.

3. Anugerah Taman Floria (Kategori Kerajaan)

FRIM meraih tempat ketiga Anugerah Taman Floria (Kategori Kerajaan) di Festival Bunga dan Taman Putrajaya 2013 (FLORIA Putrajaya 2013) yang bertemakan, "Orkid—Khazanah Tropika". Ketua Pengarah FRIM, Dato' Dr Abd Latif Mohmod, menerima trofi dan sijil penghargaan yang disampaikan oleh Dr Loga Bala Mohan, Timbalan Menteri Wilayah Persekutuan, semasa majlis penutup FLORIA Putrajaya 2013. Majlis perasmian FLORIA Putrajaya yang berlangsung selama sembilan hari mulai 22 Jun di Pesisiran Tasik, Presint 2, Putrajaya, telah disempurnakan oleh Yang di-Pertuan Agong Tuanku Abdul Halim Mu'adzam Shah.



Calet mini yang dipamerkan di "Taman dalam Hutan"
Mini chalet exhibited at its "Garden in the forest"

3. Floria Garden Award (Government Category)

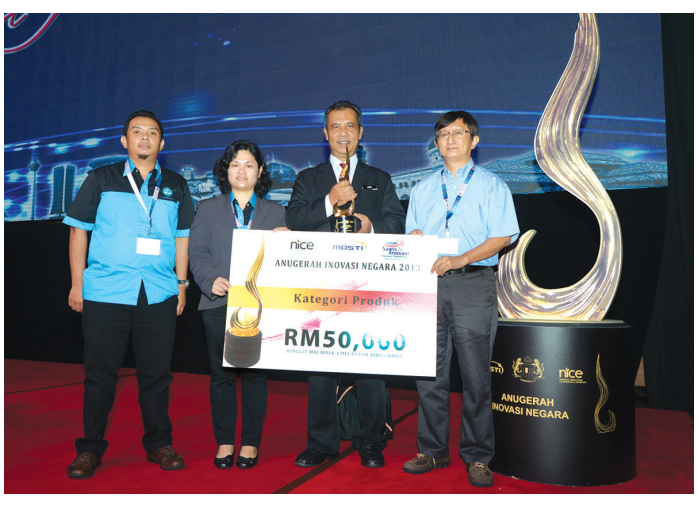
FRIM won third prize at the Putrajaya Flower and Garden Festival 2013 (FLORIA Putrajaya 2013) themed: "Orchid—Tropical Treasure". FRIM Director General received a trophy and a certificate from the Deputy Federal Territories Minister Dr Loga Bala Mohan at the closing ceremony on 30 June 2013. FLORIA Putrajaya was held along the Waterfront, Precinct 2, Putrajaya for nine days, starting 22 June 2013, with the opening ceremony officiated by the Yang di-Pertuan Agong Tuanku Abdul Halim Mu'adzam Shah.



4. Anugerah Inovasi Negara 2013 (Kategori Produk)

Sistem rawatan kayu menggunakan pengeringan suhu tinggi (HTD) yang dibangunkan oleh FRIM memenangi Anugerah Inovasi Negara 2013 bagi Kategori Produk pada 14 November. Pasukan penyelidik FRIM terdiri daripada Dr Sik Huei Shing, Choo Kheng Ten dan Ramzul Ikhlas Ablah, membawa pulang trofi dan RM50,000 di Majlis Penyampaian Anugerah Inovasi Negara 2013 yang diadakan bersempena dengan Persidangan Kebangsaan dan Pameran Inovasi (NICE) 2013 dan Forum Inovasi Dunia Kuala Lumpur (WIF KL) 2013 dari 12 hingga 14 November. WIF KL 2013 yang berhasrat mewujudkan budaya inovasi baharu dianjurkan bersama oleh Kementerian Sains, Teknologi dan Inovasi (MOSTI) dan Yayasan Inovasi Malaysia.

FRIM telah memperoleh paten untuk sistem HTD ini dari Pejabat Paten dan Cap Dagang Amerika Syarikat (USPTO) pada Mac serta dari Pendaftar Paten Perbadanan Harta Intelek Malaysia (MyIPO) pada Oktober. FRIM juga telah memfailkan paten di enam buah negara lain iaitu Singapura, Thailand, Vietnam, Indonesia, China dan India. Teknologi HTD ini merupakan penyelesaian kepada masalah yang dihadapi oleh industri kayu-kayan negara terutamanya pengeluar perabot berasaskan kayu getah berkaitan halangan serta syarat-syarat ketat perdagangan semakin ketat yang ditetapkan oleh pelbagai negara maju dalam memastikan penggunaan produk-produk lebih mesra alam.



Tahniah Dr Sik (kanan), En Choo (tengah) dan Ramzul (kiri)
Congratulations Dr Sik (right), Mr Choo (middle) and Ramzul (left)

4. 2013 National Innovation Award (Product Category)

FRIM High Temperature Drying (HTD) Lumber Treatment System won the prestigious National Innovation Award 2013 for the Product Category on 14 November. The FRIM research team, comprising Dr Sik Huei Shing, Choo Kheng Ten and Ramzul Ikhlas Ablah, received a trophy and RM50,000 at the awards ceremony, held in conjunction with the National Innovation Conference and Exhibition (NICE) 2013 and World Innovation Forum Kuala Lumpur (WIF KL) from 12 to 14 November. Aimed at creating a new culture of innovation, WIF KL 2013 was jointly organised by the Ministry of Science, Technology and Innovation (MOSTI) and the Malaysian Innovation Foundation.

FRIM has obtained the patent for the HTD technology from the United States Patent and Trademark Office (USPTO) in March 2013 and from the Malaysian Intellectual Property Corporation (MyIPO) Registrar of Patents in October 2013. The Institute has also filed for patent in six other countries, namely Singapore, Thailand, Vietnam, Indonesia, China and India. The HTD technology is the solution to the concerns of the country's rubberwood furniture manufacturers and timber trade industry over the increasingly stringent requirements for environmental-friendly products imposed by various developed countries.



5. Anugerah Antarabangsa Jepun bagi Penyelidik Muda Pertanian

Pegawai Penyelidik FRIM, Dr Tnah Lee Hong, memenangi anugerah *Japanese International Award for Young Agricultural Researchers* 2013 oleh Kementerian Pertanian, Perhutanan dan Perikanan (MAFF) Jepun sebagai pengiktirafan ke atas kecemerlangan dalam penyelidikannya di majlis penghargaan yang diadakan di Tokyo pada 20 November. Tnah yang bekerja di Makmal Genetik Bahagian Bioteknologi Perhutanan FRIM telah dipilih berdasarkan penyelidikannya berkenaan pembangunan sistem pengesanan kayu untuk spesies kayu penting, iaitu cengal atau *Neobalanocarpus heimii* (Dipterocarpaceae) menggunakan pendekatan DNA.



Dr Tnah sedang menjalankan kajian di dalam Makmal Genetik FRIM
Dr Tnah working in the FRIM Genetic Laboratory

5. Japanese International Award for Young Agricultural Researchers 2013

FRIM researcher, Dr Tnah Lee Hong, received the Japanese International Award for Young Agricultural Researchers 2013 by the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) for outstanding research achievements at a ceremony held in Tokyo on 20 November. Tnah, who works at FRIM Forestry Biotechnology Division Genetic Laboratory, was selected for her research on timber tracking system of an important timber species, cengal or *Neobalanocarpus heimii* (Dipterocarpaceae) using DNA approach.

6. Anugerah Buku Negara

FRIM memenangi Anugerah Buku Negara 2013 untuk tahun yang ketiga berturut-turut, iaitu Anugerah Industri Buku bagi Kategori Buku Umum Terbaik (Sains) dan Anugerah Perdana bagi Kategori Penyelidikan. FRIM meraih Anugerah Industri Buku (Kategori Sains) bagi buku bergambarnya yang bertajuk, "99 Spesies Buah di FRIM" yang ditulis oleh Zawiah Ngah, Pembantu Penyelidik FRIM, dan suaminya, Othaman Hasin, yang berkhidmat sebagai pemandu di FRIM dan disunting oleh Abd Latif Mohmod, Nik Zanariah Nik Mahmood dan Praveena Balaikerishnan. Buku 256 muka surat mengandungi penerangan serta maklumat saintifik tentang spesies buah-buahan terpilih yang terdapat di dalam kampus FRIM di Kepong serta beberapa stesen penyelidikan FRIM. Trofi dan sijil anugerah disampaikan oleh



Othaman (kiri) menerima sijil kemenangan bagi Kategori Buku Umum Terbaik (Sains) daripada Datuk Dr Abu Bakar Mohamad Diah (tengah)
Othaman (left) receiving the winning certificate for the Best General Book from Datuk Dr Abu Bakar Mohamad Diah (middle)

6. National Book Award

FRIM won the National Book Award 2013 for the third consecutive year and this time, the Institute took home two awards instead of one for the Best General Book under the Book Industry Award (Science Category) and the Premier Award (Research Category). FRIM clinched the Book Industry Award (Science Category) for its pictorial book entitled, "99 Spesies Buah di FRIM", by a husband and wife team—FRIM research assistant, Zawiah Ngah, and driver, Othaman Hasin and edited by Abd Latif Mohmod, Nik Zanariah Nik Mahmood and Praveena Balaikerishnan. This beautiful 256-page publication comprised description and scientific information on selected fruit species found in the FRIM campus in Kepong as well as in some of its research stations. The trophy and certificate was presented by the Deputy Minister of

Timbalan Menteri Sains, Teknologi dan Inovasi, Datuk Dr Abu Bakar Mohamad Diah pada 11 Disember.

Anugerah Perdana bagi buku "FRIM Warisan Kebangsaan" pula telah diterima oleh Ketua Pengarah FRIM di Majlis Anugerah Buku Negara 2013 pada 12 Disember yang disempurnakan oleh Menteri Dalam Negeri Dato' Seri Dr Ahmad Zahid Hamidi. Buku tersebut disunting oleh Abd Latif Mohmod, Shamsudin Ibrahim, Ismail Parlan dan Nik Zanariah Nik Mahmood. Buku "FRIM Warisan Kebangsaan" yang telah dilancarkan oleh Menteri NRE, Datuk Seri G Palanivel pada 11 November ini memaparkan secara komprehensif tentang latar belakang dan sumber maklumat FRIM sehingga melayakkannya sebagai Warisan Semula Jadi dan Warisan Kebangsaan. Buku yang dihasilkan dengan penglibatan 59 orang pegawai FRIM ini mengandungi 16 bab yang masing-masing membincangkan tentang kampus FRIM, penyelidikan, pendidikan, pencapaian, sumbangan kepada komuniti dan aspirasi masa hadapan. Majlis Anugerah Buku Negara ini telah diadakan sempena Ekspo Buku 1Malaysia 2013 dan Persidangan Buku Antarabangsa 2013 yang dianjurkan oleh Yayasan Pembangunan Buku Negara (YPBN) di Pusat Dagangan Dunia Putra (PWTC), Kuala Lumpur, dari 11 hingga 15 Disember.



Dato' KP berkongsi saat gembira dengan Dato' Seri Dr Ahmad Zahid Hamidi
Dato' KP sharing light moments with Dato' Seri Dr Ahmad Zahid Hamidi

Science, Technology and Innovation, Datuk Dr Abu Bakar Mohamad Diah, at the award ceremony on 11 December.

FRIM Director General, Dato' Dr Abd Latif Mohmod received the Premier Award (Research Category) for the another book entitled, "FRIM Warisan Kebangsaan" at the award ceremony on 12 December. The trophy and certificate were presented by the Home Minister, Dato' Seri Dr Ahmad Zahid Hamidi. The book was edited by Abd Latif Mohmod, Shamsudin Ibrahim, Ismail Parlan and Nik Zanariah Nik Mahmood. "FRIM Warisan Kebangsaan", launched by the Minister of NRE Datuk Seri G Palanivel on 11 November, is a comprehensive book providing information on the background and content of FRIM which qualifies it for the status of natural heritage and national heritage. The 16-chapter book, authored by 59 FRIM staff, discusses FRIM campus history, research activities, education, achievements, contribution to the country and future aspiration. The award presentation ceremonies were held in conjunction with the 1Malaysia Book Expo 2013 and International Book Conference 2013, organised by the National Book Development Foundation (YPBN) at the Putra World Trade Centre (PWTC), Kuala Lumpur, from 11 to 15 December.



Dato' Dr Abd. Latif bersama-sama Dato' Seri Dr Ahmad Zahid Hamidi selepas menerima Anugerah Perdana (Kategori Penyelidikan), Anugerah Buku Negara
Dato' Dr Abd. Latif with Dato' Seri Dr Ahmad Zahid Hamidi (second from right) after receiving the Premier Award (Research Category), National Book Awards

7. Anugerah Penghargaan daripada Kerajaan Negeri Selangor dan Tourism Malaysia Selangor

FRIM menerima anugerah penghargaan daripada Kerajaan Negeri Selangor dan Tourism Malaysia Selangor atas sumbangannya kepada industri pelancongan di negeri tersebut. Majlis Penghargaan Pelancongan Selangor 2013 yang berlangsung di Subang Jaya pada 15 November ini disempurnakan oleh Menteri Besar Selangor, Tan Sri Dato' Seri Abdul Khalid Ibrahim. Abdul Khalid telah menyampaikan sijil penghargaan dan trofi anugerah kepada Ketua Pengurusan Korporat, Norhayati Nordin, yang mewakili FRIM.

FRIM merupakan salah satu daripada lima destinasi ekopelancongan di Selangor yang terpilih untuk menerima anugerah tersebut. Destinasi lain ialah Pulau Ketam di Klang, Taman Botani Negara di Shah Alam, Kalumpang Resort Training Center di Hulu Selangor, dan Hutan Lipur (Gunung Nuang) di Hulu Langat di bawah Jabatan Perhutanan Selangor. Matlamat acara tahunan ini adalah untuk membangun, menggalak dan menyerlahkan kebaikan dan keistimewaan produk pelancongan Selangor; serta memberi pengiktirafan kepada pihak usahawan, pengusaha serta pemain industri pelancongan.

8. Anugerah Saintis Penyelidikan Terbaik Malaysia

Ketua Pengarah FRIM, Dato' Dr Abd Latif Mohmod telah menerima Anugerah Saintis Penyelidikan Terbaik Malaysia (TRSM) daripada Akademi Sains Malaysia di Majlis Penganugerahan Felo 2013 kepada ahli-ahli sains yang terpilih dan pengumuman Anugerah Saintis Penyelidikan Terbaik Malaysia 2013 yang dirasmikan oleh Perdana Menteri Dato' Sri Najib Tun Razak pada 17 Disember 2013 di Kuala Lumpur. Abd Latif yang diiringi oleh isterinya Datin Halidah Kasmin menerima plak dan sijil pengiktirafan TRSM yang disampaikan oleh Presiden ASM, Tan Sri Dr Ahmad Tajuddin Ali. Abd Latif merupakan saintis FRIM pertama yang menerima Anugerah TRSM sebagai pengiktirafan atas sumbangan dan usaha beliau yang konsisten dalam menggerakkan penyelidikan perhutanan.

7. Appreciation Award from the Selangor Government and Tourism Malaysia Selangor

FRIM received an Appreciation Award from the Selangor Government and Tourism Malaysia Selangor for its contribution to the state's eco-tourism industry. The Selangor Tourism Appreciation 2013 Ceremony held in Subang Jaya on 15 November was officiated by the Selangor Menteri Besar, Tan Sri Dato' Seri Abdul Khalid Ibrahim. Khalid presented the trophy and certificate to FRIM Corporate Management Head, Norhayati Nordin, who represented the Institute.

FRIM is one of the five eco-tourism sites in the state selected to receive the award. The others were Pulau Ketam in Klang, Taman Botani Negara in Shah Alam, Kalumpang Resort Training Center in Hulu Selangor and Hutan Lipur (Gunung Nuang) in Hulu Langat under the Selangor Forestry Department. The aim of this annual event is to develop, promote and highlight the advantages and specialty of the state's tourism products; as well as to show appreciation to the state's tourism entrepreneurs, operators and industry players.

8. Top Research Scientists Malaysia (TRSM) Award

FRIM Director General Dato' Dr Abd Latif Mohmod received the Top Research Scientists Malaysia (TRSM) Award from the Academy of Sciences Malaysia (ASM) at the 2013 Conferment of Fellowships to Scientists by ASM and the announcement of the 2013 TRSM, officiated by Prime Minister Dato' Seri Najib Tun Razak on 17 December 2013 in Kuala Lumpur. Abd Latif, accompanied by his wife Datin Halidah Kasmin, received the plaque and certificate presented by ASM President, Tan Sri Dr Ahmad Tajuddin Ali. Abd Latif is the first FRIM scientist to receive the TRSM Award, in recognition of his many years of consistent efforts and contribution in undertaking and mobilising research in the field of forestry.





Dato' Dr Abd. Latif (kanan) menerima Anugerah Saintis Penyelidikan Terbaik Malaysia daripada Tan Sri Dr Ahmad Tajuddin Ali (kiri)
Dato' Dr Abd. Latif (right) receiving the Top Research Scientists Malaysia Award from Tan Sri Dr Ahmad Tajuddin Ali (left)

9. Felo Akademi Sains Malaysia

Di majlis yang sama, Perdana Menteri telah menyampaikan sijil pengiktirafan felo Akademi Sains Malaysia kepada Dr Saw Leng Guan, Pengarah Bahagian Biodiversiti Hutan, FRIM, bagi kategori "Taksonomi Tumbuhan dan Ekologi" di bawah bidang Pertanian Biologi dan Sains Alam Sekitar. Beliau telah banyak menyumbang kepada usaha dokumentasi dan pemuliharaan tumbuh-tumbuhan Malaysia. Saw terlibat secara aktif dalam tiga projek flora moden yang dilaksanakan di FRIM, iaitu Tree Flora of Malaya; Tree Flora of Sabah and Sarawak; dan Flora of Peninsular Malaysia. Beliau merupakan pakar dalam penyelidikan palma dan telah menjalankan kajian ekologi dan taksonomi pelbagai spesies palma di Malaysia. Saw telah menamakan 57 taksa baru (iaitu spesies dan jenis tumbuhan) dan sebagai pengiktirafan sumbangannya, tiga spesies telah dinamakan sempena nama beliau.

9. Fellow of Academy of Sciences Malaysia

In the same occassion, the Prime Minister presented the ASM fellowship certificate to Dr Saw Leng Guan, Director of Forest Biodiversity Division, for the "Plant Taxonomy and Ecology" category under the Biological Agriculture and Environmental Sciences discipline. Dr Saw has contributed significantly towards documenting and conserving plants of Malaysia. He is involved in three modern flora projects initiated in FRIM: Tree Flora of Malaya; Tree Flora of Sabah and Sarawak; and the Flora of Peninsular Malaysia. He specialises in the study of palms and has conducted research on native palms of Malaysia. He has described 57 new taxa (i.e. species and varieties) of plants and in recognition of his work, three plant species were named after him.



Dr Saw (kanan) bergambar bersama-sama Perdana Menteri (tengah) dan Tan Sri Dr Ahmad Tajuddin (kiri) semasa menerima sijil pengiktirafan
Dr Saw (right) with the Prime Minister (middle) and Tan Sri Dr Ahmad Tajuddin while receiving the fellowship certificate

SISTEM PENGURUSAN KUALITI
QUALITY MANAGEMENT SYSTEM

1. MS ISO 9001:2008

FRIM berjaya mengekalkan Pensijilan Pengurusan Kualiti MS ISO 9001:2008 melalui Audit Pensijilan Semula yang diadakan pada 8–9 Oktober. FRIM telah memperoleh Pensijilan MS ISO 9001:2008 bagi skop pengurusan penyelidikan dan pembangunan (R&D) dan khidmat sokongan untuk pembangunan sektor perhutanan. Audit Pensijilan Semula ini telah dijalankan oleh empat orang juruaudit daripada Intertek International Sdn Bhd; melibatkan sejumlah 39 cawangan, unit, makmal dan bengkel di FRIM yang meliputi skop proses penyelidikan dan pembangunan, perundingan, komersialisasi, jualan, latihan, pembekalan perkhidmatan dan bahan rujukan serta perkhidmatan sokongan yang lain. Sebelum itu, Audit Dalam MS ISO 9001:2008 telah dilaksanakan ke atas kesemua Bahagian. Seramai 85 orang juruaudit dalam terlibat dan 98 CUMBS telah diaudit.

2. MS ISO/IEC 17025

Audit luar MS ISO/IEC 17025 telah dilaksanakan sebanyak sembilan kali. Kebanyakan audit telah dilaksanakan oleh En Tommy Tan Kim Ho yang merupakan lead assessor dan technical assessor yang dilantik oleh Jabatan Standard Malaysia. Kebanyakan penemuan dapat diambil tindakan pembetulan. Manakala Audit Dalam Siri 1/2013 telah melibatkan sebanyak 15 makmal dan 22 Juruaudit.

3. Penarafan Bintang

Audit dalam penarafan bintang telah dilaksanakan oleh pegawai PJK pada 20–21 Ogos ke atas proses R&D, pembekalan perkhidmatan, kemudahan rekreasi, penjualan bahan, perkhidmatan ujian, latihan, perundingan dan sewaan. FRIM berjaya memperoleh empat bintang dengan markah 80.50%.

1. MS ISO 9001:2008

FRIM succeeded in maintaining its MS ISO 9001:2008 Quality Management System Certification through the re-certification audit which was conducted on 8–9 October 2013. The scope of the certification is for the management of research and development (R&D) and support services for the forestry development. The auditing was carried out by four auditors from Intertek International Sdn Bhd; involving a total of 39 branches, units, laboratories and workshops at FRIM and covered the R&D processes, consultations, commercialisations, sales, trainings, supply of services and reference materials, and other support services. Prior to this, MS ISO 9001:2008 internal auditing was conducted on all Divisions. A total of 85 internal auditors were involved and 98 CUMBS were audited.

2. MS ISO/IEC 17025

MS ISO/IEC 17025 external audit was conducted nine times, mostly by Mr Tommy Tan Kim Ho, a lead assessor and technical assessor appointed by the Department of Standard Malaysia. Corrective actions were taken on most of the findings. The Internal Audit Series 1/2013 and 2/2013 involved a total of 15 laboratories and 22 auditors.

3. Star Rating

The internal audit for star rating was conducted by the Quality Management Unit officers from 20 to 21 August on R&D process, supply of services, recreational facilities, sales of materials, testing, training, consultancy and rental services. FRIM managed to obtain four stars with 80.50% total marks.

4. QE/5S

On 10 October 2013, two Malaysian Productivity Corporation (MPC)'s auditors conducted the Quality Environment (QE/5S) recertification audit at FRIM and for the fourth time since 2010, FRIM has managed to



4. QE/5S

Pada 10 Oktober, dua orang juruaudit daripada Perbadanan Produktiviti Malaysia (MPC), telah menjalankan Audit Pensijilan Semula Persekitaran Berkualiti (QE/5S) di FRIM, dan buat kali keempat sejak 2010, FRIM berjaya mengekalkan Pensijilan QE/5S. Audit Dalam dilaksanakan pada 27–28 Ogos di 32 zon yang melibatkan 90 orang juruaudit dalaman. Secara keseluruhan pelaksanaan adalah pada tahap yang baik dan banyak zon menunjukkan peningkatan. Purata markah bagi 32 Zon ialah 84% —berjaya melepasi sasaran pengurusan, tiada lagi zon yang berada dalam kategori 0–50% dan 30% zon berada dalam kategori cemerlang.

5. Skim Pensijilan Sistem Pengurusan Maklumat (ISMS)—(ISO/IEC 27001:2005)

Cawangan Teknologi Maklumat, Bahagian Perkhidmatan Teknikal menerima sijil "Skim Pensijilan Sistem Pengurusan Maklumat (ISMS)—(ISO/IEC 27001: 2005) yang disampaikan oleh Dato' Dr Rosli Mohamed, Ketua Setiausaha Kementerian Sains, Teknologi dan Inovasi (MOSTI) kepada Dr Khali Aziz Hamzah, Pengarah Bahagian Perkhidmatan Teknikal di Majlis makan malam "SIRIM Industri 2013" pada 15 November 2013 di Petaling Jaya. Majlis yang dirasmikan oleh YB Datuk Dr Ewon Ebin, Menteri MOSTI ini dianjurkan khas untuk memberi penghargaan kepada organisasi dan syarikat yang telah berjaya mendapat pensijilan pada 2013.

6. Penarafan 5-Bintang Bagi Laman Sesawang FRIM

FRIM berjaya mengekalkan penarafan 5-bintang bagi laman sesawangnya untuk tahun ketiga berturut-turut, berdasarkan kepada Penilaian Portal dan Laman Web dan Portal Kerajaan Malaysia (MGPWA) 2013. Dalam penilaian yang dilaksanakan oleh Perbadanan Pembangunan Multimedia (MDeC) tahun ini, www.frim.gov.my telah dikategorikan sebagai laman web berbanding dengan portal pada tahun-tahun sebelum ini. Kriteria pemarkahan yang ditetapkan oleh MDEC merangkumi lima aspek/tonggak iaitu kandungan, maintain the QE/5S certification. The internal auditing was conducted from 27–28 August for 32 zones involving 90 internal auditors. Overall, the implementation was good and some zones have shown improvement. The average mark for the 32 zones was 84%, therefore surpassed the management target. No zones obtained 0–50% mark and 30% of the zones were in the excellent category.

5. Information Management System Certification Scheme—(ISO/IEC 27001: 2005)

Information Technology Branch, Technical Services Division received a certification on "Information Management System Certification Scheme—(ISO/IEC 27001: 2005). The certificate was handed over by Dato' Dr Rosli Mohamed, Secretary General, Ministry of Science, Technology and Innovation (MOSTI) to Dr Khali Aziz Hamzah, Technical Services Division Director during the "SIRIM Industri 2013" dinner on 15 November at Petaling Jaya. The dinner, officiated by YB Datuk Dr Ewon Ebin, Minister of MOSTI was organised for the 2013 certificate recipients.

6. Five-Star Rating For FRIM Website

FRIM managed to retain its 5-star rating for the third consecutive year, based on the Malaysian Government Portals and Website Assessment (MGPWA) 2013. The only difference this year is that FRIM's www.frim.gov.my was assessed by the Multimedia Development Corporation Sdn Bhd (MDeC) under the website category instead of a portal as in the case of the past few years. The criteria for assessment cover the following five aspects/pillars—content, usability, security, participation and services. The MGPWA 2013 was supported by a technical working group comprising members from the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU), Ministry of Science, Technology and Innovation (MOSTI), Public Services Department (PSD) and Economic Planning Unit (EPU).

7. IKM Laboratory Excellence Awards

Three FRIM laboratories received the IKM Laboratory Excellence Awards at the IKM



kebolehgunaan, keselamatan, penyertaan dan perkhidmatan. Penilaian MGPWA ini disokong oleh Jawatankuasa Kerja Teknikal yang terdiri daripada Unit Pemodenan Tadbiran dan Perancangan Pengurusan Malaysia (MAMPU), Kementerian Sains, Teknologi dan Inovasi (MOSTI), Jabatan Perkhidmatan Awam (JPA) dan Unit Perancangan Ekonomi (EPU).

7. Anugerah Kecemerlangan Makmal Institut Kimia Malaysia

Tiga makmal Institut Penyelidikan Perhutanan Malaysia (FRIM) menerima pengiktirafan Anugerah Kecemerlangan Makmal Institut Kimia Malaysia (IKM) di Majlis Penyampaian Anugerah IKM 2013 yang diadakan bersempena dengan Majlis Makan Malam IKM 2013 di Kuala Lumpur pada 6 Disember. Majlis ini telah dirasmikan oleh Timbalan Menteri Sains, Teknologi dan Inovasi, Datuk Dr Abu Bakar Mohamad Diah. Makmal FRIM yang mendapat anugerah tersebut ialah Makmal Analisis Awetan Kayu, Makmal Pengujian Komposit Kayu dan Makmal Kimia Tanah. Ini merupakan tahun ke-18 berturut-turut Makmal Analisis Awetan Kayu diberi pengiktirafan tersebut yang sebelum ini menerima Anugerah Emas pada 2010 dan Anugerah Perak pada 2005.

IKM memperkenalkan Anugerah Akreditasi IKM pada 1986 untuk makmal-makmal kimia dan pada 1994, ia ditukar kepada Anugerah Kualiti IKM untuk memberikan pengiktirafan kepada makmal-makmal yang telah mencapai kecekapan dalam amalan kerja analisis. Anugerah tersebut ditukar nama kepada Anugerah Kecemerlangan Makmal IKM pada 2001. Tujuan pengiktirafan ini adalah untuk memastikan komitmen makmal ke arah mencapai kecemerlangan dalam menyediakan perkhidmatan ujian yang berkualiti dan berwibawa berdasarkan undang-undang tempatan terutamanya dari segi kesihatan, keselamatan dan alam sekitar. Antara lain, makmal yang mengambil bahagian dikehendaki mengendalikan sistem kualiti yang menepati keperluan yang ditetapkan dalam MS ISO / IEC 17025:2005.

Awards 2013 presentation ceremony held in conjunction with the Malaysian Institute of Chemistry's (IKM) Annual Dinner in Kuala Lumpur on 6 December. The event was officiated by the Deputy Minister of Science, Technology and Innovation, Datuk Dr Abu Bakar Mohamad Diah. The laboratories are the Wood Preservative Analytical Laboratory, the Wood Composite Testing Laboratory and the Soil Chemistry Laboratory. The Wood Preservative Analytical Laboratory received the IKM Excellence Award for the 18th consecutive year. It was bestowed the Gold Award in 2010 and the Silver Award in 2005. The Wood Composite Testing Laboratory was presented with the Silver Award for maintaining excellence for the 10th consecutive year; whilst the Soil Chemistry Laboratory, received the IKM Excellence Award for the 9th consecutive year.

IKM introduced the Laboratory Accreditation Award since 1986 for chemical laboratories and in 1994, the award was changed to the IKM Quality Award to accord recognition to laboratories that have achieved competency in the practice of analytical work. The award was again renamed the IKM Laboratory Excellence Award in 2001. The objective of the award presentation is to ensure the commitment of laboratories towards achieving excellence in providing quality and competent testing services based on local legislation particularly in the terms of health, safety and the environment. Among others, participating laboratories are required to operate a quality system in accordance with the requirements as stipulated in MS ISO/IEC 17025:2005.



AKTIVITI HARI INOVASI

FRIM menyambut Hari Inovasi 2013 pada 26–28 November 2013 dengan memberi pelbagai pengiktirafan dan penghargaan kepada kakitangan atas sumbangan idea kreatif dan usaha penghasilan inovasi. Majlis Perasmian Hari Inovasi 2013 FRIM yang bertemakan, "Inovasi Tercipta Keunggulan Terpelihara" telah disempurnakan oleh Dato' Sri James Dawos Mamit, Timbalan Menteri Kementerian Sumber Asli dan Alam Sekitar (NRE), pada 28 November.

INNOVATION DAY ACTIVITIES

FRIM celebrated its Innovation Day from 26–28 November by according deserving staff with awards and recognitions for their innovative ideas and efforts. The FRIM Innovation Day themed, "Inovasi Tercipta Keunggulan Terpelihara" (Creation of Innovation, Maintenance of Excellence), was officiated by the Deputy Minister of Natural Resources and Environment (NRE) Dato' Sri James Dawos Mamit on 28 November. The aim of the celebration was to accord recognition to the efforts of staff who had successfully produced high quality innovations; to encourage teamwork, as well as to promote and strengthen a culture of innovation and quality in FRIM.



Timbalan Menteri NRE diiringi Dato' Dr Abd. Latif menyampaikan hadiah "Best of the Best" bagi Pertandingan Inovasi dan Reka Cipta kepada Mohd Yusouf Abdul Latif

The Deputy Minister of NRE accompanied by Dato' Dr Abd. Latif to present the Best of the Best prize for the Innovation and Invention Competition 2013 to Mohd Yusouf Abdul Latif

Pertandingan/Competition	Pemenang/Winners
Tema Hari Inovasi/**Innovation Day Theme**	**Pertama/First**: Nor Haliyan Tan Shilan (Inovasi Tercipta Keunggulan Terpelihara) **Kedua/Second:** Norul Huda Abas (Inovasi Pemangkin Kecemerlangan) **Ketiga/Third:** Puad Elham (Inovasi Pemangkin Kecemerlangan)
Persekitaran Kerja Terbaik/**Best Work Environment:** Kategori Pejabat/**Office Category**	**Pertama/First:** Unit Pengurusan Kualiti/Quality Management Unit **Kedua/Second:** Caw. Kewangan & Akaun, Bhg Kewangan/Finance & Accounts Branch, Finance Division **Ketiga/Third:** Caw. Ekologi Hutan, Bhg Perhutanan & Alam Sekitar/Forest Ecology Branch, Forest & Environment Division
Kategori Makmal/**Laboratory Category**	**Pertama/First:** Makmal Teknologi Biji Benih, Bhg Bioteknologi Perhutanan/Seed Technology Lab/Forestry Biotechnology Division **Kedua/Second:** Makmal Biotenaga, Bhg Keluaran Hutan/Bio-Energy Lab, Forest Products Division **Ketiga/Third:** Makmal Instrumentasi, Bhg Hasilan Semula Jadi Instrumentation Lab, Natural Products Division
Kategori Bengkel/Taman/Nurseri **Workshop/Garden/Nursery Category**	**Pertama/First:** Taman Etnobotani, Bhg Hasilan Semula Jadi/Ethno-Botany Garden, Natural Products Division **Kedua/Second:** Bengkel Pemprosesan Kayu, Bhg Keluaran Hutan Wood Proc. Lab, Forest Products Division **Ketiga/Third:** Makmal Perlindungan Api, Bhg Keluaran Hutan Wood Protection Lab, Forest Products Division

Pertandingan/Competition	Pemenang/Winners
Stesen Penyelidikan FRIM (SPF) **FRIM Research Stations**	**Pertama/First:** SPF Mata Ayer, Bhg Bioteknologi Perhutanan Mata Ayer SPF, Forestry Biotechnology Division **Kedua/Second:** SPF Pasoh, Bhg Perhutanan & Alam Sekitar Pasoh SPF, Forestry & Env. Division **Ketiga/Third:** SPF Jengka, Bhg Perhutanan & Alam Sekitar Jengka SPF, Forestry & Env. Division
Zon QE/5S Terbaik/**The Best QE/5S Zones**	**Pertama/First:** Zon/Zone 12 **Kedua/Second:** Zon/Zone 13 **Ketiga/Third:** Zon/Zone 8
Sudut Kualiti Terbaik **The Best Quality Corner**	**Pertama/First:** Bhg Keluaran Hutan/Forest Products Division **Kedua/Second:** Bhg Bioteknologi Perhutanan/Forestry Biotechnology Division **Ketiga/Third:** Bhg Perkhidmatan Teknikal/Technical Services Division
Poster Propaganda **Propaganda Poster**	**Pertama/First:** Luqman Hakim Adzis **Kedua/Second:** Dr Abdul Hamid Saleh **Ketiga/Third:** Yanti Abdul Kadir **Sagu hati/Consolation:** Azrina Yahaya, Nordin Puteh, Norul Maslissa Ahmad, Nik Yasmin Nik Yahya, Zalina Mustaffa & Siti Sarah Tayit, Dr Ng Chin Hong, Mohd Yusof Mohamed & Azrina Yahaya
Montaj Inovasi **Montage on Innovation**	**Pertama/First:** Ahmad Fauzi Mohd Shariff & Dr Lee Chai Ting, Bhg Bioteknologi Perhutanan/Forestry Biotechnology Division —Inovasi Tercipta Keunggulan Terpelihara **Kedua/Second:** Dato' Dr Hajah Marzalina Mansor, Hirawati Abdul Rahman & Roshamida Ruslan, Bhg Perancangan Penyelidikan & Korporat/Research Planning & Corporate Division—Dreaming of Forest **Ketiga/Third:** Nur Fazreen Zainal, Nor Azila Mohamed, Siti Shahida Mohd Shah & Noor Hazmira Merous, Bhg Inovasi & Komersialisasi/ Innovation & Commercialisation Division— FRIM Warisan Negara Persada Dunia
Cabaran Crazy Idea **Crazy Idea Challenge**	Kategori Pengurusan & Profesional/Management & Professional Category: Dato' Dr Hajah Marzalina Mansor, Mohd Yusouf Abdul Latif, Wahayu Haji Abdul Wahab & Dr Lee Chai Ting Kategori Sokongan/Support Group Category: Mohd Radzi Ahmad, Azizi Abd Jalil & Norul Huda Abas
Mini Konvensyen KIK /**KIK Mini Convention**	**Pertama/First:** Kumpulan UNO (Bhg Hasilan Semula Jadi/ Natural Products Division) **Kedua/Second:** Kumpulan BIJAK WANG (Bhg Kewangan/Finance Division) **Ketiga/Third:** Kumpulan B.O.H (Bhg Bioteknologi Perhutanan/ Forestry Biotechnology Division) **Saguhati/Consolation:** Kumpulan PHONETIC PHOENIX (Bahagian Perkhidmatan Teknikal/ Technical Services Division) **Saguhati/Consolation:** Kumpulan MESRA (Bhg Keluaran Hutan/ Forest Products Division)



Pertandingan/Competition	Pemenang/Winners
Anugerah Juruaudit Terbaik/ **Best Auditor's Award**	MS ISO 9001: 2008: Dr Hamdan Husain MS ISO/IEC 17025: Dr Sharmiza Adnan QE/5S: Nadiah Salmi Nadzri
Reka cipta & Inovasi/Invention & Innovation	**Terbaik antara yang Terbaik/Best of the Best**: Mohd Yusouf Abdul Latif—Corrugated Particleboard (CPB) Inno-Forovus **Emas/Gold:** Mohd Yusouf Abdul Latif—Corrugated Particleboard (CPB) Inno-Forovus Dr Mohamad Nasir Mat Arip—A Novel DNA Biosensors for Determination of Permethrin Pesticide Wan Zahiri Wan Yaacob—Sistem Inventori dan Pengurusan Pokok (SIPP) Dr Nor Hasnida Hassan—Sustainable Production of Tongkat Ali Bioactive Compounds from Hairy Root Culture Using Bioreactor Technology Mahmudin Saleh—Development of Pulp and Paper Products from Oil Palm Empty Fruit Bunches (EFB) Fibres for Commercial Application Dr Mastura Mohtar—Ciera® Ecofriendly Multipurpose Disinfectant Dr Abdul Hamid Saleh—Product Development from Sesenduk Clone Dr Abdul Hamid Saleh—The Production of Hybrid or Un-Hybrid Moulded Rotary Veneer Bamboo Chair (Rovbam Chair) **Perak/Silver:** Dr Rushdan Ibrahim—Kenaf—A Sustainable and Environmental Friendly Raw Material for Pulp, Paper, Textile and Chemical Industries Dr Rushdan Ibrahim—Producing Antimicrobial Biodegradable Pulp Moulded Products from Kenaf Core Dr Mohamad Nasir Mat Arip—Antifungal Properties of *Dioscorea hispida* sp. Starch Based Hydrogel by Chemical Method Used as Wood Preservatives Hirawati Abdul Rahman—Permainan FRIM 101 Sahrim Lias—Agarwood Identification System (AIS) Using Modified K-NN Kfold Technique Siti Suhaila A. Rahman—Rapid Production of Kacip Fatimah Plantlets Using Temporary Immersion System (TIS) for Sustainable Supply of Planting Material Puad Elham —OPF Pellet (Sumber Tenaga) Diperbaharui dari Ladang Sawit Dr Lee Chai Ting —Development of Genic Microsatellite Markers from Transcriptome Sequences of Tongkat Ali Root Dato' Dr Hjh Marzalina Mansor—Picker-Slider Dr Abdul Hamid Saleh —Rovbam Plyboard for Interior and Souvenir Products **Gangsa/Bronze:** Dr Fadhilah Zainudin—AquaRias™; Aslina Baharum —i-Newsletter; Zainorasri Yahya — Sistem Permohonan Pendahuluan Diri Kerja Luar Online; Dr Suffian Misran —RERP; Nik Adlin Nik Mohamed Sukri —Wakaf yang Dilengkapi Sumber Elektrik dan Sistem Bunyi Bluetooth; Saidatul Husni Saidin —Herbal Therapy Oil; Nashatul Zaimah Noor Azman — Synthetic Seeds of Tongkat Ali: An Alternative Planting Material; Dr Mohd Khairun Anwar Hj Uyup —Light Weight Bamboo Composite; Dr Farah Fazwa Md Ariff — Mesin Meracik Daun Limau Purut; Zalina Mustaffa —Crazy Catch Ball Pong (CCBP); Dr Fadzureena Jamaludin —Anti-Gout Herbal Remedies from Standardised Extract (SEBF) of *Baeckea frutescens* & Mohd Ghazali Hasan — Tanaman Tumbuhan Akuatik di Atas Platform Terapung yang Dibina Menggunakan Bahan Terpakai



Pertandingan/Competition	Pemenang/Winners
Anugerah Pendedahan Reka Cipta Invention Disclosure Award	Rujuk senarai penerima di ms 75/Refer to the recipients' list on page 75)
Anugerah Pemfailan Paten Patent Filing Award	Rujuk senarai penerima di ms 76/Refer to the recipients' list on page 76)
Anugerah Pengiktirafan Paten Patent Recognition Award	Rujuk senarai penerima di ms 76/Refer to the recipients' list on page 76)
Anugerah ITEX/MTE ITEX/MTE Awards	**Emas/Gold:** Kenaf—A Sustainable and Environmental Friendly Raw Material for Pulp, Paper, Textile and Chemical Industries—Dr Rushdan Ibrahim; Non Starch Polysaccharide Rich Fraction of *Morinda citrifolia* as a Glucose Lowering Agent—Dr Nik Musa'adah Mustapha **Perak/Silver:** Municipal Solid Waste Plastic and EFB Fuel Pellets for Energy Generation—Dr Wan Asma Ibrahim; ELYSA- Engineered Lumber from Young Trees—Dr Wan Tarmeze Wan Ariffin; Gaharu Relaxation Indexer—Sahrim Lias; Producing Pulp and Paper from the Malaysian Kenaf Stalk—Dr Rushdan Ibrahim Corrugated Hybrid Palm Wood Veneer (CHYPAWV)—Dr Abdul Hamid Salleh **Gangsa/Bronze:** Anti–gout Standardised Extract (SEBF) from *Baeckea frutescens*—Dr Fadzureena Jamaludin; Engineered Palm Wood Veneer (E-PAWV)—Dr Abdul Hamid Saleh
Anugerah Pelaksanaan Sistem Pengurusan Kualiti Terbaik (Bahagian)/ Best Implementation of Quality Management System Award	Bahagian Hasilan Semula Jadi/Natural Products Division
Sagu hati Kumpulan GBS Consolation Prize for Kumpulan GBS	Kumpulan Generasi Berdaya Saing/Generasi Berdaya Saing Team
Anugerah Khas Ketua Pengarah Director General's Special Award	Kumpulan FLORIA/The FLORIA Team
Anugerah Inovasi Ketua Pengarah Director General's Innovation Award	Kumpulan High Temperature Drying System (HTD) High Temperature Drying System (HTD) Team



INOVASI DAN KOMERSIALISASI
INNOVATION AND COMMERCIALISATION

Pada tahun ini, FRIM mengendalikan sebanyak 55 khidmat perundingan yang bernilai RM 2,295,431.72 kepada kedua-dua sektor awam dan swasta. Daripada jumlah ini, FRIM menerima sebanyak RM 504,528.54 untuk kos pengurusan dan pentadbiran. Hasil penyelidikan FRIM juga berjaya memperoleh 20 pendedahan reka cipta, empat pemfailan paten dan dua pengiktirafan paten. FRIM juga telah berjaya menandatangani tiga perjanjian pelesenan. Senarai khidmat perundingan, pendedahan reka cipta dan perjanjian adalah seperti yang berikut:

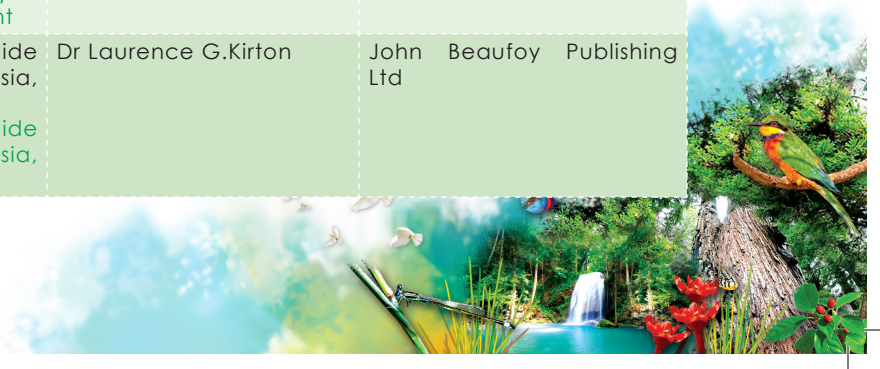
During the year, FRIM conducted 55 consultancies worth RM2,295,431.72. From these consultancy services, FRIM received RM504,528.54 as management fees. FRIM's new research findings led to 20 invention disclosures, four patents filing and two patents granted. FRIM also successfully signed three licensing agreement. The lists of the consultancy services, invention disclosures and agreement are given as follows:

KHIDMAT PERUNDINGAN 2013
CONSULTANCY SERVICES 2013

BIL. NO.	BIDANG/FIELD	PENGURUS PROJEK/ PROJECT MANAGER	PELANGGAN/ CLIENT
1	Pemetaan 800 pokok di Tanjung Sanctuary Resort, Langkawi/Mapping of 800 trees at Tanjung Sanctuary Resort, Langkawi	Muhammad Farid Abdul Rashid	Minang Agro Sdn Bhd
2	Komunikasi mengenai fungsi hutan di Cermat Ceria, Betong, Sarawak Communications on forest functions in Cermat Ceria, Betong, Sarawak	Dr Noor Azlin Yahya	Lembaga Minyak Sawit Malaysia Malaysian Palm Oil Board (MPOB)
3	Pemindahan pokok ketapang di SS14, Subang Jaya/Transplanting of a ketapang tree at SS14, Subang Jaya	Adnan Mohammad	Syarikat Prasarana Negara Berhad
4	Pembangunan kapasiti bagi pematuhan kepada Skim Pensijilan Kayu-Kayan Malaysia/ Capacity building for compliance with Malaysian Timber Certification Scheme (MTCS)	Dr Tan Yu Eng	Lembaga Industri Kayu-Kayan Malaysia Malaysian Timber Industry Board
5	Penyelenggaraan Sistem eTNT MARDI 2013 Maintenance of MARDI eTNT for 2013	Zahari Othman	Institut Penyelidikan dan Kemajuan Pertanian Malaysia Malaysian Agriculture Research and Development Institute (MARDI)
6	Pengurusan perosak dan penyakit di ladang-ladang Sabah Softwoods Berhad—Lawatan pertama/Pest and disease management in the plantations of Sabah Softwoods Berhad—1st visit	Dr Lee Su See	Sabah Softwoods Berhad
7	Penasihat Teknikal, Penghutanan Semula Kawasan Hutan dan Pengurusan Ladang Pokok Hutan/Technical advisor, reforestation of forest area and management of forest plantation	Dr Lok Eng Hai	Sreem Resources



BIL. NO.	BIDANG/FIELD	PENGURUS PROJEK/ PROJECT MANAGER	PELANGGAN/ CLIENT
8	Cadangan spesies pokok untuk reka bentuk landskap bagi Projek Kg Razak, Ipoh Plant species recommendations for Kg Razak Project, Ipoh	Dr Noor Azlin Yahya	DKLS Premierhome Sdn Bhd
9	Penyediaan Pelan Pengurusan Hutan Ladang Hutan Simpan Kemasul, Pahang Preparation of Forest Plantation Management Plan for Kemasul Forest Reserve, Pahang	Dr Khali Aziz Hamzah	Amanah Saham Pahang Berhad (ASPA)
10	Pemantauan, diagnosis dan pengecaman pelbagai penyakit di Eucalypt Plantations—Lawatan pertama/Monitoring, diagnosis and identification of the various diseases in Eucalypt Plantations—First visit	Dr Lee Su See	Syarikat Samling Timber Sdn Bhd
11	Pemantauan, diagnosis dan pengecaman pelbagai penyakit di Acacia Plantations—Lawatan pertama/Monitoring, diagnosis and identification of pests and diseases in Acacia Plantations-First visit	Dr Lee Su See	Grand Perfect Sdn Bhd
12	Silvikultur dan pengurusan dirian spesies campuran di tanah bermasalah Silviculture and management of mixed species stands on problematic soil	Dr Ang Lai Hoe	Jabatan Pengairan dan Saliran Malaysia (JPS)
13	Pemeriksaan pokok hujan-hujan untuk pemindahan dalam kawasan pembangunan Checking of hujan-hujan trees for transplanting in development area	Adnan Mohammad	Mutiara Alam Enterprise
14	Membantu ITTO menjalankan kajian tentang pembangunan deklarasi produk alam sekitar bagi tiga produk kayu tropika To assist ITTO in conducting a study on development of environmental product declaration for three tropical wood products	Dr Gan Kee Seng	International Tropical Timber Organization(ITTO)
15	Program pemadanan spesies tapak dan penghutanan semula dalam ekosistem terrestrial terosot/Species site matching and reforestation program on degraded terrestrial ecosystems	Dr Ang Lai Hoe	AEON CO (M) Sdn Bhd
16	Penyediaan spesimen herbarium untuk PerakBio Corporation Sdn Bhd Preparation of herbarium specimen for PerakBio Corporation Sdn Bhd	Dr Richard Chung Cheng Kong	Perbadanan Kemajuan Negeri Perak Perak State Development Corporation
17	Pengendalian dan penyediaan spesimen serangga/Handling and preparation of pest specimen	Dr Christine Fletcher	Perbadanan Kemajuan Negeri Perak Perak State Development Corporation
18	Cadangan bekalan air ke Petrochemical Complex (PIPC) —Penilaian Terperinci Kesan Alam Sekitar Proposed water supply to Pengerang Integrated Petrochemical Complex (PIPC) — Detailed Environmental Impact Assessment	Dr Christine Fletcher	SMHB Environmental Sdn Bhd
19	Writing a book entitled 'A Naturalist's Guide to the Butterflies of Peninsular Malaysia, Singapore and Thailand' Penulisan buku berjudul 'A Naturalist's Guide to the Butterflies of Peninsular Malaysia, Singapore and Thailand'	Dr Laurence G.Kirton	John Beaufoy Publishing Ltd



BIL. NO.	BIDANG/FIELD	PENGURUS PROJEK/ PROJECT MANAGER	PELANGGAN/ CLIENT
20	Penghutanan semula kawasan bekas lombong bijih timah/Reforestation of tin tailing area	Dr Hj Ahmad Zuhaidi Yahya	Rahman Hydraulic Tin Sdn Bhd
21	Penghasilan 10 kg pulpa dan black liquor daripada kenaf untuk pengeluaran selulosa Producing 10 kg pulp and black liquor from kenaf for cellulose production	Dr Rushdan Ibrahim	Universiti Kebangsaan Malaysia
22	Penyelenggaraan Sistem eOT MARDI tahun 2012/2013/Maintenance of MARDI eOT for 2012/2013	Norul Maslissa Ahmad	Institut Penyelidikan dan Kemajuan Pertanian Malaysia Malaysian Agriculture Research and Development Institute (MARDI)
23	Penyelenggaraan Sistem Pengurusan Gaji MARDI (eSPG MARDI) 2012/2013 Maintenance of MARDI Salary Management System (eSPG) for 2012/2013	Wan Zahiri Wan Yaacob	Institut Penyelidikan dan Kemajuan Pertanian Malaysia Malaysian Agriculture Research and Development Institute (MARDI)
24	Kerja-kerja makmal bagi pempulpaan, pembuatan dan pengujian kertas daripada kenaf dan daun nenas/Laboratory works for pulping, making and testing of paper from kenaf and pineapple leaf	Dr Sharmiza Adnan	Fakulti Kejuruteraan Mekanikal dan Pembuatan, Universiti Tun Hussein Onn Malaysia
25	Penilaian risiko pokok/Tree risk assessment	Dr Elizabeth Philip	The Datai Langkawi
26	Kerjasama penyelidikan tentang pengeluaran pulpa dan kertas daripada kulit ari durian Research collaboration on production of pulp and paper from durian rinds	Dr Sharmiza Adnan	Fakulti Kejuruteraan Mekanikal dan Pembuatan (FKMP), Universiti Tun Hussein Onn Malaysia (UTHM)
27	Perkhidmatan pempulpaan kimia gentian kenaf/Service for chemical pulping of kenaf fibre	Dr Sharmiza Adnan	Pusat Pengajian Fizik Gunaan, Fakulti Sains dan Teknologi, Universiti Kebangsaan Malaysia
28	Audit Tahap 2 untuk Anap Muput FMU bagi memenuhi keperluan MC&I (Hutan Asli) Stage 2 audit on Anap Muput FMU against the requirements of MC&I (Natural Forest)	Dr Lim Hin Fui	SIRIM QAS International Berhad
29	Penilaian ke atas kesan kaedah prarawatan terhadap komposisi fizikal dan kimia dahan kelapa sawit/Evaluation of the effect of pretreatment methods on the physical & chemical composition of oil palm fronds	Dr Wan Asma Ibrahim	MyBiomass Sdn Bhd
30	Pengecaman kayu kerangka bumbung Wood identification of roof truss	Nordahlia Abdullah Siam	En. Muhammad Firdaus Abdullah
31	Penilaian ke atas Amalan Pengurusan Baik Paya Gambut di Malaysia/Assessment of Best Management Practices of Peatland in Malaysia	Dr Khali Aziz Hamzah	Jabatan Perhutanan Semenanjung Malaysia Forestry Departments Peninsular Malaysia



BIL. NO.	BIDANG/FIELD	PENGURUS PROJEK/ PROJECT MANAGER	PELANGGAN/ CLIENT
32	Merancang dan memantau pelaksanaan serta penyelenggaraan pembangunan landskap lembut Projek Pengindahan Sungai Melaka Fasa 2 Planning and monitoring of the implementation and maintenance of softscape development for Phase 2 Sungai Melaka Beutifying Project	Adnan Mohammad	Jabatan Pengairan dan Saliran Malaysia (JPS)
33	Pembangunan kertas halus untuk percetakan/ Development of fine paper for printing	Dr Rushdan Ibrahim	Pusat Penyelidikan Mineral/ Mineral Research Centre
34	Pemulihan hutan paya gambut yang terosot Rehabilitation of degraded peat swamp forest	Dr Ismail Parlan	Jabatan Perhutanan Semenanjung Malaysia Forestry Departments Peninsular Malaysia
35	Pempulpaan, pembuatan serta pengujian kertas dan gentian daripada tujuh spesimen tumbuhan/Pulping, making and testing of paper and fiber from seven plant specimens	Dr Sharmiza Adnan	Fakulti Kejuruteraan Mekanikal Faculty of Mechanical Engineering, Universiti Tun Hussein Onn Malaysia
36	Penyelenggaraan Tahunan Sistem Pengurusan Gaji LKM (ESPG LKM) 2013 Yearly maintenance of LKM Salary Management System (ESPG LKM) 2013	Wan Zahiri Wan Yaacob	Lembaga Koko Malaysia Malaysian Cocoa Board
37	Penyediaan Rancangan Pengurusan Kawasan Hutan Mempunyai Nilai Pemeliharaan yang Tinggi (HCVF) di Negeri Johor/Preparation of Management Plan for High Conservation Value Forest in Johor	Dr Khali Aziz Hamzah	Jabatan Perhutanan Negeri Johor Johore Forestry Department
38	Menasihati dan memantau pemindahan pokok dalam kawasan tapak cadangan pembangunan Dataran Pahlawan, Presint 1, Putrajaya/Advise and monitor tree transplanting in Dataran Pahlawan, Presint 1, Putrajaya proposed site development	Adnan Mohammad	AJ-Corp Sdn Bhd
39	Annual Surveillance Assessment RSPO Supply Chain Certification at PBB Oils Palm Berhad-Sri Kamusan Certification Unit	Dr Lim Hin Fui	SIRIM QAS International Berhad
40	Pemantauan, diagnosis dan pengecaman penyakit dan perosak di acacia plantations—Lawatan kedua Monitoring, diagnosis and identification of pests and diseases in acacia plantations—2nd visit	Dr Lee Su See	Grand Perfect Sdn Bhd
41	Pemantauan, diagnosis dan pengecaman pelbagai penyakit di ladang Eucalypt — Lawatan kedua/Monitoring, diagnosis and identification of the various diseases in eucalypt plantations—2nd visit	Dr Lee Su See	Syarikat Samling Timber Sdn Bhd
42	Prarawatan tandan kosong kelapa sawit (EFB) bagi percubaan pirolisis cepat menggunakan teknik R&D FRIM Pre-treatment of oil palm empty fruit bunches (EFB) for fast pyrolysis trials using FRIM R&D techniques	Dr Wan Asma Ibrahim	Sahabat Renewable Fuel Ventures Sdn Bhd



BIL. NO.	BIDANG/FIELD	PENGURUS PROJEK/ PROJECT MANAGER	PELANGGAN/ CLIENT
43	Laporan konsultansi dan saksi pakar untuk Ekowood/Consultation report and expert witness for Ekowood	Dr Hamdan Husain	Ekowood Malaysia Sdn bhd
44	Pemprosesan pulpa kenaf yang delignified menjadi dulang makanan dan kertas Processing of delignified kenaf pulp into food trays and paper	Dr Sharmiza Adnan	SIRIM Berhad
45	Pengiraan stok karbon dan intepretasi alam sekitar/Carbon stock counting and environmental interpretation	Dr Elizabeth Philip	Lembaga Minyak Sawit Malaysia (MPOB) Malaysian Palm Oil Board (MPOB)
46	Penyediaan dan pengujian papan gentian Preparation and testing of fiber panel	Dr Sufian Misran	Robin Resources (Malaysia) Sdn Bhd
47	Kajian Jangka Hayat Resin bagi Produk Kertas—Fasa 2/Study on resin life span for paper product—Phase 2	Dr Sharmiza Adnan	Malayan Adhesives & Chemicals Sdn Bhd
48	Pemantauan, diagnosis dan pengecaman pelbagai penyakit di ladang Eucalypt — Lawatan kedua Monitoring, diagnosis and identification of the various diseases in eucalypt plantations—3rd visit	Dr Lee Su See	Syarikat Samling Timber Sdn Bhd
49	Aplikasi Sistem eLatihan MPOB Application of MPOB eLatihan system	Norul Maslissa Ahmad	Lembaga Minyak Sawit Malaysia Malaysian Palm Oil Board (MPOB)
50	Aplikasi Sistem eKehadiran MIROS Application of MIROS eKehadiran System	Zahari Othman	Institut Penyelidikan Keselamatan Jalan Raya Malaysia/Malaysian Institute of Road Safety Research (MIROS)
51	Pemantauan, diagnosis dan pengecaman perosak dan penyakit di ladang Acacia — Lawatan ketiga Monitoring, diagnosis and identification of pests and diseases in Acacia plantations —3rd visit	Dr Lee Su See	Grand Perfect Sdn Bhd
52	Peer Review: Kedah FMU Final Draft Recertification Report	Dr Woon Weng Chuen	SIRIM QAS International Berhad
53	Menyediakan 'Selangor Action Plan for Peatland'/Preparation of Selangor Action Plan for Peatland	Dr Ismail Parlan	Jabatan Perhutanan Semenanjung Malaysia Forestry Depts P. Malaysia
54	Pengeluaran piring kertas beracuan dan selulosa mikrokristalin daripada batang *Stevia*/Production of moulded paper plate and microcrystalline cellulose from Stevia stem	Dr Sharmiza Adnan	Pure Circle Sdn Bhd
55	Perkhidmatan Mengenal Pasti dan Melabel Jenis-Jenis Pokok di Kawasan Rumah Persendirian Identification and labeling services of tree types in private housing areas	Ahmad Azaruddin Mohd Nor	B&A Family Holdings Sdn Bhd



PELESEN/LICENSEE

BIL. NO.	TEKNOLOGI TECHNOLOGY	PELESEN LICENSEES
1	Timber Processing Using High Temperature Drying System (HTD)	Advance Low Pressure System Sdn Bhd
2	Polysaccharide Fraction from Fruit of *Averrhoa carambola* as Cholesterol Lowering Agent	Syarikat Zulkifli Bamadhaj Sdn Bhd
3	Fungal Composition as Natural Biocodes against MRSA	Green Business JV Marketing Sdn Bhd

PENDEDAHAN REKA CIPTA/INVENTION DISCLOSURE

BIL. NO.	NO. IDENTITI ID NO.	REKA CIPTA INNOVATION	KETUA PEREKA CIPTA KEY INNOVATOR
1	01/2013	Microsatellite Markers of *Begonia maxwelliana* (Begoniaceae)	Chan Yoke Mui
2	02/2013	*Thaumatococcus daniellii* (Kaseh) Fruits: A Sugar Replacement	Masitah Mohd Taini
3	03/2013	Good Budget System Version (GBS V.2)	Mohamad Jemain Mohamad Ridhwan
4	04/2013	Grading System for Bakau Poles	Dr Gan Kee Seng
5	05/2013	Drying of Bakau Poles	Dr Gan Kee Seng
6	06/2013	Microsatellite Markers of Misai Kucing (*Orthosiphon stamineus*) for DNA Profiling	Dr Tnah Lee Hong
7	07/2013	A Method for Producing Biodiesel from Multifeedstock Waste Oil of High Acid Values	Dr Wan Asma Ibrahim
8	08/2013	Cement-bonded Brick Making Using Wood Polymer Composite (WPC) as Additional Raw Material	Mohd Yusouf Abdul Latif
9	09/2013	A Natural Sweetener with Honey Properties from Starfruit (*Averrhoa carambol*)	Abd Rashid Li
10	10/2013	Active Pharmaceutical Ingredient from *Cerbera*sp. as Anti-cancer	Dr Nurhanan Murni Yunos
11	11/2013	Alleviation of Antioxidant Enzymes in Mice After Consumption of Natural Sweetener from Star Fruit (*Averrhoa carambola*)	Mohd Kamal Nik Hassan
12	12/2013	Wooden Planter Box with Unique "Mangrove Forest" Motive	Nik Adlin Nik Mohamed Sukri
13	13/2013	Reinforcement Corrugated Biocomposite, its Fabrication and Application in Structural Construction	Mohd Yusouf Abdul Latif
14	14/2013	Antibacterial Properties of Natural Sweetener from *Averhoa carambola*	Saiful Azmi Johari
15	15/2013	Producing Antimicrobial Biodegradable Moulded Products from Kenaf Core	Dr Rushdan Ibrahim



BIL. NO.	NO. IDENTITI ID NO.	REKA CIPTA INNOVATION	KETUA PEREKA CIPTA KEY INNOVATOR
16	16/2013	Agarwood Identification System (AIS) Using Modified K-NN KFold Technique	Dr Nor Azah Mohamad Ali
17	17/2013	Kaempferol, A New Oligomers from *Neobalanocarpus heimii* extract against termites	Dr Roszaini Kadir
18	18/2013	Mobile Drying Unit	Anee Suryani Sued
19	19/2013	Methods and Production of Rotary Veneer from Bamboo (RoVBAM)	Dr Abdul Hamid Saleh
20	20/2013	The Production of Hybrid or Un-hybrid Moulded Rotary Veneer Bamboo Chair (RoVBAM CHAIR)	Dr Abdul Hamid Saleh

PEMFAILAN PATEN/PATENT FILING

BIL. NO.	PATEN PATENT (MALAYSIA)	NO. HI IP NO.	KETUA PEREKA CIPTA KEY INNOVATOR
1	A Method of Manufacturing Laminated Lumber and the Laminated Lumber Produced	PI 2013000873	Dr Wan Tarmeze Wan Ariffin
2	A Method of Producing Paper from Kenaf	PI 2013700380	Dr Rushdan Ibrahim
3	A Method of Producing Fine Paper and Lineboard	PI 2013700381	Dr Rushdan Ibrahim
4	A Method of Producing an Alpha-Glucosidase Inhibitor	PI 2013701182	Abd Rashid Li

PENGIKTIRAFAN PATEN/PATENT GRANTED

BIL. NO.	PATEN PATENT	NO. MY MY NO.	PEREKA CIPTA/INNOVATOR
1	Method of Producing Composite Bamboo Board	MY-147974-A	Dr Mohd Khairun Anwar Uyup Dr Hamdan Husain Paridah Md. Tahir
2	Engineered Lumber from Crushed and Dismantled Bamboo Sticks	MY-148038-A	Dr Wan Tarmeze Wan Ariffin Dato' Dr Marzalina Mansor



PEMINDAHAN TEKNOLOGI / TECHNOLOGY TRASFER
SEMINAR/PERSIDANGAN/DIALOG/BENGKEL/KURSUS/KONSULTASI PEMEGANG TARUH YANG DIANJUR/ANJURAN BERSAMA OLEH FRIM
SEMINARS/CONFERENCES/DIALOGUES/WORKSHOPS/COURSES/STAKEHOLDER CONSULTATIONS ORGANISED/CO-ORGANISED BY FRIM

BIL NO	PERKARA ITEM	TEMPAT VENUE	TARIKH DATE
1	Kursus Interpretasi Data Survei Tanah dan Makmal Tanah/Course on Interpretation of Soil Survey and Soil Laboratory Data	FRIM	7–9 Januari/January
2	Bengkel Interaktif kepada Usahawan Herba/ Penduduk Kawasan Luar Bandar di Sarawak/ Herbal Entrepreneurs/ Community Interactive Workshop in Sarawak	Simunjan Sadong Jaya,	2–3 Februari/February 2 Mac/March
3	Bengkel Serantau Projek-Projek REDD+ di Semenanjung Malaysia /Regional Workshop on REDD+ Projects in Peninsular Malaysia	Kuala Lumpur	4–5 Februari/February
4	Bengkel Kesedaran Pengetahuan Tradisi (TK) berkaitan Tumbuhan Ubatan & Beraroma/ Workshop on Traditional Knowledge Awareness on Medicinal & Aromatic Plants	Perak	21 Februari/February
5	Bengkel Kesedaran Pengetahuan Tradisi (TK) berkaitan Tumbuhan Ubatan & Beraroma/ Workshop on Traditional Knowledge Awareness on Medicinal & Aromatic Plants	Kelantan	22 Februari/February
6	Kursus Teknologi Pulpa & Kertas Course on Pulp & Paper Technology	FRIM	25 Februari/ February–1 Mac/March & 17–21Mei/May
7	Kursus Pengenalan Pokok & Daun Course on Tree & Leaf Identification	FRIM	25–26 Februari/February, 1–2 April, 10–11 Jun/June, 26–27 Ogos/August
8	Seminar Kesedaran Pencegahan Kebakaran Seminar on Fire Prevention Awareness	FRIM	28 Februari/February
9	Seminar on the Use of Finger Jointed/Laminated Door Jambs for Fire Rated Doorsets	Ampang	6 Mac/ March
10	Bengkel Kesedaran bagi Projek Penanaman Pokok Hutan di Sekolah Seluruh Malaysia Awareness Workshop on Forest Tree Planting Project in Schools in Peninsular Malaysia	SMK Matang Jaya, Kuching	13–14 Mac/ March
11	Seminar Pembayaran Perkhidmatan Ekosistem Hutan Tropika Seminar on Payment for Ecosystem Service (PES) of Tropical Forest	Kuala Lumpur	13 Mac /March
12	Kursus Penanaman Karas Course on Karas Planting	Limbang, Sarawak	18–20 Mac/March
13	Teknik Pembiakan Beberapa Spesies Pokok Herba/Plant Propagation Techniques for Some Herbal Species	SPF Mata Ayer, Perlis	19–20 Mac/March
14	Bengkel Konsultasi Pemegang Taruh Kajian Impak Penyelidikan dan Pembangunan (R&D) serta Khidmat Teknikal FRIM Workshop on Stakeholders Consultation for Impact Study of FRIM's R&D and Technical Services	Kuala Lumpur	20 Mac/March



BIL NO	PERKARA ITEM	TEMPAT VENUE	TARIKH DATE
15	Program Kesedaran Alam Sekitar TABIKA KEMAS FRIM/Environmental Awareness Programme for FRIM's TABIKA KEMAS	FRIM	21 Mac/March
16	Kursus Penanaman Karas Course on Karas Planting	Kapit, Sarawak	23–25 Mac/March
17	Kursus Landskap dan Penyelenggaraan Pokok/ Course on Landscape and Tree Maintenance	FRIM	1–4 April, 9–10 April, 23–26 April, 11–13 September, 1–2 Oktober /October, 7–9 Oktober /October & 7–9 November
18	Bengkel Pendedahan Pembangunan Produk Herba & Teknologi Herba bagi Program Teknousahawan MARA-FRIM Workshop on Exposure of Herbal Products Development & Herbal Technology for MARA-FRIM Technopreneurship Programme	FRIM	10–11 April
19	Kursus Teknik dan Pengurusan Herbarium Course on Herbarium Techniques and Management	FRIM	22–25 April, 2–5 Disember/ December
20	Bengkel Konsultasi Pemegang Taruh Projek ITTO REDDES/Workshop on Stakeholders Consultation for ITTO REDDES Project	Kuantan, Pahang	23 April
21	Simposium Konservasi 2013 National Conservation Symposium	Kuching, Sarawak	13–16 Mei/May
22	Kursus Pengecaman Spesies Pokok Hutan Course on Forest Tree Species Identification	FRIM	13–16 Mei/May
23	Bengkel Meningkatkan Kesedaran di bawah Projek Menanam Pokok di Sekolah Seluruh Malaysia/Workshop on Raising of Awareness under Nationwide School Forest Tree Planting Project	Kuching, Sarawak	15–16 Mei/May
24	Kursus Teknologi Herba Course on Herbal Technology	FRIM	27–30 Mei/May
25	Kursus Penggunaan Nivo Total Station & Kamera 360/Course on Handling of Nivo Total Station & 360 Camera	Mata Ayer, Perlis	29 Mei/May–1 Jun/June
26	Bengkel Pengurusan Data & Analisis Data MyERNET/Workshop on MyERNET Data Management and Analysis	FRIM	6–7 Jun/June
27	Taklimat mengenai Peranan FRIM sebagai Badan Pensijilan Produk Perabot Berasaskan Kayu bagi Sistem Kontrak Berpusat/Briefing on FRIM's Role as a Wood-Based Furniture Products Certification Body for the Central Contract Panel System	FRIM	11 Jun/June
28	Kursus Teknologi Pulpa & Kertas Course on Pulp & Paper Technology	FRIM	19–20 Jun/June
29	Seminar Kebangsaan Pemuliharaan Hutan Pesisiran Pantai Negara National Seminar on the Conservation of Coastal Forest	Universiti Malaysia Terengganu (UMT)	11–13 Jun/June
30	Bengkel Pengendalian Biji Benih Spesies Hutan/ Workshop on Handling of Forest Species Seeds	FRIM	18–20 Jun/June



BIL NO	PERKARA ITEM	TEMPAT VENUE	TARIKH DATE
31	Kursus Biologi/Course on Biology	SPF Pasoh	25 Jun/June
32	Seminar R&D & Pempatenan & Komersialisasi/ Seminar on R&D & Patenting & Commercialisation	FRIM	27 Jun/June
33	Kursus Pengenalan Interpretasi Alam Course on Introduction to Nature Interpretation	Kepong/FRIM/Kuala Selangor	1–5 Julai/July
34	Bengkel Pangkalan Data Carian Paten Lexis Nexis/Workshop on Lexis Nexis Patent Search Database	FRIM	8 Julai/July
35	Bengkel Konsultasi Pemegang Taruh mengenai Pengetahuan Tradisi Melayu Stakeholder Consultation Workshop on Malay Traditional Knowledge	FRIM	29 Julai/July
36	Bengkel/Workshop on the Diagnostics of Scale Insects of Agricultural Importance		20–27 Ogos/August
37	Kursus Analisis Pelepasan Formaldehid daripada Produk Komposit Kayu/Course on Formaldehyde Emission Analysis from Wood Composite Products	FRIM	10–11 September
38	Seminar Agri Dana/Seminar on Agri-Fund	Shah Alam, Selangor	10–11 September
39	Bengkel Pemudahcara Pendidikan Alam Sekitar untuk Pembelajaran di Luar Bilik Darjah (Guru)/ Workshop for Nature Education Facilitators for Outside-Classroom Learning (Teachers)	FRIM	11–12 September
40	Seminar Kebangsaan Pengurusan Kawasan Hijau /National Seminar on Green Area Management	Putrajaya	1–2 Oktober/October
41	Seminar Landskap & Taman-Taman Awam Seminar on Landscape & Public Parks	Kuala Lumpur	1–2 Oktober /October
42	Kursus Perlindungan Kayu dalam Pembuatan Perabot/Course on Wood Protection in Furniture Making	FRIM	2 Oktober /October
43	Seminar Papan Lapis untuk Pasaran Jepun Seminar on Plywood for the Japanese Market	FRIM	22–23 Oktober/October
44	Seminar Kebangsaan Kumpulan Kerja Sektor Perubahan Guna Tanah dan Perhutanan (LULUCF)/Working Group National Seminar for Land-Use, Land-Use Change and Forestry Sector	Petaling Jaya	1 November
45	Persidangan Penyelidikan Perhutanan dan Keluaran Hutan/Conference on Forestry & Forest Products Research (CFFPR) 2013	Kuala Lumpur	11–12 November
46	Bengkel Teknologi Penghasilan Reka Bentuk Inovatif Secara Bersepadu 2013 Workshop on Integrated Innovative Design Technology	Kuala Terengganu	3–6 Disember/December
47	Kongres Antarabangsa Persatuan Mikrobiologi Malaysia 2013 International Congress of the Malaysian Society for Microbiology 2013	Langkawi	12–15 Disember/December



PAMERAN YANG DISERTAI/DIANJURKAN OLEH FRIM
EXHIBITIONS PARTICIPATED/ORGANISED BY FRIM

BIL NO	PERKARA ITEM	TEMPAT VENUE	TARIKH DATE
1	Hari Hijau Malaysia Airports Holding Bhd Malaysia Airports Holding Bhd Green Day	Pejabat Korporat Malaysia Airports, KLIA Sepang Malaysia Airports Corporate Office, KLIA Sepang	14 Februari/February
2	Pameran dan Seminar BioBorneo BioBorneo Exhibition and Seminar	Kota Kinabalu, Sabah	19–20 Februari/February
3	Pameran sempena Ekspo Teknologi Malaysia/Malaysia Technology Expo (MTE)	Pusat Dagangan Dunia Putra, Kuala Lumpur/Putra World Trade Centre, Kuala Lumpur	21–23 Februari/February
4	Pesta Perabot Antarabangsa Malaysia Malaysian International Furniture Fair (MIFF)	Pusat Dagangan Dunia Putra, Kuala Lumpur Putra World Trade Centre, Kuala Lumpur	5–9 Mac/March
5	Ekspo Reka Cipta, Inovasi & Reka Bentuk 2013 (Pertandingan dan Pameran) Invention, Innovation & Design Expo 2013 (Competition & Exhibition) (IIDEX 2013)	UiTM Shah Alam	15–17 Mac/March
6	Hari Perhutanan Sedunia Ke-42 Peringkat Kebangsaan/The 42nd National World Forestry Day	Universiti Malaysia Pahang, Cawangan Pekan	21 Mac/March
7	Pameran Sains, Inovasi dan Teknologi Science, Innovation & Technology Exhibition (SITEX), Selangor	Pusat Konvensyen Shah Alam Shah Alam Convention Centre	4–6 April
8	Pameran Sempena Ceramah Kesihatan Kesedaran Kanser Payu Dara Exhibition during Breast Cancer Awareness Talk	PUSPANITAPURI, Putrajaya	30 April
9	Pameran Antarabangsa Reka Cipta, Inovasi & Teknologi /International Invention, Innovation & Technology Exhibition (ITEX)	Pusat Konvensyen Kuala Lumpur Kuala Lumpur Convention Centre	9–11 Mei/May
10	Festival Sports and Spinach 2 Sports and Spinach 2 Festival	Pusat Sains Negara, Bukit Kiara, Kuala Lumpur National Science Centre, Bukit Kiara, Kuala Lumpur	1–9 Jun/June
11	Persidangan PUSPANITA Kebangsaan National PUSPANITA Conference	Kuala Lumpur	3–4 Jun/June
12	Sambutan Hari Alam Sekitar Sedunia Peringkat Petaling Jaya Sempena Ulang Tahun Ke-7, Bandaraya Petaling Jaya Petaling Jaya World Environmental Day in conjunction with the 7th Petaling Jaya City Anniversary	Padang Desa Temuan/ Desa Temuan Field , Damansara Perdana	5 Jun/June
13	Persidangan dan Ekspo Kayu-Kayan Sarawak & Ekspo Pengusaha Kecil dan Sederhana Sarawak/Sarawak Grand Timber Expo and Conference & Sarawak Small and Medium Enterprises (SMEs) Expo	Pusat Konvensyen Borneo, Kuching Borneo Convention Centre, Kuching	7–10 Jun/June
14	Pertandingan Mengenal Burung Antarabangsa Bukit Fraser 2013 Frasers' Hill International Bird Recognising Competition	Bukit Fraser Frasers Hill	22–23 Jun/June



BIL NO	PERKARA ITEM	TEMPAT VENUE	TARIKH DATE
15	FLORIA Putrajaya	Putrajaya	22–30 Jun/June
16	Festival Pendidikan Sains/Science Education Festival	Institut Pendidikan Guru Kampus Perempuan Melayu, Durian Daun, Melaka	2–3 Julai/July
17	Pameran Sempena Seminar Agri-Dana Exhibition in Conjunction with Agri-Dana Seminar	Shah Alam, Selangor	10–11 September
18	Mesyuarat ke-35 Menteri-menteri Asean mengenai Pertanian dan Perhutanan The 35th Meeting of Asean Ministers on Agriculture and Forestry (35TH AMAF)	Kuala Lumpur	23–29 September
19	Pameran Biodiversiti Sempena Program Karnival Sungai Rol Pop Exhibition on Biodiversity in conjunction with Sungai Rol Pop Carnival Programme	Sek. Men. Keb. Taman Melawati, Ulu Kelang Taman Melawati Secondary School, Ulu Kelang	29 September
20	Pameran & Persidangan Antarabangsa ke-4 Greentech & Eco Products The 4th International Greentech & Eco Products Exhibition & Conference Malaysia (IGEM 2013)	Pusat Konvensyen Kuala Lumpur Kuala Lumpur Convention Centre	10–13 Oktober/October
21	Majlis Pelancaran Pasukan Pemantau Pencemaran (3p) Peringkat Kebangsaan dan Pelepasan Jelajah Jejak Mesra Rakan Alam Sekitar Sempena Minggu Alam Sekitar Malaysia 2013 The launching of National Level Pollution Monitoring Team and Flag-Off "Jelajah Jejak Mesra Rakan Alam Sekitar" in conjunction with Malaysia Environment Day 2013	Cameron Highlands	20 Oktober/October
22	Persidangan & Pameran BioMalaysia dan Bioekonomi Asia Pasifik 2013 BioMalaysia and the Asia Pacific Bioeconomy 2013 Conference & Exhibition	Pusat Konvensyen Antarabangsa Persada Johor Persada Johor International Convention Centre	21–23 Oktober/October
23	Hari Inovasi NRE/NRE Innovation Day	NRE, Putrajaya	29–30 Oktober/October
24	Minggu Alam Sekitar Malaysia (MASM) Peringkat Kebangsaan/National Level Malaysia Environmental Week	Presint 4, Putrajaya	27 Oktober/October
25	Pameran Sempena CFFPR 2013 Exhibition in conjunction with CFFPR 2013	Kuala Lumpur	11–12 November
26	Pameran Sempena Majlis Anugerah Inovasi Perdana Menteri (AIPM) 2013/ Exhibition in conjunction with Prime Minister's Innovation Award	Pusat Konvensyen Antarabangsa Putrajaya Putrajaya International Convention Centre (PICC)	13 November
27	Program Kesedaran Alam Sekitar Environmental Awareness Programme	FRIM	19–20 November
28	Pameran Sempena Hari Inovasi FRIM/ Exhibition in conjunction with Innovation Day	FRIM	28 November
29	Pameran Satu Daerah Satu Industri/ One District One Industry Exhibition	MTC, Ayer Keroh Melaka	29 November–2 Disember/December



HARI ANUGERAH/AWARD DAY

FRIM telah mengadakan Majlis Hari Anugerah di Dewan Alwy pada 16 Mei untuk menyampaikan penghargaan kepada 156 orang penjawat awamnya sebagai menghargai sumbangan, jasa dan khidmat cemerlang mereka pada sepanjang tahun 2013. Majlis perasmian yang disempurnakan oleh Dato' Dr Abdul Latif Mohmod, Ketua Pengarah FRIM, turut dihadiri oleh Puan Halimah Hassan, Ketua Pengarah Jabatan Alam Sekitar.

FRIM held its annual award ceremony this year on 16 May at Dewan Alwy to present various awards, prizes and recognition to a total of 156 staff for excellent service and contributions. The ceremony, officiated by FRIM Director General, Dato' Dr Abd Latif Mohmod, was also attended by the Department of Environment Director General, Madam Halimah Hassan.



Penerima Anugerah Saintis Terbaik, Dr Wan Rasidah (kiri) bersama-sama Dato' Dr Abd Latif, Dr Mohamed Nor dan Dr Norini
The FRIM Best Scientist Award recipient, Dr Wan Rasidah (left) , with Dato' Dr Abd Latif, Dr Mohamed Nor and Dr Norini



Choo Kheng Ten (kanan) dan Nik Zanariah (kiri) menerima Anugerah Ketua Pengarah
Choo Kheng Ten (right) and Nik Zanariah (left) received the Director General Award



Mahmudin Saleh (empat dari kiri) dan ahli-ahli pasukannya menerima Anugerah Penyelidikan Terbaik
Mahmudin Saleh (fourth from left) and his team members received the Best Research Award

A. Anugerah Lembaga MFRDB/MFRDB Award
Tiada penerima/No recipient

B. Anugerah Ketua Pengarah/Director General Award
Choo Kheng Ten—Pesara FRIM/FRIM Retiree
Nik Zanariah Nik Mahmood—Bhg. Perancangan Penyelidikan & Korporat/Research Planning & Corporate Division

C. Anugerah Saintis Terbaik FRIM/FRIM Best Scientist Award
Dr Wan Rasidah Wan A. Kadir

D. Anugerah Penyelidikan Terbaik FRIM/FRIM Best Research Award

BIL. NO.	PROJEK PENYELIDIKAN RESEARCH PROJECTS	AHLI KUMPULAN TEAM MEMBERS
1	Development and Commercialisation of Pulp and Paper Products from Oil Palm Empty Fruit Bunches (EFB) Fibres	Mahmudin Saleh, Dr Mohamed Nor Mohd Yusoff, Dr Rushdan Ibrahim, Dr Sharmiza Adnan, Latifah Jasmani, Azizi Abd Jalil, Mohd Shukri Said & Zaitun Said
2	Penggunaan Kayu Sambungan Jejari/Laminasi yang Dipasang Bersama Pintu Rintangan Api The Use of Finger Jointed and Laminated Timber Door Frame for Fire Rated Doorset	Dr Gan Kee Seng, Dr Tan Yu Eng, Khairul Azmi Jabar & Zairul Amin Rabidin
3	Malaysian Concept Spa Products from Essential Oil and Plant Extracts	Dr Nor Azah Mohamad Ali, Mailina Jamil, Saidatul Husni Saidin, Mohammad Faridtz Zollpatah, Azrina Aziz, Abd Majid Jalil, Siti Humeirah Ab Ghani, Mohd Irman Shah Mustafar, Zaridah Mohd Zaki, Norulaiman Yusoff & Dr Mastura Mohtar

E. Anugerah Pekerja Terbaik Tahunan/Best Employee Award

Kumpulan Pengurusan & Profesional/Management & Professional Group
Dr Hamdan Hussain Pegawai Penyelidik/Research Officer Keluaran Hutan/ Forest Products
Kumpulan Pelaksana 1/Implementor Group 1
Sadali Sahat Penolong Pegawai Penyelidik/Assistant Research Officer Perhutanan & Alam Sekitar/Forestry & Environment
Kumpulan Pelaksana 2/Implementor Group 2
Abd Rahim Hj Yunus Perhutanan & Alam Sekitar/Forestry & Environment



F. Anugerah Perkhidmatan Cemerlang—Individu/Excellent Service Award—Individual

BIL. NO.	NAMA NAME	SKIM PERKHIDMATAN SCHEME OF SERVICE	BAHAGIAN DIVISION
1	Dr Nur Supardi Md Noor	Peg. Penyelidik/ Research Officer Q54	Perancangan Penyelidikan & Korporat/Research Planning & Corporate
2	Dr Serafina Christine Fletcher	Peg. Penyelidik/ Research Officer Q48	Perhutanan & Alam Sekitar Forestry & Environment
3	Dr Fadhilah Zainuddin	Peg. Penyelidik/ Research Officer Q48	Hasilan Semula Jadi Natural Products
4	Dr Getha R. Krishnasamy	Peg. Penyelidik/ Research Officer Q48	Hasilan Semula Jadi Natural Products
5	Dr Mohd Rosli Haron	Peg. Penyelidik/ Research Officer Q48	Bioteknologi Perhutanan Forest Biotechnology
6	Ahmad Azaruddin Mohd. Noor	Peg. Penyelidik/ Research Officer Q48	Perhutanan & Alam Sekitar Forestry & Environment
7	Dr Ng Chin Hong	Peg. Penyelidik/ Research Officer Q44	Hasilan Semula Jadi Natural Products
8	Dr Sik Huei Shing	Peg. Penyelidik/ Research Officer Q44	Keluaran Hutan Forest Products
9	Toh An Nee	Peg. Penerangan/ Inform. Officer Q44	Pejabat Ketua Pengarah Director General's Office
10	Nor Azura Ahmad Murad	Peg. Undang-Undang/ Legal Off. L44	Pejabat Ketua Pengarah Director General's Office
11	Abd. Rashid Li	Peg. Penyelidik/ Research Officer Q41	Hasilan Semula Jadi Natural Products
12	Hamdan Omar	Peg. Penyelidik/ Research Officer Q41	Perhutanan & Alam Sekitar Forestry & Environment
13	Jumaaton Abu Bakar	Akauntan/ Accountant W41	Kewangan Finance
14	Noorsuhanis Abdul Latif	Peg. Tadbir/ Admin. Officer N41	Pentadbiran Administration
15	Hada Masayu Ismail@Dahlan	Peg. Penyelidik/ Research Officer Q41	Hasilan Semula Jadi Natural Products
16	Rohana Abd. Rahman	Peg. Penyelidik/ Research Officer Q41	Inovasi & Komersialisasi Innovation & Commercialisation
17	Ida Suraini Abd. Shukor	Peg. Penyelidik/ Research Officer Q41	Perkhidmatan Teknikal Technical Services
18	Md. Nasir Dayat PPN, PJK	Pen. Peg. Tadbir/ Assist. Administrative Officer N32	Pentadbiran Administration
19	Nordaiman Shairi	Pen. Peg. Teknologi Maklumat Assistant Inform.Tech. Officer F29	Perkhidmatan Teknikal Technical Services
20	Nur Wahida Tajudin	Setiausaha Pejabat Administrative Secretary N27	Bioteknologi Perhutanan Forestry Biotechnology
21	Ahmad Shahar Mohmad Yusof	Pemb. Penyelidik Research Assist. Q22	Perhutanan & Alam Sekitar Forestry & Environment
22	Yusni Idris	Pemb. Penyelidik Research Assist. Q22	Perhutanan & Alam Sekitar Forestry & Environment



BIL. NO.	NAMA NAME	SKIM PERKHIDMATAN SCHEME OF SERVICE	BAHAGIAN DIVISION
23	Suzana Eshak	Pembantu Tadbir (Kew) Administrative Assistant (Fin.) W22	Kewangan Finance
24	Mohd Zulfadli Mat Yasin	Pembantu Taman/Ladang Garden/Plantation Assistant G22	Perhutanan & Alam Sekitar Forestry & Environment
25	Rozita Ibrahim	Pembantu Tadbir (P) Administrative Assistant (O) N17	Pejabat Ketua Pengarah Director General's Office
26	Roziah Ayoub	Pembantu Tadbir (Kew) Administrative Assistant (Fin.) W17	Kewangan Finance
27	Sharifah Talib	Pemb. Penyelidik/ Res. Assist. Q17	Hasilan Semula Jadi Natural Products
28	Saharudin Musa	Pemb. Penyelidik/ Res. Assist. Q17	Keluaran Hutan Forest Products
29	Rashidah Hasnim@Hashim	Pemb. Penyelidik/ Res. Assist. Q17	Perhutanan & Alam Sekitar Forestry & Environment
30	Mohd. Yusoff Abd. Razak	Pengawas Hutan/ Forester G11	Bioteknologi Perhutanan Forestry Biotechnology
31	Samsul Musa	Pekerja Awam/ General Worker R1	Pentadbiran Administration
32	Narayanan Alimuthu	Pemandu Kenderaan/ Driver R6	Pentadbiran Administration
33	Nazri Mohamad	Pemandu Kenderaan/ Driver R3	Pentadbiran Administration
34	Halim Man	Pekerja Awam/ General Worker R1	Bioteknologi Perhutanan Forestry Biotechnology
35	Zamrudah Musa	Pekerja Awam/ General Worker R2	Hasilan Semula Jadi Natural Products

G. Anugerah Perkhidmatan Cemerlang—Kumpulan/Excellent Service Award—Group

BIL. NO.	NAMA KUMPULAN NAMES	AHLI KUMPULAN TEAM MEMBERS
1	*Pertama/First* Makmal Ujian Perabot/Furniture Testing Laboratory	Mohd Arshad Saru (Ketua/Head) Siti Zaliha Ali; Zawawi Kassim; Mahat Mijan; Nuraini Othman & Shah Md. Darus
2	*Kedua/Second* Kumpulan/Team Kesedaran Alam Sekitar Generasi Pelapis	Dr Noor Azlin Yahya (Ketua/Head) Nik Azyyati Abdul Kadir; Naimah Che Long; Azahari Mohd. Yusoff; Sharmillah Saleh; Fakhrul Effendi Othman; Mohd. Saiful Salehin; Marzuina FK Nasyir; Yazid Nyan; Bukhari Ahmad; Mahat Shamsudin; Saiful Azahari Zainal Abidin; Rosfarizal Kamaruzaman & Wan Mohd Nafizul Hal-Alim Wan Ahmad
3	*Ketiga/Third* Makmal Genetik Genetic Laboratory	Dr Lee Soon Leong (Ketua/Head) Dr Norwati Adnan; Dr Norlia Basherudin; Dr Siti Salwana Hashim; Dr Mohd Rosli Haron; Dr Lee Chai Ting; Dr Ng Chin Hong; Dr Kevin Ng Kit Siong; Dr Tnah Lee Hong; Dr Shawn Cheng; Sharifah Talib; Ghazali Jaafar; Yahya Marhani; Suryani Che Seman; Nurul Hudaini Mamat; Ramli Ponyoh; Yasri Baya; Hamiliar Hamid; Nurul Farhanah Zakaria & Dinaiz Thinagaran



H. Anugerah Khidmat Masyarakat/Community Service Award
Tiada penerima/No recipient

Anugerah Khidmat Setia/Loyal Service Award

BIL. NO.	NAMA NAME	SKIM PERKHIDMATAN SCHEME OF SERVICE	BAHAGIAN DIVISION
1	Dato' Dr Hjh Marzalina Mansor	Pegawai Penyelidik/Research Officer Gred Khas/Special Grade C, VK7	Perancangan Penyelidikan & Korporat/Research Management & Corporate
2	Dr Ahmad Zuhaidi Yahya	Pegawai Penyelidik/Research Officer Gred/Grade Q54	Bioteknologi Perhutanan Forestry Biotechnology
3	Dr Laurence G Kirton	Pegawai Penyelidik/Research Officer Gred/Grade Q54	Biodiversiti Hutan/Forest Biodiversity
4	Dr Mohamad Omar Mohamad Khaidzir	Pegawai Penyelidik/Research Officer Gred/Grade Q54	Keluaran Hutan Forest Products
5	Mohd Radzi Ahmad	Pen. Pegawai Penyelidik/Assist. Research Officer Gred/Grade Q32	Hasilan Semula Jadi Natural Products

J. Augerah Penerbitan FRIM/FRIM Publication Award
Kategori/Category A: Penerbitan Teknikal/Technical Publications

Pertama (Bersama)/First (two winners)
Dr Tnah Lee Hong, Dr Lee Soon Leong, Dr Kevin Ng Kit Siong,
Dr Lee Chai Ting, Subha Bhassu & Rofina Yasmin Othman
Phylogeographical Pattern and Evolutionary History of an Important Peninsular Malaysian Timber Species, *Neobalanocarpus heimii* (Dipterocarpaceae)
Journal of Heredity doi: 10.1093/jhered/ess076

dan/and
Dr Christine Fletcher, Zubaid Akbar & Thomas H Kunz
Fruit Diet of Frugivorous Bats (*Cynopterus brachyotis* and *Cynopterus horsfieldii*) in Tropical Hill Forest of Peninsular Malaysia
Mammalia 76: 389–397

Ketiga/Third
Dr Saw Leng Guan
A Revision of *Licuala* (Araceae, Coryphoideae) in Borneo
Kew Bulletin 67: 577–654

Kategori/Category B: Penerbitan Separa/Bukan Teknikal/Semi/Non-Technical Publications

Pertama/First
Dr Lim Hin Fui, Liang Luohui, Leni D Camacho, Edwin A Combalicer & Savinder Kaur Kapar Singh
Southeast Asia
Pp 357–394 in Traditional Forest-Related Knowledge: Sustaining Communities, Ecosystems and Biocultural Diversity

Kedua/Second
Sreetheran Maruthaveeran & Cecil C Konijnendijk
Scary Places? *Green Places* 84: 27–29

Ketiga/Third
Khairuddin Kamaruddin
The Bamboo Garden at Kepong Botanical Garden, *FRIM Reports No 97*



Kategori/Category C: Buku/Books

Pemenang/Winner Hamdan Omar, Dr Khali Aziz Hamzah, Dr Shamsudin Ibrahim & Dr Raja Barizan Raja Sulaiman (Eds.) *Status of Mangroves in Peninsular Malaysia*
Hadiah Merit/Merit Prize Mahmudin Saleh, Ainun Zuriyati Mohamed@Asa'ari, Latifah Jasmani, Mohd Shahwahid Hashim, Hj Othman, Paridah Md Yasir, Jalaluddin Harun, Norchahaya, Dr Mohd Nor Mohd Yusoff, Singaran & Harmaen Ahmad Saffian *Kenaf: A Potential Fibre for Pulp and Paper Manufacture*

Kategori/Category D: Buku Panduan/Handbooks

Pemenang / Winner Dr Aminah Hamzah, Ahmad Fauzi Mohd Shariff & Dr Ab. Rasip Ab. Ghani Prosidur Piawai bagi Pengeluaran Bahan Tanaman dan Penubuhan Tapak Semaian Perhutanan

Kategori/Category E: Anugerah Tesis Terbaik/Best Thesis Award

Tesis Terbaik/Best Thesis: PhD Dr Zaihan Jalaludin The Water Vapour Sorption Behaviour of Wood
Hadiah Merit/Merit Prize: PhD Dr Farah Fazwa Md Ariff Penilaian Kandungan Fenolik dan Hubungan Genetik bagi Dua Varieti Kacip Fatimah (*Labisia pumila* var. *pumila* dan *Labisia pumila* var. *alata*)
Tesis Terbaik/Best Thesis: MSc. Ihsan Safwan Kamarazaman *In Vitro* Study of Aqueous and Methanol Extracts of *Tinospora crispa* (L.) Hook. F & Thomson in Early Stage Atherogenesis
Hadiah Merit/Merit Prize Noor Azlina Ahmad

Kategori/Category F: Anugerah Khas Penerbitan/Special Publication Award

Zawiah Ngah & Othaman Hasin 99 Spesies Buah di FRIM dan/and Dr Wan Asma Ibrahim, Dr Wan Rasidah Kadir, Rafidah Jalil & Khairul Azmi Jabar As Good as Wood

K. Insentif Penerbitan dalam Jurnal Berimpak Faktor dan Terkemuka
Incentive for Publications in Impact Factored and Renowned Journals
Kategori: Individu/Category: Individual

Bil. No.	Nama/Name	Faktor Impak Kumulatif Accumulative Impact Factor	Hadiah/Prize (RM)
1	Dr Asiah Osman	13.647	3,250
2	Dr Tnah Lee Hong	5.634	1,250
3	Dr Sharmiza Adnan	2.59	500
4	Ahmad Nazarudin Mohd Roseli	2.447	500



Bil. No.	Nama/Name	Faktor Impak Kumulatif Accumulative Impact Factor	Hadiah/Prize (RM)
5	Norhayati Abdullah	2.436	500
6	Dr Lee Soon Leong	2.799	500
7	Dr Lee Chai Ting	2.664	500
8	Dr Ling Sui Kiong	2.189	500
9	Dr Roszaini Kadir	1.748	250
10	Salamah Selamat	1.727	250
11	Tumirah Khadiran	1.727	250
12	Fauziah Abdullah	1.65	250
13	Rafidah Abdul Rahman	1.606	250
14	Dr Ricahrd Chung Cheng Kong	1.517	250
15	Dr Mohd Khairun Anwar Uyup	1	250
16	Chew Ming Yee	1	250

Kategori/Category: Bahagian/Division

Bil. No.	Bahagian/Divisions	Faktor Impak Kumulatif Accumulative Impact Factor	Hadiah Prize (RM)
1	**Tempat Pertama/First Prize** Perhutanan & Alam Sekitar/Forestry & Environment	29.631	2000
2	**Tempat Kedua/Second Prize** Hasilan Semula Jadi/Natural Products	22.837	1000
3	**Tempat Ketiga/Third Prize** Keluaran Hutan/Forest Products	18.093	500

L. Sagu Hati bagi Artikel yang Diterbitkan dalam JTFS
Appreciation for Articles Published in JTFS

Bil./ No.	Nama/Names	Artikel/Articles
1	Nordahlia Abdullah Siam, Dr Khairun Anwar Uyup, Dr Hamdan Hussain & Abd Razak Othman	Nordahlia AS, Anwar UMK, Hamdan H, Zaidon A, Paridah MT & Abd Razak O Effects of Age and Height on Selected Properties of Malaysian Bamboo (*Gigantochloa levis*)
2	Dr Siti Aisah Shamsudin & Abd Rahman Kassim	Siti Aisah S, Yusop Y, Noguchi S & Abd Rahman K Rainfall Partitioning into Throughfall, Stemflow and Interception In a Young *Hopea odorata* Plantation
3	Mohd Farhan Abdul Razak & Dr Pin Kar Yong	Farhan M, Abdul Razak S, Pin K Y & Chuah AL Antioxidant Activity and Phenolic Content of Different Parts of *Orthosiphon stamineus* Grown under Different Light Intensities
4	Dr Rushdan Ibrahim	Zaidon A, Kim GH, Paridah MT, Bakar ES & Rushdan I
5	Dr Zaihan Jalaludin	Xie Y, Hill CAS, Sun DY, Z Jalaludin & Q Wang Effects of Extractives on the Dynamic Water Swelling Behavior and Fungal Resistance of Malaysian Hardwood



6	Dr Khairun Anwar Uyup, Dr Hamdan Hussain, Nordahlia Abdullah Siam	Anwar UMK, Paridah MT, Hamdan H, Zaidon A, Roziela H & Nordahlia AS. Adhesion and Bonding Properties of Low Molecular Weight Phenol Formaldehyde-Treated Plybamboo
7	Dr Khairun Anwar Uyup	Paridah MT, Zaidon A, Chuo TW, Zakiah A & Anwar UMK Accelerated and Tropical Outdoor Agings of Laminated Veneer Lumber and its Correlation with Strength and Stiffness

M. Anugerah Sukan/Sport Award

Sukan antara Zon/ Inter-Zone Sport

TEMPAT/PLACE	BAHAGIAN/DIVISIONS	KETUA ZON/ZONE HEADS
Pertama/First ZON/Zone B	Bioteknologi Perhutanan, Kelab FRIM, Kewangan & Inovasi & Komersialisasi Forestry Biotechnology, FRIM Club, Finance & Innovation & Commercialisation	Dr Norwati Muhammad
Kedua/Second Zon/Zone A	Perhutanan & Alam Sekitar, Sumber Manusia, Unit-unit di bawah Pejabat Ketua Pengarah Forestry & Environment, Human Resource & Units under the Director General's Office	Dr Ismail Harun
Ketiga/Third Zon/Zone D	Pentadbiran, Keluaran Hutan & Perkhidmatan Teknikal Administration, Forest Products & Technical Services	Dr Rahim Sudin
Keempat/Fourth Zon/Zone C	Biodiversiti Hutan, Hasilan Semula Jadi & Pengurusan Penyelidikan & Korporat Forest Bodiversity, Natural Products & Research Planning & Corporate	Dr Rasadah Mat Ali

Anugerah Sukan/Sport Award

ANUGERAH/AWARDS	PENERIMA/RECIPIENTS
Pasukan Terbaik/Best team	**Boling/Bowling** Abdul Jabbar Hj. Sabli; Mohd Shafie Jusoh; Harfendy Othman; Kamarul Hizam Hamsan; Mohd Shahrul Amin Mat Shaharudin; Roswadi Ahmad; Mohd. Kamaruddin Jalil; Yaacob Zahari; Mohd Zamri Mohd Zain; Maimunah Tompang; Salbiah Man & Mazurah Mohd. Isa
Pengurus Pasukan Terbaik/Best Team Manager	**Boling/Bowling** Abdul Jabbar Hj. Sabli
Olahragawan/Sportsman	Mohd Shis Ibrahim
Olahragawati/Sportswoman	Nurfarahain Mohamad
Anugerah Kepimpinan Sukan Sport Leadership Award	Dr Wan Rasidah Wan Ab. Kadir



PELAWAT RASMI/OFFICIAL VISITS

BIL. NO.	PELAWAT VISITORS	TARIKH DATE
1	Delegasi China—Prof Dr Zhong-Li Ding, Naib Presiden, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences/Delegation from China—Prof Dr Zhong-Li Ding, Vice President, Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences	11 Januari/ January
2	Prof Madya Dr Maketab Mohamed, Presiden Persatuan Pencinta Alam Malaysia/ Assoc. Prof Dr Maketab Mohamed, President of Malaysian Nature Society	11 Januari/ January
3	Datuk Ahmad Phesal Talib, Datuk Bandar Kuala Lumpur ke SPF Bidor, Perak Datuk Ahmad Phesal Talib, Mayor of Kuala Lumpur to SPF Bidor, Perak	11 Januari/ January
4	Malaysian Institute of Accountants (MIA)—En Abdul Rahim Abdul Hamid (Naib Presiden MIA), En G Shanmugam (Ketua Pusat Pembangunan Profesional) & En Iszudin Mohd Amin (Pengurus Komunikasi MIA) Institut Akauntan Malaysia (MIA)— Mr Abdul Rahim Abdul Hamid (MIA Vice President), Mr G Shanmugam (Head, Centre for Professional Development) & Mr Iszudin Mohd Amin (Manager, Communication)	21 Januari/ January
5	SIRIM —Makmal Perlindungan Api/ SIRIM —Fire Testing Laboratory	6 Februari/ February
6	Perbadanan Kemajuan Industri Kayu-Kayan Sarawak Sarawak Timber Industries Development Corporation (STIDC)	7 Februari/ February
7	Delegasi Jerman termasuk empat orang wakil Kementerian Sains, Penyelidikan dan Kesenian Baden-Württemberg — PYT (Her Excellency) Theresia Bauer (Menteri Sains, Penyelidikan dan Kesenian Baden-Württemberg), Jochen Schönmann (Ketua Pejabat Akhbar, Kementerian Sains Penyelidikan dan Kesenian), Christopher Böhmler, (Perunding Unit Hal Ehwal Antarabangsa dan EU), Prof Dr Edwin Hettesheimer (Penyelaras Program Malaysia, Kementerian Sains, Penyelidikan dan Kesenian Baden-Württemberg), 17 orang ahli parlimen dan tiga orang dari akhbar Jerman dan tujuh orang Jawatankuasa Penganjur. Rombongan diketuai oleh MP Helen Heberer, Pengerusi Sains, Penyelidikan dan Jawatankuasa Kesenian. Delegation from German including four representatives from Baden-Württemberg Ministry of Science, Research and Arts— PYT (Her Excellency) Theresia Bauer (Ministry of Science, Research and Arts— Baden-Württemberg), Jochen Schönmann (Head of Newspaper Office, Ministry of Science, Research and Arts), Christopher Böhmler, (Consultant of International Affairs Unit and EU), Prof Dr Edwin Hettesheimer (Coordinator of Malaysia Programme, Ministry of Science, Research and Arts Baden-Württemberg), Members of Parliament and representatives from German newspaper and organizing committee members. Delegation was headed by MP Helen Heberer, Chairperson of Science, Research and Arts Committee.	8 Februari/ February
8	Datin Sri Shahriah Md. Khalid, Pengerusi PUSPANITA Caw. NRE, Pengerusi-Pengerusi serta Setiausaha PUSPANITA —Lawatan & Mesyuarat AJK Induk Puspanita Cawangan NRE Bil 2/2013 Datin Sri Shahriah Md. Khalid, Chairperson NRE PUSPANITA Branch, Chairpersons and Secretaries of PUSPANITA—Visit & main committee members of the NRE PUSPANITA Branch No. 2/2013 Meeting	19 Februari/ February
9	Kitakuwada Senior High School, Jepun diketuai oleh Mr Kawabe Satoshi, Pengetua Kitakuwada Senior High School, Mr Yamana Hideo (Ketua Pejabat Pengurusan Am)/ Kitakuwada Senior Highschool, Japan headed by Mr Kawabe Satoshi, Principal of Kitakuwada Senior Highschool, Mr Yamana Hideo (Head of General Management Office)	20 Februari/ February



BIL. NO.	PELAWAT VISITORS	TARIKH DATE
10	MCG Events (Ekspatriat & Warganegara Malaysia)/MCG Events (Expatriates & Malaysians)	20 Februari/ February
11	Arkib Negara Malaysia —En Hazrul Izam Hatar dan Puan Zam Zarina Ishak dari Seksyen Pengurusan Rekod Elektronik Arkib Negara Malaysia. National Archive Malaysia—Mr Hazrul Izam Hatar and Mdm Zam Zarina Ishak from Electronic Records Management Section, National Archive Malaysia	21 Februari/ February
12	Dr Kerri-Ann Jones, Penolong Setiausaha Negara AS Dr Kerri-Ann Jones, US Assistant Secretary	11 Mac/ March
13	Duta Republic Ecuador, PYT Lourdes Puma Puma Ambassador of Republic of Ecuador, HE Lourdes Puma Puma	12 Mac/ March
14	YDP PUSPANITA Kebangsaan, YBhg Datin Sri Dato' Rohani Abdullah dan IM4U/YDP PUSPANITA Kebangsaan, YBhg Datin Sri Dato' Rohani Abdullah and IM4U Team	19 Mac/ March
15	Prof Dr Marchal Remy, Ketua Unit Biowooeb (Biomass, Wood, Energy, Biocomposites) CIRAD, Perancis /Prof Dr Marchal Remy, Head Biowooeb Unit (Biomass, Wood, Energy, Biocomposites) CIRAD, France	2 April
16	Delegasi pegawai tinggi Jabatan Perhutanan, Bangladesh Delegation of top officials from Forestry Department, Bangladesh	15 April
17	Unit Penyelarasan Pelaksanaan (ICU), Jabatan Perdana Menteri Implementation Coordination Unit (ICU), Prime Minister's Department	20 Mei/May
18	Bahagian Perolehan Kerajaan, Kementerian Kewangan Government Acquisition Division, Ministry of Finance	20 Mei/May
19	YB Datuk Dr James Dawos Mamit, Timbalan Menteri NRE YB Datuk Dr James Dawos Mamit, Deputy Minister of NRE	28 Mei/May
20	Felda Agricultural Services Sdn Bhd	14 Jun/June
21	Toyota Tsusho (Malaysia) Sdn Bhd	20 Jun/June
22	Pusat Pengurusan Penyelidikan, Universiti Islam Antarabangsa Malaysia Research Management Centre, International Islamic University Malaysia	19 Julai/July
23	*Exit Conference* Jabatan Audit Negara/Exit Conference National Audit Department	30 Ogos/ August
24	Delegasi China/Delegation from China	6 September
	Presiden NIES, Jepun/ President of NIES, Japan	20 September
25	Pegawai Lembaga Minyak Sawit Malaysia (MPOB) Officials from Malaysian Palm Oil Board (MPOB)	23 September
26	Pegawai dari Konsortium Pengelolaan Hutan Tropis Berlanjutan, Kalimantan, Indonesia yang diketuai oleh Pengarahnya, Prof. Dr. Ir. Yudi Firmanul Arifin/ Officials from " Konsortium Pengelolaan Hutan Tropis Berlanjutan, Kalimantan, Indonesia" headed by Director, Prof Dr Ir Yudi Firmanul Arifin	23 Disember



HAL EHWAL ANTARABANGSA/INTERNATIONAL AFFAIRS

APAFRI

Pada awal 2013, APAFRI telah menganjurkan satu bengkel peralihan hutan yang dihoskan oleh Institut Perhutanan Bogor (IPB) di Kuningan, Indonesia. Bengkel tersebut telah mengumpulkan perwakilan dari sembilan negara peserta iaitu China, India, Indonesia, Jepun, Korea, Laos, Malaysia, Filipina dan Vietnam, untuk berkongsi mengenai perkembangan dan pengalaman dalam pelaksanaan projek yang dibiayai oleh Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet).

Pada bulan Mei, APAFRI telah diberi satu kontrak oleh FAO untuk menguruskan sumber manusia, dan membantu tuan rumah tempatan-the South Asian Association for Regional Cooperation (SAARC) Forestry Centre-untuk menganjurkan kursus polisi selama dua minggu di Bhutan. Kursus pendek ini dihadiri oleh 22 peserta, terutamanya pegawai kanan dan pertengahan dari agensi perhutanan di Bangladesh, Bhutan, India, Myanmar, Nepal, Pakistan dan Sri Lanka; juga beberapa peserta dari industri perhutanan dan NGO berkaitan perhutanan dari China, Indonesia dan Filipina. Kursus ini merupakan siri keenam dipimpin oleh FAO, dan dianggap sebagai kursus yang paling berjaya, merujuk kepada komitmen tinggi para peserta yang melibatkan diri secara aktif dan bersemangat dalam semua perbincangan dan debat.



Lawatan lapangan ke Japara Private Forest yang kebanyakannya ditanam dengan *Albizia (Paraserianthes falcataria)* serta tanaman pertanian lain seperti melinjo (*Gnetum gnemon*), halia dan rempah-ratus lain

Field visit to Japara Private Forest which was mainly planted with *Albizia (Paraserianthes falcataria)* mixed with a few crops such as melinjo *(Gnetum gnemon)*, ginger and other spices

Korea Forest Research Institute (KFRI) merupakan penyumbang utama kepada APAFRI, membiayai kebanyakan aktiviti APAFRI di rantau ini, melengkapkan sumbangan besar dari FRIM yang menjadi tuan rumah kepada Sekretariat dengan kemudahan lengkap, dan menyediakan khidmat dua kakitangan sepenuh masa termasuk Setiausaha Eksekutif. Sepanjang 2013, sumbangan KFRI membolehkan APAFRI menganjurkan satu

APAFRI

In early 2013, APAFRI organised a workshop on forest transition hosted by Bogor Agricultural University (IPB) in Kuningan, Indonesia. The workshop has gathered the focal persons from the nine participating countries: China, India, Indonesia, Japan, Korea, Laos, Malaysia, Philippines and Vietnam, to share their progress and experiences in implementing the project funded by the Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet).

In May APAFRI was awarded a contract from FAO to engage resource persons, and support the local host-the South Asian Association for Regional Cooperation (SAARC) Forestry Centre-in organising a two-week forest policies course in Bhutan. This short course was attended by a total of 22 participants, mainly senior and mid-rank officers of forestry agencies in Bangladesh, Bhutan, India, Myanmar, Nepal, Pakistan and Sri Lanka, as well as a few from the forest industries and forestry-related NGOs from China, Indonesia, Myanmar and the Philippines. This is the sixth in the series conducted by FAO thus far, and has been deemed as one of the most successful course, due principally to the highly committed participants who had participated actively and enthusiastically in all of the discussions and debates.

Korea Forest Research Institute (KFRI) is now a major contributor to APAFRI, financing most of APAFRI's activities in the region, complementing the very substantial outlay from FRIM which hosted the Secretariat with full facilities and provided the services of two full-time staff including the Executive Secretary. During 2013, KFRI's contributions enabled APAFRI to organise a three-day workshop on forest hydrology together with Forest Research Institute of the Indian Council for Forestry Research

bengkel selama tiga hari mengenai hidrologi hutan bersama Forest Research Institute of the Indian Council for Forestry Research and Education (ICFRE-FRI) di Dehradun, India, yang telah menarik seramai 127 peserta, 20 daripadanya adalah dari lapan negara rantau Asia luar India. Sumbangan KFRI juga membolehkan APAFRI untuk memberi bantuan kewangan kepada beberapa aktiviti termasuklah antaranya Annual Meeting and Workshop of the International Long-term Ecological Research Network, 6th International Conference on Forest-related Traditional Knowledge and Culture in Asia dan Northeast Asian Workshop for Sustainable Forest Management and Reforestation. Kebanyakan pembentangan dan laporan telah dimuat naik di laman web APAFRI dan boleh dicapai oleh semua.

APAFRI mempunyai tugas tambahan untuk penutupan projek peralihan hutan pada penghujung 2013. Dibiayai oleh APFNET, projek ini diluluskan pada Oktober 2013, dilancarkan secara rasminya dalam satu mesyuarat di Beijing semasa Asia-Pacific Forest Commission 24th Session pada November 2011. Projek yang melibatkan penyertaan sembilan negara Asia Pasifik, telah dilanjutkan lagi tempohnya selama tiga bulan untuk membolehkan semua laporan aktiviti dilengkapkan dengan sempurna dan memuaskan. Output utama daripada projek ini ialah satu set yang mengandungi sembilan laporan nasional, yang turut mengandungi analisis terperinci kajian kes yang mengenal pasti sebab berlakunya perubahan liputan hutan, dan pemacu peralihan hutan kepada pengekalan pengurusan hutan di negara-negara tersebut. Kesemua laporan tersebut telah dimuat naik dalam laman sesawang APAFRI dan boleh dicapai oleh sesiapa sahaja yang berminat. Simposium penamatan projek telah diadakan pada Oktober dan Renmin University of China di Beijing bertindak sebagai tuan rumah, untuk mempamerkan output projek. Satu kompilasi laporan dan abstrak lanjutan akan diterbitkan sebagai prosiding simposium. Laporan penamatan projek dan penyata kewangan juga telah dilengkapkan dan akan dihantar kepada APFNet pada awal Januari untuk penamatan perjanjian projek secara rasmi.

APAFRI telah menerima beberapa permintaan untuk sokongan dan sumbangan bagi pelbagai aktiviti yang dilaksanakan oleh ahli-ahli institusi. Secara tradisinya, APAFRI akan menanggung penyertaan staf dari ahli institusi dalam aktiviti yang dilaksanakan oleh ahli insitusi lain. Tahun ini, APAFRI telah memperuntukkan sokongan kewangan kepada Universiti Putra Malaysia untuk menganjurkan Forestry Graduate Students' and Education (ICFRE-FRI) in Dehradun, India, which has attracted 127 participants, 20 of which were from eight countries in the Asian region outside India. The KFRI's contributions also enabled APAFRI to support several activities including the Annual Meeting and Workshop of the International Long-term Ecological Research Network, the 6th International Conference on Forest-related Traditional Knowledge and Culture in Asia, the Northeast Asian Workshop for Sustainable Forest Management and Reforestation, among others. Most of the presentations and reports have since then uploaded onto APAFRI website and are freely accessible to all.

APAFRI has the additional task of closing the project on Forest Transition end of 2013. Funded by APFNet, the project was approved in October 2011, and launched officially with a meeting in Beijing, during the Asia-Pacific Forest Commission 24th Session in November 2011. The project with the participation of nine Asia Pacific countries, was extended by another three months to allow for the satisfactorily completion of all the project activities. The major outputs of this project are a set of nine national reports, several of them with very detailed case study analyses, which identify the causes of forest cover changes, and the drivers of forest transition to sustainable forest management in these countries. All these reports have already been finalised, and uploaded to the APAFRI website and are freely accessible to whoever may be interested. An end-of-project symposium was organised in October, hosted by the Renmin University of China in Beijing, to show-case the outputs of this project. A compilation of the extended abstracts will be published as the proceedings of this symposium. The project completion report and financial statements have been finalised and would be submitted to APFNet within the first couple of weeks in January 2014 to officially close-off the project agreement.

APAFRI has received several requests for support and contributions to events organised by member institutions. Traditionally, APAFRI will contribute a very modest amount to be used to support the participation of staff from member institutions to an event organised by a member institution. This year, APAFRI has provided support to the Universiti Putra Malaysia for organising the International Forestry Graduate Students' Conference 2013 (FORGRAD2013), the Arbonaut User Days 2013 Workshop and the 1st International Scientific Symposium on Agarwood (ISSA 2013). APAFRI has also given a small contribution to FRIM for the International Congress of the Malaysian Society for Microbiology (ICMSM2013).



Conference 2013 (FORGRAD2013), Arbonaut User Days 2013 Workshop dan 1st International Scientific Symposium on Agarwood (ISSA 2013). APAFRI juga telah memberi sedikit sumbangan kepada FRIM untuk International Congress of the Malaysian Society for Microbiology (ICMSM2013).

Keahlian APAFRI telah meningkat kepada 69 pada penghujung 2013 dengan penyertaan Forest Research Institute dari India.

Penerbitan :

Extended abstracts from the Yangling International Agri-Science Forum, International Conference on Traditional Forest-related Knowledge and Culture for Green Economy, 5-8 November 2012, Yangling, China.

APAFRI membership has increased to 69 as of end 2013, with the joining of Forest Research Institute from India.

New publications :

Extended abstracts from the Yangling International Agri-Science Forum, International Conference on Traditional Forest-related Knowledge and Culture for Green Economy, 5-8 November 2012, Yangling, China.

SUMBER MANUSIA
HUMAN RESOURCE

Pelantikan, Kenaikan Pangkat, Peletakan Jawatan,
Anugerah Anjakan Gaji, Persaraan
Appointment, Promotion, Resignation,
Salary Increment Award, Retirement

Latihan/Training

Hari Anugerah/Award Day

Pegawai /Officials



PERJAWATAN/ESTABLISHMENT

Komposisi penjawat awam/ Staff composition	Bil/No.
Bilangan penjawat awam /Total number of staff	684 (223 (K))
Kategori/Categories Pegawai (JUSA) Officers (JUSA)	7
Pegawai penyelidik/Research officers	198 (76 (K))
Pegawai (selain pegawai penyelidik)/Officers (Other than research officers)	13 (10 (K))
Penolong pegawai penyelidik/Assistant research officers	38 (11 (K))
Pen. Pegawai (selain pen. pegawai penyelidik)/Officers (Other than Assistant Research Officers)	34 (2 (K))
Staf (Kump. Pelaksana 2)/ staff (Support Group 2)	394 (124 (K))

Nota/Note: K=Kontrak/Contract

PELANTIKAN/APPOINTMENT

Nama/Jawatan/Gred Name/Position/Grade	Bahagian Division	Tarikh lantikan Appointment date
Faezah Mohd Pembantu Penyelidik/Research Assistant Q17	Keluaran Hutan Forest Products	2 Ogos/August
Roshafiza Mohamad Pembantu Penyelidik/Research Assistant Q17	Inovasi & Komersialisasi Innovation & Commercialisation	
Mohd Fadzlan Hussain Pembantu Penyelidik/Research Assistant Q17	Sumber Manusia Human Resource	
Imin Kamin Pembantu Penyelidik/Research Assistant Q17	Biodiversiti Hutan Forest Biodiversity	
Zainol Khalid Renjer Hutan/Ranger G17	Perhutanan & Alam Sekitar Forestry & Environment	
Mohd Muflif Mohd Rodzi Pembantu Penyelidik/Research Assistant Q17	Perhutanan & Alam Sekitar Forestry & Environment	5 Ogos/August
Mohd Sopian Muktar	Keluaran Hutan Forest Products	
Mahat Shamsudin Pekerja Awam Khas/ Special General Worker R3	Perhutanan & Alam Sekitar Forestry & Environment	
Ahmad Norsidar Ab Halim	Perhutanan & Alam Sekitar Forestry & Environment	
Mohd Faizullah Ngah Ibrahim	Keluaran Hutan Forest Products	
Ahmad Awang Renjer Hutan/Ranger G17	Perhutanan & Alam Sekitar Forestry & Environment	13 Ogos/August
Rohaidah Ngah Pembantu Penyelidik/Research Assistant Q17	Bioteknologi Perhutanan Forestry Biotechnology	14 Ogos/August
Nurul Hudaini Mamat Pembantu Penyelidik/Research Assistant Q17	Keluaran Hutan Forest Products	
Zairi Sudin Renjer Hutan/Ranger G17	Perhutanan & Alam Sekitar Forestry & Environment	19 Ogos/August
Halim Man	Bioteknologi Perhutanan Forestry Biotechnology	
Shukor Mohd Arif	Bioteknologi Perhutanan Forestry Biotechnology	20 Ogos/August





Nama/Jawatan/Gred Name/Position/Grade	Bahagian Division	Tarikh lantikan Appointment date
Hamsinah Hashim Pekerja Awam Khas/ Special General Worker R3	Keluaran Hutan Forest Products	21 Ogos/August
Mohd Erwan Mohd	Perhutanan & Alam Sekitar Forestry & Environment	27 Ogos/August

KENAIKAN PANGKAT/PROMOTIONS

Nama/Name	Jawatan/Gred Post/Grade	Tarikh/Date
Dr Ismail Harun	Pegawai Penyelidik Gred Utama 'C' VU7 Research Officer Premier Grade 'C' VU7	1 Jun/June 2011
Dr Mohd Rosli Harun	Pegawai Penyelidik/Research Officer Q52	1 Januari/January 2013
Dr Norwati Adnan		
Dr Norlia Basheruddin		
Dr Mohd Zaki Abdullah		
Dr Zaihan Jalaludin		
Nashatul Zaimah Noor Azman	Pegawai Penyelidik/Research Officer Q48	1 Januari/January2013
Dr Suffian Misran		
Dr Sharmiza Adnan		
Dr Abdul Hamid Salleh		
Ahmad Fauzi Mohd Shariff		
Sam Yen Yen		
Dr Siti Salwana Hashim		
Dr Mohd Farid Ahmad		
Ong Chee Beng		
Mohd Nazak @ Nasir Husin		1 April 2013
Nor Asmah Hassan	Pegawai Penyelidik/Research Officer Q44	1 Januari/January2013
Noor Atizza Mansor		
Siti Syarifah Mohd Mutalip		
Norhayati Ismail		
Noraliza Alias		
Huda Farhana Mohd Muslim		
Abd Rashid Li		
Hamdan Omar		
Yazid Nyan	Pemb. Penyelidik/Research Assist. Q22	1 Jun/June 2013
Mahamad Sakri Ismail	Tukang K2 R22 (KUP)	12 Mac/March 2013
Mohamad Zin Salim	Pengawas Hutan/Forrester G14 (KUP/PTH)	8 Januari/January2013



PEMANGKUAN JAWATAN
ACTING APPOINTMENT

Nama/Name	Jawatan Pemangkuan/Gred Acting Post/Grade	Tarikh/Date
Dr Norwati Muhammad	Pegawai Penyelidik Gred Utama 'C' VU7 Research Officer Premier Grade 'C' VU7	1 Ogos/August 2013–31 Julai/July 2014
Wan Zahiri Wan Yaacob	Pegawai Penyelidik/ Research Officer Q54	1 Oktober/October 2013–30 September 2015
Dr Roszaini Kadir	Pegawai Penyelidik/ Research Officer Q52	1 Ogos/August 2013–31 Julai/July 2014
Dr Siti Aisah Shamsuddin		26 Ogos/August 2013–25 Ogos/August 2014
Dr Mohamad Nasir Mat Arip	Pegawai Penyelidik/ Research Officer Q52	7 Mei/May 2013–6 Mei/May 2015
Dr Abdul Hamid Saleh		8 Mei/May 2013–7 Mei/May 2015
Dr Lok Eng Hai	Pegawai Penyelidik/ Research Officer Q48	10 Ogos/August 2013–9 Ogos/August 2014
Dr Mary Khoo Gaik Hong		22 Februari/February 2013–21 Februari/February 2015
Dr Sik Huei Shing		22 Jun/June 2013–21 Jun/June 2014
Wahayu Abdul Wahab	Pegawai Penerangan/ Information Officer S44	1 Julai/July 2013–30 Jun/June 2014
Ilyani Mazlan	Juruaudit/Auditor W44	1 Oktober/October 2013
Azuarni Abdul adzis	Pegawai Tadbir/Admin. Officer N44	

PELANTIKAN SECARA PINJAMAN/APPOINTMENT BY SECONDMENT

Nama/Name	Jawatan dipinjamkan/Gred Secondment Posts/Grade	Tarikh/Date
Dr Gary William Theseira	Timbalan Setiausaha Bahagian Q54 (terbuka), NRE	16 April 2013–15 April 2015
Norain Mohd Arif	Pegawai Penyelidik/ Research Officer Q48	1 September 2013–31 Ogos/August 2015
Dato' Dr Che Abdul Rahim Hj Nik	Timbalan Ketua Setiausaha/ Deputy Secretary General 2	15 April 2013–14 April 2015
Dr Norwati Adnan	Pengarah Seksyen Penilaian dan Penyelidikan Q52 (Terbuka) Director, Evaluation and Research Q52 (Open)	1 September 2013–30 September 2014
Nor Azman Hussein	Pengurus/Manager Syarikat Ligni Energy Sdn Bhd.	1 Oktober/October 2013–31 Mac/March 2014

PELETAKAN JAWATAN/RESIGNATION

Nama/Name	Tarikh/Date
Azmarizawati Zainal Azhar	1 Mei/May
Azril Deenor Md Dan	25 Julai/July
Noor Nazreen Nasir	1 September



PERSARAAN/RETIREMENT

Persaraan Retirement	Tarikh Date
Wajib/Mandatory	
Dr Aminah Hamzah	27 April
Dr Hashim Mohd Noor	28 April
Suhaimi Sulaiman	18 Mac/March
Saimas Ariffin	23 Mei/May
Pilihan/ Optional	
Wan Rahmah Wan A. Raof	1 Januari/January
Rohimah Abdullah	1 Disember/December
Maskom Peseri	1 Disember/December

MENINGGAL DUNIA/DECEASED

Nama/Name	Tarikh/Date
Jaafar Man	23 Mac/March
Hj Jamaludin Malek	12 Disember/December

Latihan Akademik/Academic Training

Bil. No.	Nama Name	Ijazah Degree (PhD/MSc)	Universiti University
1	Mohd Nasir Mat Arip	PhD	Universiti Kebangsaan Malaysia
2	Mary Khoo Gaik Hong	PhD	University of Surrey, UK
3	Wan Mohd Shukri Wan Ahmad	PhD	Universiti Kebangsaan Malaysia
4	Abdul Hamid Saleh	PhD	Universiti Sains Malaysia
5	Saiful Iskandar Khalit	PhD	Universiti Putra Malaysia
6	Amir Saaifuddin Kassim	MSc	Universiti Putra Malaysia
7	Mohd Ismawee Ismail	MSc	Universiti Putra Malaysia
8	Zairul Amin Zabidin	MSc	Universiti Putra Malaysia
Skim Bantuan Penyelidikan/Research Assistantship			
1	Mohd Farhan Abdul Razak	MSc	Universiti Putra Malaysia

PEGAWAI/OFFICERS

Senarai pegawai FRIM Gred 27 dan ke atas (kelulusan tertinggi)/
List of FRIM officers Grade 27 and above (highest educational background):

PEJABAT KETUA PENGARAH/DIRECTOR GENERAL'S OFFICE

Ketua Pengarah (KP)/Director General
Dato' Dr Abd Latif Mohmod (DIMP, JSM, KMN, AMN)
PhD Non-Wood Forest Product (UPM)

Timbalan Ketua Pengarah (Penyelidikan dan Pembangunan)
Deputy Director General (Research and Development)
Dr Mohamed Nor Mohd Yusoff (KMN) PhD (Manchester)



Timbalan Ketua Pengarah (Operasi)
Deputy Director General (Operations)
Dr Norini Haron, PhD (Aberystwyth, Wales)

Pegawai Penyelidik/Research Officer
Praveena a/p Balai Kerishnan, BSc Forestry (UMS)

Setiausaha Pejabat/Administrative Secretary
Ketua Pengarah/Director General
Amrah Toha, Dip Sec. Sc. (UiTM)
Maimunah Tompang, SPM

Setiausaha Pejabat/Administrative Secretary
Timbalan Ketua Pengarah (Penyelidikan dan Pembangunan)
Deputy Director General (Research and Development)
Zariza Mohamed Yusuf, Dip Sec. Sc. (UiTM)

Unit Undang-Undang/Legal Unit
Ketua/Head
Nor Azura Ahmad Murad, LLB (Hons) (UIA)

Penolong Pegawai Tadbir/Assistant Administrative Officer
Nurli Shazlin Zulkiffeli, Dip Public Admin. (UiTM)

Audit Dalam/Internal Audit
Juruaudit/Auditor
Ilyani Mazlan, B Acc. (Hons) (UiTM)

Penolong Juruaudit/Assistant Auditor
Mohd. Rozmi Mohamed Arif, Dip Acc. (UiTM)

Unit Pengurusan Kualiti/Quality Management Unit
Ketua /Head
Salamah Selamat, BSc (Hons), Analytical Chem.(UKM)

Pegawai Penyelidik/Research Officers
Suhana Rafidah Md. Yusof, MSc Qty & Product. Mgmt (UKM)
Suharti Samod, BSc Forestry (UPM)

Pegawai Teknologi Maklumat (Kontrak)/Information Technology Officer (Contract)
Nor Haliyan Tan Shilan, MSc IT (UiTM)

Unit Pengurusan Korporat/*Corporate Management Unit*
Ketua/Head
Norhayati Nordin, MSc Tech. & Innov. Mgmt (Sussex)

Pegawai Media/Media Officer
Toh An Nee, B Mass Comm. (USM)

Pegawai Perhubungan Awam/Public Relations Officer
Maria Arlene Anak Siba, BSc International Trop. Forestry (UMS)

Pegawai Pelatih Mobiliti/Mobility Trainee Officer
Dasrul Iskandar Darus, MSc Agroforestry Mgmt (UPM)

APAFRI
Setiausaha Eksekutif/Executive Secretary
Dr Sim Heok Choh, PhD (Idaho)



***FRIM-MTDC Incubation Centre*/Pusat Inkubasi FRIM-MTDC**
Ketua /Head
Mohd Shahidan Mohd Arshad,

Akauntan/Accountant
Faizah Sahran, B Acc. (UPM)

BAHAGIAN PERANCANGAN PENYELIDIKAN DAN KORPORAT/ RESEARCH PLANNING AND CORPORATE DIVISION

Pengarah/Director
Dato' Dr Hjh Marzalina Hj Mansor (KMN), PhD

Cawangan Dasar dan Perancangan Penyelidikan/Policy and Research Planning Branch
Ketua/Head
Dr Hj Nur Supardi Md Noor (AMK), PhD Ecology (Reading)

Pegawai Penyelidik/Research Officers
Dr Mohd Rosli Haron, PhD Molecular Bio. & Genetic Eng. (UPM) (Mulai Jun/From June)
Nik Zanariah Nik Mahmood, MSc Corporate Comm. (UPM)

Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Abdul Hafiz Mohmad Zakuan, MBA (UKM)
Ariff Fahmi Abu Bakar, BSc For. (Hons) (UMS)

Pegawai Teknologi Maklumat (Kontrak)/Inform. Technology Officers (Contract)
Roshamida Ruslan, MSc IT (UiTM)
Rosniza Rawi, MSc IT (UiTM)

Pen. Pegawai Tadbir (Kontrak)/Assistant Admin. Officer (Contract)
Siti Ramizah Mohamed Pauzi, Dip Office Mgmt. (UiTM

BAHAGIAN PERHUTANAN DAN ALAM SEKITAR/FORESTRY AND ENVIRONMENT DIVISION

Pengarah/Director
Dr Ismail Harun, PhD Forest Mgmt. (UPM)

Setiausaha Pejabat/Administrative Secretary
Zanariah Nassaruddin, Dip Sec. Sc. (UiTM)

Program Hutan Asli/Natural Forest Programme
Ketua/Head
Dr Ismail Harun, PhD Forest Mgmt. (UPM)

Setiausaha Pejabat/Administrative Secretary
Nor Shahidah Hussin, Dip Sec. Science
(Politeknik Tuanku Syed Sirajuddin)

Pegawai Penyelidik/Research Officers
Dr Raja Barizan Raja Sulaiman, PhD Biological & Molecular Sci.—Plant Eco.(Stirling)
Dr Ismail Parlan, PhD Botany (UKM)
Wan Mohd Shukri Wan Ahmad, MSc (UKM)
Mohd Nasir Husin, MSc Environ. Mgmt (UKM)
Dr Serafina Christine Fletcher, PhD Zoology (UKM)
Nur Hajar Zamah Shari, MSc Tropical Forest Mgmt (UPM)
Salleh Mat, MSc Forest Economics (UPM)
Tariq Mubarak Husin, BSc Forestry (UPM)
Azharizan Mohd Norizan, MSc Forest Prod. & Marketing (UiTM)



Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Farah Shahanim Mohamed Mohidin, MSc Conserv. Biology (UKM)
Musalmah Nasardin, BSc Biology (Plant) (UPM)
Mohamad Faizul Kamarudin, BSc Geomatic Science (UiTM)
Nur Zati Akma Mustafa, MSc Zoologi (UKM)
Nadia Che Idris, MSc Conserv. Biology (UKM)
Noraishah Safee, MSc Environ. Monitoring & Assess. (UKM)
Norsheilla Mohd Johan Chuah, MSc Science Remote Sensing (UTM)
Mohd Izwan Ramlan, BSc Agricultural Sc. (UPM)

Penolong Pegawai Penyelidik/Assistant Research Officers
Sadali Sahat
Harfendy Osman, Dip Comp. Sc. (UPM)

Penolong Pegawai Penyelidik (Kontrak)/Assisstant Research Officers (Contract)
Muhammad Safuan Sulaiman, Dip Eng. in Building Services
(Politeknik Sultan Azlan Shah)
Mohd Hafiz Musa, MSc Furniture Design and Eng. (UiTM)

Program Ekopelancongan dan Hutan Bandar/Ecotourism and Urban Forestry Programme
Ketua/Head
Dr Noor Azlin Yahya, PhD Forest Recreation Mgt. (UPM)

Setiausaha Pejabat /Administrative Secretary
Azrinawati Samsuri, Dip. Exec. Secretary (UiTM)

Pegawai Penyelidik/Research Officers
Ahmad Azaruddin Mohd. Noor, MSc Landscape Studies (UPM)
Ahmad Nazarudin Mohd. Roseli, MSc Plant Eco-physiology (UPM)
Sreetheran Maruthaveeran, MSc Trop. Forest Resource Mgmt. (UPM)
Nik Azyyati Abdul Kadir, BSc Forestry (UPM)
Nik Adlin Nik Mohamed Sukri, BSc Landscape Arch. (UTM)

Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Nor Azlin Mohd Fauzi, MSc Biology Conserv. (UKM)
Nazimatul Azma Nazeri, BSc Forestry (UPM)
Sharmillah Saleh, B Forestry Science (UMS)

Penolong Pegawai Penyelidik/Assistant Research Officers
Mohd. Afendi Hussin, Dip Agric. (UPM)
Azahari Hj. Mohd. Yusoff, Dip Landscape Design (UiTM)
Naimah Che Long, BSc Forestry (UPM)
Wan Mohd Nafizul Hal Alim Wan Ahmad, BSc Electrical Eng. (UiTM)

Program Geoinformasi/Geoinformation Programme
Ketua/Head
Dr Abd Rahman Kassim, PhD Forest Resources (Oregon State)

Pegawai Penyelidik/Research Officers
Tan Sek Aun, MSc Forestry (UPM)
Hamdan Omar, MSc Remote Sensing (UTM)



Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Mohd Azahari Faidi, MSc Remote Sensing (UTM)
Mohd Rizuwan Mamat, BEng, Mech. (UiTM)
Muhamad Afizzul Misman, MSc Spatial Eng. (UPM)
Siti Yasmin Yaakub, BSc Remote Sensing (UTM)
Ahmad Firdaus Zainuddin, BSc Forestry (UPM)
Mohamad Danial Md Sabri, BSc Applied Sc. (UiTM)

Penolong Pegawai Penyelidik/Assistant Research Officers
Rodziah Hashim, Dip Science Geoinform. (UiTM)
Abdul Azhan Shah Idris, Dip Forestry (UPM)

Program Perubahan Iklim dan Perhutanan/Climate Change and Forestry Programme
Ketua/Head
Dr Samsudin Musa, PhD Botany (UKM)

Pegawai Penyelidik/Research Officers
Dr Elizabeth Philip, PhD Plant Physiology (UM)
Azian Mohti, MSc Applied Remote Sensing/GIS (UPM)

Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Chong Yen Mee, BSc Forestry (UMS)

Penolong Pegawai Penyelidik/Assistant Research Officers
Nazaruddin Ramli, Dip Agric. (UPM)
Mohd Rizal Mohd Kassim, Dip Plantation Mgmt (UiTM)

Program Kualiti Air/Water Quality Programme
Ketua/Head
Dr Siti Aisah Shamsuddin, PhD Hydro. & Water Resource Mgmt (UTM)

Pegawai Penyelidik/Research Officers
Mohd. Ghazali Hasan, M Agric. Sc. (UPM)
Dr Saiful Iskandar Khalit, PhD Geotech. & Geological Eng. (UPM)
Marryanna Lion, MSc Env. Planning & Mgmt.(UPM)

Penolong Pegawai Penyelidik/Assistant Research Officers
Shahrulzaman Idris, Dip For. (UiTM)
Mohd. Md. Sahat

Taman Botani Kepong/Kepong Botanic Garden
Ketua/Head
Adnan Mohammad, MSc (London)

Pegawai Penyelidik/Research Officers
Muhammad Farid Abdul Rashid, M For. (Oregon State)
Norsham Suhaina Yaakob, MSc (UKM)

Pegawai Penyelidik Sosial/Social Research Officer
Nur Suriani Salleh, BSc. (UiTM)

Pegawai Penyelidik (Kontrak)/Research Officers(Contract)
Nur Farhana Mohamad Fakhri, BSc Hort. Sc. (UPM)

Arkitek Landskap/Landscape Architect
Muhammad Ammar Hamzah, B LA (UIAM)



Penolong Pegawai Perancang Bandar & Desa/Assistant Town Planner
Azrina Yahaya, BSc Town & Reg. Plan (UiTM)

Penolong Pegawai Penyelidik/Assistant Research Officer
Mohd. Shis Ibrahim, Dip Comp. Sc. (UPM)
Khairuddin Kamaruddin, International Dip Herbarium Techniques,
(Royal Botanical Gardens,UK)

Penolong Pegawai Penyelidik (Kontrak)/Assistant Research Officer (Contract)
Mohd Hafizul Rashid, Dip Mech. Agric. Eng.
(Politeknik Kota Bharu)

WHS-UNESCO Sekretariat/Secretariat WHS-UNESCO
Pegawai Penyelidik/Research Officers
Dr Shamsudin Ibrahim (Senior Fellow)
Noorsiha Ayop, BSc Botany (UM)

BAHAGIAN KELUARAN HUTAN/FOREST PRODUCTS DIVISION
Pengarah/Director
Dr Rahim Sudin (AMN, DSM), PhD Wood Composites (Sheffield)

Program Biokomposit dan Perlindungan Kayu/Bio-Composites and Wood Protection Programme
Ketua/Head
Dr Zaihan Jalaludin, PhD Wood Sci. (Edinburgh)

Setiausaha Pejabat/Administrative Secretary
Azlina Ahmad, Dip Sec. Sci. (UiTM)

Pegawai Penyelidik/Research Officers
Salamah Selamat, BSc Chemistry (Hons) (UKM)
Dr Salmiah Ujang, PhD Wood Mycology (Portsmouth)
Hashim W. Samsi, MSc Wood Technology (UPM)
Dr Roszaini Kadir, PhD Wood Sci. (Bangor)
Dr Suffian Misran, PhD Wood Sci. (Bangor)
Dr Rafeadah Rusli, PhD Material Sci. (Manchester)
Dr Mohamad Nasir Mat Arip, PhD Chemistry (UKM)
Dr Mohd Khairun Anwar Uyup, PhD Wood Sci. & Tech. (UPM)
Tumirah Khadiran, MSc Chemistry (UKM)
Shahlinney Lipeh, MSc Entomology (UKM)
Mohd Yusouf Abdul Latif, MSc Bio Env. Eng (UIAM)

Pegawai Penyelidik (Kontrak)/ Research Officers (Contract)
Khairul Azmi Jabar, MSc Building Tech. (USM)
Siti Nor Ain Tamiran, BSc Furniture Tech. (UiTM)
Noor Azrieda Abd. Rashid, MSc Wood Sci. (UiTM)

Penolong Pegawai Penyelidik /Assistant Research Officers
Habibah Mohamad (PPN), Dip Ind. Chem. (UiTM)
Nor Azian Mohd Kasby, Dip Civil Eng. (UTM)
Baharudin Kamaruddin, BSc Forest Industry (UPM)
Rozaida Latip, Dip Wood Tech. (UiTM)
Siti Rafidah Mahmud, Dip Wood Tech. (UiTM)

Program Pemprosesan Termaju dan Reka Bentuk/Advanced Processing and Design Programme
Ketua/Head
Dr Tan Yu Eng, PhD Wood Engineering (Brighton)



Setiausaha Pejabat/Administrative Secretary
Nor Azlina Zakaria, Dip Sec. Sc. (UiTM)
Pegawai Penyelidik/Research Officers
Dr Mohamad Omar Mohamad Khaidzir, PhD Automatic Control and Syst. Eng. (Sheffield)
Mohd. Arshad Saru, B Eng. Mech. (Sunderland)
Abdul Hamid Saleh, PhD Material, Design & Tech. (USM)
Ong Chee Beng, MSc Wood Sci. (UPM)
Dr Khairul Awang, PhD Wood Sci. & Tech. (USM)
How Seok Sean, MSc Information Tech. (UPM)
Siti Zaliha Ali, B Eng. Manufact. (UIAM)

Pegawai Penyelidik (Kontrak)/ Research Officers (Contract)
Mohd. Jamil Abdul Wahab, B Eng. Mech. (UM)
Izran Kamal, MSc Wood Sci. & Tech. (UPM)
Yanti Abdul Kadir, BSc Forestry (UPM)

Penolong Pegawai Penyelidik/Assistant Research Officers
Zaitun Said, Dip Wood Tech. (UiTM)
Zawawi Kassim, Dip Applied Science (UiTM)
Roszalli Mohd. STPM

Penolong Jurutera/Assistant Engineer
Ya'akob Zahari, Dip Mech. Marine Eng. (Politeknik Ungku Omar)

Program Pulpa dan Kertas/Pulp and Paper Programme
Ketua/Head
Mahmudin Saleh, MSc Mech. Eng. (UiTM)

Pegawai Penyelidik/Research Officers
Dr Rushdan Ibrahim, PhD Paper Sci. (Manchester)
Dr Sharmiza Adnan, PhD Chemical Eng. (Monash)
Latifah Jasmani, MSc Material Sci. (UKM)

Penolong Pegawai Penyelidik/Assistant Research Officers
Azizi Abd. Jalil, Dip Wood Tech. (UiTM)

Program Biotenaga/Bioenergy Programme
Ketua/Head
Dr Wan Asma Ibrahim, PhD Soil Chemistry (UPM)

Pegawai Penyelidik/Research Officers
Puad Elham, MSc Wood Indust. (UPM)
Shaharuddin Hashim, BSc Analytical Chem. (USM)
Rafidah Jalil, MSc Chemical & Process Eng. (UKM)
Mahanim Sarif @ Mohd. Ali, MSc Chemical Eng. (USM)

Program Teknologi Mesra Alam/Green Technology Programme
Ketua/Head
Dr Gan Kee Seng, PhD Mechanical Eng. (Strathclyde)

Pegawai Penyelidik/Research Officer
Dr Sik Huei Shing, PhD Material Sci. (UKM)

Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Zairul Amin Rabidin, MSc Wood Sci. & Tech. (UPM)
Khairul Masseat, BSc Furniture Tech. (UiTM)



Program Kualiti Kayu dan Hasil Bukan Kayu/Wood Quality and Non-Wood Products Programme
Ketua/Head
Dr Mohd. Tamizi Mustafa PhD Bioresource (USM)

Pegawai Penyelidik/Research Officers
Dr Hamdan Husain, PhD Wood Sci. (Wales)(dari/from February)
Dr Wan Tarmeze Wan Ariffin, PhD Civil Eng. (Birmingham)
Nordahlia Abdullah Siam, MSc Wood Sci. & Tech. (UPM)

Penolong Pegawai Penyelidik (Kontrak)/Assistant Research Officer (Contract)
Mohd Izani Ishak, Dip Mech. Eng. (Politeknik Sultan Salahuddin Abdul Aziz Shah)

BAHAGIAN BIOTEKNOLOGI PERHUTANAN/FORESTRY BIOTECHNOLOGY DIVISION
Pengarah/Director
Dr Norwati Muhammad, PhD Forest Genetic (Reading)

Setiausaha Pejabat/Administrative Secretary
Nur Wahida Tajudin, Dip Sec. Sc. (Politeknik Sultan Hj Ahmad Shah)

Program Bioteknologi/Biotechnology Programme
Ketua/Head
Dr Norwati Muhammad, PhD Forest Genetic (Reading)

Pegawai Penyelidik/Research Officers
Dr Lee Soon Leong, PhD Plant Genetic (UKM)
Dr Lee Chai Ting, PhD Genetic Resources (UPM)
Dr Nor Hasnida Hassan, PhD Botany (UKM)
Dr Kevin Ng Kit Siong, PhD Population Genetics (UM)
Dr Mohd Rosli Haron, PhD Molecular Biology & Genetic Eng. (UPM)(Sehingga Mei/until May)
Dr Norwati Adnan, PhD Plant Genetic (UKM)
Dr Norlia Basherudin, PhD Molecular Biology & Genetic Eng. (UPM)
Nashatul Zaimah Noor Azman, MSc Applied Plant Sci. (London)
Haliza Ismail, MSc Micropropagation (UPM)
Dr Siti Salwana Hj. Hashim, PhD Plant Genetic (UKM)(Sehingga September/until September)
Dr Ng Chin Hong, PhD Genetics (UKM)
Dr Shawn Cheng, PhD Molecular Biology & Genetic Eng. (UPM)
Dr Tnah Lee Hong, PhD Plant Genetic (UM)
Nor Asmah Hassan, MSc Botany (UKM)
Nadiah Salmi Nadzri, BSc (Hons) Genetics (UKM)
Noraliza Alias, BSc (Hons) Biotech. (UPM)

Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Siti Suhaila A. Rahman, MSc Plant Biotech. (UPM)
Nurul Farhanah Zakaria, BSc Biotech. (UPM)
Nazirah Abdullah, BSc Biotech. (UPM)
Dinaiz Thinagaran, BSc (Hons.) Genetics & Molecular Biology (UM)
Muhammad Fuad Yahya, B Biochemical Eng. (UIA)
Zahidah Zafhian, BSc (Hons.) Biomolecular Sci. (UiTM) (Mulai Jun/From June)

Program Hutan Ladang/Forest Plantation Programme
Ketua/Head
Dr Hj Ahmad Zuhaidi Yahya (AMN), PhD Growth & Yield Modelling (Irish U. Dublin)

Setiausaha Pejabat/Administrative Secretary
Nor Fazhani Hashim, Dip Office Mgt & Tech (UiTM)

Pegawai Penyelidik/Research Officers
Dr Hashim Md. Noor (AMP), PhD Pioneer Species (Wales) (Sehingga April/Until April)
Dr Ang Lai Hoe, PhD Plant & Soil Physiology (Aberdeen)



Dr Wan Rasidah Wan Abdul Kadir, PhD Soil Chem. (Ghent)
Tuan Hj. Abd. Razak Othman, MSc Botany (UKM)
Rosdi Koter, MSc Forest Meteor. (UPM)
Dr Lok Eng Hai, PhD Tree Ecophysiology (Murdoch Uni., Western Australia)
Dr Ho Wai Mun, PhD Silvic., Restoration & Ecology (SNU, Seoul)
V. Jeyanny Vijayanathan, MSc Soil Fertility & Mgmt (UPM)
Rozita Ahmad, BSc (Hons) Industrial Chem. (USM)
Mohamad Fakhri Ishak, BSc Forestry (UPM)

Penolong Pegawai Penyelidik/Assistant Research Officers
Suhaimi Wan Chik, Dip Agriculture (UPM)
Amir Saaiffuddin Kassim, MSc Forestry (UPM)

Penolong Pegawai Penyelidik (Kontrak)/ Assistant Research Officer (Contract)
Tang Lai Kuen, BSc Chem. & Biology (TARC)

Program Membaikbiak Tumbuhan/Plant Improvement Programme
Ketua/Head
Dr Mohd Zaki Abdullah, PhD Plant Genetic (UKM)

Pegawai Penyelidik/Research Officers
Dr Aminah Hamzah (KMN), PhD Forestry (Edinburgh)(Hingga April/until April)
Dr Mohamad Lokmal Ngah, PhD Forest Breeding (UNISZA)
Ahmad Fauzi Mohd. Shariff, BSc Agric. (UPM)
Dr Siti Salwana Hj. Hashim, PhD Plant Genetic (UKM) (Mulai Oktober/From October)
Dr Farah Fazwa Md Ariff, PhD Genetic (UKM)
Mohd Adi Faiz Ahmad Fauzi, BSc Indust. Statistic (UUM)(Sehingga April/until April)

Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Faridah Ahmad Azam, MSc Env. & Dev. (UKM) (Mulai 1 Mac/From 1 Mac)
Syafiqah Nabilah Samsul Bahari, BSc Biotech. (UIA)
Norhayati Saffie, BSc Agric. Biotech. (UniSZA)
Khairul Azwa Taharin, BSc Forestry (UMS) (Mulai 1 Julai/From 1 July)

Penolong Pegawai Penyelidik/Assistant Research Officers
Azril Deenor Md Dan, Dip. Microbio. (UiTM) (Hingga 25 Julai/until 25 July),
Muhammad Farhan Zolkifle, Dip Elect. Eng.(Politeknik Shah Alam)

Penolong Pegawai Taman/ Ladang/Assistant Garden/Plantation Officer
Mohd Ramly Mohd. Saleh, Dip Agric. (UPM)

BAHAGIAN BIODIVERSITI HUTAN/FOREST BIODIVERSITY DIVISION
Pengarah/Director
Dr Saw Leng Guan FASc, PhD (Reading)

Program Biodiversiti Flora/Flora Biodiversity Programme
Ketua/Head
Dr Richard Chung Cheng Kong FLS, PhD (UM)

Pegawai Penyelidik/Research Officers
Sam Yen Yen, M Agric. Sc. (UPM)
Chew Ming Yee, BSc For. (UPM)
Nor Ezzawanis Abdullah Thani, MSc (UKM)
Ummul Nazrah Abdul Rahman, MSc (UKM)
Syahida Emiza Suhaimi, MSc (UM)
Avelinah Julius, MSc (UMS)
Siti Munirah Mat Yunoh, MSc (UKM)



Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Dr E. Soepadmo, PhD (Cambridge)
Dr Ruth Kiew, PhD (Cantab.)
Rafidah Abdul Rahman, MSc (UM)
Nadiah Idris, BSc (Hons) (UKM)
Yao Tze Leong, MSc (UM)
Lim Chung Lu, BSc For. (UPM)
Joanne Tan Pei Chih, BSc Hort. (UPM)
Ong Poh Teck, BSc (UPM)

Penolong Pegawai Penyelidik/Assistant Research Officers
Kamarudin Saleh
Kamarul Hisham Mustafa, Dip Agric. Sc. (UPM)

Program Biodiversiti Fauna/Fauna Biodiversity Programme
Ketua/Head
Dr Laurence G Kirton, PhD (London)

Pegawai Penyelidik/Research Officers
Nada Badruddin, MSc (UM)

Pegawai Penyelidik Kontrak/Contract Research Officers
Phon Chooi Khim, MSc (USM)
Veronica Khoo Swee Imm, BSc (Hons) (USM)
Ong Su Ping, BSc (Hons) (USM)
Mohammad Shahfiz Azman, BSc (Hons) (UNIMAS)
Kaviarasu A/L Munian, BSc (Hons) (UPM)

Program Kesihatan dan Pemuliharaan Hutan/Forest Health and Conservation Programme
Ketua/Head
Dr Lee Su See (AMN), PhD (Aberdeen)

Setiausaha Pejabat/Administrative Secretary
Syuriani Mohd. Zaki, Dip Sec. Sc. (UiTM)

Pegawai Penyelidik/Research Officers
Dr Lillian Chua Swee Lian, PhD (Bath)
Dr Gary William Theseira, PhD (Mississippi)
Dr Mohd. Farid Ahmad, PhD (USM)
Patahayah Mansor, MSc (UPM)
Hamidah Mamat, MSc (Geoinformatics) (UTM)
Lau Kah Hoo, MSc (UKM)
Thi Bee Kin, MSc (UKM)
Suhaida Mustafa, BSc (UPM)

Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Chan Yoke Mui, MSc (UM)
Wendy Yong Sze Yee, MSc (UPM)
Aslina Baharum, MSc (UiTM) (Sehingga Oktober/Until October)
Wan Muhammad Azrul Wan Azhar, BSc (UiTM)
Mohd. Salleh Sanusi, Bsc (UiTM)

BAHAGIAN HASILAN SEMULA JADI/NATURAL PRODUCTS DIVISION
Pengarah/Director
Dr Rasadah Mat Ali (AMP), PhD Natural Products Chem. (London)



Setiausaha Pejabat/Administrative Secretary
Jesmini Mat Ali, Dip Sec. Science (UiTM)

Program Sumber Biologi/Biology Resource Programme
Ketua/Head
Zamree Md. Shah, MSc Food Chem. & Biochem. (UPM)

Pegawai Penyelidik/Research Officers
Hada Masayu Ismail @ Dahlan, B Process & Food Eng. (Hons.) (UPM)
Tan Ai Lee, MSc Plant Systematics (UKM)

Pegawai Penyelidik (Kontrak)/Research Officer (Contract)
Ihsan Safwan Kamarazaman, MSc Physiology (UPM)
Nurnida Mohd Kamal, MSc Botany (UKM)
Penolong Pegawai Penyelidik/Assistant Research Officer
Sharmizi Ismail, Dip Plant Indust. Mgmt (UiTM)
Penolong Pegawai Penyelidik (Kontrak)/Assistant Research Officer (Contract)
Mastura Mat Yasin, Dip Civil Eng. (UiTM)

Program Fitokimia/Phytochemistry Programme
Ketua/Head
Dr Ling Sui Kiong, PhD Natural Products Chem. (Nagasaki)

Pegawai Penyelidik/Research Officers
Fauziah Abdullah, MSc Natural Products Chem. (UKM)
Nor Hayati Abdullah, MSc Natural Products Chem. (UM)
Dr Zunoliza Abdullah, PhD Natural Products Chem. (USM)
Abdul Rashid Li, MSc Natural Products Chem. (UiTM)
Adiana Mohd Adib, MSc Synthetic Chem. (UTM)

Pegawai Penyelidik (Kontrak)/Research Officer (Contract)
Dr Tan Hooi Poay, PhD Natural Products Chem. (UM)
Nur Zalikha Mohd Taha, BSc Applied Chem. (UiTM)

Penolong Pegawai Penyelidik/Assistant Research Officers
Mohd Radzi Ahmad, Dip MLT (UKM)
Nuziah Hashim, Dip Industrial Chem. (UiTM)
Salbiah Man, Dip Industrial Chem. (UiTM)
Abdull Rashih Ahmad
Nor Azlianie Ablah, BSc Applied Chem. (UiTM)
Syazwani Dzolin, BSc Pure Chem. (UiTM)

Program Bioaktiviti/Bioactivity Programme
Ketua/Head
Dr Nik Musa'adah Mustapha, PhD Biomedical Sci. (London)

Pegawai Penyelidik/Research Officers
Dr Vimala Subramaniam, PhD Biotech. (UM)
Dr Mastura Mohtar, PhD Biomedical Sci.(UKM)
Zaridah Mohd. Zaki, M Health Sc. (UKM)
Chee Beng Jin, MSc Animal & Plant Physio. (UPM)
Mazura Pisar, MSc Biomedical Sci. (UKM)
Saiful Azmi Johari, MSc Genetic Eng. & Molecular Bio. (UPM)
Dr Fadzureena Jamaluddin, PhD Medicinal Chem. (UPM)
Dr Mary Khoo Gaik Hong, PhD Biomedical Sci. (Univ. of Surrey)

Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Khairul Kamilah Abd Kadir, MSc Physio. (UPM)
Mohd Kamal Nik Hasan, MSc Physio. (UPM)



Mohamad Jemain Mohamad Ridhwan, MSc Natural Prod. (UiTM)
Shalini Markandan, B Biomedical Sci.(Hons.) (MSU)
Dionysia Modingin, BSc (Hons.) Forestry (UMS)

Pegawai Sains (Kontrak)/Science Officer (Contract)
Siti Nur Aisyah Mohd Hashim, BSc (Hons.) Biomedical Sci. (UKM)

Penolong Pegawai Penyelidik/Assistant Research Officers
Rohana Sahdan, Dip Microbio. (UiTM)
Mazurah Mohamed Isa, Dip Microbio. (UiTM)

Program Pembangunan Produk Herba/Herbal Products Development Programme

Ketua/Head
Dr Nor Azah Mohamad Ali, PhD Natural Products Chem. (UPM)

Pegawai Penyelidik/Research Officers
Mailina Jamil, MSc Pharmacy (UKM)
Saidatul Husni Saidin, MSc Sistematic Bio. (UPM)
Norulaiman Yusoff, MSc Microbio.(UPM)
Ong Boo Kean, MSc Biotech.(UPM)

Pegawai Penyelidik (Kontrak)/ Research Officers (Contract)
Siti Humeirah Ab Ghani, MSc Biotech. & Biomolecular Sci.(UPM)
Sahrim Lias, BSc Electrical Eng. (UiTM)

Pegawai Sains (Kontrak)/Science Officer (Contract)
Muhd Hafizi Zainal, BSc Chem.(UKM)

Penolong Pegawai Penyelidik/Assistant Research Officer
Abdul Majid Jalil, Dip Chemical Eng (UTM)

Penolong Pegawai Penyelidik (Kontrak)/Assistant Research Officer (Contract)
Azrina Aziz, BSc Industrial Chem. (UiTM)

Pusat Teknologi Herba/Herbal Technology Centre

Ketua/Head
Zamree Md. Shah, MSc Food Chem. & Biochem.(UPM)

Pegawai Penyelidik/Research Officers
Dr Pin Kar Yong, PhD Chemical Eng. (UPM)
Noor Rasyila Mohamed Noor, MSc Genetic Eng. & Molecular Bio. (UPM)

Pegawai Penyelidik (Kontrak)/ Research Officers (Contract)
Daryl Jesus Arapoc, BSc (Hons.) Biomedicine (MSU)
Adib Zubaidi Rashid, B Eng., Bioprocess Eng. (UniMAP)

Pegawai Sains (Kontrak)/Science Officer (Contract)
Nurhazwani Mohd Hirmizi, BSc (Hons.) Materials Tech. (UiTM)

Pusat Penemuan Ubatan/Drug Discovery Centre

Ketua/Head
Dr Mohd Ilham Adenan, PhD Bioactive Chem.(Okayama)

Pegawai Penyelidik/Research Officers
Dr Getha Krishnasamy, PhD Microbial Biotech.(UM)
Dr Asiah Osman, PhD Biological Sci. (Griffith Univ.)
Dr Nurhanan Murni Yunos, PhD Medicine (Univ. of Sydney)



Lili Sahira Husin, BSc (Hons) Biochemistry (UPM)
Siti Syarifah Mohd Mutalip, BSc (Hons) Microbiology (UPM)
Norhayati Ismail, BSc (Hons) Microbiology (UPM)
Nor Datiakma Mat Amin, MSc Biotech. (UIAM)

Pegawai Penyelidik (Kontrak)/Research Officers (Contract)
Anee Suryani Sued, MSc Pharmacy (UKM)
Nur Fairuz Mat Yasin, MSc Information Mgmt (UiTM)
Muhammad Haffiz Jauri, MSc Synthetic Chem. (UTM)
Roshan Jahn Mohd Salim, MSc Biotechnology Eng. (UIAM)
Hema Thopla Govender, BSc (Hons), Industrial Biotech. (UNISEL)
Muhammad Syamil Azahar, MSc Synthetic Chem. (UTM)
Alia Aina Hj Anuar, BSc (Hons), Biomedical Sc. (UIAM)

BAHAGIAN PENTADBIRAN/ADMINISTRATION DIVISION

Pengarah/Director
Abdul Jabbar Hj Sabli, MBA (UKM)

Setiausaha Pejabat/Administrative Secretary
Suzrina Shamsuddin, Dip Sec. Sc. (UiTM)

Cawangan Pentadbiran Am/General Administration
Ketua/Head
Zamri Mohd. Zangi, BSc (Hons) (UUM)

Penolong Pegawai Tadbir/Assistant Administrative Officers
Md. Nasir Dayat (PPN, PJK)
Nazly Jamaludin

Cawangan Perolehan/Procurement Branch
Ketua/Head
Norli Raja Mohamad, Dip Bus. Stud. (UiTM)

Penolong Akauntan/Assistant Accountant
Norbaite Saharudin, Dip Bus. Stud. (UiTM)

Cawangan Pembangunan dan Penyelenggaraan/
Development and Maintenance Branch
Ketua/Head
Pegawai Tadbir/Administrative Officer
Noorsuhanis Abdul Latif, B (Hons.) (UiTM)

Penolong Juruukur Bahan/Assistant Quantity Surveyor
Jamal Abdul Razak, Dip Qty. Survey (UiTM)

Penolong Pegawai Penyelidik/Assistant Research Officer
Mohd Azhar Ishak @ Asahak, Dip Mech. Eng. (Polytech)

Penolong Jurutera/Assistant Engineer
Norhusaini Abdullah, Dip Power Elect. Eng. (UTM)

BAHAGIAN KEWANGAN/FINANCE DIVISION

Pengarah/Director
Mohd Zamshari Hj Abd Rahman, MBA (UIAM)

Setiausaha Pejabat/Administrative Secretary
Sarina Hussin, Dip Sec. Sc. (UiTM)



Akauntan/Accountants
Jumaaton Abu Bakar, B Acc. (Hons) (UiTM)
Saizatul Maheran Ramle, B Acc.(Hons) (UiTM)

Penolong Akauntan/Assistant Accountants
Zainorasri Yahya, B Acc. (Hons) (UiTM)
Emylia Ayoub, Dip in Banking (UiTM)

BAHAGIAN SUMBER MANUSIA/HUMAN RESOURCE DIVISION

Pengarah/Director
Norhara Hussein, BSc Hon, USM

***Cawangan Perjawatan dan Perkhidmatan*/Establishment and Services Branch**
Ketua/Head
Mohd. Asmawee Ismail, MBA (Human Res. Mgmt) (UPM)

Penolong Pegawai Tadbir/Assistant Administration Officer
Nur Azani Abdul Rasid, B HRM (Hons) (UUM)

***Unit Bimbingan AKRAB*/AKRAB Guidance Unit**
Ketua/Head
Mohd Akhir Abd Rahman, STPM

Cawangan Kompetensi dan Peperiksaan*/*Competency and Examination Branch
Ketua/Head
Azuarni Abdul Adzis, B (Hons.) Malay Lang. & Linguist. (UPM)

Cawangan Pembangunan Modal Insan/*Human Capital Development Branch*
Ketua/Head
Liza Ismail, M (Human Res. Dev.) (UPM)

BAHAGIAN PERKHIDMATAN TEKNIKAL/TECHNICAL SERVICES DIVISION

Pengarah/Director
Dr Khali Aziz Hamzah, PhD (Reading)

Setiausaha Pejabat/Administrative Secretary
Yang Nazli Yahya, Dip Sec. Sc. (UiTM)

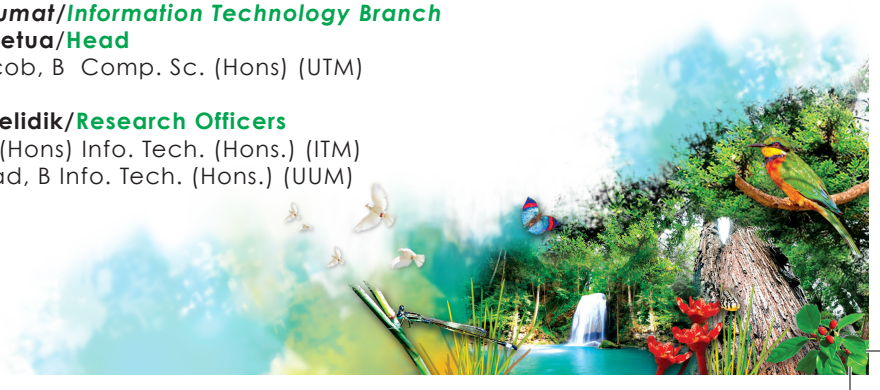
Cawangan Penerbitan*/*Publications Branch
Ketua/Head
Mohamad Zaki Hj Mohd. Isa, M Lib. Sc. (UIAM)

Pegawai Penyelidik/Research Officers
Ho Yuen Foon, MSc (UM)
Sarifah Kunju Ahmad, M Biotech. (UM)

Pegawai Penyelidik (Kontrak)/Research Officer (Contract)
Ida Suraini Abd. Shukor, MBA Gen. Mgmt. (UIA)

Cawangan Teknologi Maklumat*/*Information Technology Branch
Ketua/Head
Wan Zahiri Wan Yaacob, B Comp. Sc. (Hons) (UTM)

Pegawai Penyelidik/Research Officers
Zahari Othman, BSc (Hons) Info. Tech. (Hons.) (ITM)
Norul Maslissa Ahmad, B Info. Tech. (Hons.) (UUM)



Maizura Ishak, BSc Comp. (Hons.) (UTM)
Nurul Hilal A. Tarmidzi, BSc (Hons) Info Tech. (UNISEL)

Pegawai Teknologi Maklumat (Kontrak)/Information Technology Officer (Contract)
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Siti Zaleha Abdul Goni, Dip Interact. Multimedia (UniKL)
Omar Ali Abdul Rahim, Dip Comp. Sc. (Poly. Ungku Omar)
Intan Farah Wahida Khabir, Dip Comp. Sc. (UiTM)
Nordaiman Shairi, Dip Comp. Sc. (UPM)

Cawangan Perpustakaan/Library Branch
Ketua/Head
Mastura Buang, MLib. Sc. (UIA)

Cawangan Pameran/Exhibition Branch
Ketua/Head
Wahayu Abd. Wahab, BComm (UPM)

Pereka Grafik/Graphic Artist
Rosdi Mohamad, Dip Comp. Sc. Multimedia (UTM)

Cawangan Arkib dan Antikuiti/Archive and Antiquity Branch
Ketua/Head
Noor Atizza Hj Mansor, MSc IT (UKM)

BAHAGIAN KOMERSIALISASI DAN INOVASI
COMMERCIALISATION AND INNOVATION DIVISION

Pengarah/Director
Mohd. Zamshari Hj. Abd Rahman, CA, CPA Aust, MBA (UIAM)

Cawangan Pengurusan Harta Intelek dan Inovasi
Intellectual Property Management and Innovation Branch
Ketua/Head
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Commercialization and Incubation Branch
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Pusat Perkhidmatan Setempat (PPS)/One-Stop-Service Centre
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Cawangan Perundingan/Consultancy Branch
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Dr Ismariah Hj. Ahmad, PhD Forest Resources Economics (Washington)

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Huda Farhana Muslim, MSc Tourism Management (UiTM)
Rohana Abd. Rahman, MSc Marketing (UPM)

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Dr Lim Hin Fui, PhD Social Anthropology (UM)
Norliyana Adnan, M. Eng. Env (UTM)
Nurul Husna Zaidi, MSc Conservation Biology (UKM)
Juliana Ahmad, BSc Agribusiness (UPM)

Pegawai Hal Ehwal Ekonomi (Kontrak)/Economist (Contract)
Noor Hazmira Merous, MSc Natural Resource and Environmental Economics (UPM)

Pegawai Penyelidik Sosial (Kontrak)/Social Research Officers (Contract)
Norshakila A/P Yusof, B Soc. Sc (Hons) (UKM)
Intan Nurulhani Baharuddin, B Soc. Sc (Hons) (UKM)

PENERBITAN

Pada tahun 2013, FRIM menghasilkan sejumlah 32 judul baharu bagi menyebar maklumat hasil penyelidikannya. Jumlah ini tidak termasuk buku *Foresters' Manual of Dipterocarps* yang dicetak semula disebabkan permintaan yang menggalakkan. Antara buku yang dicetak pada tahun 2013 ialah empat keluaran *Journal of Tropical Forest Science* (JTFS), empat keluaran surat berita, *FRIM in Focus* dan dua keluaran *Conservation Malaysia* yang memperihalkan tentang isu pemuliharaan tumbuhan dan haiwan yang terkini di Malaysia. Nilai faktor impak JTFS meningkat daripada 0.467 menjadi 0.537. Ketiga-tiga keluaran *JTFS, FRIM in Focus* dan *Conservation Malaysia* boleh dicapai secara dalam talian.



Sebanyak empat buku mesra ilmu diterbitkan pada tahun 2013. Tiga daripada buku tersebut mengkhusus kepada sejarah dan warisan FRIM iaitu *FRIM Warisan Kebangsaan*, *Forest Products R&D at FRIM: Yesterday and Today* dan *Khazanah Warisan Alam Semula Jadi: Koleksi Produk dan Artifak FRIM*.

PUBLICATIONS

In 2013, FRIM published a total of 32 new titles to disseminate information on its research findings. This total does not include *Foresters' Manual of Dipterocarps* which was reprinted due to good demand. Among them are four issues of the *Journal of Tropical Forest Science* (JTFS), four issues of FRIM's newsletter, *FRIM in Focus*, and two issues of *Conservation Malaysia*, the newsletter that focuses on current conservation issues of flora and fauna in Malaysia. The impact factor for JTFS increased from 0.467 to 0.537. The JTFS, *FRIM in Focus* and *Conservation Malaysia* are available on-line.

A total of four coffee-table books were published in 2013, three of which dealt specifically with the history and legacy of FRIM, namely, *FRIM Warisan Kebangsaan*, *Forest Products R&D at FRIM:*



Pada bulan Ogos 2013, Kedai Buku FRIM menyambut ulang tahun ke-11. Antara aktiviti yang dijalankan untuk sambutan ulang tahun ke-11 ialah pemberian buku percuma untuk pengunjung kedai buku dan kuiz untuk pelanggan. Sepanjang bulan Ogos, beg *non-woven* percuma diberi untuk setiap pembelian RM50. Ejen buku yang membuat pembelian terbanyak dari September 2012 hingga Ogos 2013 diberi ganjaran berupa diskaun sebanyak 40% untuk pembelian buku FRIM pada bulan Oktober dan November 2013.

Yesterday and Today and *Khazanah Warisan Alam Semula Jadi: Koleksi Produk dan Artifak FRIM*.

In the month of August 2013, FRIM Bookstore celebrated its 11th anniversary. Among the activities organised during the anniversary celebration were giving away of free books and quizzes. Non-woven bags were also given free for every RM50 spent. A book agent who was the top buyer of FRIM books from September 2012 till August 2013 was given 40% discount for books purchased in October and November 2013.

Jenis penerbitan Types of publications	Judul Title	Bil. No.
Journal of Tropical Forest Science	JTFS23(1-4)	4
Malayan Forest Records	Flora of Peninsular Malaysia Series I: Ferns and Lycophytes, Volume 2 Flora of Peninsular Malaysia Series II: Seed Plants, Volume 4	2
FRIM in Focus	March, June, September, December	4
Research Pamphlet	A Revised Moss Checklist of Peninsular Malaysia and Singapore	1
FRIM Reports	Aktiviti Penerbitan di FRIM: Satu Perspektif Sejarah	1
FRIM Technical Information	Authentication of Herbal Raw Materials: *Labisia pumila* (Kacip Fatimah)	1
Timber Technology Bulletin	Wood Properties of Selected Plantation Species: *Khaya ivorensis* (African Mahogany), *Azadirachta excelsa* (Sentang), *Endospermum malaccense* (Sesendok) and *Acacia mangium* Good Practices in Producing Laminated Scantling Focus on Forest Products	3
Special Publications	Malaysian Herbal Heritage FRIM Warisan Kebangsaan Forest Products R&D at FRIM: Yesterday and Today Khazanah Warisan Alam Semula Jadi: Koleksi Produk dan Artifak FRIM	4
Conservation Malaysia	Conservation Malaysia No. 17 Conservation Malaysia No. 18	2
Proceedings	Proceedings of the Seminar on Long-Term Ecological Research in East Asia Pacific Region (EAP-LTER2012) (CD) Prosiding Seminar Agri-Dana 2013 : R&D Perhutanan - Sumber Kekayaan Baharu Highlights of FRIM Projects: Project Evaluation & Montoring (PEM), 1 November 2012, Cameron Highlands (CD) Translating Natural Products R, D & C Intiatives in Line with Economic Transformation Programme: Proceedings of the Seminar on Medicinal and Aromatic Plants, 25–26 September 2012	4
Annual Report	Annual Report 2012	1



Jenis penerbitan Types of publications	Judul Title	Bil. No.
Other Publications	Financial Analysis of Establishing *Gigantochloa albociliata* (Buluh Madu) Plantation for Shoot Production in Perlis Pokok Arboretum di Hutan Simpan Pasoh/Arboretum Trees of Pasoh Forest Reserve Chain-of-Custody Certification Based on Program for the Endorsement of Forest Certification (PEFC) Scheme: Manufacturer FRIM Innovation and Technology 2012 Tumbuhan Pesisir Pantai: Fenologi dan Penyediaan Bahan Tanaman	5
Jumlah penerbitan baharu/Total number of new publications		32

SENARAI PENERBITAN/PUBLICATIONS LIST

	BUKU / BOOKS
1	**ABD. LATIF, M., SHAMSUDIN, M., ISMAIL, P. & NIK ZANARIAH, N.M.** FRIM Warisan Kebangsaan. Institut Penyelidikan Perhutanan Malaysia, Kepong. 342 pp.
2	**AZHARIZAN, M.N., ISMAIL, H. & KHAIRUL, A.** Chain of Custody Certification: Based on Program for the Endorsement of Forest Certification (PEFC) Schemes: Manufacturer. Forest Research Institute Malaysia, Kepong. 134 pp.
3	**GAN, K.S., ISMAIL, P., GETHA, K., CHUNG, R.C.K., MOHD. ROSLI, H. & NIK ZANARIAH, N.M.** (Eds.) Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013, Shah Alam. 266 pp.
4	**GAN, K.S., LIM, S.C. & RAHIM, S.** Forest Products R&D FRIM at FRIM - Yesterday & Today. Forest Research Institute Malaysia. Kepong. 140 pp.
5	**HAMDAN, O., KHALI AZIZ, H., TAKAO, G., SATO, T. & MOHD. PARID, M.** (Eds.) Proceedings Workshop on REDD+ Research Project in Peninsular Malaysia, 4 February 2013, Kuala Lumpur. 137 pp.
6	**HO, Y.F.** Aktiviti penerbitan di FRIM: Satu Perspektif Sejarah. *FRIM Reports No.* 99, Forest Research Institute Malaysia, Kepong. 22 pp.
7	**IDA SURAINI, A.S.** (Ed.) FRIM Innovation and Technology 2012. Forest Research Institute Malaysia, Kepong. 37 pp.
8	**JOANN, C.L., AHMAD SHAHAR, M.Y., AMINUDIN, A.A., MOHAMMAD ROZAIMI, M.N., ABU HUSIN, H. & FLETCHER, C.** Pokok Arboretum di Hutan Simpan Pasoh, Forest Research Institute Malaysia, Kepong. 85 pp.
9	**KIEW, R., CHUNG, R.C.K., SAW, L.G., SOEPADMO, E.** Flora of Peninsular Malaysia Series II: Seed Plants, Volume 4. Forest Research Institute Malaysia. 405 pp.
10	**MASTURA, M., ASIAH, O., ADIANA, M.I. & HADA MASAYU, I.** (Eds.) Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme, 25–26 September 2012, Kuala Lumpur. Forest Research Institute Malaysia. 261 pp.
11	**MOHD. AFENDI, H., MARZALINA, M., TARIQ MUBARAK, H., WAN TARMEZE, W.A.** Tumbuhan Pesisir Pantai: Fenologi, Penyemaian Biji Benih dan Pengutipan Benih Liar. 120 pp.
12	**NOOR ATIZZA, M., KHALI AZIZ, H., WAN ZAHIRI, W.Y. & NIK ZANARIAH, N.M.** Khazanah Warisan Alam Semula Jadi –Koleksi Produk & Artifak, Institut Penyelidikan Perhutanan Malaysia. Kepong. 127 pp.
13	**PARRIS, B.S., KIEW, R., CHUNG, R.C.K. & SAW, L.G.** (Eds.) Flora of Peninsular Malaysia Series I: Ferns and Lycophytes, Volume 2. Forest Research Institute Malaysia. 243 pp.
14	**ROSHAMIDA, R., SUFFIAN, M., MOHD ROSLI, H. & HO, Y.F.** (Eds.) Highlights of FRIM's R&D Projects 2012, Forest Research Institute Malaysia, Kepong. 68 pp. (CD)
15	**SALLEH, M., ABD. RAZAK, O. & AZHAN SHAH, I.** Financial Analysis of Establishing *Gigantochloa albociliata* (Buluh Madu) Plantation for Shoot Production in Perlis. Forest Research Institute Malaysia, Kepong.16 pp.
16	**VIMALA, S.** *et al*. Malaysia Herbal Heritage. Forest Research Institute Malaysia. Kepong. 131 pp.
17	**YONG, K.T., TAN, B.C., HO, Q.Y. & MOHAMED, H.** A Revised Moss Checklist of Peninsular Malaysia and Singapore. Research Pamphlet No. 133. Forest Research Institute Malaysia. 152 pp.



	BAB BUKU/CHAPTER IN A BOOK
1	**ADNAN, M., AHMAD, ZUHAIDI, Y., ABD. LATIF, M., MUHAMAD FARID, M.R., NOORSUHANIS, A.L., MOHAMAD ZAKI, A. & SHAMSUDIN, I.** Hak milik kawasan. Pp. 30–42 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
2	**ABD. LATIF, M., SHAMSUDIN, I., ISMAIL, P. & NIK ZANARIAH, N.M.** Aspirasi masa hadapan FRIM. Pp. 315–320 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
3	**AHMAD AZARUDDIN, M.N., AZAHARI, M.Y. & NOOR AZLIN, Y**. Penanaman pokok oleh VIP. Pp. 190–202 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
4	**AHMAD, ZUHAIDI, Y. & HASHIM, M.N.** Petak tanaman percubaan. Pp. 101–123 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
5	**AZIAN, M., ISMAIL, P. & HAMDAN, O.** Research and development activities towards sustainable management of mangroves in Peninsular Malaysia. Pp. 373–390 in Faridah, H. *et al*. (Eds.) *Mangrove ecosystem of Asia. Status, Challenges and Management Strategies*. Springer, New York.
6	**CHEE, B.J. & NIK MUSA'ADAH, M.** Men's health. Pp. 55–78 in Vimala, S. (Ed.) *Malaysian Herbal Heritage*. Forest Research Institute Malaysia. Kepong.
7	**CHUA, L.S.L.** Conservation. Pp. 199–201 in Parris, B.S., Kiew, R., Chung, R.C.K & Saw, L.G (Eds.) *Flora of Peninsular Malaysia Series I: Ferns and Lycophytes, Vol. 2*. Forest Research Institute Malaysia, Kepong.
8	**CHUNG, R.C.K. & JULIUS, A**. Flora: Herbarium Kepong. Pp. 149–158 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
9	**FADZUREENA, J., ROHANA, S. & SITI NUR AISYAH, M.H.** Woman's health. Pp. 31–54 in Vimala, S (Ed.) *Malaysian Herbal Heritage*. Forest Research Institute Malaysia. Kepong.
10	**ISMAIL, H. & TARIQ MUBARAK, H.** Pelan pemuliharaan dan pengurusan bersepadu. Pp. 224–246 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
11	**ISMAIL, H., ISMAIL, P., ABD. RAHMAN, K. & MOHD SADALI, S**. Kawasan hutan asli dan hutan ditanam. Pp. 62–76 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
12	**MAILINA, J. & NOR AZAH, M.A.** Aromatic plants for personal care. Pp. 79–102 in Vimala, S. (Ed.) *Malaysian Herbal Heritage*. Forest Research Institute Malaysia. Kepong.
13	**NIK ZANARIAH, N.M., MOHAMAD ZAKI, A., CHRISTINE, F., HARFENDY, O., ROSDI, K., ANG, L.H., RASADAH, M.A., MOHD. NOOR, M., AHMAD ZUHAIDI, Y., EMLEE, T. & HADA MASAYU, I.** Stesen-Stesen Penyelidikan FRIM. Pp. 288–312 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
14	**NOORSIHA, A. AHMAD AZARUDDIN, M.N., MOHD. SHAHFIZ, A. & MOHD. SADALI, S.** Keunikan flora, fauna dan fenomena alam. Pp. 204–224 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanarian, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
15	**NOR AZAH, M.A. & LING, S.K**. Introduction to Malaysian Herbal Heritage. Pp. 1–6 in Vimala, S. (Ed.) *Malaysian Herbal Heritage*. Forest Research Institute Malaysia. Kepong.
16	**NOR EZZAWANIS, A.T.** Parkeriaceae. Pp. 33–41 in Parris, B.S., Kiew, R., Chung, R.C.K & Saw, L.G (Eds.) *Flora of Peninsular Malaysia Series I: Ferns and Lycophytes, Vol. 2*. Forest Research Institute Malaysia, Kepong.
17	**NOR EZZAWANIS, A.T**. Plagiogyriaceae. Pp. 27–32 in Parris, B.S., Kiew, R., Chung, R.C.K & Saw, L.G (Eds.) *Flora of Peninsular Malaysia Series I: Ferns and Lycophytes, Vol. 2*. Forest Research Institute Malaysia, Kepong.
18	**PHON, C.K.** Kupu-kupu 'The Golden Birdwing'. P. 171 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
19	**SHAMSUDIN, I. & ISMAIL, P.** Pengenalan. Pp. 20–28 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
20	**SITI AISAH, S., MARRYANNA, L. & ABD. RAHMAN, K.** Ekohidrologi. Pp. 56–60 in Abd. Latif, M., Shamsudin, I., Ismail, P. & Nik Zanariah, N.M. (Eds.) *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong.
21	**TAN, A.L., CHANG, Y.S. & ZAINON, A.S.** General tonics. Pp. 7–30 in Vimala, S. (Ed.) *Malaysian Herbal Heritage*. Forest Research Institute Malaysia. Kepong.
22	**VIMALA, S. & SHALINI, M.** Preventive health care. Pp. 103–125 in Vimala, S. (Ed.) *Malaysian Herbal Heritage*. Forest Research Institute Malaysia. Kepong.
	ARTIKEL JURNAL/JOURNAL ARTICLES
1	**AHMAD MAELA, B., PARIDAH, M.T., RAHIM, S., ANWAR, U.M.K. & HUSSEINIC AGHMED, S**. Effect of fiber extraction methods on some prioperties of kenaf bast fiber. *Industrial Crops and Products* 46: 117–123.
2	**AHMAD NAZIF, A., HALIJAH, I., DEVY ROSMY, S., MASTURA, M., JAYA, V. & KHALIJAH, A.** Antimicrobial compounds from *Alpinia conchigera*. *Journal of Ethnopharmacology* 145 (2013): 8–802.



3	**AHMAD ZUHAIDI, Y.** A crown diameter prediction model for plantation-grown *Neolamarckia cadamba*. *Journal of Tropical Forest Science* 25(4): 446–453.
4	**AISAH, M., SITI NORASMAH, S. & WAN ASMA, I.** Renewable sugars hydrolyzed from banana pseudo-stem using different chemical pretreatments. *Applied Mechanics and Materials* 372: 97–100.
5	**AMINAH, H., NAIMAH, C.L., RAJA BARIZAN, R.S. & MOHD NOR, M.**Effect of light intensity and fertiliser levels on the stock plants of chengal (*Neobalanocarpus heimii*) and rooting of its subsequent cuttings. *Sains Malaysiana* 42(3): 257–263.
6	**AZHARIZAN, M.N., ROHANA, A.R., ISMAIL, P. & MOHD IZWAN, R.** The chain-of-custody certification trend in Malaysia since 2001 to 2009 under the Malaysian Timber Certification Scheme. *International Journal of Advanced Research in Management and Social Sciences* 2(9): 190–197.
7	**AZWAN, M.L., MUSA, A., ZURIATI, Z., M. SUZEREN, J., SURIA, R., FAIZ, Z., MOHD NASIR, T. & MOHD NASIR, M.A.** Kajian awal penggunaan Jaringan Neural Tiruan (ANN) bagi menentukan nilai peroksida tiga minyak sawit komersil berdasarkan spektrum FTIR. *The Malaysian Journal of Analytical Sciences* 17(3): 376–386.
8	**BALDECK, C.A., KEMBEL, S.W., HARMS, K.E., YAVITT, J.B., JOHN, R., TURNER, B.L., CHUYONG, G.B., KENFACK, D., THOMAS, D.W., MADAWALA, S., GUNATILLEKE, N., GUNATILLEKE, S., BUNYAVEJCHEWIN, S., KIRATIPRAYOON, S., YAACOB, A., NUR SUPARDI, M.N., VALENCIA, R., NAVARRETE, H., DAVIES, S.J., HUBBELL, S. & DALLING, J.W.** A taxonomic comparison of local habitat niches of tropical trees. *Oecologia*.
9	**BALKIS FATOMER, A.B., PARIDAH, M.T., KARIMI, A., EDI, S.B., ANWAR, U.M.K. & ADRIAN, C.Y.C.** Evaluations of some physical properties for oil palm as alternative biomass resources. *Wood Material Science and Engineering* 8(2): 119–128.
10	**BINU, M.T., MINCHEOL, K., ANG, L.H., NOR AINI, A.S., RAHA, A.R., RUSEA, G. & JONATHAN, M.A.** pH dominates variation in tropical soil archaeal diversity and community structure. *FEMS Microbiology Ecology* 86(2): 303–311.
11	**CHENG, S., LEE, C.T., WAN MOHD HAFIZUL, W.A. & TAN, S.G.** Microsatellite markers uncover cryptic species of *Odontotermes* (Termitoidae: Termitidae) from Peninsular Malaysia. *Gene* 518(2): 412–418.
12	**CHISHOLM, R.A., MULLER-LANDAU, H.C., ABDUL RAHMAN, K., BEBBER, D.P., BIN, Y.** *et al*. Scale-dependent relationships between tree species richness and ecosystem function in forests. *Journal of Ecology* 101(5): 1214–1224.
13	**EA LIN, L., TIONG, C.S., XUE, F.K., HABIBAH, A.W., MOHD ILHAM, A., MOHD FADZLY AMAR, JAMILL, MOHD ISA, A.M. & TAN, M.L.** In vitro evaluation of cytochrom P450 induction and inhibition potential of mitraganine, a stimulant alkaloids. *Toxicology In Vitro* 27: 812–824.
14	**FARAH FAZWA, M.A., SYAFIQAH NABILAH, S.B., MOHD ZAKI, A. & NORHAYATI, S.** Evaluation of ecophysiological characteristcs of natural habitats for *Labisia pumila* in several forest reserves, Peninsular Malaysia. *Malaysian Forester* 76(1): 17–28.
15	**GAN, K.S., KHAIRUL AZMI, J., ZAIRUL AMIN, R., PANG, S.K., TAN, Y.E., LAU, L.H., MOHD ADAWI, T.O. & ZAIHAN, J.** Fire performance of timber door frame. *Journal of Tropical Forest Science* 25(3): 429–436.
16	**HAMDAN, O., KHAIRUNNISA, M.R., AMMAR, A.A. MOHD HASMADI, I. & KHALI AZIZ, H.** Mangrove carbon stock assessment by optical satellite imagery. *Journal of Tropical Forest Science* 25(4): 554–565.
17	**HAMDAN, O., NUR LAILA, C.M., KHALI AZIZ, H. & MOHD HASMADI, I.** L-Band Synthetic Aperture Radar (SAR) response to the tropical forest stands for carbon stock assessment. *AIP Conference Proceeding* 1528(76): 76–81.
18	**INTAN, S., AMIZON, A., RUZITAH, M.S., RAFIDAH, J., TENGKU ELIDA, T.Z.M., NADZEERAH, I., SANDRA, U. & AIMI LIYANA, S.** Biomaterials availability: Potential for Bioethanol production. *Advanced Materials Research* 701(2013): 243–248.
19	**ISHAK, M.R. LEMAN, Z., SAPUAN, S.M., RAHMAN, M.Z.A. & ANWAR, U.M.K.** Impregnation modification of sugar palm fibres with phenol formaldehyde and unsaturated polyester. *Fibers and Polymers* 14(2): 250–257.
20	**ISHAK, M.R., LEMAN, Z., SAPUAN, S.M., RAHMAN, M.Z.A. & ANWAR, U.M.K.** Chemical composition and FT-IR spectra of sugar palm (*Arenga pinnata*) fibers obtained from different heights. *Journal of Natural Fibers* 10(2): 83–97.
21	**ISHAK, M.R., LEMAN, Z., SAPUAN, S.M., RAHMAN, M.Z.A., ANWAR, U.M.K. & RIAZ, A.** IFSS, TG, FT-IR spectra of impregnated sugar palm (*Arenga pinnata*) fibres and mechanical properties of their composites. *Journal of Thermal Analysis and Calorimetry* 111(2): 1375–1383.
22	**JEYANNY, V., BALASUNDRAN, S.K., HUSNI, M.H.A., WAN RASIDAH, K. & ARIFIN, A.** Spatial variability of selected forest soil properties related to carbon management in tropical lowland and montane Forests. *Journal of Tropical Forest Science* 25(4): 577–591.
23	**JOANN, C.L., FLETCHER, C. & ABD. RAHMAN, K.** Spatial effects of virgin jungle reserves (VJR) on the community of insectivorous bats in Peninsular Malaysia. *Journal of Tropical Forest Science* 25(1): 118–130.
24	**JULIUS, A., IMIN, K., KIEW, R. & UTTERIDGE, T.M.A.** *Gardneria* and *Spigelia* (Loganiaceae), two genera new to the Flora of Peninsular. *Phytotaxa 129(1)*: 39–46.
25	**KHALI AZIZ, H., AZHAN SHAH, M.I. & ISMAIL, P.** Classification of degraded peat swamp forest for restoration planning at landscape level using remote sensing technique. *Journal of Forest Scienc* 9(1): 49–57.
26	**KIEW, R & SANG, J.** Two new *Monophyllaea* (Gesneriaceae) species from Sarawak, Borneo. *Phytotaxa* 129(1): 59–64.
27	**KIEW, R.** *Ridleyandra chuana* (Gesneriaceae), a new species from Peninsular Malaysia. *PhytoKey* 25: 15–19.
28	**LATIFAH, J., SAMUEL, E., RACHEL, W. & WIM, T.** A facile one-pot route to cationic cellulose nanocrystals. *Nanoscale* 5: 10207–10211.



29 **LEE, S.L., CHUA, L.S.L, NG, K.K.S., HAMIDAH, M., LEE, C.T., NG, C.H., TNAH, L.H. & HONG, L.T.** Conservation management of rare and predominantly selfing tropical trees: an example using *Hopea bilitonensis* (Dipterocarpaceae). *Biodiversity and Conservation* 22: 2989–3006.

30 **LILI SHAHIRA, H., GETHA, K., MOHD ILHAM, A., NORHAYATI, I., SITI SYARIFAH, M.M., MUHD, SYAMIL, A., MUHD HAFFIZ, J. & HEMA, G.T.** In vitro evaluation of antitrypanosomal and cytotoxic activities of soil actinobacteria isolated from Malaysian forest. *African Journal of Agricultural Research* 8(3): 484–490.

31 **LIM, C.L., JUTTA, M., KIEW, R., O'BYRNE, P. & ONG, P.T.** Conservation status of some orchids in Peninsular Malaysia. *Malesian Orchid Journal* 12: 133–146.

32 **MARRYANNA, L., SITI AISHA, S., ABD. RAHMAN, K. & MOHD, M.S.** Suspended sediment response on improved harvesting protocol in an upper hill dipterocarp forest, Peninsular Malaysia. *International Journal of Chemical and Environmental Engineering* 3(6):

33 **MOHAMAD NASIR, M.A., LEE, Y.H. & MUSA, A.** Reaction of 2,6-Dichloroquinone-4-Chloroimide (Gibbs Reagent) with permethrin – An optical sensor for rapid detection of permethrin in treated wood. *Chemistry Central Journal* 7(122): 1–9.

34 **MOHAMAD NASIR, M.A., LEE, Y.H., MUSA, A. & SALMIAH, U.** A Cell-based potentiometric biosensor using the Fungus *Lentinus* sajor-caju for permethrin determination in treated wood. *Talanta* 116: 776–781.

35 **MOHD FADZLY AMAR, J., MOHD FIRDAUES, M.S., TAN, M.L., MOHD ISA, A.M. & MOHD ILHAM, A.** The effect of mitragynine on cAMP formation and mRNA expression of mu-opioid receptors mediated by chronic morphine treatment in SK–N–SH neuroblastoma cell. *Journal of Ethnopharmacology* 148: 135–143.

36 **MOHD JAMIL, A.W., MOHD ZAMIN, J. & MOHAMAD OMAR, M.K.** Mechanical properties relationship between structural size and small clear specimens of timber. *Journal of Tropical Forest Science* 25(1): 12–21.

37 **MOHD PARID, M., MOHD RUSLI, Y., ALIAS, R., AWANG NOOR, A.G & LIM, H.F.** Willingness to pay for protecting natural environments in Pulau Redang Marine Park, Malaysia. *African Journal of Business Management* 7(25): 2420–2426.

38 **MUHD HAFFIZ, J., NORHAYATI, I., GETHA, K., NOR AZAH, M.A., MOHD ILHAM, A., LILI SHAHIRA, H., ROSHAN JAHN, M.S. & MUHD SYAMIL, A.** Chemical composition and in vitro antitrypanosomal activity of fractions of essential oil from *Cymbopogon nardus* L. *Tropical Biomedicine* 30(1): 9–14.

39 **MURATA, Y., TANAKA, R., FUJIMOTO, K., KOSUGI, A,. ARAI, T., TOGAWA, E., TAKANO, T., WAN ASMA, I., PUAD, E., OTHMAN, S., ROKIAH, H. & MORI, Y**. Development of sap compressing system from oil palm trunk. 2013. *Biomass and Bioenergy* 51: 8 – 16

40 **NAZRE, A.R., MOHD NASIR, T., ZUNAIRAH, M., ROS SHILAWANI, S.A.K., SAHRIM, L. & NORIZAM, S**. Kolb's learning style correlate to extraversion using EEG and clustering analysis. *International Journal of Electrical and Electronic Systems Research (IEESR)* 6: 1–10.

41 **NOOR AINI, Z., NOOR HAZMIRA, M., HAFIZAH, A.R. & ADIBAH, H.** Export-Led Growth Theory: Malaysian Timber Industry. *International Journal of Business and Technopreneurship* 3(2): 319–328.

42 **NOORUL ADAWIAH, M., MOHD ASPOLLAH, S., AHMAD BUSTAMAM, A., NOR AZAH, M.A. & GWENDOLINE, E.C.L.** Evaluation of biological activities of *Alpinia mutica* Roxb and its chemical constituents. *Pakistan Journal Pharmaceutical Science* 26(2): 391–395.

43 **NOR AKMALAZURA, J., HASNAH, M.S., NOR AZAH, M.A. & AZRINA, A.** Chemical compositions of the rhizome, leaf and stem oils from Malaysian *Hornstedtia leonorus*. *Natural Products Communications* 8(4): 513–514.

44 **NOR AZAH, M.A., SAIDATUL HUSNI, S., MAILINA, J., SAHRIM, L., ABDUL MAJID, J. & MOHD FARIDZ, Z.** Classification of agarwood (gaharu) by resin content. *Journal of Tropical Forest Science* 25(2): 213–219.

45 **NORDAHLIA, A.S., ANWAR, U.M.K., HAMDAN, H., ABD. LATIF, M. & MAHANIM, S.M.A.** Anatomical, physical and strenght properties of *Schizostachyum brachycladum* (buluh lemang). *Journal of Bamboo and Rattan* 10(3&4): 111–123.

46 **NORHAIZAN, M.E., KHAIRUL KAMILAH, A.K., ZULKHAIRI, A. & AZRINA, A.** Antioxidant activity of white rice, brown rice and germinated brown rice (in vivo and in vitro) and the effects on lipid peroxidation and liver enzymes in hyperlipidaemic rabbits. *Food Chemistry* 141: 1306–1312.

47 **NORHAYATI, I., GETHA, K., MUHD HAFFIZ, J., MOHD ILHAM, A., LILI SHAHIRA, H., SITI SYARIFAH, M.M. & MUHD SYAMIL, A.** *In vitro* antitrypanosomal activity of Malaysian plants. *Journal of Tropical Forest Science* 25(1): 52–59.

48 **NORUL IZANI, M.A., PARIDAH, M.T., ANWAR, U.M.K., MOHD NOR, M.Y. & H'NG, P.S**. Effects of fiber treatment on morphology, tensile and thermogravimetric analysis of oil palm empty fruit bunches fibers. *Composites Part B* 45(2013): 1251–1257.

49 **NORUL IZANI, M.A., PARIDAH, M.T., MOHD NOR, M.Y. & ANWAR, U.M.K.** Properties Of Medium-Density Fibreboard (Mdf) made from treated empty fruit bunch of Oil Palm. *Journal of Tropical Forest Science* 25(2): 175–183.

50 **NURHANAN, M.Y., SITI SYARIFAH, M.M., MUHD HAFFIZ, J. & HUD, F. & YU, J.Q.** Anti-proliferative and apoptotic effects of combined andrographolide and cisplatin against ovarian cancer cells. *Anticancer Research* 33(10): 4365–4371.

51 **NURLAILA, I., NOR AZAH, M.A.., MAILINA, J., MOHD HEZRI, F.R., SAIFUL NIZAM, T. & MOHD NASIR, T.** Analysis of high quality agarwood iol chemical compounds by means of SPME/GC-MS and Z-Score technique. *Malaysian Journal of Analytical Sciences* 17 (3): 403–413.

52 **NURLAILA, I., NOR AZAH, M.A.., MAILINA, J., MOHD HEZRI, F.R., SAIFUL NIZAM, T. & MOHD NASIR, T.** Differentiating agarwood oil quanlity using artificial neural network. *Malaysian Journal of Analytical Sciences* 17(3): 490–498.

53 **NURNADIHA, R., DZARAINI, K., ABDUL, RASHID, L. & MOHD RADZI, A.** Synthesis and characterization of cosslinked *Galactomannan* nanoparticles for drug delivery application. *Advanced Materials Research* 812: 12–19.



54 **NURSAKINAH, I., ZULKHAIRI, H.A., NORHAFIZAH, M., HASNAH, B., ZAMREE, M.S., FARRAH SHAFEERAL, I, RAZIF, D. & HAMDAH FANZURI, H.** Nutritional content and in vitro antioxidant potential of *Garcinia atroviridis* (asam gelugor) leaves and fruits. *Malaysian Journal of Nutrition* 18(3): 363–371.

55 **NURULHUSNA, M.H., SUHAIMI, M. & RUSHDAN, I.** Effect of Soda-Anthraquinone pulping conditions and beating revolution on the mechanical properties of paper made from *Gigantochloa scortechinii* (Semantan Bamboo). *Malaysian Journal of Analytical Science* 17(1): 75–84.

56 **O'BYRNE, P., ONG, P.T. & WOOD, J.J**. *Dendrobium* species in section distichophyllae from Borneo. *Malesian Orchid Journal* 11: 83–91.

57 **OHASHI, S., OKADA, S., ABDUL AZIM, A., SOMKID, S., TEERA, V., AHMAD ZUHAIDI, Y. & NOBUCHI, T.** Vessel feature changes as a tool for detecting annual rings in tropical forests. *Trees* 28: 137–149.

58 **OHTANI, M., KONDO, T., TANI, N., UENO, S., LEE, S.L., NG, K.K.S., NORWATI, M., FINKELDEY, R., NA'IEM, M., INDRIOKO, S., KAMIYA, K., HARADA, K., DIWAY, B., KHOO, E., KAWAMURA, K. & TSUMURA, Y.** Nuclear and chloroplast DNA phylogeography reveals Pleistocene divergence and subsequent secondary contact of genetic lineages of the tropical rainforest tree species *Shorea leprosula* (Dipterocarpaceae) in South-East Asia. *Molecular Ecology* 22: 2264–2279.

59 **ONG, P.T. & O'BYRNE, P**. A new *Anoectochilus* species from Peninsular Malaysia. *Malesian Orchid Journal* 11: 15–20

60 **ONG, P.T.** Flora of Peninsular Malaysia– Apostasioideae. *Malesian Orchid Journal* 12: 93–116.

61 **ONG, P.T.** Three new records of Orchidaceae for the Flora of Peninsular Malaysia. *Malesian Orchid Journal* 11: 63–69.

62 **PHILIP, E.** Post Rio+20: Where does Pam Oil and REDD stand? *Journal of Oil Palm and Environment* 4(4): 17–21.

63 **PHONGOUDOME, C., LEE, D.K., SAWATHVONG, S., PARK, Y.D., COMBALICER, M.S. & HO, W.M.** Changes in stand structure and environmental conditions of a mixed deciduous forest after logging and shifting cultivation in Lao PDR. *Asia Life Sciences* 22(1): 75–94.

64 **RAFIDAH, A.R. & HARON, N.W.** *Microchirita ruthiae* sp. nov. (Gesneriaceae) from Peninsular Malaysia. *Nordic Journal of Botany* 31(5): 612–615.

65 **RAMAGE, B.S., SHEIL, D., SALIM, H.M.W., FLETCHER, C., NUR ZATI, A.M., JOANN, C.L., HARRISON, R.D., ELIZABETH, B., AHMAD DZAMIR, D. & ABD. RAHMAN, K.** Pseudoreplication in tropical forests and the resulting effects on biodiversity conservation. *Conservation Biology* 27(2): 364–372.

66 **RAUTKARI, L., HILL, C.A.S., CURLING, S., ZAIHAN, J. & ORMONDROYD, G.** What is the role of the accessibility of wood hydroxyl groups in controlling moisture content? *Journal of Materials Science* 48: 6352–6356

67 **RAZAK, W., MOHAMMED, A.S., OTHMAN, S., MAHMUD, S., HASHIM, W.S. & MOHD SUKHAIRI, M.R.** Properties of engineered oil palm composite boards from 32 year-old tree stems. *Journal of Agricultural and Biological Science* 8(7): 541–545.

68 **RAZAK, W., MOHD TAMIZI, M., AMINUDIN, M., HASHIM, W.S. & MOHD SUKHAIRI, M.R.** Extractives, holocellulose, a-cellulose, lignin and ash contents in 3 year-old bamboo culms *Gigantochloa brang*, *G. Levis*. *G, Scortechinii* and *G. Wrayi*. *Research Journal of Pharmaceutical, Biological and Chemical Sciences* 4(3): 1235.

69 **ROHANA, A.R., MOHD PARID, M. & AZHARIZAN, M.N.** Conservation of forest reserve in urban area: how much residents' willingness to pay. *International Journal of Advanced Research in Management and Social Sciences* 2(10): 104–118.

70 **ROSZAINI, K., NOR AZAH, M.A., MAILINA, J., ZAINI, S. & MOHD FARIDZ, S.** Toxicity and antitermite activity of the essential oils from *Cinnamomum camphora*, *Cymbopogon nardus*, *Melaleuca cajuputi* and *Dipterocarpus* sp. against *Coptotermes curvignathus*. *Wood Science and Technology* 47(6): 1273–1284.

71 **ROZIELA, H., ZAIDON, A., ANWAR, U.M.K. & RAFIDAH, S**. Effects of chemical treatments on durability properties of *Gigantochloa scortechinii* strips and plybamboo. *Asian Journal of Biological Sciences* 6(3): 153–160.

72 **SAIFUL AZMI, J., NORHAYATI, S., MASTURA, M. & MAZURAH, M.I.** Anti methicillin resistant *Staphylococcus aureus* (MRSA) activities of compounds isolated from *Psidium guajava* Linn. leaves. *Malaysian Journal of Chemistry* 15(1): 001–005.

73 **SANG, J., KIEW, R. & GERI, C.** Revision of *Begonia* (Begoniaceae) from the Melinau Limestone in Gunung Mulu National Park and Gunung Buda National Park, Sarawak, Borneo, including thirteen new species. *Phytotaxa* 99(11): 1–34.

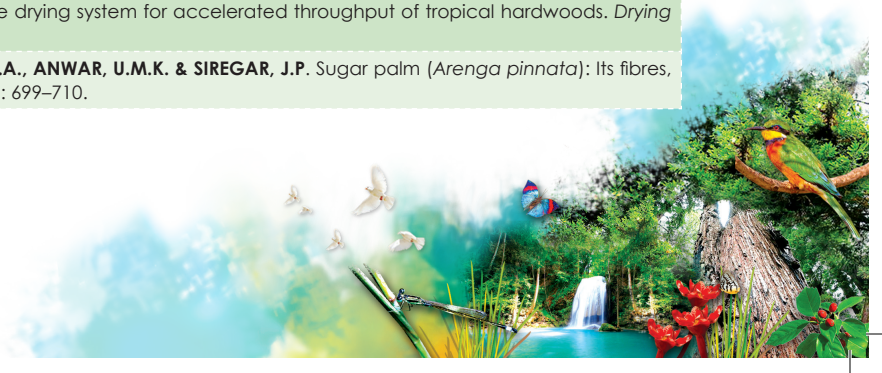
74 **SASE, H., CARANDANG, W.M., PHILIP, E., TAKAHASSHI, M. & YAMASHITA, M.** Forest and related ecosystem monitoring in acid deposition monitoring network in East Asia Ferretti. *Development in Environmental Science* 12: 33–48.

75 **SATOME, K., AKAGI, Y., LEE, S.S., ISHIKAWA, N.K. & HATTORI, T.** Taxonomic study of Favolus and Neofavolus gen. Nov. segregated from Polyporus (*Basidiomycota, Polyporales*). *Fungal Diversity* 58: 245–266.

76 **SHEUE, C.R., CHESSON, P., CHEN, Y.J., GUU, T.Y., WU, Y.H., YONG, J.W.H., LIM, C.L., RANDRIANASOLO, R.M.A., RAZANAJATOVO, M.H. & YANG, Y.P.** Comparative morphology and structure of colleters of the Rhizophoraceae. *Botanical Journal of the Linnean Society* 172: 449–464.

77 **SIK, H.S., CHOO, K.T. & WOON, W.C.** High temperature drying system for accelerated throughput of tropical hardwoods. *Drying Technology and Equipment* 11(1): 14–22.

78 **SISHAK, M.R., SAPUAN, S.M., LEMAN, Z., RAHMAN, M.Z.A., ANWAR, U.M.K. & SIREGAR, J.P**. Sugar palm (*Arenga pinnata*): Its fibres, polymers and composites. *Carbohydrate Polymers* 91: 699–710.



79	**SYAHIDA EMIZA, S., KIEW, R., HARON, N.W. & STAPLES, G.** Distribution, conservation status and threats to Erycibe species (Convolvulaceae) in Peninsular Malaysia. *Journal of Tropical Forest Science* 25(3): 325–338.
80	**TOSHIRO, Y., TETSURO, H., TOSHINORI, O. & ABD. RAHMAN, K.** Effects of 50 years of selective logging on demography of trees in a Malaysian lowland forest. *Forest Ecology and Management* 310: 531–538.
81	**YANTI, A.K., ABD. HAMID, S., HAMDAN, H., IZRAN, K. & KHAIRUL, M.** Physical and mechanical properties of Engineered Coconut Trunk (ECTV) for interior products. *International Journal on Coconut R&D CORD* 29(1): 12–56.
82	**ZARIZAL, S., SAIFUL AZMI, J., MOHAMMAD HAILMI, S., AZIFAH, Y., ZAINUL AMIRUDIN, Z., MOHD NASIR, M.D. & ABDUL MANAF, A.** In silico PCR verification and simplex Real-Time PCR detection of methicillin-resistant *Staphylococcus aureus* (MRSA) from east coast Malaysian clinical isolates. *Walailak Journal of Science and Technology* 10(3): 237–246.
83	**ZUKERI, M.R.H.M., GHAZALI, A., WAN ROSLI, W.D., RUSHDAN, I., AHMAD, T. & ZIYA, K.** Fiber morphological transition for extraordinary EFB pulp network: Effects of extended beating of EFB alkaline peroxide pulp. *Journal of Industrial Research & Technology* 3(1): 47–52.

ARTIKEL E-JOURNAL/E-JOURNAL ARTICLES

1	**BALDECK, C.A., HARMS, K.E., YAVITT, J.B., JOHN, R., TURNER, B.L., VALENCIA, R., NAVARRETE, H., DAVIES, S.J., CHUYONG, G.B., KENFACK, D., THOMAS, D.W., MADAWALA, S., GUNATILLEKE, N., GUNATILLE, S., BUNYAVEJCHEWIN, S., KIRATIPRAYOON, S., YAACOB, A., NUR SUPARDI, M.N. & DALLING, J.W.** Soil resources and topography shape local tree community structure in tropical forests. *Proceedings of the Royal Society B* 280(1753) doi: 10.1098/rspb.2012.2532.
2	**BALDECK, C.A., HARMS, K.E., YAVITT, J.B., JOHN, R., TURNER, BENJAMIN L.,VALENCIA, R., NAVARRETE, H., BUNYAVEJCHEWIN, S., KIRATIPRAYOON, S., YAACOB, A., NUR SUPARDI, M.N., DAVIES, S.J., HUBBELL, S.P., CHUYONG, G.B., KENFACK, D., THOMAS, D.W. & DALLING, J.W.** Habitat filtering across tree life stages in tropical forest communities. *Proceedings of the Royal Society B: Biological Sciences* 280(1766): 20130548. http://dx.doi.org/10.1098/rspb.2013.0548.
3	**BROWN, C. BURSLEM,D.F.R.P., LILIAN, J.B., BAO, L., BOROCELMA, W., CAO, M., CHANG, L.W., DATTARAJ, H.S., DAVIES, S., GUNATILLE, C.V.S., GUNATILLE, I.A.U.N., HUANG, J., KASSIM, A.R., LAFRANKIE, J.V., LIAN, J., LIN, L., MA, K., MI, X., NATHALANG, A., NOOR, S., ONG, P., SUKUMAR, R., SU, S.H., SUN, I.F., SURESH, H.S., TAN, S., THOMPSON,J., URIARTE, M., VALENCIA, R., YAP, S.L., YE, W., LAW, R.** Multispecies coexistence of trees in tropical forests: spatial signals of topographic niche differentiation increase with environmental heterogeneity. Proceedings of the Royal Society B 280(1764): http://dx.doi.org/10.1098/rspb.
4	**FARAH FAZWA, M.A., HASHIM, S.S., HAJA, M. & OSMAN, M.** An assessement of genetic relationship among superior accessions of *Labisia pumila* analysed by amplified fragment length polymorphism (AFLP) markers. *Open Science Repository Agriculture* doi: e70081945. doi 10.7392/agriculture 70081945
5	**LEE, C.T., LEE, S.L., TNAH, L.H., NG, K.K.S., NG, C.H., CHENG, S. & TANI, N.** Isolation and characterisation of 16 microsatellite markers in *Intsia palembanica*, a high-value tropical hardwood species. *Conservation Genetics Resources*. Online First doi: 10.1007/s12686-013-0100-9.
6	**MAILINA, J., NOR AZAH, M.A., SAIDATUL HUSNI, S., FADZUREENA, J., SITI HUMEIRAH, A.G., AZRINA, A., MOHAMAD FARIDZ, Z.P. & NOOR ROSLIZA, R.** Volatile constituents and antiinflammatory effect of *Alpinia galangal* extract. *The Open Conference Proceeding Journal–Bentham Sciences* 4: doi: 10.2174/2210289201304010119
7	**MASUDA, S., TANI, N., UENO, S., LEE, S.L., NORWATI, M., KONDO, T., NUMATA, S. & TSUMURA, Y.** Non-density dependent pollen dispersal of *Shorea maxwelliana* (Dipterocarpaceae) revealed by a Bayesian mating model based on paternity analysis in two synchronized flowering seasons. PloS ONE. 8(12): e82039. doi: 10.1371/journal.pone.0082039.
8	**NG, C.H., LEE, C.T., LEE, S.L., TNAH, L.H. & NG, K.K.S.** Isolation and characterization of microsatellite markers for *Shorea platyclados* (Dipterocarpaceae). *Applications in Plant Sciences* 1(7): 1200538. doi: http://dx.doi.org/10.3732/apps.
9	**NIELSEN, A.B., VAN DEN BOSCH, M., SREETHERAN, M. & VEN DEN BOSCH, C.K.** Species richness in urban parks and its drivers: a review of empirical envidence. *Urban Ecosystems* http://www.dx.doi 10.1007/s11252-013-0316-1.
10	**NOR AZAH, M.A., MAILINA, J., AZRINA, A., MOHD FARIDZ, Z.P. & CHE MOHD AIZAL, C.M.** Chemical constituents of the essential oils of *Prunus arborea* var densa. *The Open Conference Proceeding Journal–Bentham Sciences* 4 doi: 10.2174/2210289201304010211.
11	**NORULAIMAN, U., ONG, B.K., SAIDATUL HUSNI, S., SAIFUL AZMI, J., NOR AZAH, M.A. & MOHD IRMAN SHAH, M.** Potential of *Syzygium malaccense* as antimicrobial preservative agent for topical application products. *The Open Conference Proceeding Journal–Bentham Sciences* 4: doi:10.2174/ 2210289201304010193
12	**ROSHAN JAHN, M.S., MOHD ILHAM, A., AMID, A., MUHD HAFFIZ, J. & ANEE SURYANI, S.** Statistical analysis of metal chelating activity of *Centella asiatica* and *Erythroxylum cuneatum* using response surface methodology. *Biotechnology Research International* Article ID 137851, 5 pp. http://dx.doi.org/10.1155/2013/137851
13	**ROSZAINI, K, NOR AZAH, M.A., MAILINA, J., ZAINI, S. & MOHD FARIDZ, Z.** Highlight recent findings in wood technology. *Technology Business Journal* 518: ID 009311286.
14	**SAIDATUL HUSNI, S., NOR AZAH, M.A., MAILINA, J., IRENEO, K., ALBERTO, B., MUHD FARIDZ, Z.P. & DARIO, S.** Optimisation of SC-CO2 extraction of *Alpinia galangal* (L.) wild and estimation of cost of manufacturing (COM) via simulation process. *The Open Conference Proceeding Journal–Bentham Sciences* 4: doi: 10.2174/2210289201304010027.



	PENERBITAN LUAR/EXTERNAL PUBLICATIONS
1	**NORMANIZA, O., AHMAD NAZARUDIN, M.R., TSAN, F.Y., OTHMAN, R., DING, P., ZAMRI, I. MAHMUD, T.M.M. & PUTERI EDAROYATI, M.W.** (Eds.) *Transactions of the Malaysian Society of Plant Physiology 21*. 27–29 August 2013, Terengganu. 234 pp.
2	**SITI AISAH, S., MARRYANNA, L. & ABD. RAHMAN, K.** (Eds.) Proceedings of the Seminar Long-Term Ecological Research in East Asia Pacific Region (EAP-LTER 2012), 4–5 July 2012, Kuala Lumpur. 190 pp. (CD)
3	**WAN RASIDAH, K., ROSAZLIN, A., MOHAMAD FAKHRI, I., CHE FAUZIAH, I., LIEW, Y.A., ZULKEFLI, M. & CHRISTOPHER TEH, B.S.(**Eds.) Proceedings of Soil Science Conference of Malaysia 2013. Good Agriculture Practice (GAP) for soil health sustainability. 16–18 April 2013., Gambang. 334 pp.
	LAPORAN INSTITUSI/INSTITUTIONAL REPORTS
1	**AZIAN, M. AMINAH, H & ISMAIL, H.** Laporan Jawatankuasa Teknikal Mengenai Penyelidikan dan Pembangunan (R&D) Program Penanaman Pokok Bakau dan Spesies Lain Yang Sesuai di Pesisiran Pantai Negara bagi tahun 2010. 98 pp.
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6	**AZIAN, M.** Laporan kemajuan projek Komponen 2, Projek ITTO REDDES pada 24 Oktober 2013. Laporan dibentangkan dalam TWG Projek ITTO REDDES di Institut Penyelidikan Perhutanan Malaysia.
7	**CHONG, Y.M., PHILIP, E. & ABDUL RAHIM, N.** Progress report of National Greenhouse Gas Inventory for Land Use, Land Use Change and Forestry Sector 2013. Report for the Ministry of Natural Resources and Environment.
8	**CHONG, Y.M., PHILIP, E. & ABDUL RAHIM, N.** Report on mid-term review Workshop on Sustainable Greenhouse Gas Inventory System. 8-10 October 2013, Manila, Philippines. Report for the Ministry of Natural Resources and Environment.
9	**CHUNG, R.C.K., SAW, L.G. & KAMARUDIN, S.** The Proposed Puncak Alam Kuala Lumpur Expressway (PAKLEX) – Report on Plant Survey in Forest Research Institute Malaysia (FRIM). Technical Report for Forest Research Institute Malaysia, Kepong. 136 pp.
10	**HASHIM, W.S., RAFEADAH, R. & ZAIHAN, J.** FRIM sebagai badan pPengujian Aautoritatif untuk skim pensijilan Japanese Agricultural Standard dan California Air Resource Board. Nota Jemaah Menteri.
11	**ISMAIL, P., AZHARIZAN, M.N., SAMSUDIN, M., KHALI AZIZ, H., HAMDAN, O., NOOR AZLIN, Y., NIK AZZYATI, A.K., MOHD. PARID, M. & TARIQ MUBARAK, H**. Laporan pengurusan hutan (RPH) Negeri Perlis 2013–2022. Laporan perundingan untuk Jabatan Perhutanan Negeri Perlis. 482 pp.
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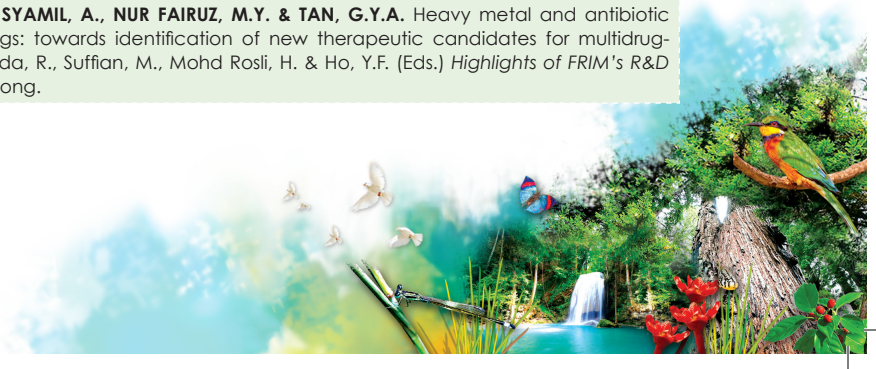
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27	**SUHAIMI, W.C., MOHD FAKHRI, I. & WAN RASIDAH, K.** Laporan kajian tanah Projek Pembersihan dan Pengindahan Sungai Melaka Parcel 1 dan 2, Negeri Melaka Bandar Bersejarah. Laporan perundingan untuk Jabatan Pengairan dan Saliran (JPS) Melaka.
28	**WAN ASMA, I., ZULKAFLI, H., OTHMAN, S., MOHAMMAD FAISAL, M.Y., PUAD, E., RAFIDAH, J., ROHANA, A.R., ZAINATUL BAHIYAH, H., KHAIRATUN NAJWA, M.A. & NURUL FAHIZA, A.Z.** Converting waste oil palm trees into a resource. Collaborative Project Report for the FRIM-UNEP. 201 pp.
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ARTIKEL PROSIDING/ARTICLES IN PROCEEDINGS

1	**ABD. RAHMAN, K. & NUR HAJAR, Z.S.** Alternative approach to modeling volume equations for multispecies stand. Pp. 56–60 in Seca, G. *et al. Prosiding of 2nd International Symposium on Tropical Forest Ecosystem Science and Management: Challenges and Solutions,* 11–13 September 2013, Bintulu.
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3	**ABD. RAHMAN, K., ISMAIL, HARUN., SAMSUDIN, M., WAN MOHD SHUKRI, W.A., NUR SUPARDI, M.N. & MATTHEW, P.** The impact of timber harvesting on growth, yield and dominance of key species in hill dipterocarp forest. Pp. 174–175 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana* 2013: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013, Shah Alam.
4	**ABD. RAZAK, O., SALLEH, M., & AZAHAN SHAH, I.** Plantation of *Gigantocgloa albocialata* (buluh madu) for shoot production in Peninsular Malaysia. Pp. 69–79 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
5	**ADIANA, M.A. & NADIA HANIM, S.** Study on *Eurycoma longifolia* and its different extracts by fourier transform infrared (FTIR) spectroscopy and two-dimensional correlation infrared spectroscopy. P. 173 in Mastura, M. *et al.* (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
6	**AHMAD NAZARUDIN, M.R., TSAN, F.Y. & ROSFARIZAL, K.** Flowering response of *Xanthostemon chrysanthus* to paclobutrazol and potassium nitrate. Pp. 29–34 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
7	**AHMAD ZUHAIDI, Y. & AMIR SAAIFFUDIN, K.** Growth response and yield of plantation-grown teak (*Tectona grandis*) after low thinning treatments at Pagoh, Peninsular Malaysia. Pp. 206–207 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
8	**AISYAH HARTINI, H., MOHD NASIR, T., MEGAT SYAHIRUL AMIN, M.A., NOORITAWATI, M.T., SAHRIM, L., MOHD HUSHNIE, H., ROSHAKIMAH, M.I., WAN ROSEMEHAH, W.O. & NORFAIZA, F.** Evaluation of brainwave sub-band spectral centroid in human intelligence. Pp. 295–298 in *Proceedings of the IEE 9th International Coloquium on Signal Processing and Its Applications (CSPA)*, 8–10 March 2013, Kuala Lumpur.
9	**AMINAH, H. & FARAH FAZWA, M.A.** Cultivation and growth performance of some selected medicinal plants. Pp. 210–214 in Mohd Shukri, M.A. *et al.* (Eds.) *Proceedings of 1st Regional Conference on Agrobiodiversity Conservation and Sustainable Utilization (RAC-1) 2012*, 25–27 September 2012, Langkawi.



10	**AMINAH, H., AHMAD FAUZI, M.S. & TARIQ MUBARAK, H.** Effect of different types and rates of fertilizer on *Neolamarckia cadamba* (kelempayan) potted rooted cutting. Pp. 324–328 in Wan Rasidah, I., Rosazlin, A., Mohamad Fakhri, I., Che Fauziah, I., Liew, Y.A., Zulkefli, M. & Christopher Teh, B.S.(Eds.). *Proceedings of Soil Science Conference of Malaysia 2013: Good Agriculture Practice (GAP) for Soil Health Sustainability*, 16–18 April 2013, Gambang.
11	**AMINAH, H., FARAH FAZWA, M.A. & AB. RASIP, A.G.** An approach towards cultivation and sustainability of medicinal plants. Pp. 30–42 in Mastura, M. *et al*. (Eds.). *Proceedings of the 13th Seminar on Medicinal and Aromatic Plants. Translating Natural Products R,D &C Initiatives in Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
12	**ANG, L.H., TANG, L.K., HO, W.M., FUI, H.T. & THEISERA, G.W.** Bioaccumulation of heavy metals by *Acacia mangi*, *Hopea odorata*, *Instia palembanica* and *Swietenia macrophylla* grown on slime tailings. Pp. 200–205 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
13	**CHENG, S., THINAGARAN, D. & SHAH FADIR, I.** DNA barcoding for rapid inventorisation of termites in the Sg. Enam Basin, Belum–Temenggor rainforest. Pp. 291–301 in Abdul Latiff, M. *et al*. (Eds.) *Proceedings of the 2nd Temengor Scientific Expedition 2012*, 22–25 August 2013, Perak.
14	**ELIZABETH, P.** National REDD+ initiatives in Malaysia. Pp. 3–8 in Hamdan, O., Khali Aziz, H., Takao, G., Sato, T. & Mohd Parid, M. (Eds.) *Proceeding Workshop on REDD+ Research Project in Peninsular Malaysia*, 4 February 2013, Kuala Lumpur.
15	**FADZUREENA, J., MAZURA, M.P., VIMALA, S., NOR AZAH, M.A., FAUZIAH, A., ZUNOLIZA, A., NUZIAH, H., ROHANA, S., HANI IDAYU, B. & AZMAN, M.** Phytochemical analysis and biological evaluation of *Baeckea frutescens* towards the development of herbal preparation for the management of gout-related illnesses. Pp. 93–98 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
16	**FADZUREENA, J., MAZURA, M.P., VIMALA, S., NOR AZAH, M.A., FAUZIAH, A., ZUNOLIZA, A., NUZIAH, H., ROHANA, S., HANI, I.B. & AZMAN, A.** Phytochemical analysis and biological evaluation of *Baekia frutescens* towards the development of herbal preparation for the management of gout related illness. Pp. 51–55 in Roshamida, R., Suffian, M., Mohd Rosli, H. & Ho, Y.F. (Eds.) *Highlights of FRIM's R&D Projects 2012*, Forest Research Institute Malaysia, Kepong.
17	**FADZUREENA, J., MAZURA, M.P., ZAINON, A.S., HANI INTAN, B. & RASADAH, M.A.** Inhibition of xanthine oxidase by some selected medicinal plants. P. 88 in Mastura, M. *et al*. (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
18	**FARAH FAZWA, M.A.** Ex-situ conservation of *Labisia pumila* for breeding purposes. Pp. 43–47 in Mastura, M. *et al*. (Eds.) *Proceedings of the 13th Seminar on Medicinal and Aromatic Plants. Translating Natural Products R,D &C Initiatives in Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
19	**FARAH FAZWA, M.A., ADI FAIZ, A.F., MOHD ZAKI, A. & LOKMAL, N.** Morphological assessment of two varieties of *Labisia pumila* at naturally grown populations in Peninsular Malaysia. Pp. 332–335 in Mohd Shukri, M.A. *et al.* (Eds.) *Proceedings of 1st Regional Conference on Agrobiodiversity Conservation and Sustainable Utilization* (RAC-1) 2012, 25–27 September 2012, Langkawi.
20	**FARAH FAZWA, M.A., NORHAYATI, S., SYAFIQAH NABILA, S.B. & MOHD ADI FAIZ, A.F.** Evaluation of rooting ability of five superior genotypes of *Labisia pumila* var. alata on sand media. Pp. 329–333 in Wan Rasidah *et al*. (Eds.) *Proceedings of Soil Science Conference of Malaysia 2013: Good Agriculture Practice (GAP) for Soil Health Sustainability*, 16–18 April 2013, Gambang.
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22	**FAUZIAH, A., FADZUREENA, J. ZUNOLIZA, A., SITI KAMARIAH, H. & HANI IDAYU, B.** Xanthine oxidase inhibitor from *Tetracera maingayi*. Pp. 107–109 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
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25	**GETHA, K., HATSU, M., WONG, H.J., KHOR, S.E., MUHD SYAMIL, A., MASTURA, M., HEMA THOPLA, G. & LEE, S.S.** Discovery of a potential methicillin-resistant *Staphylococcus aureus* inhibitor from *Ganoderma sp*. FRIM550. Pp. 57–64 in Mastura, M. *et al*. (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
26	**GETHA, K., HEMA THOPLA, G., MASTURA, M., MUHD SYAMIL, A., NUR FAIRUZ, M.Y. & TAN, G.Y.A.** Heavy metal and antibiotic resistance profiling of actinobacteria from tin tailings: towards identification of new therapeutic candidates for multidrug-resistant pathogenic bacteria. Pp. 26–30 in Roshamida, R., Suffian, M., Mohd Rosli, H. & Ho, Y.F. (Eds.) *Highlights of FRIM's R&D Projects 2012*, Forest Research Institute Malaysia, Kepong.



27	**HAMDAN, O., MOHD HASMADI, I. & KHALI AZIZ, H.** Combination of SPOT-5 and Alos Palsar images in estimating aboveground biomass of lowland dipterocarp forest. P. 6 (B.11: Earth Observation Tecnhologies) in Mazlan, H. & Chai, W.H. (Eds.) *Proceeding International Symposium on Digital Earth (ISDE)*, 26–29 August 2013, Kuching.
28	**HAMDAN, O., MOHD HASMADI, I., KHALI AZIZ, H. & MOHD HAKIMI, A.H.** Methods for estimating biomass in the tropical forest using remotely sensed data. Pp. 122–128 in Lai F.S. *et al.* (Eds.) *Proceeding International Forestry Graduate Students' Conference 2013*, 2–4 July 2013, Selangor.
29	**HAMDAN, O., SITI NOORAYHAN, A.H., MOHD HAKIMI, A.H. & KHALI AZIZ, H.** Retrieving timber volume of production forests in Peninsular Malaysia using remotely sensed data. Pp. 42–46 in Seca, G. *et al.* (Eds.) *Proceedings The international Symposium on Tropical Forest Ecosystem Science and Management*, 11–13 September 2013, Bintulu.
30	**HEMA THOPLA, G., GETHA, K., ANNIE TAN, G.Y., MASTURA, M., LILI SHAHIRA, H., NUR FAIRUZ, M.Y. & MUHD SYAMIL, A.** Effects of cadmium supplement on cadmium tolerant actinobacteria isolated from Bidor and Pasoh. Pp. 195–198 in Kalaivani, N. *et al.* (Eds.) *Proceedings of International Congress of Malaysian Society for Microbiology (ICMSM 2013): Microbes with a mission - New Advances and Trends*, 12–15 December 2013, Langkawi.
31	**HEMA THOPLA, G., GETHA, K., TAN, G.Y.A., LILI SHAHIRA, H. & NUR FAIRUZ, M.Y.** Co-relationship of heavy metal tolerance actinobacteria strains with heavy metal contaminated and non-contaminated soil using rapid toxicity screening. Pp. 1–2 in Lin T.K. *et al.* (Eds.) *Proceedings of National Postgraduate Seminar of University Malaya 2012 - Microbes: Diversity in Life, Diversity in Learning, Connection Disciplines*, 11 July 2012, Kuala Lumpur.
32	**HO, W.M., SIK, H.S., MOHD GHAZALI, H. & ANG, L.H.** Biomass and carbon stock in *Hopea odorata* grown on problematic soils. Pp. 32–34 in Roshamida, R., Suffian, M., Mohd Rosli, H. & Ho, Y.F. (Eds.) *Highlights of FRIM's R&D Projects 2012*, Forest Research Institute Malaysia, Kepong.
33	**HO, W.M., SIK, H.S., MOHD GHAZALI, H. & ANG, L.H.** Carbon budget in *Hopea odorata* stands for rehabilitation of problematic soils. Pp. 207–208 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
34	**JEYANNY, V., WAN RASIDAH, K., LEE, S.S., AHMAD FAUZI, M.S. & MOHD GHAZALI, H.** Nutrient loaded *Khaya senegalensis* and *Acacia mangium* seedlings enhanced with arbuscular mycorrhizee (AM) for forest plantation established on degraded soils. Pp. 24–28 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013*, Shah Alam.
35	**JEYANNY, V., HUSNI, M.H.A., WAN RASIDAH, K., BALASUNDRAM, S.K. & ARIFIN, A.** Carbon stocks estimation in a tropical lowland and montane forest. Pp. 177–179 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
36	**JEYANNY, V., HUSNI, M.H.A., WAN RASIDAH, K., BALASUNDRAM, S.K., ARIFFIN, A. & FIRDAUS, M.** Carbon stocks and fluxes in a tropical lowland and montane forest. Pp. 274–278 in Wan Rasidah *et al.* (Eds.) *Proceedings of Soil Science Conference of Malaysia 2013: Good Agriculture Practice (GAP) for Soil Health Sustainability*, 16–18 April 2013, Gambang.
37	**KAVIARASU, M., AMIN, M.H.N. & SHAHFIZ, M.A.** Diversity and distribution of freshwater fishes in Temengor Lake, West Malaysia. Pp. 321–336 in Abdul Latiff, M. *et al.* (Eds.) *Proceedings of the 2nd Temengor Scientific Expedition 2012*, 22–25 August 2013, Perak.
38	**KHONG, H.Y., FADZUREENA, J., CLIFFORD, J. & NUR MARIA, U.S.** Antiinflatory activity of four *Cryptocarya* spp. (Lauraceae). P. 83 in Mastura, M. *et al.* (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives in Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
39	**KIRTON L.G. & PHOON C.K.** An Inventory of the butterflies of Kota Damansara Forest Reserve, Selangor. Pp. 92–100 in Yusoff, M., Mohd. Basri, A.M., Wan Abdul Hamid Shukri, W.A.R., Maketab, M. & Latiff, A. (Eds.) *Prosiding Ekspedisi Saintifik Kepelbagaian Biologi: Ke arah Pembentukan Model Hutan Komuniti,* 15–20 April 2011, Selangor.
40	**LEE, C.T., TNAH, L.H., LEE, S.L., NG, K.K.S., NG, C.H., DIWAY, B. & KHOO, E.** DNA profiling of kempas in Malaysia for timber tracking. Pp. 153–158 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
41	**LEE, C.T., TNAH, L.H., LEE, S.L., NG, K.K.S., NG, C.H., DIWAY, B. & KHOO, E.** Individual identification database of kempas in Peninsular Malaysia. *Proceedings of the 10th Malaysia Genetics Congress, "Advances in Genetics, Biotechnology and Genomics"*, 3–5 December 2013, Selangor. (CD)
42	**LEE, S.L., TNAH, L.H., NG, C.H., NMG, K.K.S., LEE, C.T. & NADZIRAH, A.** Species identification of dipterocarps using DNA barcodes. P. 152 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
43	**LILI SHAHIRA, H., GETHA, K., MOHD ILHAM, A., MUHD SYAMIL, A., HEMA THOPLA, G., NORHAYATI, I., MUHD HAFFIZ, J. & SITI SYARIFAH, M.M.** Identification of antitrypanosomal compound from *Streptomyces* sp. FACC-A032 isolated from Penang National Park. Pp. 534–538 in Kalaivani, N. *et al.* (Eds.) *Proceedings of International Congress of Malaysian Society for Microbiology (ICMSM 2013): Microbes with a mission - New Advances and Trends*, 12–15 December 2013, Langkawi.
44	**LIM, H.F., NORSHAKILA, Y. & INTAN NURULHANI, B.** Application on TFRK in forest resource managemant: A case study in Malaysia Pp. 18–22 in Sim, H.K., LIU, J. SHUNBO, Y. & SYUQIYAH, A.H. (Eds.) *International Conference on Traditional Forest-related Knowledge and Culture for Green Economy*, APAFRI, 5–8 November 2012, China.



45 **LING, S.K., TAN, H.P., FAUZIAH, A., SALBIAH, M., NUZIAH, H. & ZUNOLIZA, A.** Approaches for phytochemical standardisation in the quality assurance of botanicals: case studies in FRIM. P. 153 in Mastura, M. *et al*. (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.

46 **LING, S.K., TAN, H.P., SALBIAH, M., ZUNOLIZA, A. & FAUZIAH, A.** Characterisation of *Melastoma malabathricum* and *M. sanguineum* by FT-IR and LC-MSn analysis. Pp. 110–120 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.

47 **MAHANIM, S.M.A., PUAD, E., RAFIDAH, J., WAN ASMA, I. & SHAHARUDDIN, H.** Activated carbon from bamboo using chemical and steams activations. Pp. 45–51 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013*: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013, Shah Alam.

48 **MAHFUZAH, M., MOHD NASIR, T., SAHRIM, L., ZUNAIRAH, M. & NORIZAM, S.** EEG spectrogram classification employing ANN for IQ application. Pp. 181–185 *Proceeding of International Conference on Technological Advances in Electrical, Electronics and Computer Engineering (TAEECE)*, 9–11 May 2013, Shah Alam.

49 **MAHFUZAH, M., MOHD NASIR, T., ZUNAIRAH, M., SAHRIM, L. & NORIZAM, S.** Statistical analysis of balanced brain and IQ applications. Pp. 181–185 in *Proceedings of the IEE 3rd International Conference on System Engineering and Technology (ICSGRC)*, 19–20 August 2013, Shah Alam.

50 **MARRYANNA, L., SITI AISAH, S., ABD. RAHMAN, K. & MOHD, M.S.** Assessment of suspended sediment concentration from an upper hill dipterocarp forest. Pp. 11–16 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.

51 **MARRYANNA, L., SITI AISAH, S., ABD. RAHMAN, K. & MOHD, M.S.** Suspended sediment (SS) concentration response on commercial timber harvesting in an upper hill dipterocarp forest. Pp. 56–59 in Seca, G., Osumanu, H.A., Shahrul Razid, S., Khairulmazmi, A., Zamri, R. & Roland K.J.H. (Eds.) *Proceedings of the International Symposium on Tropical Forest Ecosystem Science and Management 2013*, 2–5 September 2013, Bintulu.

52 **MOHAMAD JEMAIN, M.R., NIK MUSA'ADAH, M., ROHANA, S., ABD. RASHID, L., MOHD RADZI, A., AZMAN, M., AHMAD SYUKRI, A., NURDALILA, Z. & NORMAIZIRA, H.** Cytotoxicity and acute toxicity studies of polysaccharide-rich fraction from *Morinda citrifolia* fruits. Pp. 212–220 in in Mastura, M. *et al*. (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.

53 **MOHD FARHAN, A.R., MUHAMMAD SHAHRUL, M.N., ZAMREE, M.S., PIN, K.Y., NOOR RASYILA, M.N., NURHAZWANI, M.H., MOHD KAMAL, N.H., MASITAH, M.T., FIRMANSYAH, J.S., MOHD HAPIZUL, U.L. AMEER JASRIE, J. & RISHWAN HAKIM, K.** Preliminary study on antioxidant activity and total phenolic content of *Cynometra cauliflora* leaves at different extraction temperatures. P. 192 in Mastura, M. *et al*. (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.

54 **MOHD GHAZALI, H.** FRIM's lake and wetlands. Pp 61–66 in Suriyani, A., Hoo, H.C., Mohd Nur Farhan, A.W. & Shahrani, M. (Eds.) *Proceedings National Seminar on Research and Management of Lakes and Their Basins for Sustainable Land Use: The Current Status of Selected Lakes in Malaysia, 3rd Series,* 27–28 September, Selangor.

55 **MOHD ILHAM, A., GETHA, K., ZURIATI, Z., LILI SHAHIRA, H., AZIMAH, A., MOHD FADZLY, A.J.I., AMYRA, A.S., LIM, K.T., MOHD FIRDAUES, M.S., MOHD NAFFIDI, A.L., MUHD HAFFIZ, J., MUHAMMAD SYAMIL, A., NORHAYATI, I., ROSHAN JAHN, M.S. & CHUAH, B.C.** Neglected diseases of the bottom billion: potential drug candidates from Malaysian biodiversity resources. Pp. 65–73 in Mastura, M. *et al*. (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.

56 **MOHD LOKMAL, N., MOHD ZAKI, A. & ABDUL RAZAK, O.** Variation in eurycomamanone in provenances of tongkat ali. P. 209 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.

57 **MOHD NASIR, M.A., LEE, Y.H. & MUSA, A.** Design of a potentiometric sandwich biosensor for insecticide permethrin detection. Pp. 35–44 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013*, Shah Alam.

58 **MOHD NASIR, M.A., LEE, Y.H., SALMIAH, U., MUSA, A. & SALAMAH, S.** Design of a biosensor based on the fungus *Lentinus sajor-caju* for insecticide permethrin detection in treated wood. Pp. 186–193 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013*, Shah Alam.

59 **MOHD PARID, M., MOTOE, M., NOOR AINI, Z., LIM, H.F. & TETSUYA, M.** Eradicating extreme poverty through land development strategy. Pp. 81–91 in Hamdan, O. *et al*. (Eds.) Proceedings of the Workshop on REDD+ Research Project in Peninsular Malaysia, 4 February 2013, Kuala Lumpur.

60 **MOHD ZAKI, A., MOHD LOKMAL, N., FARAH FAZWA, M.A., MOHD ADI FAIZ, M.A., AZRIL DEENOR, M.D. & ABD. RASIP, A.G.** *Ex-situ* conservation of *Nypa fruticans* for sap production. Pp. 266–267 in Mohd Shukri, M.A. *et al.* (Eds.) *Proceedings of 1st Regional Conference on Agrobiodiversity Conservation and Sustainable Utilization* (RAC-1) 2012, 25–27 September 2012, Langkawi.

61 **MOHD, A., SITI NURHIDAYU, A.B., BADRUL, A., PETRA, S. & SITI AISAH, S.** A preliminary investigation on water quality of water courses in oil palm smallholdings converted from peat swamp and mangrove forests. Pp. 188–192 in Lai, F.S., Halis, R. Abu Bakar, S.N., Ramachandran , S. & Puan, C.L. (Eds.) *Proceedings of the International Forestry Graduate Students*, 2–4 July 2013, Selangor.



62 **MOHD. GHAZALI, H., MARRYANNA, L., ISMAIL, P., ABD. RAHMAN, K., ABDUL RAZAK, O. & SAIFUL, I.K.** Preliminary findings on impact of logging on plant structure and potential indicator on gap opening in peat swamp forest. Pp. 204–206 in Sajim B. & Parvinder, S.S. (Eds.) *Proceedings 2nd International Conference on Agriculture and Environmental Systems (ICAES'13)* 23–24 April 2013, Pattaya.

63 **MOTOE, M., MOHD PARID, M., NOOR AINI, Z. & TETSUYA, M.** Socio-economic analysis of forest area change in Peninsular Malaysia. Pp. 92–100 in Hamdan, O. *et al.* (Eds.) *Proceedings of the Workshop on REDD+ Research Project in Peninsular Malaysia,* 4 February 2013, Kuala Lumpur

64 **NADA, B., KIRTON, L.G. & MUHAMMAD FARID, A.R.** Fireflies (Coleoptera: Lampyridae) at the Forest Research Institute Malaysia. Pp. 16–21 in Roshamida, R., Suffian, M., Mohd Rosli, H. & Ho, Y.F. (Eds.) *Highlights of FRIM's R&D Projects 2012*, Forest Research Institute Malaysia, Kepong.

65 **NG, C.H., LEE, S.L., NG, K.K.S., LEE, C.T., TNAH, L.H. & NORWATI, M.** Establishment of full-sib families in a hill dipterocarp tree, *Shorea platyclados*, inferred from paternity analysis. P. 199 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.

66 **NG, C.H., LEE, S.L., TNAH, L.H., LEE, C.T., NG, K.K.S. DIWAY, B. & KHOO, E.** Conservation genetics of *Shorea platyclados* (meranti bukit) in Malaysia. Pp. 140–146 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.

67 **NG, K.K.S., LEE, S.L., TNAH, L.H., NURUL FARHANAH, Z., NG, C.H., LEE, C.T., NADZIRAH, A., NORWATI, M., TANI, N., DIWAY, B., CHONG, L. & KHOO, E.** DNA timber tracking system of a CITES listed species *Gonystylus bancanus* . Pp. 1–10 in Roshamida, R., Suffian, M., Mohd Rosli, H. & Ho, Y.F. (Eds.) *Highlights of FRIM's R&D Projects 2012*, Forest Research Institute Malaysia, Kepong.

68 **NIK MUSA'ADAH, M., NURDALILA, Z., MOHAMED JEMAIN, M.R., ABD. RASHID, L., NORMAIZIRA, H., MOHD RADZI, A., ROHANA, S., SHUKRI, A., AZMAN, M. & SITI BALQIS, B.** Therapeutic potential of polysaccharide-rich fraction from *Morinda citrifolia* (mengkudu) fruit as hepatoprotective agent. Pp. 56–63 in Roshamida, R., Suffian, M., Mohd Rosli, H. & Ho, Y.F. (Eds.) *Highlights of FRIM's R&D Projects 2012*, Forest Research Institute Malaysia, Kepong.

69 **NIK MUSA'ADAH, M., NURDALILA, Z., MOHD JEMAIN, M.R., ABD. RASHID, L., NORMAIZIRA, H., MOHD RADZI, A., ROHANA, S., AZMAN, M., AHMAD SHUKRI, A. & SITI BALKIS, B.** Hepatoprotective effects of polysaccharide-rich fraction of *Morinda citrifolia* (mengkudu) fruits. Pp. 99–106 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.

70 **NOOR AZLIN, Y., AHMAD NAZARUDIN, M.R., AZZYATI, A.K., NAIMAH, C.L. & AZAHARI, M.Y.** Tropical plants as attractions: potentials for tourism and environmental education. Pp. 121–124 in Normaniza, O., Ahmad Nazarudin, M.R., Tsan, F.Y., Othman, R., Ding, P., Zamri, I., Mahmud, T.M.M. & Puteri Edaroyati, M.W. (Eds.) *Transactions of the Malaysian Society of Plant Physiology* 21, 27–29 August 2013, Terengganu.

71 **NOOR RASYILA, M.N., MMOHD FARHAN, A.R., NURHAZWANI, M.H., PIN, K.Y., ZAMREE, M.S., HADA MASAYU, D.I., MOHD HAPIZUL, U.L., FIRMANSYAH, J.S., MOHD SHAHRUL, M.N. & MASITAH, M.T.** In process quality control (IPQC) of compressed uncoated *Orthosiphon aristatus* (misai kucing) tablets. P. 197 in Mastura, M. *et al.* (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.

72 **NOR AZAH, M.A., MAILINA, J., SAHRIM, L., SAIDATUL HUSNI, S., MOHD FARIDZ, Z., ABD. MAJID, J., MUHD HAFIZI, Z. & MOHD NASIR, M.A.** Agarwood aroma profiling by chromatographic and sensor applications. Pp. 80–82 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.

73 **NOR AZAH, M.A., MAILINA, J., SAIDATUL HUSNI, S., SITI HUMEIRAH, A.G., VIMALA, S., LING, S.K., AZRINA, A., ZARIDAH, M.Z., MOHD JEMAIN, M.R., SHALINI, M., FADZUREENA, J., NIK MUSA'ADAH, M. & NURHANAN, M.Y.** Development of herbal health care products from gaharu and selected extracts of *Aquilaria species.* Pp. 66–68 in Roshamida, R., Suffian, M., Mohd Rosli, H. & Ho, Y.F. (Eds.) *Highlights of FRIM's R&D Projects 2012*, Forest Research Institute Malaysia, Kepong.

74 **NOR DATIAKMA, M.A., NURHANAN, M.Y., MASTURA, M., SITI SYARIFAH, M.M. & NORALIZA, A.** Anti-proliferative and anti-methicillin resistant *staphylococcus aureus* (MRSA) activities of selected plant species. Pp. 129–133 in Mastura, M. *et al.* (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.

75 **NOR HAYATI, A., IBRAHIM, A.N. & LING, S.K.** QSAR study of platelet-activating factor (PAF) receptor binding antagonist. Pp. 684–690 in 690 in Ibrahim, A. N. & Mohamed Saedi, J. (Eds.) *Proceedings of the International Conference on Biotechnology Engineering, ICBioE 2013*, 2–4 July 2013, Kuala Lumpur.

76 **NORALIZA, A., NOR DATIAKMA, M.A., ANEE SURYANI, S., NORWATI, A., MARZALINA, M., NASHATUL ZAIMAH, N.A., NOR ASMAH, H. & NADIAH SALMI, N.** Proteome profiling of *Aquilaria malaccencis* upon cold stress conditions: extraction protocol. Pp. 39–44 in Roshamida, R., Suffian, M., Mohd Rosli, H. & Ho, Y.F. (Eds.) *Highlights of FRIM's R&D Projects 2012*, Forest Research Institute Malaysia, Kepong.

77 **NORHAYATI, I., LING, S.K. GETHA, K., MOHD ILHAM, A., MUHD HAFFIZ, J., LILI SHAHIRA, H., MUHAMMAD SYAMIL, A. & SITI SYARIFAH, M.M.** Antitrypanosomal activity of flavonoids isolated from *Chromoleana odorata* (L.) KING and ROBINSON. Pp. 110–116 in Mastura, M. *et al.* (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.

78 **NORLIA, B., NOR HASNIDA, H., MOHD NOOR, I.H., MOHD ROSLI, H., NORWATI, A. & NORWATI, M.** Transcriptome analysis of tongkat ali using next generation DNA sequencing technique. Pp. 194–198 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013*: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013, Shah Alam.

79 **NORLIA, B., NOR HASNIDA, H., NORWATI, A., MOHD ROSLI, H. & NORWATI, M.** Discovery of genes involved in alkaloid biosynthesis pathway of tongkat ali root. Pp. 260–262 in *Proceedings of the 10th Malaysia Genetics Congress, "Advances in Genetics, Biotechnology and Genomics"*, 3–5 December 2013, Selangor. (CD)

80 **NORLIA, B., NOR HASNIDA, H., NORWATI, A., MOHD ROSLI, H., MOHD NOOR, M.I., FADZLI, A. & NORWATI, M.** Genes related to tongkat ali (*Eurycoma longifolia*) bioactive compound: transcriptome comparison between wild type roots and hairy root culture. Pp. 10–14 in Roshamida, R., Suffian, M., Mohd Rosli, H. & Ho, Y.F. (Eds.) *Highlights of FRIM's R&D Projects 2012*, Forest Research Institute Malaysia, Kepong.

81 **NORSHAKILA, Y., INTAN NURULHANI, B., TAN, A.L., NURUL HUSNA, Z., NIK M USA'ADAH, M. & LIM, H.F.** Knowledge & use of medicinal & aromatic plants by orang Asli Semai in Kg Ulu Geroh, Gopeng, Perak . Pp. 19–28 in Mastura, M. *et al*. (Eds.). *Proceedings of the 13th Seminar on Medicinal and Aromatic Plants. Translating Natural Products R,D &C Initiatives in Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.

82 **NUR ZATI, A.M., JOANN, C.L., ELIZABETH, B., AHMAD SHAHAR, M.Y., AMINUDDIN, A.A., FLETCHER, C.F. & ABDUL RAHMAN, K.** Rapid biodiversity assesment of trees, bats, ants and dung beetles along the recreational transect of Zon Simpai, Kota Damansara Forest Reserve, Selangor. Pp 146–157 in Yusoff, M., Mohd. Basri, A.M., Wan Abdul Hamid Shukri, W.A.R., Maketab, M & Latiff, A. (Eds.) *Prosiding Ekspdisi Saintifik Kepelbagaian Biologi Hutan Simpan Kota Damansara, Selangor. Ke Arah Pembentukan Model Hutan Komuniti*. 10–11 Januari 2012, Selangor.

83 **NURLAILA, I., MOHD HEZRI, F.R., MOHD NASIR, T., NOR AZAH, M.A., MAILINA, J. & SAIFUL NIZAM, T.** Analysis of chemical compounds of agarwood oil based on headspace solid phase microextraction combined with gas chromatography mass spectrometry. P. 180 in *Proceeding IEE 9th International Coloquium on Signal Processing and Its Applications*, 8–10 Mac 2013, Kuala Lumpur.

84 **NUZIAH, H., ZUNOLIZA, A. & LING, S.K.** Phytochemical fingerprint analysis of *Senna alata* by high performance thin layer chromatography (HPTLC). Pp. 157–163 in Mastura, M. *et al*. (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.

85 **PATAHAYAH, M., LEE, S.S. & MOHD FARID, A.** Pests, diseases and disorders of *Eurycoma longifolia* (Jack.) in Peninsular Malaysia. Pp. 131–139 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013*: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013, Shah Alam.

86 **PATAHAYAH, M., LEE, S.S., MOHD SALLEH, S. & ANDI AKBAR, M.** Assessment of inoculated ectomycorrhizas on *Hopea odorata* roots planted on ex-mining land. Pp. 120–123 Wan Rasidah, I., Rosazlin, A., Mohamad Fakhri, I., Che Fauziah, I., Liew, Y.A., Zulkefli, M. & Christopher Teh, B.S.(Eds.). *Proceeding of SOILS 2013,* 16–18 April, 2013, Gambang.

87 **PETRA, S., BADRUL, A., SITI NURHIDAYU, A.B., MOHD, A., SITI AISAH, S. & MOHAMED, Z.** A preliminary investigation on water birds and their relation with flood-control drain water quality in oil palm smallholdings. Pp 36–40 in Lai, F.S., Halis, R. Abu Bakar, S.N., Ramachandran , S. & Puan, C.L. (Eds.) *Proceedings of the International Forestry Graduate Students*, 2–4 July 2013, Selangor.

88 **PUAD, E., MAHANIM, S.M.A, RAFIDAH, J., WAN ASMA, I. & SHAHARUDDIN, H.** Converting agriculture and wood residues to pellets: opportunities and challenges. Pp. 63–68 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013*: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013, Shah Alam.

89 **RAJA BARIZAN, R.R. & ISMAIL, H.** Rehabilitation of eroded coastal mangroves using innovative techniques: a case study in Peninsular Malaysia. Pp. 70–73 in Bedjo, S. & Takahisa, K. *Proceedings on Regional Symposium on Mangrove Ecosystem Management in Southeast Asia, 26 February–2 March 2013*, Surabaya.

90 **RAJA BARIZAN, R.S. & WAN RASIDAH, K.** Research on conservation and rehabilitation of degraded coastal forests in Malaysia. Pp. 20–28 in *Proceedings of the International Symposium on Forest and Water*, 28 November 2013, Korea.

91 **ROSAZLIN, A., CHE FAUZIAH, I., WAN RASIDAH, K. & ROSENANI, A.B.** Carbon dioxide evolution in soil amended with raw and composted recycled paper mill sludge. Pp. 258–262 in Wan Rasidah, I., Rosazlin, A., Mohamad Fakhri, I., Che Fauziah, I., Liew, Y.A., Zulkefli, M. & Christopher Teh, B.S. (Eds.) *Proceedings of Soil Science Conference of Malaysia 2013: Good Agriculture Practice (GAP) for Soil Health Sustainability*, 16–18 April 2013, Gambang.

92 **ROSHAN JAHN, M.S., MUHAMMAD HAFFIZ, J., MUHAMMAD SYAMIL, A., AMYRA, M.S., GETHA, K., MOHD ILHAM, A. & VANESSA, Y.** Evaluation on selected Malaysian plants and actinobacteria for their anti-leishmanial activity. Pp. 117–120 in Mastura, M. *et al*. (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.

93 **ROZITA, A. & WAN RASIDAH, K.** Evaluation of heavy metals and their relation to soil properties. Pp. 31–33 in Roshamida, R., Suffian, M., Mohd Rosli, H. & Ho, Y.F. (Eds.) *Highlights of FRIM's R&D Projects 2012*, Forest Research Institute Malaysia, Kepong.

94 **ROZITA, A. & WAN RASIDAH, K.** Heavy metal status of two medicinal plants grown in Maran locations. Pp. 222–226 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.

95 **ROZITA, A., WAN RASIDAH, K., ROSAZLIN, A., & MOHAMAD FAKHRI, I.** The effect of iron content in different soils on heavy metals uptake of two medicinal plants. Pp. 313–318 in Wan Rasidah *et al*. (Eds.) *Proceedings of Soil Science Conference of Malaysia 2013: Good Agriculture Practice (GAP) for Soil Health Sustainability*, 16–18 April 2013, Gambang.



96	**RUSHDAN, I., NURUL HUSNA, M.H., KATIFAH, J., AINUN, Z.M.A., SHARMIZA, A. & MAHMUDIN, S.** Mathematical models for alkaline pulp and paper properties of oil palm empty fruit bunch fibre. Pp. 181–183 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013, Shah Alam.
97	**RUSHDAN, I., SHARMIZA, A., MAHMUDIN, S. & LATIFAH, J.** Processing of oil palm empty fruit bunches into value=added products using the organosolv technology. Pp. 8–11. in Hiroshi, O. *et al.*(Eds.) *Proceedings 2012 International Symposium on Resource Efficiency in Pulp and Paper Technology*, 20–22 November 2012, Bandung.
98	**SAIDATUL HUSNI, S., FAUZIAH, A., FADZUREENA, J., SITI KAMARIAH, H., HANI IDAYU, B. & ROZLIANAH FIRTI, S.** Active ingredients for herbal products from *Tetracera maingayi*. P. 142 in Mastura, M. *et al.* (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
99	**SAIDATUL HUSNI, S., NOR AZAH, M.A., MAILINA, J., PIN, K.Y., MARZITA, M.D., ABD. MAJID, J. & MOHD FARIDZ, Z.** Comparison of volatile chemicals in *Jasminum sambac* and *Citrus hystixvia* various extraction technique. Pp. 83–92 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
100	**SALBIAH, M., TAN, A.L., TAN, H.P. & LING, S.K.** Application of infrared spectral fingerprinting for identification of three *Senna species*. Pp. 164–172 in Mastura, M. *et al.* (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
101	**SALLEH, M. & ISMAIL, H.** Stumpage value of second cycle forest in the states of Pahang and Terengganu, Peninsular Malaysia. Pp. 167 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
102	**SAMSUDIN, M., NUR HAJAR, Z.S., MOHD NIZAM, M.S., SALLEH, M., NIK NORAFIDA, N.A., ABD. RAHMAN, K. & WAN MOHD. SHUKRI, W.A.** Enhancing the management of seraya and kapur forest through improved volume predictions. Pp. 1–10 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
103	**SHAHFIZ, M.A. SHAHRUL ANUAR, M.S., KAVIARASU, M., FAUZI, M.Z. & RIZAL, M.R.** Preliminary checklist of mammals at Sungai Enam in Temengor Forest Reserve, Perak , Peninsular Malaysia. Pp. 197–214 in Abdul Latiff, M. *et al.* (Eds.) *Proceedings of the 2nd Temengor Scientific Expedition 2012*, 22–25 August 2013, Perak.
104	**SHAHFIZ, M.A., KAVIARASU, M., PAN, K.A. & RIZAL, M.R.** Non-volant small mammals surveys at Gunung Belumut, Johor. Pp. 265–271 in Abd. Rahman, A.R., Yahaya, M., Nasir, M.A.H., Abdullah, M. & Latiff, A. (Eds.). *Hutan Simpan Gunung Belumut, Johor: Pengurusan Hutan, Persekitaran Fizikal dan Kepelbagaian Biologi,* 2012, Kuala Lumpur.
105	**SHAHFIZ, M.A., SHAHRUL ANUAR, M.S., NOR ZALIPAH, M., PAN, K.A., YUSOF, O., RIZAL, M.R., LIM, S.L., SYAFIQ, M., ABDUL MUIN M.A., NUR MUNIRA, A., NUR JULIANI, S., YUSUF, A. & RASHID, A.** Non-volant small mammals survey at Pulau Pangkor, Perak. Pp. 280–287 in Abd. Rahman, A.R., Masran, M.S., Nasir, M.A.H., Abdullah, M. & Latiff, A. (Eds.) *Hutan Pulau Pangkor, Perak: Pengurusan Hutan, Persekitaran Fizikal dan Kepelbagaian Biologi,* 2012, Kuala Lumpur.
106	**SHAHFIZ, M.A., SHAHRUL ANUAR, M.S., YUSOF, M.O., YUSUF, A., MUIN, M.A., LEE SIM, AKBAR, SHAFIQ, M., RASHID, M., KHULAIMI, B. & NORDIN, A.** Surveys of bats at Pulau Jerejak and Bukit Panchor, Penang, Peninsular Malaysia. Pp. 251–257 in Abd. Rahman, A.R., Nasir, M.A.H., Puat, D., Abdullah, M. & Latiff, A. (Eds.). *Taman Negeri Bukit Panchor dan Pulau Jerejak, Pulau Pinang: Pengurusan Hutan, Persekitaran Fizikal dan Kepelbagaian Biologi*, 2012, Kuala Lumpur.
107	**SHAHFIZ, M.A., SHAHRUL ANUAR, M.S., YUSOF, M.O., YUSUF, A., MUIN, M.A., LEE SIM, AKBAR, SHAFIQ, M., RASHID, M., KHULAIMI, B. & NORDIN, A.** Surveys of non-volant mammals at Pulau Jerejak and Bukit Panchor, Penang, Peninsular Malaysia. Pp. 245–250 in Abd. Rahman, A.R., Nasir, M.A.H., Puat, D., Abdullah, M. & Latiff, A. (Eds.) *Taman Negeri Bukit Panchor dan Pulau Jerejak, Pulau Pinang: Pengurusan Hutan, Persekitaran Fizikal dan Kepelbagaian Biologi*, 2012, Kuala Lumpur.
108	**SHAHFIZ, M.A., SHAHRUL ANUAR, M.S., ZAINAL, A.M., KAVIARASU, M., NOR DIANA, M., RIZAL, M.R., HAMDON, T., HAIROL, M.Z. & KHAIRUL, A.A.** Assemblage at Sungai Enam in Temengor Forest Reserve, Perak, Peninsular Malaysia. Pp. 235–241 in Abdul Latiff, M. *et al.* (Eds.) *Proceedings of the 2nd Temengor Scientific Expedition 2012*, 22–25 August 2013, Perak.
109	**SHAHIDAN, M.A., HADA MASAYU, I., KHAIRUL KAMILAH, A.K., SITI FATIMAH, E. & AHMAD FAUZI, M.S.** Unlocking the value of Malaysia's biodiversity through herbal products: technological application. P. 173 in Mastura, M. *et al.* (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
110	**SHARMIZA, A. & MAHMUDIN, S.** Profeciency testing (PT) to benchmark paper testing laboratory performance. Pp. 8–11 in Hiroshi, O. *et al.* (Eds.) *Proceedings 2012 International Symposium on Resource Efficiency in Pulp and Paper Technology*, 20–22 November 2012, Bandung.
111	**SHARMIZA, A., MAHMUDIN, S., RUSHDAN, I., MOHD NOR, M.Y. & AHMAD ZUHAIDI, Y.** Pulp and paper properties of a Forest Pioneer Species: *Macaranga gigantean*. Pp. 69–72. in Hiroshi, O. *et al.* (Eds.) *Proceedings 2012 International Symposium on Resource Efficiency in Pulp and Paper Technology*, 20–22 November 2012, Bandung.



112	**SITI AISAH, S., YUSOP, Z., NOGUCHI, S. & MARRYANNA, L.** Rainfall interception loss from young *Hopea odorata* plantation. Pp. 168–171 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
113	**SITI HUMEIRAH, A.G., NOR AZAH, M.A. & MAILINA, J.** Chemical compositions of twig essentials oils from three *Xylopia* species and their potentials as new actimicrobial agent. P. 121 in Mastura, M. *et al*. (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
114	**SITI MUNIRAH, M.Y., UMMUL NAZRAH, A.R., IMIN, K. & MOHD NAZRI, A.** The diversity of flowering plants in Sungai Enam Basin, Temengor Forest Reserve, Perak. Pp. 123–136 in Abdul Latiff, M. *et al*. (Eds.) *Proceedings of the 2nd Temengor Scientific Expedition 2012*, 22–25 August 2013, Perak.
115	**SITI SUHAILA, A.R., MOHD SALEH, N., NORWATI, M., MAHANI, M.C., SITI SALWANA, H., NAMASIVAYAM, P., KANDASAMY, K.I., NOR HASNIDA, H., HALIZA, I., NAZIRAH, A., & MUHD FUAD, Y.** Chromosome doubling in *A. malaccensis* through in vitro polyploidization. Pp. 247–250 in *Proceedings of the 10th Malaysia Genetics Congress, "Advances in Genetics, Biotechnology and Genomics"*, 3–5 December 2013, Selangor. (CD)
116	**SITI SUHAILA, A.R., NORWATI, M., BRIAN YAP, J.W., MAHANI, M.C., KANDASAMY, K.I., FARIDAH, Q.Z. & FADELAH, A.A.** Polyploidy induction in selected native Malaysia slipper orchids: toward the development of improved breeding stock. Pp. 160–165 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
117	**SYAFIQAH NABILA, S.B., FARAH FAZWA, M.A., NORHAYATI, S. & MOHD ZAKI, A.** Production of quality planting stocks from five selected clones of *Labisia pumila* var. *alata* through leaf cuttings. Pp. 276–280 in *Proceedings of The International Symposium on Tropical Forest Ecosystem Science and Management 2013*, 11–13 September 2013, Bintulu.
118	**TAN, A.L., NURUL HUSNA, Z., NORSHAKILA, Y., INTAN NURULHANI, B. & LIM, H.F.** Utilization of the herbal plants by the indigenous communities in Pahang: a case study on three sub-ethnic (Semelai, Jahut & Jakun) groups. Pp. 11–19 in Mastura, M. *et al*. (Eds.). *Proceedings of the 13th Seminar on Medicinal and Aromatic Plants. Translating Natural Products R,D &C Initiatives in Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
119	**THI, B.K.** Inventory of macrofungal diversity of Sungai Enam Basin at Temengor Forest Reserve, Perak. Pp. 171–178 in Abdul Latiff, M. *et al*. (Eds.) *Proceedings of the 2nd Temengor Scientific Expedition 2012*, 22–25 August 2013, Perak.
120	**TNAH, L.H., LEE, C.T., LEE, S.L., NG, C.H. & NG, K.K.S.** Development of microsatellites for three important medicinal plants: *Eurycoma longifolia*, *Ficus deltoidea* and *Labisia pumila*. Pp. 147–151 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013*: "R&D Perhutanan: Sumber Kekayaan Baharu", 10–11 September 2013, Shah Alam.
121	**VIMALA, S., SHALINI, M., JULIZA, M. & ABDULL RASHIH, L.** Biopotential and Bioefficacy evaluation of *Ocimum sanctum linn*: towards production of standardised extract. P. 128 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
122	**VIMALA, S., SHALINI, M., KHAIRUNNISA, A.S., JULIZA, M. & ABDULL RASHIH, A.** Antioxidant evaluation: ORAC analysis of common spices used in Malaysia. Pp. 99–109 in Mastura, M. *et al*. (Eds). *Proceedings of the 13th Medicinal and Aromatic Plants Seminar (MAPS-13): Translating Natural Products R, D & C Initiatives In Line with Economic Transformation Programme*, 25–26 September 2012, Kuala Lumpur.
123	**WAN MOHD SHUKRI, W.A., ISMAIL, H., HARFENDY, O. & MOHD. SADALI, S.** Improvement of the merchantable height table for determining volume of standing trees. Pp. 173 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
124	**WAN RASIDAH, K., ROZITA, A., ROSAZLIN, A. & WAN ASMA, I.** Properties and application of sludge from paper mill processing recycle paper. Pp. 18–23 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.
125	**YUNITA MEGASARI, D., ARNIZA, G.M., WAN ROSLI, W.D. & RUSHDAN, I.** Identification of paper strength development by two variations of refiner plate pattern. Pp. 343–347 in Teng, T.T., Yusri, Y. & Fera Fizani, A.F. (Eds.) *Proceedings of the International Conference on Environmental Research and Technology (ICERT 2012)*, 30 May–1 June 2012, Penang.
126	**ZUNOLIZA, A., ABD. RASHID, L., KHAIRUL KAMILAH, A.K., NORSUHAINA, Z., ZULKHAIRI, A., MOHD RADZI, A., AHMAD SHUKRI, A. & MOHD KHAIR, M.A.** Evaluation of polysaccharide fraction from *Averrhoa carambola* as cholesterol lowering agent. Pp. 121–130 in Gan, K.S., Ismail, P., Getha, K., Chung, R.C.K., Mohd Rosli, H. & Nik Zanariah, N.M. (Eds.) *Prosiding Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"*, 10–11 September 2013, Shah Alam.



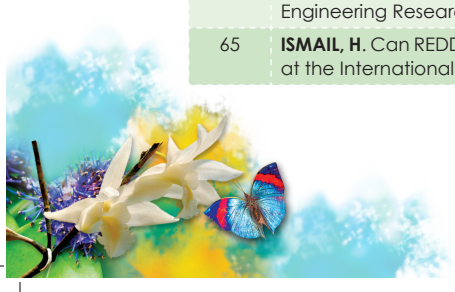
	KERTAS KERJA/PAPERS
1	**ABD. RAZAK, O., ROSDI, K., AMIR SAAIFFUDDIN, K. & SALLEH, M.** 'Mengenali buluh sumber bukan balak yang istimewa'. Paper presented at the 'Simposium Kebangsaan Konservasi 2013 "Melestari Khazanah Warisan Negara"', 13–16 May 2013, Kuching.
2	**ABDUL HAMID, S., NASARUDDIN, M.I. & YANTI, A.K.** Pembuatan kapal tradisional Terengganu. Paper presented at the National Symposium on Conservation 2013, 13–16 May 2013, Kuching.
3	**ABDUL HAMID, S., YANTI, A.K., ANIS, T. & KHAIRUL, M.** Development of products from bamboo veneer. Paper presented at the International Workshop on Sustainable Industrialisation and Commercialisation of Non-Timber-Forest-Products (NTFPS 2013), 25 August–14 September 2012, China.
4	**ABDUL KHALIM, A.S., KHALI AZIZ, H., NORHAIDI, Y. & MOHD NASIR, H.** Local government involvement in managing mangrove for ecotourism and nature education purposes in the State of Pahang, Malaysia. Paper presented at the Regional Symposium Mangrove Ecosystem Management in Southeast Asia, 11–13 February 2013, Surabaya.
5	**ABDUL LATIF, M. & ISMAIL, H.** Forestry and sustainable Development. Paper presented at the Asian Dialogue on Forestry in Eco-Civilization Context, 18–21 July 2013, Guiyang.
6	**ABDUL RAHIM, N. & ISMAIL, H.** Harnessing natural capital for wealth creation. Paper presented at the International Conference of Extended Mega Urban Regions: The Changing Face of South East Asia and the World, 19–21 November 2013, Putrajaya.
7	**ABU BAKAR, S.N., CHAPPELL, N.A., TYCH, W. & SITI AISAH, S.** Use of UC-DHR model to identify sediment recovery following tropical selective logging given the affect of climate dynamics and data gaps. Paper presented at the Asia Pacific Workshop on Forest Hydrology: Water and Forests-Beyond Traditional Forest Hydrology, 23–25 September 2013, India.
8	**ADNAN, M., AHMAD AZARUDDIN, M.N., RASHIDAH, A.B. & NURUL AYUNI, B.** Pengurusan landskap oleh PBT di Semenanjung Malaysia: status semasa. Paper presented at the 'Seminar Kebangsaan Pengurusan Kawasan Hijau 2013: "Kawasan Hijau dan Taman Awam: Transformasi Untuk Kesejahteraan Rakyat"', 1–2 October 2013, Putrajaya.
9	**AHMAD AZARUDDIN, M.N., ADNAN, M., MOHD AFENDI, H., NOOR AZLIN, Y., LIM, H.F., HUDA FARHANA, M.M. & MOHD PARID, M.** Status semasa pengurusan pokok dan amalan arborikultur oleh PBT di Semenanjung Malaysia. Paper presented at the 'Seminar Kebangsaan Pengurusan Kawasan Hijau 2013 "Kawasan Hijau dan Taman Awam:Transformasi untuk Kesejahteraan Rakyat"', 1–2 October 2013, Putrajaya.
10	**AHMAD FAUZI, M.S.** Amalan dan pengurusan tapak semaian. Paper presented at the 'Bengkel Biji Benih 2013', 18–20 June 2013, Forest Research Institute Malaysia, Kepong, 'Kursus Landskap dan Penyelenggaraan Pokok', 19–21 June 2013, Dengkil, 'Kursus Tanaman Karas (Industri Gaharu)', 17–21 March 2013, Limbang, 'Bengkel Interaktif Herba', 2 March 2013, Sadong Jaya dan Kursus Tanaman Karas (Industri Gaharu), 21–26 March 2013, Kapit.
11	**AHMAD FAUZI, M.S.** Penjagaan keratan kacip fatimah di tapak semaian. Paper prensented at 'Kursus Perambatan Tampang Perambatan Kacip Fatimah Stesen Penyelidikan FRIM Mata Ayer', Perlis 21–22 March 2013.
12	**AHMAD FAUZI, M.S.** Penubuhan tapak semaian buluh. Paper presented at the 'Bengkel Inspirasi Buluh: Sumber Khazanah Negara yang Berharga', 28–29 August 2013, Seremban.
13	**AHMAD FAUZI, M.S.** Racun makhluk perosak. Paper presented at the 'Kursus Perlindungan dan Kawalan Serangga serta Penyakit Tanaman Landskap', 29–30 October 2013, Kuala Lumpur.
14	**AHMAD FAUZI, M.S.** Standard prosedur operasi penyediaan media dan pemasuan kacip fatimah. Paper prensented at the 'Kursus Perambatan Tampang Perambatan Kacip Fatimah Stesen Penyelidikan FRIM Mata Ayer', 21–22 March 2013, Perlis.
15	**AHMAD ZUHAIDI, Y., HASHIM, M.N. & AMINAH, H.** Early findings on the suitability of *Neolamarckia cadamba* as forest plantation species: relating the silviculture, ecological requirements and planting materials production. Paper presented at the International Plantation Conference "Capacity Building, Development and Sustainable Technology", 18–20 December 2012, Bogor.
16	**AHMAD ZUHAIDI, Y., LOK, E.H. & HASHIM, M.N.** Model rehabilitation of ex-mining Lands through afforestation with selected forest plantation species. Paper presented at the Mineral Symposium (SIMPOMIN) 2013, 12–13 November 2013, Perak.
17	**AISYAH HARITINI, J., MOHD NASIR, T., MEGAT SYAHIRUL AMIN, M.A. & SAHRIM, L.** Summative EEG-based between learning styles and personality traits of openness. Paper presented at 9th International Conference on Cognitive Science, 27–30th August 2013, Kuching.
18	**AISYAH HARTINI, H., MOHD NASIR, T., MEGAT SYAHIRUL AMIN, M.A., NOORITAWATI, M.T., SAHRIM, L., MOHD HUSHNIE, H., ROSHAKIMAH, M.I., WAN ROSEMEHAH, W.O. & NORFAIZA, F.** Evaluation of brainwave sub-band spectral centroid in human intelligence. Paper presented at the IEEE 9th International Colloquium on Signal Processing and its Applications (CSPA), 8–10 March 2013, Kuala Lumpur.
19	**AMINAH, H.** Pengenalan pembiakan tampang. Paper prensented at the 'Kursus Perambatan Tampang Perambatan Kacip Fatimah Stesen Penyelidikan FRIM Mata Ayer', Perlis 21–22 March 2013.
20	**AMIR, H.M.S. & AHMAD ZUHAIDI, Y.** Pollarding technique as a mean to shorten the harvesting period for teak crop. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
21	**ANEE SURYANI, S., CHEE, B.J., MAILINA, J., ADIANA, A., SITI HUMEIRAH, A.G., IHSAN SAFWAN, K., MOHD FAIZULZAKI, M.Y., MUHAMMAD KHAIR, M.A., MOHD FAISAL ISKANDAR, S. & MOHD NIZAL, S.** Pengeringan bahan mentah kurang efisyen. Paper presented at the 'Mini Konvensyen KIK 2013', 26 November 2013, Forest Research Institute Malaysia, Kepong.



22	**ANNERSTEDT, M., NIELSEN, A.B., KONIJNENDIJK, C. & SREETHERAN, M.** Health effects of the urban parks - strength of the evidence. Paper presented at the 16th European Forum on Urban Forestry, 7–11 May 2013, Milano.
23	**ANWAR, U.M.K., SARAH, W.S., ZUNOLIZA, A., HAMDAN, H. & WAN MOHD NAZRI, W.A.R.** Characteristic of polyol from three different biomass resources. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
24	**AZAHARI, M.Y.** Hutan hujan tropika dan strata hidupan liar. Paper presented at the 'Program Perintis Hijau', Majlis Bandaraya Shah Alam, 24 April 2013, Shah Alam.
25	**AZIAN, M. & NORAISHAH, S.** Forest degradation reduced at forest management unit (FMU) level - reducing forest degradation and emission through sustainable forest management (SFM) in Peninsular Malaysia. Progress Report for Component 2 presented at the Technical Working Group Meeting, 24 October 2013, Forest Research Institute Malaysia, Kepong.
26	**CHAN, Y.M., LEE, C.T., TNAH, L.H., LEE, S.L. & CHUA, L.S.L.** Development of microsatellite markers for begonias of Peninsular Malaysia for population genetic studies. Paper presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
27	**CHEE, B.J. & MASTURA, M.** 11 herba emas negara. Paper presented at the 'Kursus Teknologi Herba', 27–30 May 2013, Forest Research Institute Malaysia, Kepong, dan 'Bengkel Interaktif Herba', 2–3 March 2013, Sadong Jaya.
28	**CHENG, S., THINAGARAN, D., MONTAZARI-BARFOROUSHI, S. & NADAVIANA, A.** Elucidating species boundaries of the Peninsular Malaysian fungus-feeding *Odontotermes* using mitochondrial DNA and microsatellite markers. Paper presented at the 10th Malaysia Genetics Congress, "Advances in Genetics, Biotechnology and Genomics", 3–5 December 2013, Putrajaya.
29	**CHEW, M.Y., SAW, L.G., ONG, P.T., SITI MUNIRAH, M.Y., KAMARUL, H.M., IMIN, K. & MOHD HAIRUL, M.A.** Pulau Tioman, a lush tropical paradise revisited. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
30	**CHONG, Y.M., PHILIP, E. & ABDUL RAHIM, N.** GHG Workshop for Land Use, Land Use Change and Forestry Sector in Peninsular Malaysia, 16–17 May 2013, Petaling Jaya.
31	**CHONG, Y.M., PHILIP, E. & ABDUL RAHIM, N.** GHG Workshop for Land Use, Land Use Change and Forestry Sector in Sabah, 3–4 October 2013, Kota Kinabalu.
32	**CHONG, Y.M., PHILIP, E. & ABDUL RAHIM, N.** Greenhouse gas inventory for land use, land use change and forestry sector. Paper presented at the Training Session on Agriculture and Land Use (ALU) Software, 15 February 2013, Forest Research Institute Malaysia, Kepong.
33	**CHONG, Y.M., PHILIP, E. & ABDUL RAHIM, N.** Land use data and results for the land use, land use change and forestry sector. Paper presented at the National Seminar on Greenhouse Gas Inventory for the Land Use, Land Use Change & Forestry Sector, 1 November 2013, Petaling Jaya.
34	**CHUNG, R.C.K. & SOEPADMO, E.** Pollen morphology of Malvaceae subfamilies Brownlowioideae, Grewioideae and Dombeyoideae in Peninsular Malaysia and Borneo. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
35	**CHUNG, R.C.K.** Herbarium, Koleksi dan Penyelidikan Flora di Malaysia. Paper presented at the 'Simposium Kebangsaan Konservasi 2013 "Melestari Khazanah Warisan Negara"', 13–16 Mei 2013, Hotel Riverside Majestic, Kuching.
36	**FADZUREENA, J.** *et al.* Laporan kemajuan analisis fitokimia dan bioaktiviti. Paper presented at the 'Mesyuarat Jawatankuasa TK-MoU FRIM dengan JAKOA', 3 April 2013, Forest Research Institute Malaysia, Kepong.
37	**FARAH FAZWA, M.A. & AHMAD FAUZI, M.S.** Penjagaan keratan kacip fatimah di tapak semaian dan penanamannya. Paper presented at the 'Kursus Perambatan Kacip Fatimah' Stesen Penyelidikan FRIM Mata Ayer, 21–22 March 2013, Perlis.
38	**FARAH FAZWA, M.A., MAILINA, J., MUHD HAFIZI, Z. & MOHD ZAKI, A.** Screening of *Citrus hystrix* genotypes for high citronellal content from three population for future breeding activities. Paper presented at the 'Simposium Biologi Kebangsaan 2013', 28–30 May 2013, Port Dickson.
39	**FARAH FAZWA, M.A., MOHD ZAKI, A., MOHD LOKMAL, N., SITI SALWANA, H., MAILINA, J. & HAFIZI, Z.** Breeding kaffir lime for high oil yield and high citronellal content. Paper presented at the 5th Global Summit on Medicinal and Aromatic Plants Conference, 9–12 December 2013, Miri.
40	**FARAH FAZWA, M.A., SITI SALWANA, H., NORHAYATI, S., SITI SUHAILA, A.R., SYAFIQAH NABILAH, S.B., AHMAD FAUZI, M.S., NORNAJWA, C.L., ROHAIDAH, N., SAMSURI, T.H. & SAMSUL BAHRIN, A.** Pembangunan sistem makmal mudah alih bagi pengekstrakan minyak pati spesis limau purut ke arah penjimatan kos dan penyaringan baka berkualiti tinggi. Paper presented at the 'Mini Konvensyen KIK 2013', Forest Research Institute Malaysia, 26 November 2013.
41	**GAN, K.S.,KHAIRUL AZMI, J. & ZAIRUL AMIN, R.** Project overview and experimental design on the use finger/laminated timber for rated door frame. Paper presented at the Seminar on the Use of Finger Jointed/Laminated Timber for Fire Rated Door Frame, 6 March 2013, Kuala Lumpur.
42	**GAN, K.S.,KHAIRUL AZMI, J. & ZAIRUL AMIN, R.** Result of fire performance testing on the use finger/laminated timber for rated door frame. Paper presented at the Seminar on the Use of Finger Jointed/Laminated Timber for Fire Rated Door Frame, 6 March 2013, Kuala Lumpur.
43	**GEN, T., KHALI AZIZ, H., MOHD AZAHARI, F., HAMDAN, O., YASUMASA, H. & HIDEKI S.** Landcover and forest type mapping by satellite imagery. Paper presented at the Workshop on REDD+ Research Project in Peninsular Malaysia, 4 February 2013, Kuala Lumpur.



44	**GETHA, K., HATSU, M., NUR FAIRUZ, M.Y., HEMA THOPLA, G., LILI SHAHIRA, H. & MUHD SYAMIL, A.** Biosynthetic potential of phylogenetically and biochemically unique actinobacteria from Malaysian soil. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
45	**HADARIAH, B., SITI NAJIHAH, A.B., KARIMAH, K., MASTURA, M. & BOHARI, M.Y.** Schiff base derived from m-phenylenediamine and o-vanillin with its dimeric dinuclear and tetranuclear metal complexes: Physicochemical and antimicrobial studies. Paper presented at the 5th International Conference on Drug Discovery and Therapy 2013, 17–21 February 2013, Dubai.
46	**HALIZA, I.** Micropropagation of *Dendrobium* hybrids*, Aglonema* hybrid and *Grammatophllum speciosum*. Paper presented at the 'Sesi pembentangan kepada Agensi Inovasi Malaysia'. 14 May 2013, Forest Research Institute Malaysia, Kepong.
47	**HAMDAN, H.** Development of hybrid moulded laminated chair from bamboo and wood veneer. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
48	**HAMDAN, H.** Recovery and veneer quality of betong (*Dendrocalamus asper*). Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
49	**HAMDAN, H.** Sesenduk clone-future timber for furniture industry. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
50	**HAMDAN, H.** The innovative manufacturing process of E-PaWV chair. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
51	**HAMDAN, H., ANWAR, U.M.K., SITI RAFIDAH, A.K. ROSZAINI, K., ZAIHAN, J. & ANA AZRENA, R.** Enhancement of wood properties of selected plantation species by modification for architectural application. Paper presented at the 'Bengkel Pemantauan Projek Siap ScienceFund di Bawah Kluster Industri Bil 1/2013'. 2–3 September 2013, Putrajaya.
52	**HAMDAN, O.** Assessing carbon stock of forest in Peninsular Malaysia using Alos Palsar. Paper presented at the 'Seminar Siswazah Sesi 2012/2013', 3 January 2013, Serdang.
53	**HAMDAN, O., KHALI AZIZ, H. & MOHD HASMADI, I.** Biomass of forests in Peninsular Malaysia from L-Band Alos Palsar. Paper presented at the Seminar on Advance Active Remote Sensing (SAARS 2013), 11–13 June 2013, Kuala Lumpur.
54	**HAMDAN, O., MASZARIFAH, I. & KHALI AZIZ, H.** Alos Palsar for biomass assessment on rubber and teak plantations in Peninsular Malaysia. Paper presented at the Asian Conference on Remote Sensing, 20–24 October 2013, Bali.
55	**HAMDAN, O., MOHD HASMADI, I. & MOHD HAKIMI, H.** Optimal plot size for sampling biomass in natural and logged tropical forests. Paper presented at the Conference on Forestry & Forest Products Research, 11–12 November 2013, Kuala Lumpur.
56	**HARAMAINI, A., SULONG, I., ISMAIL, P. & SITI MARIAM, M.N.** The phenological calender of mangrove palm, *Nypa fruticans* in Kelantan Delta, Kelantan. Paper presented at the INOS Postgraduate Conference 2013, 19–20 February 2013, Terengganu.
57	**HASHIM, W.S., JALALUDIN, Z., RAFEADAH, R., SUFFIAN, M., MOHD YUSOUF, A.L. & SITI NOR AIN, T.** Utilisation of oil palm trunk for laminated engineered products. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
58	**HASHIM, W.S., RAFEADAH, R. & ZAIHAN, J.** Formaldehyde emission from wood composite products, Paper presented at the Course on Formaldehyde Emission Analysis from Wood Composite Products, 2–4 September 2013, Forest Research Institute Malaysia, Kepong.
59	**HASHIM, W.S., ZAIHAN, J., RAFEADAH, R., SUFFIAN, M., MOHD YUSOUF, A.L. & SITI NOR AIN, T.** Pemesinan 'plywood' dan kawalan mutu venir dan 'plywood'. Paper presented at the 'Kursus Asas Susunatur Mesin Kilang dan Pengenalan kepada Mesin-Mesin Perkayuan', 13–15 November 2013, Kuching.
60	**HASHIM, W.S., ZAIHAN, J., RAFEADAH, R., SUFFIAN, M., MOHD YUSOUF, A.L. & SITI NOR AIN, T.** Pengenalan kepada industri 'plywood' negara. Paper presented at the 'Kursus Asas Susunatur Mesin Kilang dan Pengenalan kepada Mesin-Mesin Perkayuan', 13–15 November 2013, Kuching.
61	**HASHIM, W.S., ZAIHAN, J., RAFEADAH, R., SUFFIAN, M., MOHD YUSOUF, A.L. & SITI NOR AIN, T.** Prinsip asas pemprosesan utama: pengubahsuaian kayu balak dan pengeringan rawatan. Paper presented at the 'Kursus Asas Susunatur Mesin Kilang dan Pengenalan kepada Mesin-Mesin Perkayuan', 13–15 November 2013, Kuching.
62	**HASHIM, W.S., ZAIHAN, J., RAFEADAH, R., SUFFIAN, M., MOHD YUSOUF, A.L. & SITI NOR AIN, T.** Sumber, kayu 'recovery' dan carta alir proses. Paper presented at the 'Kursus Asas Susunatur Mesin Kilang dan Pengenalan kepada Mesin-Mesin Perkayuan', 13–15 November 2013, Kuching.
63	**HUDA FARHANA, M.M., NIK AZYYATI, A.K., MOHD PARID, M., LIM, H.F., NOR AZLIN, Y. & NUR AFNIZA, G.** Pengunaan taman awam di Semenanjung Malaysia: persepsi pelawat. Paper presented at the 'Seminar Kebangsaan Pengurusan Kawasan Hijau 2013',1–2 October, Putrajaya.
64	**INTAN SHUHADA, A., AMIZON, A., RUZITAH, M.S., RAFIDAH, J., TENGKU ELIDA, T.Z.M., NADZEERAH, I. SANDRA, U. & AIMI LIYANA, S.** Green engineering technologies in bioethanol production. Paper presented at the IEEE Symposium on Humanities, Science and Engineering Research (SHUSER) 2013, 23–25 June 2013, Penang.
65	**ISMAIL, H**. Can REDD+ contributes to sustainable forest management and biodiversity conservation in Malaysia? Paper presented at the International in-house Seminar, 12 January 2013, Tsukuba.



66 **ISMAIL, H., NUR HAJAR, Z.S. & ABDUL RAHMAN, K.** Permanent sample plots in Peninsular Malaysia: design & layout. Paper presented at Tropical Managed Forest Observatory Workshop 2013, 28–29 November 2013, Bogor.

67 **ISMAIL, H., RAJA BARIZAN, R.S., AZIAN, M. & TARIQ MUBARAK, H.** Hasil dan impak penyelidikan yang telah dijalankan oleh Jawatankuasa Penyelidikan dan Pembangunan (JTRD) sepanjang tempoh Rancangan Malaysia ke-9 dan ke-10. Paper presented at the 'Seminar Kebangsaan Pemuliharaan Hutan Pesisiran Pantai Negara 2013', 11–13 June 2013, Terengganu.

68 **ISMAIL, H., SAMSUDIN, M. & ELIZABETH, P.** Studies on climate change & forestry by FRIM. Paper presented at the Workshop on REDD+ Research Project in Peninsular Malaysia, 4 February 2013, Kuala Lumpur.

69 **ISMAIL, P**. Reducing forest degradation and emissions through sustainable forest management (SFM) in Peninsular Malaysia. Paper presented at the Workshop on Management Techniques for Sustainable Forest Management in a Changing Climate, 1–12 July 2013, Kunming.

70 **ISMAIL, P., SAMSUDIN, M., ZAHARI, I., ABDUL KHALIM., A.S., NORHAIDI, Y., HAMDAN, O., AZIAN, M., NURHAJAR, Z.S., FLETCHER, C.D. & NADIA, C.I.** Utilizing sustainable forest management (SFM) practices in Peninsular Malaysia under the REDD+ mechanism in mitigating the climate change. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.

71 **ISMARIAH, A. & NORLIYANA, A.** PES: Valuation of watershed services of tropical forest. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.

72 **ISMARIAH, A., JEFFREY, R.V. & NORLIYANA, A**. Economic valuation on ecosystem services of tropical Forest. Paper presented at the 6th ESP Conference, 26–30 September 2013, Bali.

73 **ISMARIAH, A., JEFFREY, R.V. & NORLIYANA, A.** Valuing recreation of tropical forest parks: Improving the Design and Management. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.

74 **ISMARIAH, A., NORLIYANA, A. & MOHD FARIDZUL, Y.** Valuation of watershed services for tropical forest ecosystem services conservation. Paper presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.

75 **KAVIARASU, M.** Diversity and distribution of freshwater fishes in Temengor Lake, West Malaysia. Paper presented at the Symposium on the 2nd Temengor Scientific Expedition 2012, 22–25 August 2013, Gerik.

76 **KHAIRUL, A., MOHD TAMIZI, M., KHAIRUL, M. & AHMAD AZARUDDIN, M.N.** Sifat pemesinan dan nilai inovasi produk kayu daripada pokok hutan bandar. Paper presented at the 'Simposium Teknologi Penghasilan Rekabentuk Inovatif Secara Bersepadu 2013', 3–5 December 2013, Terengganu.

77 **KHALI AZIZ, H. & MOHD AZAHARI, F.** Forest cover and carbon mapping in the greater Mekong sub-region and Malaysia: progress of Malaysia. Paper presented at the 3rd Progress Workshop of GMS+ Project, 8–10 May 2013, Kunming.

78 **KHALI AZIZ, H., HAMDAN, O., MOHD AZAHARI, F. & TAKAO, G.** Plotless sampling techniques for biomass estimation in stratified tropical forest using remotely sensed data. Paper presented at the Workshop on REDD+ Research Project in Peninsular Malaysia, 4 February 2013, Kuala Lumpur.

79 **KHALI AZIZ, H., MOHD AZAHARI, F. & HAMDAN, O.** Application of hyperspectral technology in discriminating *Gonystylus bancanus* in Malaysia. Paper presented at the International Meeting on Sustainable Forest Management in CITES, 8–10 January 2013, Bali.

80 **KHALI AZIZ, H., PUAD, E., HAMDAN, O. & MOHD PARID, M.** Assessment of biomass for energy from forest industry waste. Paper presented at the Biomass Asia Conference 2013, 20–22 May 2013, Kuala Lumpur.

81 **KHOO, V.** The syncronous fireflies of the Selangor River. Paper presented at the Taylors's University Biodiversity & Conservation Course, 21 June 2013, Petaling Jaya.

82 **KIEW, R., LIM, C.L., RAFIDAH, A.R., YAO, T.L., MIDDLETON, D.J.** Towards a revision of the Gesneriaceae for the Flora of Peninsular Malaysia. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.

83 **LAU, K.H., CHUA, L.S.L., TNAH, L.H., LEE, C.T., LEE, S.L., NG, K.K.S., NG, C.H. & NURUL FARHANAH, Z.** *Aquilaria* in Peninsular Malaysia: towards its conservation and management. Paper presented at the International Conference on Agarwood, 27–29 September 2013, Taiwan.

84 **LEE, C.T.** DNA-based timber tracking system of *Koompassia malaccensis* in Malaysia. Paper presented at the Taylor's University Biodiversity & Conservation Course, 13 November 2013, Petaling Jaya.

85 **LEE, S.L. & EKUE, M.** Identification of timber species and origin: priority species for Asia Pacific & Oceania. Paper presented at the Regional Workshop for Asia, Pacific & Oceania, "Identification of Timber Species and Origins", 20–21 August 2013, Beijing.

86 **LEE, S.L.** DNA barcoding and fingerprinting in combating illegal logging. Paper presented at the 'Mesyuarat Penyelidikan FRIM 3/2013', 9 April 2013, Forest Research Institute Malaysia, Kepong.

87 **LEE, S.L.** DNA database of four important Malaysia timber tree species for timber tracking. Paper presented at the 'Mesyuarat Urusan Hutan dan Sivilkultur (MAJURUS) Ke-46, Jabatan Perhutanan Semenanjung Malaysia (JPSM)', 18–19 November 2013, Institut Penyelidikan Perhutanan Malaysia, Kepong.

88 **LEE, S.L., NG, K.K.S., TNAH, L.H., LEE, C.H., NG, C.H., NURUL FARHANAH, Z., CHUA, L.S.L., HAMIDAH, M., SAW, L.G., NORWATI, M., TANI, N., TUSMURA, Y., KOSLELA, J. & HONG, L.T.** Optimum population size for the effective conservation of Malaysian forest tree species. Paper presented at the 'Mesyuarat Jawatankuasa Penyelarasan Penyelidikan Perhutanan JPSM 1/2013', 10 October 2013, Port Dickson.



89	**LEE, S.L., TNAH, L.H., NG, K.K.S., LEE, C.T., NG, C.H., NURUL FARHANAH, Z., NADZIRAH, A., CHAN, Y.C., KAMARUDIN, S., TANI, N., TSUMURA, Y., BIBIAN, D. & KHOO, E.** DNA database of four important Malaysia timber tree species for timber tracking. Paper presented at the 'Mesyuarat Jawatankuasa Penyelarasan Penyelidikan Perhutanan JPSM 1/2013', 10 October 2013, Port Dickson.
90	**LEE, S.S. & PATAHAYAH, M.** Role of mycorrhizal fungi in the natural regeneration, sustainable management and Bbiodiversity of dipterocarp forest in South-East Asia/BioAsia. Paper presented at the 9th Project Evaluation Monitoring (PEM), 19 October 2013, Forest Research Institute Malaysia, Kepong.
91	**LIM, C.L. & KIEW, R.** Sections in Codonoboea: the Peninsular Malaysian Scenario. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
92	**LIM, H.F., HUDA FARHANA, M.M., MOHD PARID, M., TARIQ MUBARAK, H., INTAN NURULHANI, B. NORSHAKILA, Y. & MOHD NASIR, H.** Kesan-kesan sosio-ekonomi yang berkaitan dengan penanaman bakau dan ru di Semenanjung Malaysia. Paper presented at the 'Seminar Kebangsaan Pemuliharaan Hutan Pesisiran Pantai Negara 2013', 11–13 June 2013, Terengganu.
93	**LIM, H.F., MOHD PARID, M., NORSHAKILA, Y. & INTAN NURULHANI, B.** Social forestry practices in Peninsular Malaysia. Paper presented at the National Multi-Stakeholder Workshop to Identify and Prioritise Policy and Strategic Issues and Relevant Capacity Building Needs, 8–9 October 2013, Forest Research Institute Malaysia, Kepong.
94	**LIM, H.F., NORINI, H., NORSHAKILA, Y., INTAN NURULHANI, B., NIK MUSA'ADAH, M., TAN, A.L. & NURUL HUSNA, Z.** Traditional knowledge documentation: from FRIM to the world. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
95	**LING, S.K., TAN, H.P., FAUZIAH, A., TAN, A.L., SALBIAH, M., NUZIAH, H. & ZUNOLIZA, A.** Autentikasi herba melalui pendekatan analisis kimia. Paper presented at the 'Kursus Mengenali Herba dan Khasiatnya', 1–2 October 2013,Forest Research Institute Malaysia, Kepong.
96	**LOK, E.H. & AHMAD ZUHAIDI, Y**. Some silvicultural considerations in *Aquilaria* cultivation for agarwood and oil production. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
97	**MAHANIM, S.M.A., PUAD, E., RAFIDAH, J., WAN ASMA, I. & SHAHRUDDIN, I.** Activated carbon from bamboo using chemical and steams activations. Paper presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
98	**MAHANIM, S.M.A., WAN ASMA, I. & PUAD, E.** Production of activacated carbon (AC) derived from bamboo for supercapacitor and hHigh-end application. Paper presented at the 'Pembentangan Projek Pra-Pengkomersialan kepada Pihak Malaysian Technology Development Centre (MTDC)', 18 October 2013, Kepong.
99	**MAHFUZAH, M., MOHD NASIR, T., SAHRIM, L., ZUNAIRAH, M. & NORIZAM, S.** EEG spectrogram classification employing ANN for IQ application. Paper presented at the International Conference on Technological Advances in Electrical, Electronics and Computer Engineering (TAEECE), 9–11 May 2013, Shah Alam.
100	**MAHFUZAH, M., MOHD NASIR, T., ZUNAIRAH, M., SAHRIM, L. & NORIZAM, S.** Statistical analysis of balanced brain and IQ applications. Paper presented at the IEEE 3rd International Conference on System Engineering and Technology (ICSGRC), 19–20 August 2013, Shah Alam.
101	**MAILINA, J., NOR AZAH, M.A., PIN, K.Y. & SAIDATUL HUSNI, S.** Teknologi pemprosesan herba dan minyak pati. Paper presented at the 'Bengkel Interaktif Herba', 2–3 February 2013. Sadong Jaya.
102	**MAILINA, J., NOR AZAH, M.A., SITI HUMEIRAH, A.G., SAIDATUL HUSNI, S. & MOHD FARIDZ, Z. P.** Study on essential oils of selected Annonaceae from Pasoh Forest Reserve Negeri Sembilan Malaysia. Paper presented at the 5th Global Summit on Medicinal and Aromatic Plants Conference, 9–12 December 2013, Miri.
103	**MARRYANNA, L., SITI AISAH, S., MOHD GHAZALI, H., ABD. RAHMAN, K. & MOHD M.S.** Short term water quality changes after timber harvesting in an upper hill dipterocarp dorest Malaysia. Paper presented at the Asia Pacific Workshop on Forest Hydrology: Water and Forests-Beyong Traditional Forest Hydrology, 23–25 September 2013, India.
104	**MASTURA, M.** Herba, tumbuhan ubatan dan beraroma (apa, mengapa, siapa, bagaimana dan bila). Paper presented at the 'Bengkel Interaktif Herba', 2–3 March 2013, Sadong Jaya.
105	**MOHAMAD NASIR, M.A, LEE, Y.H. & MUSA, A.** Design of a potentiometric sandwich biosensor for insecticide permethrin detection. Paper presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
106	**MOHAMAD NASIR, M.A.** Daya ketahanan dan pengawetan kayu. Paper presented at the 'Kursus Penggunaan Kayu Dalam Pembinaan', 10 April 2013, Forest Research Institute Malaysia, Kepong.
107	**MOHAMAD NASIR, M.A., LEE, Y.H., SALMIAH, U., MUSA, A. & SALAMAH, S.** Design of a biosensor based on the fungus *Lentinus* sajor-caju for insecticide permethrin detection in treated wood. Paper presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
108	**MOHAMAD NASIR, M.A., LEE, Y.H., SALMIAH, U., MUSA, A. & SALAMAH, S.** Development of chemical sensor and biosensors for determination of permethrin pesticide. Paper presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
109	**MOHAMMAD SHAHFIZ, A. & KAVIARASU, M.** Monitoring of small vertebrates at ecological linkage Belum-Temengor Forest Reserves, Perak. Paper presented at the Conference on Perak's Central Forest Spine: The Offing of the State's Biodiversity Bastion, 9 February 2013, Ipoh.



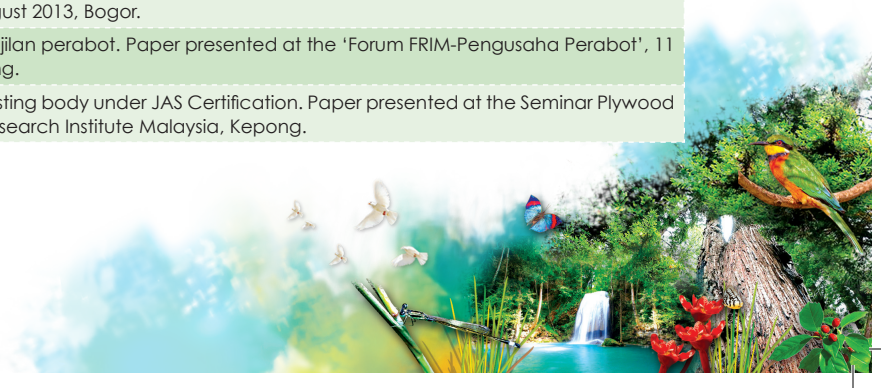
110	**MOHAMMAD SHAHFIZ, A.** Avifauna assemblage at Sungai Enam in Temengor Forest Reserve, Perak, Peninsular Malaysia. Paper presented at the Symposium on the 2nd Temengor Scientific Expedition 2012, 22–25 August 2013, Gerik.
111	**MOHAMMAD SHAHFIZ, A.** Preliminary checklist of mammals at Sungai Enam in Temengor Forest Reserve, Perak, Peninsular Malaysia. Paper presented at the Symposium on the 2nd Temengor Scientific Expedition 2012, 22–25 August 2013, Gerik.
112	**MOHD AFENDI, H.** Amalan 7K di dalam landskap. Paper presented at the 'Kursus Landskap dan Penyelenggaraan Pokok anjuran Institut Pembangunan Modal Insan, Jabatan Pengairan dan Saliran Malaysia', 9–11 April 2013, Kuala Lumpur.
113	**MOHD AFENDI, H.** Pengenalan Landskap. Paper presented at the 'Kursus Landskap dan Penyelenggaraan Pokok anjuran Institut Pembangunan Modal Insan, Jabatan Pengairan dan Saliran Malaysia', 9–11 April 2013, Kuala Lumpur.
114	**MOHD AZAHARI, F. & KHALI AZIZ, H**. Forest cover and carbon mapping in the greater Mekong sub-region and Malaysia: Malaysia workplan. Paper presented at the 3rd Progress Workshop of GMS+ Project, 8–10 May 2013, Kunming.
115	**MOHD AZAHARI, F., KHALIZA, A.F. & MUHAMAD AFIZZUL, M**. Forest cover and carbon mapping in the greater Mekong sub-region and Malaysia: a preliminary result of Malaysia. Paper presented at the 4th Progress Workshop of GMS+ Project, 4–6 November 2013, Ho Chi Minh.
116	**MOHD AZAHARI, F., MUHAMAD AFIZZUL, M. & KHALI AZIZ, H.** Peat swamp forest mapping using remote sensing technique: a classification result of Pekan forest reserve. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
117	**MOHD AZRIE, A., LUQMAN CHUAH, A., PIN, K.Y. & TAN, H.P**. Effect of solvents on the extraction of kacip fatimah (*Labisia pumila*). Paper presented at the International Conference of Chemical Engineering and Industrial Biotechnology (ICCEIB), 28–29 August 2013, Kuantan.
118	**MOHD GHAZALI, H., MARRYANNA, L., SAIFUL ISKANDAR, K., SITI AISAH, S., AHMAD AZARUDIN, M.N., ABD. RAHMAN, K. & MOHD M.S.** The application of eco-microbe for water quality bioremediation, pilot test at FRIM Kepong, Malaysia. Paper presented at the International Seminar on Climate Change and Food Security (ISCCFS 2013), 24–25 October 2013, Palembang.
119	**MOHD ILHAM, A., CHUAH, B.C., GETHA, K., LILI SHAHIRA, H. & MUHD AFIQ AIZUDDIN, R.** Ipharm drug discovery platform technology IV. in search of Malaysian natural resources for therapeutic agents of Type II diabetes using PPAR-gamma ligand. Paper presented at the National Biotechnology Seminar, 6–8 June 2013, Penang.
120	**MOHD JAMIL, A.W., MOHD ZAMIN, J. & MOHAMAD OMAR, M.K.** Strength assessment of Malaysian timbers in structural size. Paper presented at the International Civil and Infrastructure Engineering Conference, 22–24 September 2013, Kuching.
121	**MOHD NASIR, M.A., ZAIHAN, J. & SALAMAH, S.** An effective quality control system in analysis CCA in treated wood and preservative. Paper presented at the Seminar on Metrology in Chemistry, 18 November 2013, Petaling Jaya.
122	**MOHD NOR, M.Y., MAHMUDIN, S. & AHMAD ZUHAIDI, Y.** Potential utilisation of fast growing species from planted forest. Paper presented at the International Conference on Timber, 6–8 June 2013, Kuching.
123	**MOHD PARID, M., LIM, H.F. & HUDA FARHANA, M.M.** Penilaian ekonomi pemuliharaan sumber taman bandaran Semenanjung Malaysia. Paper presented at the 'Seminar Kebangsaan Pengurusan Kawasan Hijau 2013',1–2 October, Putrajaya.
124	**MOHD PARID, M., LIM, H.F., HUDA FARHANA, M.M., MUKRIMAH, A. & TARIQ MUBARAK, H.** Assessing the conservation value of mangrove forest ecosystem. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
125	**MOHD PARID, M., LIM, H.F., TARIQ MUBARAK, H. & HUDA FARHANA, M.M.** Penilaian ekonomi pemuliharaan sumber hutan paya bakau Delta Kelantan penilaian. Paper presented at the 'Seminar Kebangsaan Pemuliharaan Hutan Pesisiran Pantai Negara 2013', 11–13 June 2013, Terengganu.
126	**MOHD PARID, M., LIM, H.F., TARIQ MUBARAK, H., HUDA FARHANA, M.M., TAN, L.L. & AZMEER, M.** Penilaian ekonomi pemuliharaan sumber hutan paya bakau delta Kelantan. Paper presented at the 'Seminar Kebangsaan Hutan Pesisiran Pantai Negara 2013: Pemulihan Hutan Pesisiran Pantai 2013', 11–13 June 2013, Kuala Terengganu.
127	**MOHD YUSOUF, A.L. & SUFFIAN, M.** Updates on particleboard. Paper presented at the Meeting on Industry Updates, Heveaboard Sdn Bhd, 16 January 2013, Gemas.
128	**MOHD ZABIR, J., ZULKARNAIN, Z., TUMIRAH, K. & RAFEADAH, R**. Nano-encapsulation of organic phase change materias with copolymer shell as thermal energy storage. Paper presented at the Joint International Conference on Nanoscience, Engineering and management (BOND21), 19–21 August 2013, Penang.
129	**MOHD ZAKI, A., FARAH FAZWA, M.A., MOHD LOKMAL, N., NORHAYATI, S., SYAFIQAH NABILAH, S.B. & NORFADILAH, W.** Production of high quality planting materials of *Eurycoma longifolia* and *Labisia pumila* in FRIM: status, achievement and the way forward. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
130	**MUHAMAD AFIZZUL, M., MOHD AZAHARI, F. & KHALI AZIZ, H.** Forest cover and carbon mapping in the greater Mekong sub-region and Malaysia: implementation strategy of Malaysia. Paper presented at the 4th Progress Workshop of GMS+ Project, 4–6 November 2013, Ho Chi Minh.
131	**MUHAMAD, AFIZZUL, M., MOHD AZAHARI, F. & KHALI AZIZ, H.** Potential use of landsat imagery in discriminate mangrove forest variations. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.



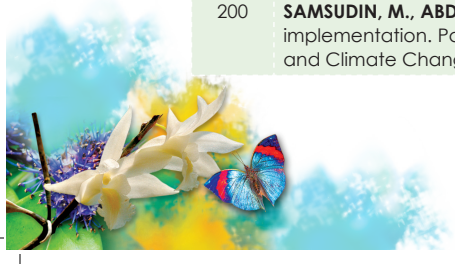
132	**NADA, B., MOHD. SALLEH, S. & KHIRUL FAIZAL, O.** A survey of fireflies (Coleoptera: Lampyridae) in Fraser's Hill, Pahang. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
133	**NASHATUL ZAIMAH, N.A., NOR ASMAH, H., NORALIZA, A. & NADIAH, SALMI, N.** Storage technique for a difficult to store seeds: *Shorea leprosula*. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
134	**NAZRE, A.R., MOHD NASIR, T., SAHRIM, L., NORIZAM, S., ZUNAIRAH, M., ROS SHILAWANI, S.A.K. & KHAIRULANUAR, S.** Asymmetry pattern of resting EEG for different IQ levels. Paper presented at the 9th International Conference on Cognitive Science, 27–30th August 2013, Kuching.
135	**NG, C.H., LEE, S.L., TNAH, L.H., LEE, C.T. & NG, K.K.S.** DNA profiling of meranti timber (*Shorea platyclados*) for chain-of-custody certification. Paper presented at the 10th Malaysia Genetics Congress, "Advances in Genetics, Biotechnology and Genomics", 3–5 December 2013, Putrajaya.
136	**NIELSEN, A.B., ANNERSTEDT, M., KONIJNENDIJK, C. & SREETHERAN, M.** Species richness in urban parks and its drivers: a review of empirical envidence. Paper presented at the 16th European Forum on Urban Forestry, 7–11 May 2013, Milano.
137	**NIK ADLIN, N.M.S. & WAN TARMEZE, W.A.** Thermo LOPVL for hard landscaping uses?. Paper presented at the International Conference on Biofuels and Biomass For Value-Added Products 2012 (ICBBVAP 2012), 23–24 October 2013, Kuala Lumpur.
138	**NIK MUSA'ADAH, M.** *et al*. Laporan kemajuan bengkel pembangunan produk prototaip daripada TSBR087 berasaskan pengetahuan tradisi sub-etnik Semelai. Paper presented at the 'Mesyuarat Jawatankuasa TK-MoU FRIM dengan JAKOA, 3 April 2013, Forest Research Institute Malaysia, Kepong.
139	**NOOR AZLIN, Y., AHMAD NAZARUDIN, M.R., AZYYATI, A.K., NAIMAH, C.L. & AZAHARI, M.Y.** Tropical plants as attractions: potentials for tourism and environmental education. Poster presented at the 16th European Forum on Urban Forestry, 7–11 May 2013, Milano.
140	**NOR AZAH, M.A.** Proses piawaian produk herba berkualiti. Paper presented at the 'Kursus Teknologi Herba', 27–30 May 2013, Forest Research Institute Malaysia, Kepong.
141	**NOR AZAH, M.A., MAILINA, J., SAHRIM, L., SAIDATUL HUSNI, S., MOHD FARIDZ, Z., ABD. MAJID, J. & MUHD HAFIZI, Z. & MOHD NASIR, M.A.** Agarwood aroma profiling by chromatographic and sensor applications. Paper presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
142	**NOR AZAH, M.A., MAILINA, J., SAIDATUL HUSNI,, S., SITI HUMEIRAH, A.G., ABDUL MAJID, J., AZRINA, A., MOHD FARIDZ, Z., MUHD HAFIZI, Z. & SAHRIM, L.** Teknologi pemprosesan herba dan penyulingan herba. Paper presented at the 'Kursus Teknologi Herba', 27–30 May 2013, Forest Research Institute Malaysia, Kepong.
143	**NOR AZAH, M.A., SAIDATUL HUSNI, S., MAILINA, J., SAHRIM, L., MUHD HAFIZI, J., AZRINA, A., SITI HUMEIRAH, A.G., MOHD FARIDZ, Z., ABD. MAJID, J. & LOK, E.H.** Investigation into the induction of agarwood in *Aquilaria* trees and their quality control assessment. Paper presented at the 1st International Seminar on Agarwood 2013, 3–5 September 2013, Selangor.
144	**NOR DATIAKMA, M.A., NORALIZA, A., NURHANAN, M., ANEE SURYANI, S. & MASTURA, M.** Preliminary study of protein profile from methicillin resistant *Staphylococcus aureus* (MRSA). Paper presented at the Project Evaluation Monitoring, 19 November 2013, Forest Research Institute Malaysia, Kepong.
145	**NOR HASNIDA, H., NAZIRAH, A., SITI SUHAILA, A.R., HALIZA, I., LING, S.K., ABDUL RASHIH, A., NIK MUSAADAH, M., SITI SYARIFAH, M., MUHAMMAD FUAD, Y. & MEGAT ERMI FAISAL, L.** Production of bioactive compounds in hairy root cultures of tongkat ali using bioreactor technology. Paper presented at the 'Seminar Bioteknologi Kebangsaan', 6–8 June 2013, Penang,
146	**NOR HASNIDA, H., NORWATI, M., HALIZA, I., NAZIRAH, A., SITI SUHAILA, A.R. & MUHAMMAD FUAD, Y.** Projek pembangunan Pusat Inkubator Biousahawan Teknologi Kultur Tisu, FRIM. Paper presented at the 'Bengkel Penilaian Outcome NRE', 19–21 May 2013, Pulau Perhentian.
147	**NORAISHAH, S.** Penilaian stok karbon dalam tanah hutan paya laut. Progress report presented at the 'Mesyuarat Core-Group Bakau 02/2013', 18 October 2013, Forest Research Institute Malaysia, Kepong.
148	**NORDAHLIA, A.S., HAMDAN, H., ANWAR, U.M.K. & ABD. RAZAK, O.** Authenticated reference of commercial bamboo occuring in FRIM. Paper presented at the 9th Project Evaluation Monitoring (PEM), 19 October 2013, Forest Research Institute Malaysia, Kepong.
149	**NORSHEILA, M.J.C., HAMDAN, O. & KHALI AZIZ, H.** Identifying drivers of deforestation and forest degradation. Progress report for Component 1 presented at the Technical Working Group Meeting, 24 October 2013, Forest Research Institute Malaysia, Kepong.
150	**NUR HAJAR, Z.S. & WAN MOHD SHUKRI, W.A.** Establishment of sample plot for non-timber forest products inventory. Paper presented at the Project Workshop on the Non-Timber Forest Products Inventory at FRIM Campus, 4 April 2013, Forest Research Institute Malaysia, Kepong.
151	**NUR HAJAR, Z.S. & WAN MOHD SHUKRI, W.A.** FRIM-FFPRI Colloborative project on development of carbon monitoring system for REDD+. Paper presented at the' Mesyuarat Pelaksanaan Projek FRIM FFPRI Di Negeri Johor', Johor Forestry Department Johor Forestry Department, 19 March 2013, Johor Bahru.
152	**NUR HAJAR, Z.S., WAN MOHD SHUKRI, W.A. & MOHD SHAHID, M.** Tree measurements. Paper presented at the Workshop on the Establishment of Permanent Sample Plot at Taman Negara Johor Endau Rompin, 15–18 March 2013, Rompin.



153	**NUR HAJAR, Z.S., WAN MOHD SHUKRI, W.A., TAMOTSU, S., KAORU N., TATSUYA, O., ISMAIL, H. & ABD. RAHMAN, K.** Estimate of forest carbon stocks in Peninsular Malaysia; the ground-based forest inventory approach. Paper presented at the Workshop on REDD+ Research Project in Peninsular Malaysia, 4 February 2013, Kuala Lumpur.
154	**NURHANAN, M.Y., SITI SYARIFAH, M.M., MUHD HAFIZM J., ASIAH, O., MOHD ILHAM, A., PUTERI SYAFINAZ AKMA, A.R., ALIA AINA, A., NIK MUSA'ADAH, M., NOR DATIAKMA, M.A., MOHD JEMAIN, M.R. & ANEE SURYANI, S.** Anti-cancer effect of SNA209 compound and its potential mechanisms of action in ovarian cancer cells. Paper presented at the Project Evaluation Monitoring, 19 November 2013, Forest Research Institute Malaysia, Kepong.
155	**NURLAILA, I., MOHD HEZRI, F.R., MOHD NASIR, T., NOR AZAH, M.A., MAILINA, J. & SAIFUL NIZAM, T.** Analysis of Agarwood oil based on headspace-solid phase microextraction combined with gas chromatography mass-spectrometry. Paper presented at the IEEE 9th International Colloquium on Signal Processing & Its Applications (CSPA 2013), 8–10 March 2013, Kuala Lumpur.
156	**NURNIDA, M.K**. Autentikasi herba menggunakan ciri mikroskopik. Paper presented at the 'Kursus Mengenali Herba & Khasiatnya', 1–2 October 2013,Forest Research Institute Malaysia, Kepong.
157	**NURUL FARHANAH, Z., LEE, S.L., LEE, C.T., TNAH, L.H., NG, C.H., NG, K.K.S., SITI SALWANA, H., CHUA, L.S.L. & LAU, K.H.** Genetic diversity of *Aquilaria malaccensis* (Thymelaeaceae) in Peninsular Malaysia. Paper presented at the 10th Malaysia Genetics Congress, "Advances in Genetics, Biotechnology and Genomics", 3–5 December 2013, Putrajaya.
158	**NURUL HUSNA, Z., TAN, A.L., NURNIDA, M.K., NORSHAKILA, Y., INTAN NURULHANI, B., LIM, H.F., NIK MUSA'ADAH, M., FADZUREENA, J. & NORINI, H.** Utilisation of the medicinal and aromatic plants by selected Orang Asli (OA) communities in Peninsular Malaysia. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
159	**ONG, B.K. & NORULAIMAN, Y.** Kawalan kualiti produk herba. Paper presented at the 'Bengkel Interaktif Herba', 2–3 March 2013, Sadong Jaya.
160	**ONG, B.K., NORULAIMAN, Y. & NUR HAZWANI, M.H.** Kawalan kualiti produk herba. Paper presented at the 'Kursus Mengenali Herba dan Khasiatnya', 1–2 October 2013, Forest Research Institute Malaysia, Kepong.
161	**ONG, P.T.** A fruit fly pest as pollinator of *Bulbophyllum praetervisum*. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
162	**PHILIP, E. & ABDUL RAHIM, N**. VIAA Tolls for biodiversity and forest climate change adaptation. Paper presented at the UNEP Workshop on Climate Change Adaptation, 10–12 July 2013, Vietnam.
163	**PHILIP, E.** Evaluation of ecosystem services-support tool for land use planning. Paper presented at the International Conference on Oil Palm and Environment, 24–25 October 2013, Selangor.
164	**PHILIP, E.** Financing for REDD+ implementation. Paper presented at the National Workshop on REDD+: Engaging Private Sectors, 19 February 2013, Kuala Lumpur.
165	**PHILIP, E.** National REDD+ strategy. Paper presented at the National REDD+ Stakeholder Consultation Workshop, 20–21 February 2013, Kuala Lumpur.
166	**PHILIP, E**. REDD+ Activities in Malaysia. Paper presented at the Workshop on REDD+ Research Project in Peninsular Malaysia, 4 February 2013, Kuala Lumpur.
167	**PHILIP, E.** REDD+ for Malaysia. Paper presented at the DOE's Capacity Building Workshop, 6 February 2013, Putrajaya.
168	**PHON, C.K., KIRTON, L.G. & NORMA, R.Y**. The potential of enhancing birdwing populations and their visibility as ecotourism icons by planting indigenous host and nectar plants. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
169	**PIN, K.Y.** Teknologi pemprosesan herba. Paper presented at the 'Kursus Usahawan Teknologi Herba FRIM', 27–30 May 2013, Forest Research Institute Malaysia, Kepong.
170	**PUAD, E., KHALI AZIZ, H., HAMDAN, O. & MOHD PARID, M.** Assessment of biomass for energy from forest industry waste. Paper presented at the Biomass Asia Conference 2013, 20–22 May 2013, Kuala Lumpur.
171	**PUAD, E., MAHANIM, S.M.A., RAFIDAH, J., WAN ASMA, I. & SHAHARUDDIN, H.** Converting agriculture and wood residues to pellets: Opportunities and challenges. Paper presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
172	**PUAD, E., WAN ASMA, I., MAHANIM, S.M.A, RAFIDAH, J. & SHAHARUDDIN, H.** Biomass renewable energy for sustainable tomorrow. Paper presented at the MICET Renewable Energy Day 2013, 6 November 2013, Melaka.
173	**RAFEADAH, R., HASHIM, W.S. & ZAIHAN, J.** Formaldehyde emission from wood composite products. Paper presented at the Course on Formaldehyde Emission Analysis from Wood Composite Products, 2–4 September 2013, Forest Research Institute Malaysia, Kepong.
174	**RAFIDAH, A. & KIEW, R**. Towards a revision of *Monophyllaea* (Gesneriaceae) from Peninsular Malaysia. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
175	**RAHIM, S. & HASHIM, W.S.** FRIM sebagai badan pensijilan perabot. Paper presented at the 'Forum FRIM-Pengusaha Perabot', 11 June 2013, Forest Research Institute Malaysia, Kepong.
176	**RAHIM, S.** Catering to the industrial needs: FRIM as testing body under JAS Certification. Paper presented at the Seminar Plywood for Japanese Market, 22–23 October 2013, Forest Research Institute Malaysia, Kepong.



177	**RAHIM, S**. Testing services provided by FRIM which accredited by ISO 17025 and other recognised International body for wood-based industries. Paper presented at the International Conference on Timber, 7–8 June 2013, Kuching.
178	**RASADAH, M.A.** Healthfood and phytomedicines from Malaysian medicinal plants: FRIM's experiences. Paper presented at the 'Seminar Akademik', 11 March 2013, Kuala Lumpur.
179	**RASADAH, M.A., ABD. RASHID, L. & NIK MUSA'ADAH, M**. Antidiabetic activity of Malaysian medicinal plants. Paper presented at the 16th Meeting of the ASEAN Experts Group on Herbal and Medicinal Plants, 2–3 July 2013, Brunei.
180	**RASADAH, M.A., LING, S.K., KHAIRUL KAMILAH, A.K., ZAMREE, M.S. & MOHD SHAHIDAN, M.A.** Botanical and chemical characterisation of *Tinospora crispa*. Paper presented at the National Biotechnology Seminar, 6–8 June 2013, Penang.
181	**RASADAH, M.A., LING, S.K., TAN, A.L., FAUZIAH, A., TAN, H.P. & NURNIDA, M.K.** Quality control of herbal raw material: Botanical & chemical aspects: Paper presented at the 'Seminar Monograf Herba Malaysia', 14 April 2013, Putrajaya.
182	**RASADAH, M.A., TAN, H.P. & LING, S.K.** Approaches for phytochemical standardisation in the quality assurance of botanical. Paper presented at the 16th Meeting of the ASEAN Experts Group on Herbal and Medicinal Plants, 2–3 July 2013, Brunei.
183	**ROHANA, A.R., LIM, H.F. & ISMARIAH, A.** Socio-economic backgrounds and income generation of herbal cultivators in Peninsular Malaysia. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
184	**ROSZAINI, K.** Borers in outdoor furniture in Japan. Paper presented at the 'Kursus Perlindungan Kayu dalam Pembuatan Perabot', 2 October 2013, Forest Research Institute Malaysia, Kepong.
185	**ROSZAINI, K.** Kayu: penggunaan, masalah dan rawatan. Paper presented at the 'Kursus Industri Perhutanan, Sijil Perhutanan Renjer Hutan Sesi 2012–2014, Institut Latihan Perhutanan (FORTRAIN)', 17 July 2013, Forest Research Institute Malaysia, Kepong.
186	**ROSZAINI, K., RAHIM, S., ZAIHAN, J., SALAMAH, S. & SALMIAH, U.** Teknologi dan rawatan perlindungan kayu. Paper presented at the 'Simposium Kebangsaan Konservasi 2013 "Melestari Khazanah Warisan Negara"', 13–16 Mei 2013, Kuching.
187	**ROZITA, A., MOHD ZOBIR, H., SITI, H.S. & TAUFIK, Y.H.** Synthesis of hexenoate-intercalated zinc layered hydroxide for non-pesticide insect control. Paper presented at the International Conference on Nanoscience, Engineering and Management (BOND21), 19–21 August 2013, Penang.
188	**ROZITA, A., WAN RASIDAH, K., MOHAMAD FAKHRI, I., SUHAIMI, W.C. & AZIZAH, A.** Development of soil sampler for mangrove soil. Paper presented at the Seminar on Advances in Soil, Plant and Fertilizer Analysis 2013: Moving Forward in Sustainable Agriculture through Green Laboratory Technology, 28–30 May 2013, Penang.
189	**RUSHDAN, I., SHARMIZA, A. & AZIZI, A.J.** The effect of mineral pulp fibre on paper properties. Paper presented at the 'Seminar Teknologi Pulp & Kertas (STPK) 2013', 2 October 2013, Bandung.
190	**SAIDATUL HUSNI, S., NOR AZAH, M.A., MAILINA, J., IRENEO, K., ALBERTO, B., MUHAMMAD FARIDZ, Z. & DARIO, S.** Optimisation of SC-Co2 extraction of *Alpinia galangal* (L). Willd and estimation of cost of manufacturing (COM) via simulation process. Paper presented at the International Conference on Natural Products (ICNP2013), 4–6 March 2013, Shah Alam.
191	**SAIDATUL HUSNI, S., NOR AZAH, M.A., MAILINA, J., NURHAZWANI, M.H., MOHD ZAMREE, M.S. & PIN, K.Y.** Teknologi pemprosesan dan pembangunan produk herba. Paper presented at the 'Program Teknousahawan Mara', 17 February 2013, Terengganu.
192	**SAIDATUL HUSNI, S., NOR AZAH, M.A., MAILINA, J., PIN, K.Y., MARZITA, M.D., ABD. MAJID, J. & MOHD FARIDZ, Z.** Comparison of volatile chemicals in *Jasminum sambac* and *Citrus hystrix* via various extraction techniques. Paper presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
193	**SAIFUL ISKANDAR, K., MOHAMAD DANIAL, M.S., AHMAD FIRDAUS, Z., MOHD GHAZALI, H., IBHARIM, H., SHAHRUL ZAMAN, I., ABD. RAHMAN, K. & MOHD FAIZAL, A**. Relationship between canopy openess and erosion at stream bank of Sungai Chini. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
194	**SALMIAH, U., NOOR AZRIEDA, A.R., BAHARUDIN, K. & RAHIM, S**. Durability classification of Malaysian timbers. Paper presented at the 9th National Biology Symposium 2013, 28–30 May 2013, Port Dickson.
195	**SALMIAH, U., ROSZAINI, K. & MOHD NASIR, M.A.** Current issue on wood biodeterioration. Paper presented at the 'Mesyuarat Penyelidikan Pegawai-Pegawai FRIM', 23 May 2013, Forest Research Institute Malaysia, Kepong.
196	**SALMIAH, U., ROSZAINI, K., MOHD DAHLAN, J., ANI, S., ANWAR, U.M.K. & SALAMAH, S**. Pyrethroid compounds as alternative treatment to boron to enhance durability of Malaysian oak: exterior performance of permethrin, a pyrethroid compound using rubberwood samples. Paper presented at the 'Seminar Agri Dana "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam, Selangor.
197	**SAMSUDIN, M.** A silvicultural approach to selection of trees for felling under SMS. Paper presented at the 'Mesyuarat Jawatankuasa Teknikal Penyelidikan Perhutanan, 10 October 2013, Port Dickson.
198	**SAMSUDIN, M**. A silvicultural approach to selection of trees for felling under SMS. Paper presented to the 'Mesyuarat Majlis Urusan Hutan Dan Silvikultur (MAJURUS)', 19 November 2013, Forest Research Institute Malaysia, Kepong.
199	**SAMSUDIN, M.** ITTO-REDDES project on reducing forest degradation and emissions through sustainable forest management in Peninsular Malaysia. Paper presented at the FRIM–US LEAF Meeting, 17–18 January 2013, Kuala Lumpur.
200	**SAMSUDIN, M., ABD. LATIF, M., ELIZABETH, P. & ISMAIL, H**. Addressing climate change mitigations and adaptation through REDD+ implementation. Paper presented at the Conference on Adopting REDD+ for Conservation, Sustainable Community Livelihood and Climate Change Mitigations,13–15 December 2013, Hong Kong.



201	**SAMSUDIN, M., ABDUL LATIFF, M., MOHD NIZAM, M.S. & SALLEH, M.** Maintaining vertical structure of forest in the Sustainable Management of Forest. Paper presented at the 2nd International Symposium onTropical Forest Ecosystem Science and Management: Challenges and Soultions, 11–13 September 2013, Bintulu.
202	**SANG, J. & KIEW, R.** Diversity of *Begonia* (Begoniaceae) in Borneo: How many species are there? Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
203	**SAW, L.G., CHUNG, R.C.K., KIEW, R. & SOEPADMO, E**. Flora of Malaysia: Its challenges and future. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
204	**SHAHLINNEY, L., SALMIAH, U., NOOR AZRIEDA, A.R. & RAHIM, S.** Towards reclassification of natural durability for Malaysian timbers. Paper presented at the 9th National Biology Symposium 2013, 28–30 May 2013, Port Dickson.
205	**SHARMIZA, A.M., MAHMUDIN, S., WAN ASMA, I., M. ANUSHA, G**. *et al*. Production of feminine hygiene product using nanofiber embedded natural resources biomass.Paper presented at the World Biotechnology Congress, 3–6 June 2013, Boston.
206	**SITI AISAH, S**. Effect of clear cutting on discharge during the preparation of forest plantation establishment in forested catchment. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November, Kuala Lumpur.
207	**SITI AISAH, S., YUSOP, Z., NOGUCHI, S., SITI NURHIDAYU, A.B. & ABD, RAHMAN, K**. Influence of *Hopea odorata* forest plantation establishment on the water yield of small forested catchment in Peninsular Malaysia. Paper presented at the Asia Pacific Workshop on Forest Hydrology: Water and Forests-Beyond Traditional Forest Hydrology, 23–25 September 2013, India.
208	**SITI MUNIRAH, M.Y.** The delimitation of *Rafflesia cantleyi* species complex. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
209	**SITI MUNIRAH, M.Y., UMMUL NAZRAH, A.R., IMIN, K. & MOHD NAZRI, A**. The diversity of flowering plants in Sungai Enam Basin, Temengor Forest Reserve, Perak. Paper presented at the Symposium on the 2nd Temengor Scientific Expedition 2012, 22–25 August 2013, Gerik.
210	**SITI SALWANA, H., NORWATI, M., LEE, C.T., LEE, S.L. & TNAH, L.H**. *Aquilaria* species identification using chloroplast DNA markers. Paper presented at the 9th Project Evaluation Monitoring (PEM), 19 October 2013, Forest Research Institute Malaysia, Kepong.
211	**SITI SALWANA, H., NORWATI, M., LEE, C.T., LEE, S.L. & TNAH, L.H.** Authentication of important *Aquilaria* species for plantation in Malaysia using molecular marker technology. Paper presented at the National Biotechnology Seminar, 6–8 June 2013, Penang.
212	**SITI SUHAILA, A.R., NORWATI, M., BRIAN AYAP, J.W., MAHANI, M.C., KANDASAMY, K.O., FARIDAH, Q.Z., FADELAH, A.A., NOR HASNIDA, H., NAZIRAH, A., HALIZA, I., MUHD FUAD, Y. & NORMAH, B.** The potential of *P. callosum* polyploids: towards the development of improved native Malaysian slipper orchid. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
213	**SUFFIAN, M. & MOHD YUSOUF, A.L.** Potential of wood residue from municipal solid waste. Paper presented at the Meeting on Potential Utilisation of Wood Residues, Alam Flora Sdn Bhd, 18 January 2013, Shah Alam.
214	**SUFFIAN, M., HASHIM, W.S., MOHD YUSOUF, A.L., RAFEADAH, R. & SITI NOR AIN, T.** Compliance of Malaysian wood-based panels to international requirements. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
215	**SUFFIAN, M., MOHD YUSOUF, A.L., HASHIM, W.S., RAFEADAH, R. 7 SITI NOR AIN, T.** Testing of marine plywood. Paper presented at the Briefing on Third Party Verification of Marine Plywood Production to BS 1088, 18 November 2013, Forest Research Institute Malaysia, Kepong.
216	**SUFFIAN, M., MOHD YUSOUF, A.L., RAFEADAH, R., HASHIM, W.S. & SITI NOR AIN, T.** The effect of accelerated exposure against fibreboard from *Acacia* hybrid, Paper presented at 9th Project Evaluation Monitoring (PEM), 19 November 2013, Forest Research Institute Malaysia, Kepong.
217	**SYAHIDA EMIZA, S. & SOEPADMO, E.** A revision of the Malaysian Opiliaceae. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
218	**TAMOTSU, S., NUR HAJAR, Z.S., WAN MOHD SHUKRI, W.A., KAORU, N., TATSUYA, O., ABD. RAHMAN, K.** & ISMAIL, H. Estimation of forest carbon stocks using fixed sample plots in Peninsular Malaysia. Paper presented at the Workshop on REDD+ Research Project in Peninsular Malaysia, 4 February 2013, Kuala Lumpur.
219	**TAN, A.L.** Pengenalan herba dan khasiatnya. Paper presented at the 'Kursus Mengenali Herba & Khasiatnya', 1–2 October 2013,Forest Research Institute Malaysia, Kepong.
220	**TAN, A.L., NURNIDA, M.K., TAN, H.P., ZUNOLIZA, A., SALBIAH, M., IZLAMIRA, R. & LING, S.K.** Chemical fingerprinting of *Eurycoma longifolia* and *E. apiculata*: an authentication tool in quality control of herbal materials. Paper presented at the Project Evaluation Monitoring, 19 November 2013, Forest Research Institute Malaysia, Kepong.
221	**TAN, A.L., NURUL HUSNA, Z. & CHANG, Y.S.** Teknik pengutipan sampel tumbuhan ubatan dan beraroma (berasaskan pengetahuan tradisi). Paper presented at the 'Bengkel Teknik Pengutipan Sampel Tumbuhan Ubatan & Beraroma dan Pendokumentasian Pengetahuan Tradisi Orang Asli (Lanoh) di Kg. Air Bah, Lawin, Gerik (Fasa 1), 20–22 August 2013, Perak dan 'Bengkel Teknik Pengutipan Sampel Tumbuhan Ubatan & Beraroma dan Pendokumentasian Pengetahuan Tradisi Orang Asli (Mendriq) di Kg. Kuala Lah, Gua Musang (Fasa 1), 10–12 September 2013, Kelantan.



222	**TAN, A.L., NURUL HUSNA, Z. & NURNIDA, M.K.** Laporan kemajuan bengkel teknik pengutipan sampel tumbuhan ubatan & beraroma (berasaskan pengetahuan tradisi). Paper presented at the 'Mesyuarat Jawatankuasa TK-MoU FRIM dengan JAKOA, 3 April 2013, Forest Research Institute Malaysia, Kepong.
223	**TAN, H.P., ZUNOLIZA, A., SALBIAH, M., TAN, A.L., NURNIDA, M.K. & LING, S.K.** Chemical fingerprinting of *Eurycoma longifolia* (tongkat ali) for quality control. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
224	**TAN, J.P.C.** Conservation of endangered Malaysian Gesneriaceae limestone species. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
225	**TAN, Y.E., ONG, C.B. & IZRAN, K.** Processing of finger jointed/laminated doorframe, QC and testing. Paper presented at the Seminar on the Use of Finger Jointed and Laminated Door Frame for Fire Rated Door Set, 6 March 2013, Kuala Lumpur.
226	**TNAH, L.H.** Timber tracking system of chengal (*Neobalanocarpus heimii*) using DNA approach. Paper presented at the Taylors's University Biodiversity & Conservation Course, 21 June 2013, Petaling Jaya.
227	**WAN ASMA, I.** Forest Products R&D. Paper presented at the Korean Society of Wood Science and Technology Annual General Meeting, 12–13 April 2013, Korea.
228	**WAN ASMA, I., FADHILAH, Z., ROSDI, K. & EDZIANI, R.** FRIM Biodiesel Project. Paper presented at the meeting between Petani Sepadu Sdn Bhd–FRIM and Sarawak Chief Minister, 5 November 2013, Kuching.
229	**WAN ASMA, I., PUAD, E., SHAHARUDDIN, H., RAFIDAH, J., MAHANIM, S.M.A. & NURUL ATIQAH, S.** Biofuel production from biomass: emerging bioenergy systems and technologies in Malaysia. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
230	**WAN M. AZRUL, MOHD FARID, A., LEE, S.S., SAJAP, A.S., TOSIAH, S., PATAHAYAH, M. & TANG, S.B.** Update on pests, diseases and disorders of *Eurycoma longifolia* Jack. (tongkat ali) in Peninsular Malaysia. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
231	**WAN MOHD SHUKRI, W.A., NUR HAJAR, Z.S. & MOHD NIZAM, A.** Plot establishment. Paper presented at the Workshop on the Establishment of Permanent Sample Plot at Taman Negara Johor Endau Rompin, 15–18 March 2013, Rompin.
232	**WAN MOHD SHUKRI, W.A., NUR HAJAR, Z.S. & WAN RADZI, W.A.** Carbon stock estimations at Pasoh Forest Reserve for REDD+. Paper presented at the Pasoh Seminar Series: What's new in Pasoh? 20 September 2013, Forest Research Institute Malaysia, Kepong.
233	**WAN RASIDAH, K., ROSAZLIN, A. & ROZITA, A.** Turning biosludge from paper manufacturing waste into effective and storable plant nutrient source. Paper presented at the Ninth International Conference on Environmental, Cultural, Economic & Social Sustainability. 22–27 January 2013, Hiroshima.
234	**WAN TARMEZE, W.A.** Engineered lumbers from biomass. Paper presented at the *International Conference on Biofuels and Biomass for Value-Added Products 2013 (ICBBVAP 2013)*, 23–24 October 2013, Kuala Lumpur.
235	**WAN TARMEZE, W.A.** Penyelidkan dan inovasi dalam produk berasaskan buluh. Paper presented at the 'Seminar Potensi Buluh Sumber Alternatif Kayu', 25 October 2013, Serdang.
236	**ZAIHAN, J. & HASHIM, W.S.** Hala tuju dan kajian-kajian yang dijalankan oleh Program Biokomposit dan Perlindungan Kayu, Bahagian Keluaran Hutan FRIM. Paper presented at the 'Kursus Industri Perhutanan, Sijil Perhutanan Renjer Hutan Sesi 2012–2014, Institut Latihan Perhutanan (FORTRAIN)', 17 July 2013, Forest Research Institute Malaysia, Kepong.
237	**ZAIHAN, J., HASHIM, W.S., RAFEADAH, R., KHAIRUL AZMI, J. & SITI NOR AIN, T.** The effect of wood species and thermal modification on the sorption isotherms properties. Paper presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
238	**ZAIHAN, J., RAFEADAH, R., HASHIM, W.S., & SITI NOR AIN, T.** Development of innovative nano-biocomposites for engineered products. Paper presented at the Seminar Nanocrystallite Cellulose Research Consortia (NCRC), 25 May 2013, Kuala Lumpur.
239	**ZAMREE, M.S.** Analisis produk dan kawalan mutu produk herba. Paper presented at the 'Kursus Usahawan Teknologi Herba FRIM', 27–30 May 2013, Forest Research Institute Malaysia, Kepong.
240	**ZAMREE, M.S.** Pengendalian lepas tuai. Paper presented at the 'Kursus Usahawan Teknologi Herba FRIM', 27–30 May 2013, Forest Research Institute Malaysia, Kepong.
241	**ZAMREE, M.S.** Pusat pengumpulan dan teknologi pengendalian lepas tuai SPF Maran. Paper presented at the 'Seminar Klaster Herba/Rempah Ratus Maran', 17–18 April 2013, Maran.
242	**ZAMREE, M.S.** Teknik pemprosesan herba. Paper presented at the 'Bengkel Interaktif Herba 2013, 2–3 February 2013', Sadong Jaya.
243	**ZAMREE, M.S., PIN, K.Y., NOOR RASYILA, M.N., NURHAZEANI, M.H., NORHAYATI, A., DARY, J.A. & ADIB, Z.R.** Projek peningkatan keupayaan perkhidmatan pemprosesan dan kawalan kualiti di Pusat Teknologi Herba yang berstatus amalan pengilang baik (APB). Paper presented at the Seminar on Outcomes for Project Under RMK–10, 18 December 2013, Forest Research Institute Malaysia, Kepong.



	POSTER/POSTERS
1	**ABD. RAZAK, O., SALLEH, M., MOHD LOKMAL, N. & ROSDI, K.** Harvesting evaluation of *Dendrocalamus asper* (buluh betung) on shoot productivity. Poster presented at the 24th Malaysian Society of Plant Physiology Conference (MSPPC 2013): Innovative Plant Productivity & Quality, 27–29 August 2013, Terengganu.
2	**ADIANA, M.A., SAIFUL AZMI, J. & ZURINA, S.** Synthesis and evaluation of anti-MRSA potential of 2-pyrrolin-2-ones derivatives. Poster presented at the 5th Global Summit on Medicinal and Aromatic Plants Conference, 9–12 December 2013, Miri.
3	**AHMAD NAZARUDIN, M.R., TSAN, F.Y., NORMANIZA, O., ROSFARIZAL, K. & ADZMI, Y.** Growth performance of *Xanthostemon chrysanthus* in two selected urban sites. Poster presented at the 24th Malaysian Society of Plant Physiology Conference, 27–29 July 2013, Terengganu.
4	**AHMAD NAZARUDIN, M.R., TSAN, F.Y., NORMANIZA, O., ROSFARIZAL, K. & ADZMI, Y.** Phenolic content of *Xanthostemon chrysanthus* after treatment with paclobutrazol and potassium nitrate. Poster presented at the 24th Malaysian Society of Plant Physiology Conference, 27–29 July 2013, Terengganu.
5	**AHMAD ZUHAIDI, Y. & MAHAT, M.J.** Study on the afforestation of ex-Mining Land with selected forest plantation species. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
6	**AMINAH, H., AHMAD FAUZI, M.S., TARIQ MUBARAK, H. & HAMZAH, M.** Macropropagation of medicinal plants, *Tinospora crispa* for domestication proposes. Poster presentation for the 5th International Conference on Drug Discovery and Therapy 2013, 18–21 February 2013, Dubai.
7	**ANEE SURYANI, S., NURHANAN, M.Y., MUHD HAFFIZ, J., ABDUL RASHIH, A., ASIAH, O., ALIA AINA, A., NOR DATIAKMA, M.A., SITI SYARIFAH, M.M., MOHD HAFIDZ HADI, A., LING, S.K. & NOR HASHIDA, H.** Acute toxicity evaluation of *Eurycoma longifolia* botanical extracts. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
8	**ANG, L.H., HO, W.M., TANG, L.K., KHOO, S.I. & NADA, B.** Rehabilitation of firefly habitat at riverbank of Sungai Kuala Selangor. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
9	**ANG, L.H., HO, W.M., TANG, L.K., KHOO, S.I. & NADA, B.** Rehabilitation of firefly habitat at riverbank of Sungai Kuala Selangor. Poster presented at the 'Seminar Kebangsaan Pemuliharaan Hutan Pesisiran Pantai Negara 2013', 11–13 June 2013, Terengganu.
10	**ASIAH, O., NURHANAN, M.Y., SITI SYARIFAH, M.M. & MOHD HAFFIZ, J.** Molecular docking of anticancer compound SNA209 to its target protein. Poster presented at the 38th Annual Conference of the Malaysian Society for Biochemistry & Molecular Biology, 28–29 August 2013, Putrajaya.
11	**AZIAN, M., PHILIP, E. & CHONG, Y.** Hutan paya gambut: kandungan karbon tinggi. Poster presented at the World Forestry Day in Pahang, 21 March 2013, Kuantan.
12	**AZRINA, A., NOR AZAH, M.A., SITI HUMEIRAH, A.G., MAILINA, J. & MUHAMMAD HAFFIZ, J.** Chemical constituents from *Aquilaria subintegra* leaf extract. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
13	**AZZYATI, A.K., SHAMILLAH, S., NOOR AZLIN, Y., AZAHARI, M.Y. & NAIMAH, C.L.** Urban forests and parks for environmental learning: wetland conservation project. Poster presented at the Seventh World Environmental Education Congress, 9–14 June 2013, Morocco.
14	**BAN, C.C., MUHAMMAD AFIQ, A. & MOHD ILHAM, A.** Discovery of Malaysian natural product with anti-diabetic type II potential: effect of plant extract, IPharm423 on adipocyte differentiation, rosiglitazone-stimulated glucose uptake and PPAR- gamma transactivation. Poster presented at the 12th International Symposium (UMTAS 2013), 8–10 October 2013, Terengganu.
15	**CHONG, Y.M., PHILIP, E. & ABDUL RAHIM, N.** Assessment of soil organic carbon storage in inland and peat swamp forest. Poster presented at the 23rd Malaysian Society of Plant Physiology Conference; 6–8 September 2013, Kuantan.
16	**FADZUREENA, J., MAZURA, M.P., ADIANA, M.A. & HANI IDAYU, B.** An investigation on the inhibitory effects of *Senna alata L.* leaf extract as well as its isolated compound on xanthine oxidase assay. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
17	**FADZUREENA, J., MOHD JEMAIN, M.R., NIK MUSA'ADAH, M., NOOR RASYILA, M.N., PIN, K.Y., SITI NUR AISYAH, M.H., NUZIAH, H., ABDUL RASHIH, A., ROHANA, S., HANI IDAYU, B. & AZMAN, M.** Anti-gout standardised extract (SEBF) from *Baeckea frutescens*. Poster presented at the Malaysia Technology Expo 2013, 21–23 February 2013, Kuala Lumpur.
18	**FADZUREENA, J., SAIDATUL HUSNI, S., MOHD JEMAIN, M.R., NIK MUSA'ADAH, M., NOOR RASYILA, M.N., PIN, K.Y., SITI NUR AISYAH, M.H., NUZIAH, H., ABDUL RASHIH, A., ROHANA, S., HANI IDAYU, B. & AZMAN, M.** Anti-gout standardised extract (SEBF) from *Baeckea frutescens*. Poster presented at the Bioinnovation Awards 2013, 21–23 October 2013, Johor Baharu.
19	**FARAH FAZWA, M.A.** Identifikasi varieti dan asas pemilihan kacip fatimah. Poster presented at the 'Kursus Perambatan Tampang Kacip Fatimah Stesen Penyelidikan FRIM Mata Ayer', 21–22 March 2013, Perlis.
20	**FARAH FAZWA, M.A., SITI SALWANA, H., NORHAYATI, S., SITI SUHAILA, A.R., SYAFIQAH NABILA, S.B., AHMAD FAUZI, M.S., NORNAJWA, C.L., ROHAIDAH, N., SAMSURI, T.H. & SAMSUL BAHRIN, A.** Mesin meracik daun limau purut untuk pengekstrakan minyak pati di lapangan. Poster presented at the 'Hari Inovasi FRIM', 26–27 November 2013, Forest Research Institute Malaysia, Kepong.



21	**FAUZIAH, A., NOR HADIANI, I., FADZUREENA, J., SITI NUR AISYAH, M.H.** Xanthine oxidase inhibitory activity of T*etracera indica*. Poster presented at the International Conference on Natural Products (ICNP2013), 4–6 March 2013, Shah Alam.
22	**GETHA, K., MUHD SYAMIL, A. & MASTURA, M.** Active pharmaceutical ingredients (API) against MRSA and VISA. Poster presented at the 'Pameran Program Lawatan Turun Padang YDP PUSPANITA dan IM4U - Siri 1', 9 March 2013, Forest Research Institute Malaysia, Kepong.
23	**HADA MASAYU, I.D., M NORDIN, I., PIN, K.Y. & ZAMREE, M.S.** Drying kinetics of microwave-vacuum and convective oven drying of misai kucing (*Orthosiphon aristatus*). Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
24	**HADA MASAYU, I.D., M NORDIN, I., PIN, K.Y., ZAMREE, M.S. , MOHD. SHAHIDAN , M.A., NOOR RASYILA, M.N., & KHAIRUL KAMILAH, A.K.** Drying kinetics of microwave-vacuum and convective oven drying of misai kucing (*Orthosiphon aristatus*). Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
25	**HALIZA, I., NOR HASNIDA, H., SITI SUHAILA, A.R. & NAZIRAH, A.** Towards mass propagation of *Swietenia macrophylla* through micropropagation. Poster presented at the 24th Malaysian Society of Plant Physiology Conference , 27–29 August 2013, Terengganu.
26	**HAMIDAH, M., YONG, W.S.Y., CHUA, L.S.L. & LAU, K.H.** Towards the identification of hotspot areas in Perak. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
27	**HEMA THOPLA, G. & GETHA, K.** Screening of heavy metal tolerance in actinobacteria isolated from Bidor tin-tailings and Pasoh forest soil. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
28	**HUDA FARHANA, M.M. & LIM, H.F.** Mas cotek (*Ficus deltoidea)* as an alternative species in herbal plant industry. Poster presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
29	**HUDA FARHANA, M.M., LIM, H.F., MOHD PARID, M. & TARIQ MUBARAK, H.** Kepentingan sosio-ekonomi kawasan bakau delta Kelantan kepada masyarakat tempatan. Poster presented at the 'Seminar Kebangsaan Pemuliharaan Hutan Pesisiran Pantai Negara 2013', 11–13 Jun 2013, Terengganu.
30	**HUDA FARHANA, M.M., LIM, L.F., NIK AZYYATI, A.K. & MOHD PARID, M.** Happiness index among FRIM's joggers. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
31	**JULIANA, A., ISMARIAH, A., NOOR AINI, Z. & NORLIYANA, A.** Willingness to pay for conservation of a forest ecosystem in Negeri Sembilan. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
32	**KAVIARASU, M., MOHD SHAHFIZ, A., MOHD RIZAL, R., JOHN RAY, T., FARIDATUL NORDIANA, R. & FAKRUL IQBAL, F.** Addition on herpetofauna diversity in Forest Research Institute Malaysia (FRIM) campus, Selangor. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
33	**KHAIRANA, H., LAM, K.W., FADZUREENA, J., JAMIA AZDINA, J. & NURNAJMUL UMMAH, A.** Xanthine oxidase inhibitory activity of selected chalcone derivatives. Poster presented at the International Conference on Natural Products (ICNP2013), 4–6 March 2013, Shah Alam.
34	**KHAIRUL KAMILAH, A.K, MOHD. SHAHIDAN, M.A., HADA MASAYU, I.D., NOOR RASYILA, M.N., ZAMREE, M.S. & RASADAH, M.A.** Establishment of organic plot of *Tinospora crispa* based on Skim Oragnik Malaysia (SOM). Poster presented at the National Conference on Industry-Academia initiatives in Biotechnology (CIA-BIOTECH) 2013 "Bridging Economy and the Biotechnological Divide", 4–6 December 2013, Cameron Highlands, Pahang.
35	**KHAIRUL KAMILAH, A.K., HADA MASAYU, I., MOHD SHAHIDAN, M.A., NOOR RASYILA, M.N., ZAMREE, M.S. & RASADAH, M.A.** Establishment of organic plot of the *Tinospora crispa* based on Skim Organik Malaysia (SOM). Poster presented at Conference on Industry-Academia Joint Initiatives in Biotechnology (CIA: Biotech 13), 5–7 December 2013, Kuantan.
36	**LIM, H.F., HUDA FARHANA, M.M., MOHD PARID, M., TARIQ MUBARAK, H., INTAN NURUHANI, B., NORSHAKILA, Y. & MOHD NASIR, H.** Penanaman bakau dan ru di Semenanjung Malaysia: impak terhadap sosio-ekonomi penduduk tempatan. Poster presented at the 'Seminar Kebangsaan Hutan Pesisiran Pantai Negara 2013: Pemulihan Hutan Pesisiran Pantai 2013', 11–13 June 2013, Kuala Terengganu.
37	**LIM, K.T. & MOHD ILHAM, A.** Development of an in-vitro anti-trypanosomal high throughput screening assay. Poster presented at the 12th International Symposium (UMTAS 2013), 8–10 October 2013, Terengganu.
38	**LOKMAL, N., MOHD ZAKI, A., FARAH FAZWA, M.A. & ABD. RAZAK, O.** Production of genetically high yielding material of tongkat ali. Poster presented at the 5th International Conference on Drug Discovery and Therapy 2013, 18–21 February 2013, Dubai.
39	**MAHMUDIN, S., MOHD NOR, M.Y., RUSHDAN, I., SHARMIZA, A., LATIFAH, J., AZIZI, J.** *et al*. Green products and a healthy environment. Poster presented at the FRIM Innovation Day 2013, 27–28 November 2013, Forest Research Institute Malaysia, Kepong.



40 **MAILINA, J., NOR AZAH, M.A., SAIDATUL HUSNI, S., AZRINA, A., VIMALA, S., SITI HUMEIRAH, A.G., NUZIAH, H. & MOHD FARIDZ, Z.P.** Development of antioxidant serum using *Alpinia malaccensis* var. *Nobilis* leaf extract. Poster presented at the 'Seminar Agri-Dana 2013: R&D Perhutanan: Sumber Kekayaan Baharu', 10–11 September 2013, Shah Alam.

41 **MAILINA, J., NOR AZAH, M.A., SAIDATUL HUSNI, S., FADZUREENA, J., SITI HUMEIRAH, A.G., AZRINA, A., MUHAMMAD FARIDZ, Z. & NOOR ROSLIZA, R.** Volatile constituents and anti-inflammatory effect of *Alpinia galangal* extract. Poster presented at the International Conference on Natural Products (ICNP2013), 4–6 March 2013, Shah Alam.

42 **MARRYANA, L., SITI AISAH, S., ABD. RAHMAN, K. & MOHD M.S.** The response of water quality on timber harvesting in a tropical hill forest. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.

43 **MARY, K., ALFRED, T., MARYAM, T. & NICK, PLANT.** A metabolomics approach to investigate troglitazone toxicity. Poster presented at the Metabolomics Society Conference 2013, 1–4 July 2013, Glasgow.

44 **MAZIDAH, M., PATAHAYAH, M., ROSNANI, A.G., ERWAN SHAH, S., TANG, S.B., ZALILAH, M.A. & BADROL HISHAM, I.** Powdery Mildew: a potential threat to cultivated dukung anak in Malaysia. Poster presented at the Congress of the Malaysian Society for Microbiology 2013 (ICMSM2013), 12–15 December 2013, Langkawi.

45 **MOHAMAD DANIAL, M.S., AHMAD FIRDAUS, Z., ABD. RAHMAN, K., SAIFUL ISKANDAR, K. & SHARULZAMAN, I.** Windstorm impacts on forest cover in Sungei Menyala Forest Reserve, Negeri Sembilan. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.

46 **MOHD AFENDI, H., ADNAN, M. & AHMAD AZARUDDIN, M.N.** Pemuliharaan pokok melalui pemindahan pokok besar. Poster presented at the 'Seminar Kebangsaan Pengurusan Kawasan Hijau 2013: Kawasan Hijau dan Taman Awam:Transformasi untuk Kesejahteraan Rakyat', 1–2 November 2013, Putrajaya.

47 **MOHD AFENDI, H., AHMAD AZARUDDIN, M.N. & ADNAN, M.** Pemangkasan struktur pokok muda. Poster presented at the 'Seminar Kebangsaan Pengurusan Kawasan Hijau 2013: Kawasan Hijau dan Taman Awam: Transformasi untuk Kesejahteraan Rakyat', 1–2 November 2013, Putrajaya.

48 **MOHD AFENDI, H., AHMAD AZARUDDIN, M.N. & ADNAN, M.** Pemeliharaan pokok di tapak pembangunan. Poster presented at the 'Seminar Kebangsaan Pengurusan Kawasan Hijau 2013: Kawasan Hijau dan Taman Awam:Transformasi untuk Kesejahteraan Rakyat', 1–2 November 2013, Putrajaya.

49 **MOHD AFENDI, H., AHMAD AZARUDDIN, M.N. & NAZIMATUL AZMA, N.** Landskap berkonsep hutan hujan tropika. Poster presented at the 'Seminar Kebangsaan Pengurusan Kawasan Hijau 2013: Kawasan Hijau dan Taman Awam:Transformasi untuk Kesejahteraan Rakyat', 1–2 November 2013, Putrajaya.

50 **MOHD FARID, A., WAN MOHD AZRUL, W.A., LEE, S.S., SAJAP, A.H., PATAHAYAH M., & TOSIAH, S.** Pathogenicity assessment of Metarhizium anisopliae obtained from natural forest of Peninsular Malaysia against tiger moth larvae *(Atteva sciodoxa* meyrick*)*. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.

51 **MOHD SALLEH, S., PATAHAYAH, M., LEE, S.S. & ANDI AKBAR, M.** Belowground ectomycorrhizal diversity of *Hopes odorata* planted on sandy tailings. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.

52 **MOHD YUSOUF, A.L., SUFFIAN, M. & NORDIN, P.** New wood-based cement composite for building material. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.

53 **MOHD ZAKI, A., FARAH FAZWA, M.A. & MOHD LOKMAL, H.** Penanaman nipah (*Nypa fruticans*) sebagai zon penampan. Poster presented at the 'Seminar Kebangsaan Pemuliharaan Hutan Pesisiran Pantai Negara 2013', 11–13 June 2013, Terengganu.

54 **MOHD. RIZUWAN, M., MOHAMAD OMAR, M.K., MOHD HISBANY, M.H. & TARIQ MUBARAK, H.** Fibre hybrid in timber portable bridge. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.

55 **MUHAMMAD HAFFIZ,, J., NURHANAN, M.Y., MOHD HAFIDZ HADI, A., ABDUL RASHIH, A., SITI SYARIFAH, M.M. & ASIAH, O.** Chemical profiles and anti-cancer activities of different plant parts of *Eurycoma longifolia*. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.

56 **MUHD HAFIZI, Z., NOR AZAH, M.A., AZRINA, A., MAILINA, J. & MOHD FARIDZ, Z.P.** A rapid analysis for the determination of volatile aroma of the flowers of *Courupita guainensisand Dyera costulata* from FRIM campus. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.

57 **MUKRIMAH, A., MOHD PARID, M., LIM, H.F., NUR ALWANI, Z. & MOHD FARIT, H.** Value of recreational fishing in delta Kelantan mangrove Forest (DKMF) ecosystem. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.

58 **NABIL, F.L., ZAIDON, A., ANWAR, U.M.K. & BAKAR, S.E.** Characterization of low molecular weight phenol formaldehyde resin admixed with nanoclay: effect of sonification time. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.



59	**NADIAH SALMI, N., ISMANIZAN, I., NASHATUL ZAIMAN, N.A., NOR HASNIDA, H., NOR ASMAH, H. & NORALIZA, A**. Cryopreservation of *Eurycoma longifolia* (tongkat ali) hairy root cultures for long-term preservation. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
60	**NADIAH SALMI, N., NASHATUL ZAIMAH, N.A., NOR ASMAH, H., NORALIZA, A. & MOHAMAD NASIR, M.A.** Timber seeds attract birds. Poster presented at the International Bird Watching Exhibition, 22–23 June 2013, Pahang.
61	**NADIAH SALMI, N., NASHATUL ZAIMAH, N.A., NOR ASMAH, H. & NORALIZA, A**. FRIM seed technology. A poster presented at the 'Hari Perhutanan Sedunia Peringkat Kebangsaan Kali Ke-42', 21 March 2013, Pekan.
62	**NADIAH SALMI, N., NASHATUL ZAIMAH, N.A., NOR ASMAH, H. & NORALIZA, A.** Seed technology application in FRIM. Poster presented at the National Biotechnology Seminar, 6–8 June 2013, Penang.
63	**NADIAH SALMI, N., NORALIZA, A., NASHATUL ZAIMAH, N.A. & NOR ASMAH, H.** Seed storage in FRIM. Poster presented at the 'Minggu Alam Sekitar Malaysia 2013' Exhibition, 26–27 October 2013, Putrajaya.
64	**NASIR, H., TARIQ MUBARAK, H. & KHALI AZIZ, H.** A restricted and forgotten mangrove species. Poster presented at the Regional Symposium Mangrove Ecosystem Management in Southeast Asia, 11–13 February 2013, Surabaya.
65	**NAZIMATUL AZMA, N., AHMAD AZARUDDIN, M.N., MOHD AFENDI, H. & SAMSOL, B**. Diversity of trees at Cyberjaya Urban Forest Park. Poster presented at the 'Seminar Kebangsaan Pengurusan Kawasan Hijau 2013 "Kawasan Hijau dan Taman Awam:Transformasi untuk Kesejahteraan Rakyat"', 1–2 November 2013, Putrajaya.
66	**NASIR, H., TARIQ MUBARAK, H. & KHALI AZIZ, H.** A restricted and forgotten mangrove species. Poster presented at the Regional Symposium Mangrove Ecosystem Management in Southeast Asia, 11–13 February 2013, Surabaya.
67	**NAZIMATUL AZMA, N., AHMAD AZARUDDIN, M.N., MOHD AFENDI, H. & SAMSOL, B.** Diversity of trees at Cyberjaya Urban Forest Park. Poster presented at the 'Seminar Kebangsaan Pengurusan Kawasan Hijau 2013 "Kawasan Hijau dan Taman Awam:Transformasi untuk Kesejahteraan Rakyat"', 1–2 November 2013, Putrajaya.
68	**NAZIRAH, A., NOR HASNIDA, H., ABDUL RASHIH, A., SITI SUHAILA, A.A., HALIZA, I. & MUHD FUAD, Y.** Effect of different culture media on the growth and the production of secondary metabolites in *Eurycoma longifolia* hairy root culture. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
69	**NAZIRAH, A., NOR HASNIDA, H., ISMANIZAN, I., NORLIA, B., ABDUL RASHIH, L., SITI SUHAILA, A.R., HALIZA, I. & MUHD FUAD, Y.** Study on proliferation and secondary metabolite production in *Eurycoma longifolia* hairy root cultured in different media. Poster presented at the 5th Global Summit on Medicinal and Aromatic Plants Conference, 9–12 December 2013, Miri.
70	**NAZIRAH, A., NOR HASNIDA, H., SITI SUHAILA, A.R., HALIZA, I., MUHAMMAD FUAD, Y. & ROZIDAH, K.** Micropropagation of *Phaleria macrocarpa* (mahkota dewa). Poster presented at the 'Simposium Biologi Kebangsaan 2013', 28–30 May 2013, Port Dickson.
71	**NG, K.K.S., LEE, S.L., NG, C.H., LEE, C.T. & SHIMIZU, K**. Complete chloroplast genome sequence of an important timber tree *Shorea leprosula* (Dipterocarpaceae). Poster presented at the 10th Malaysia Genetics Congress, "Advances in Genetics, Biotechnology and Genomics", 3–5 December 2013, Putrajaya.
72	**NIK MUSA'ADAH, M., ABD. RASHID, L., MOHD JEMAIN, M.R., MOHD RADZI, A., ROHANA, S., AHMAD SHUKRI, A., AZMAN, M., NURDALILA, Z. & NOURISH CARE, SDN. BHD**. Non-strach Polysaccharide-rich fraction of *Morinda citrifolia* (mengkudu) as a glucose lowering agent. Poster presented at the 24th International Invention, Innovation & Technology Exhibition, 9–11 May 2013, Kuala Lumpur.
73	**NOOR AZLIN, Y., AZYYATI, A.K., SHARMILLAH, S. & AZAHARI, M.Y.** Urban green space for society development: a children perspective. Poster presented at the Seventh World Environmental Education Congress, 9–14 June 2013, Morocco.
74	**NOOR AZLIN, Y., PHILIP, E., SHARMILLAH, S. & AZYYATI, A.K.** Mitigating climate change: involving children in urban forest management in Malaysia. Poster presented at the 16th European Forum on Urban Forestry, 7–11 May 2013, Milano.
75	**NOOR AZLIN, Y., PHILIP, E., SHARMILLAH, S., AZZYATI, A.K. & AZAHARI, M.Y.** Addressing global issues through co-curricular activities at schools. Poster presented at the Seventh World Environmental Education Congress, 9–14 June 2013, Morocco.
76	**NOOR AZRIEDA, A.R. & SALMIAH, U.** Methods of fungi isolation from fields. Poster presented at the 9th National Biology Symposium 2013, 28–30 May 2013, Port Dickson.
77	**NOOR AZRIEDA, A.R., SALMIAH, U., RAHIM, S. & BAHARUDIN, K.** Preparation of wood decay test based on European Standard EN 350. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
78	**NOOR HAZMIRA, M. & ISMARIAH, A**. Socio-economy study on labour in wood industrial sector. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
79	**NOOR RASYILA, M.N., KHAIRUL KAMILAH, A.K., NURHAZWANI, M.H., PIN, K.Y., ZAMREE, M.S., MASITAH, M.T., MUHAMMAD SHAHRUL, M.N. & FIRMANSYAH, J.S**. Study on flowability, dissolution and HPLC by using different dosages of *Tinospora crispa* formulas. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.



80	**NOR AZAH, M.A., MAILINA, J., MUHD HAFIZI, Z., AZRINA, A., MOHAMMAD FARIDZ, Z.P., NUR ATHIRAH, G., NURFAIRUZIA, I. & FARAH NUR'AIN, Z.** Analysis of aroma compounds of essential oils by head space microextraction gas chromatography-mass spectrometry. Poster presented at the 26th Symposium of Malaysia Analytical Sciences, 4–5 December 2013, Kuching.
81	**NOR AZAH, M.A., MAILINA,J., AZRINA, A., MOHD FARIDZ, Z. & CHE MOHD AIZAL, C.M.** Chemical constituents of the essential oils of *Prunus arbora* var *densa*. Poster presented at the International Conference on Natural Products (ICNP2013), 4–6 March 2013, Shah Alam.
82	**NOR AZAH, M.A., SAHRIM, L., MAILINA, J., SAIDATUL HUSNI, S,. MOHAMAD NASIR, M.A., ABD. MAJID, J., MUHD HAFIZI, Z., MOHD FARIDZ, Z. & MUHAMMAD SHARAFI, N.** The characterisation of agarwood using gaharu sense technology. Poster presented at the 15th International Symposium on Olfaction and Electronic Nose (ISOEN) 2013, 2–5 July 2013, Korea Selatan..
83	**NOR DATIAKMA, M.A., NORALIZA, A., NURHANAN, M.Y., ANEE SURYANI, S. & MASTURA, M.** Preliminary studies of 2-dimensional gel electrophoresis (2-De) profiles of *Staphylococcus aureus*. Poster presented at the National Biology Symposium 2013, 28–30 May 2013, Port Dickson.
84	**NOR DATIAKMA, M.A., NURHANAN, M.Y., SITI SYARIFAH, M.M., ASIAH, O., MUHAMMAD HAFFIZ, J., ANEE SURYANI, S., ALIA AINA, A., LING, S.K., ABDULL RASHIH, A. & NORHASNIDA, H.** Two-dimensional gel electrophoresis profiles of anti-proliferative compound from Cfpr 138 in A2780 ovarian cancer cells. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
85	**NOR FARIZA, I., PIN, K.Y., ZUNOLIZA, A., LUQMAN CHUAH, A., DAYANG RADIAH, A.B., UMI KALSOM, Y. & ADAWIYAH, I.** Effect of extraction parameters on *Phaleria macrocarpa* leaves extract, Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
86	**NORALIZA, A., NADIAH SALMI, N., MARZALINA, M., NASHATUL ZAIMAH, N.A., NOR ASMAH, H. & TARIQ MUBARAK, H.** Ujian kualiti biji benih *Avicennia officinalis* bagi penyediaan bahan tanaman secara mapan. Poster presented at the 'Seminar Kebangsaan Hutan Pesisiran Pantai Negara 2013: Pemulihan Hutan Pesisiran Pantai 2013', 11–13 June 2013, Kuala Terengganu.
87	**NORALIZA, A., NORMAH, M.N., NORWATI, M., MOHD ADI FAIZ, A.F., NOR ASMAH, H., NASHATUL ZAIMAH, N.A. & NADIAH SALMI, N.** Effects of packing and storage conditions on germination of *Swietenia macrophylla* seeds. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
88	**NORAZAH, M.A., SITI HUMEIRAH, A.G., SAIDATUL HUSNI, S., MAILINA, J., VIMASA, S., NIK MUSA'ADAH, M., TAN, H.P., AZRINA, A., MOHD JEMAIN, M.R. & MOHD FARIDZ, Z.P.** *Aquilaria* leaf extract compositions and their biological activities. Poster presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
89	**NORDAHLIA, A.S., HAMDAN, H. & ANWAR, U.M.K.** Fibre length, fibre wall thickness and anatomical structure of genus *Gigantochloa: G.thoii, G.scortechinii, G.wrayii, G.ligulata*. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
90	**NORDAHLIA, A.S., HAMDAN, H. & ANWAR, U.M.K.** Fibre *morphology*, physical and strength properties of Malaysian bamboo: *Schizostachyum grande* (buluh semeliang). Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
91	**NORHAYATI, I., ROSHAN JAHN, M.S., GETHA, K., MOHD ILHAM, A., LILI SHAHIRA, H., MUHD HAFFIZ, J., SITI SYARIFAH, M.M. & MUHD SYAMIL, A.** Antitrypanosomal and antileishmanial of selected plant extracts. Poster presented at 38th annual conference of the Malaysian Society for Biochemistry & Molecular Biology, 28–29 August 2013, Putrajaya.
92	**NORHAYATI, S., FARAH FAZWA, M.A., SYAFIQAH NABILAH, S.B. & MOHD ZAKI, A.** Production of *Labisia pumila* var. *lanceolata* through stolon part for future planting stock. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
93	**NORLIA, B., NOR HASNIDA, H., MOHD ROSLI, H. NORWATI, A. & NORWATI, M.** Differential gene expression in root of tongkat ali (*Eurycoma longifolia*). Poster presented at the 'Simposium Biologi Kebangsaan 2013', 28–30 May 2013, Port Dickson.
94	**NORLIA, B., NOR HASNIDA, H., MOHD ROSLI, H., NORWATI, A. & NORWATI, M.** Differential expression of genes involved in terpenoid biosynthesis pathway of tongkat ali (*Eurycoma longifolia*). Poster presented at 2nd Asian Region Conference of System Biology, 8–9 Oktober 2013, Bangi.
95	**NORLIA, B., NOR HASNIDA, H., NORWATI, A., MOHD ROSLI, H. & NORWATI, M.** *De novo* sequencing of tongkat ali root transcriptome to identify genes involved in the biosynthesis of active ingredients. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
96	**NORLIYANA, A. & ISMARIAH, A.** Non-forest land use impacts on quantity dimension of watershed scale level. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
97	**NORSHEILA, M.J.C., HAMDAN, O. & ISMAIL, P.** Remote sensing, GIS & forestry. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
98	**NORULAIMAN, Y., ONG, B.K., NOR AZAH, M.A. & MOHD IRMAN, S.M.** Trends of microbial contamination in herbal raw material, semi finished and finished herbal product tested in NPQC laboratory , FRIM. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.



99	**NORULAIMAN, Y., ONG, B.K., SAIDATUL HUSNI, S., SAOFUL AZMI, J., NOR AZAH, M.A., MOHD IRMAN,** S.M. Potential of *Syzygium malaccense* as antimicrobial preservative agent for topical application product. Poster presented at International Conference on Natural Products (ICNP2013), 4–6 March 2013, Shah Alam.
100	**NORWATI, M., SITI SUHAILA, A.R., BRIAN YAP, J.W., MAHANI, M.C., KANDASAMY, K.I., FARIDAH, Q.Z., FADELAH, A.A., NOR HASNIDA, H., NAZIRAH, A., HALIZA, I., MUHD FUAD, Y. & NORMAH, B.** *In vitro* polyploidisation in *Paphiopedilum callosum* (slipper orchid) with colchicines. Poster presented at the 'Simposium Biologi Kebangsaan 2013', 28–30 May 2013, Port Dickson.
101	**NUR HAJAR, Z.S., ABD. RAHMAN, K., WAN MOHD SHUKRI, W.A. & MOHD SHAHID, M.** Long term recovery of commercial timber species after logging of Malaysian forest: impacts of adjacent unlogged virgin jungle reserves. Poster presented at the 'Seminar Agri-Dana 2013, "R&D Perhutanan; Sumber kekayaan baharu"', 10–11 September 2013, Shah Alam.
102	**NUR SURIANI, S., ADNAN, M., NIK HANITA, N.M., NURUL AYUNI, B. & YUSNIZA, Y.** A review on the perception of Kepong Botanical Garden (KBG) to visitors in main campus in the Forest Research Institute Malaysia (FRIM). Poster presented at the National Seminar on "Green Space Management 2013: Green Space and Public Parks: Transforming for Society's Well Being", 1–2 October 2013, Putrajaya.
103	**NURHANAN, M.Y., SITI SYARIFAH, M.M. & ALIA AINA, A.** The big 'C': cancer. Poster presented at the 'Program Ceramah Kesihatan Kesedaran Kanser Payu Dara', 20 Aoril, 2013, Putrajaya.
104	**NURNANAN, M.Y., SITI SYARIFAH, M.M., ASIAH, O., MUHAMMAD HAFFIZ, J., MOHD ILHAM, A., PUTERI SYAFINAZ AKMA, A.R., ALIA AINA, A. & NOR DATIAKMA, M.A.** Anti-proliferative effect of SNA209 compound isolated from *Cerbera* sp. in ovarian cancer cells. Poster presented at the National Biotechnology Seminar, 6–8 June 2013, Penang.
105	**NURNIDA, M.K. & NORAINI, T.** Peculiar mucilage cells in the leaf lamina of *Rhizophora L.* species. Poster presented at the 12th Annual UMT Symposium 2013, 8–10 October 2013, Kuala Terengganu.
106	**NURUL HUSNA, M.H., SUHAIMI, M. & RUSHDAN, I.** Corrugated paper production from semantan bamboo. Poster presented at the Invention, Innovation & Design Expo 2013 (Competition & Exhibition) (IIDEX 2013), 15–17 March 2013, Shah Alam.
107	**NURUL HUSNA, M.H., SUHAIMI, M., RUSHDAN, I. & MOHD AMINUDDIN, C.H.** Semantan bamboo for corrugated paper production. Poster presented at the 24th International Invention, Innovation & Technology Exhibition, 9–11 May 2013, Kuala Lumpur.
108	**ONG, B.K., CHUA, K.O., CHAI, L.C., NORULAIMAN, Y., NUZIAH, H. & NOR AZAH, M.A.** Phytochemical screening and anti food-borne bacterial properties of Syzygium grande ethanolic extract. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
109	**ONG, B.K., NORULAIMAN, Y., NOR AZAH, M.A, VIMALA, S. & SAM, K.Y.** Chemical constituents and antioxidant properties of *Backhousia citriodora* volatile oil. Poster presented at the International Conference on Natural Products (ICNP2013), 4–6 March 2013, Shah Alam.
110	**ONG, S.P.** 'Fauna terancam di hutan paya bakau'. Poster presented at the 'Seminar Kebangsaan Pemuliharaan Hutan Pesisiran Pantai Negara 2013', 11–13 June 2013, Terengganu.
111	**ONG, S.P., MOHD. FARID, A. & LEE, S.S.** Pest and disease survey on *Aquilaria* sp. (Karas) plantations in Peninsular Malaysia. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
112	**PATAHAYAH, M., LEE, S.S., MOHD SALLEH, S., WAN ASMA, I & RAFIDAH, J.** Fungi associated with empty fruit bunches (EFB) of oil palm. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
113	**PATAHAYAH, M., MAZIDAH, M., LEE, S.S. & MOHD FARID, A.** Morphological characteristics of fungal pathogen *Oidium phyllanthi* Yen. causing powdery mildew on *Phyllanthus* spp. in Peninsular Malaysia. Poster presented at the Congress of the Malaysian Society for Microbiology 2013 (ICMSM2013), 12–15 Dec 2013, Langkawi.
114	**PUAD, E., MAHANIM, S.M.A., RAFIDAH, J., WAN ASMA, I. & SHAHARUDDIN, H.** Densification technology of agricultural and wood residues. Poster presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
115	**PUAD, E., SHAMSURI, M.S., AHMAD SHARAFI, O.,, WAN ASMA, I., MAHANIM, S.M.A., RAFIDAH, J. & SHAHARUDDIN, H.** OPF Pellet: sumber tenaga diperbaharui daripada ladang sawit'. Poster presented at the 'Hari Inovasi FRIM', 26 – 28 November 2013, Forest Research Institute Malaysia, Kepong.
116	**RAFIDAH, J., PUAD, E., MAHANIM, S.M.A., WAN ASMA, I. & SHAHARUDDIN, H.** Energy properties of jelutong tissue culture biomass for charcoal production. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
117	**ROSHAN JAHN, M.S., GETHA, K., HEMA THOPLA, G., NUR FAIRUZ, M.Y., MOHD ILHAM, A., AMYRA, A.S. & MUHD SYAMIL, A.** Anti-leishmania activity of the selected Malaysian forest soil actinobacteria. Poster presented at the National Conference on Neglected Tropical Diseases, 13 November 2013, Perak.
118	**ROSHAN JAHN, M.S., GETHA, K., NORHAYATI, I., MUHAMMAD HAFFIZ, J., MOHD ILHAM, A. & AMYRA, A.S.** Screening of selected Malaysian biodiversity for anti-leishmania activity using extracellular model. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.



119	**ROSZAINI, K., KHAIRUL, A., ZAITIHAIZA, K. & ZAINI, S**. Toxicity of naturally occurring compounds of *Callophylumm inophyllum* to Asian subterranean termites. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
120	**RUSDHAN, I., NURUL HUSNA, M.H., LATIFAH, J., AINUN ZURIYATI, M.A., SHARMIZA, A. & MAHMUDIN, S**. Mathematical models for alkaline pulp and paper properties of oil palm empty fruit bunch fibre. Poster presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
121	**RUSHDAN, I., AINUN ZURIYATI, M., WAN SUBKI, W.O., MOHD NOR, M.Y., MAHMUDIN, S., LATIFAH, J., SHARMIZA, A. & IDRIS, M.S.** Producing antimicrobial biodegradable pulp moulded products from kenaf core. Poster presented at the BioMalaysia & Bioeconomy Asia Pacific 2013 Conference & Exhibition 2013, 21–23 October 2013, Johor.
122	**RUSHDAN, I., MAHMUDIN, S., AINUN ZURIYATI, M.A., JALALUDDIN, H., LATIFAH, J., SHARMIZA, A., AHMAD AZIZI, M., MOHAMAD ARIFF, B.** Kenaf: a sustainable and environmental friendly raw material for pulp, paper, textile and chemical industries. Poster presented at the 24th International Invention, Innovation & Technology Exhibition, 9 May 2013, Kuala Lumpur.
123	**RUSHDAN, I., MAHMUDIN, S., LATIFAH, J., SHARMIZA, A**. *et al*. Kenaf: a sustainable and environment friendly raw material for pulp, paper, textile and chemical industry. Poster presented at the FRIM Innovation Day 2013, 27–28 November 2013, Forest Research Institute Malaysia, Kepong.
124	**RUSHDAN, I., MAHMUDIN, S., LATIFAH, J., SHARMIZA, A., AZIZI, A.J., MOHD SHUKRI, S., NURAZIZI, A.R. & FARAH YANA, D., NADIA, M.K. & ZAITUN, S.** Producing pulp and paper from the Malaysian kenaf stalk. Poster presented at the Malaysia Technology Expo (MTE) 2013, 21–23 February 2013, Kuala Lumpur.
125	**SAHRIM, L., NOR AZAH, M.A., MAILINA, J., MUHD HAFIZI, Z., MOH FARIDZ, Z., ABDUL MAJID, J. & NURLAILA, I.** Classification of agarwood oils using k-NN k-fold. Poster presented at the 15th International Symposium on Olfaction and Electronic Nose (ISOEN) 2013, 2–5 July 2013, South Korea.
126	**SAIDATUL HUSNI, S., NOR AZAH, M.A., NORULAIMAN, Y., MAILINA, J., SITI HUMEIRAH, A.G., VIMALA, S., SHALINI, M., MOHD FARIDZ, Z.P. & WAN NURHAFISYA, M.N.** Development of antioxidant nanoemulsion from *Aquilaria malaccensis*. Poster presented at the 1st International Seminar on Agarwood 2013, 3–5 September 2013, Serdang.
127	**SAIFUL ISKANDAR, K.** Modelling of soil erosion risk in water catchment area for sustainable forest management. Poster presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
128	**SALLEH, M., ABD. RAZAK, O. & AZHAN SHAH, I.** Viability of *Gigantochloa albociliata* (buluh madu) plantation for shoot production in Peninsular Malaysia. Poster presented at the 24th Malaysian Society of Plant Physiology Conference (MSPPC 2013): Innovative Plant Productivity & Quality, 27–29 August 2013, Terengganu.
129	**SALMIAH, U., SHAHARUDDIN, H. & MOHD JANI, S.** Prevention od sapstain on rubberwood using Mycelia from selected polypores. Poster presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
130	**SHALINI, M., VIMALA, S. & PIRIYA D.J.** ORAC analysis: Antioxidant capacity of 10 selected Malaysian traditional vegetables /ulam. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
131	**SHARMILLAH, S., NOOR AZLIN, Y., AZYYATI, A.K., NAIMAH, C.L. & AZAHARI, M.Y.** Establishing a nature education centre in Malaysia: a collaboration between the bodies of government, NGO and a corporate company. Poster presented at the Seventh World Environmental Education Congress, 9–14 June 2013, Morocco.
132	**SITI HUMEIRAH, A.G., NOR AZAH, M.A., SAIDATUL HUSNI, S., , MAILINA, J., AZRINA, A., SHALINI, M., MOHD JEMAIN, M.R. & MOHD FARIDZ, Z.P.** Antioxidant and cytotoxic effect of *Aquilaria malaccensis* leaves from Malaysia. Poster presented at the 1st International Seminar on Agarwood 2013, 3–5 September 2013, Serdang.
133	**SITI KHADIJAH, S., NOR HADIANI, I. & FADZUREENA, J.** Aldehydes from stem *Vitex rotundifolia*. Poster presented at the International Conference on Natural Products (ICNP2013), 4–6 March 2013, Shah Alam.
134	**SITI NUR AISYAH, M.H., FADZUREENA, J., NUZIAH, H. & HANI IDAYU, B.** Inhibitory effect of crude extract and sub-fractions *Baeckea frutescens* on 13-LOX activity. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
135	**SITI SALWANA, H., NORWATI, M., LEE, C.T. & NURUL FARHANAH, Z.** Development of genetic markers for *Aquilaria* species identification using direct amplification minisatellite DNA (DAMD). Poster presented at the 10th Malaysia Genetics Congress, "Advances in Genetics, Biotechnology and Genomics", 3–5 December 2013, Putrajaya.
136	**SITI SUHAILA, A.R., MOHD SALEH, N., NORWATI, M., MAHANI, M.C., PARAMESWARI, K., KANDASAMY, K.I., SITI SALWANA, H., NOR HASNIDA, H., NAZIRAH, A., HALIZA, I. & MUHD FUAD, Y.** Chromosome number and genome size of *Aquilaria malaccensis*, an endangered agarwood producing species. Poster presented at the International Scientific Symposium on Agarwood, 3–5 September 2013, Serdang.
137	**SITI SUHAILA, A.R., NOR HASNIDA, H., NAZIRAH, A., HALIZA, I., MUHD FUAD, Y. & SHARIFAH, M.** Rapid production of *Labisia pumila* (kacip fatimah) plantlets using temporary immersion system (TIS) for sustainable supply of planting material. Poster presented at the 5th Global Summit on Medicinal and Aromatic Plants Conference, 9–12 December 2013, Miri.
138	**SITI SYARIFAH, M.M., NURHANAN, M.Y. & ALIA AINA, A.** Cancer prevention and therapy from plants. Poster presented at the 'Program Ceramah Kesihatan Kesedaran Kanser Payu Dara', 20 April, 2013, Putrajaya.



139	**SITI SYARIFAH, M.M., NURHANAN, M.Y., ABDUL RAHMAN, P.S., MUHAMMAD HAFIZ, J., ASIAH, O. & MOHD ILHAM, A.** Cardiac glycoside of *Cerbera* sp. induces apoptosis in human ovarian cancer cell lines. Poster presented at the 38th Annual Conference of the Malaysian Society for Biochemistry and Molecular Biology, 28–29 August 2013, Putrajaya.
140	**SITI ZALIHA, A., TAN, Y.E. & MOHD ARSHAD, S.** Optimising throughputs of selected commercial species (keruing) with log cutting patterns using Best Opening Face (BOF) System. Poster presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
141	**SREETHERAN, M., ARNBERGER, A. & KONIJNENDIJK, C.K**. Fear of crime in urban parks: who feared the most? Poster presented at the 16th European Forum on Urban Forestry, 7–11 May 2013, Milano.
142	**SYAFIQAH NABILAH, S.B., FARAH FAZWA, M.A., NORHAYATI, S. & MOHD ZAKI, A.** Rooting ability of five superior clones of *Labisia pumila* var. *alata* using leaf cuttings. Poster presented at the 2nd International Symposium on Tropical Forest Ecosystem Science and Management, 11–13 September 2013, Bintulu.
143	**SYAFIQAH NABILAH, S.B., SHARIFAH, M., NOR HASNIDA, H., FARAH FAZWA, M.A., SITI SUHAILA, A.R., NAZIRAH, A., MUHD FUAD, Y., HALIZA, I. & MOHAMAD, O.** Development of surface sterilisation method for culture initiation of field grown *Labisia pumila* (kacip fatimah) explants. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
144	**TAN, A.L., NURNIDA, M.K., TAN, H.P. & IZLAMIRA, R.** Notes on the morphological characteristics of *Eurycoma* sp. observed and its status in Peninsular Malaysia. Poster presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
145	**TANG, L.K., ANG, L.H. & HO, W.M.** Nursery practices of *Metroxylon* sagu wildlings. Poster presented at the 'Seminar Kebangsaan Pemuliharaan Hutan Pesisiran Pantai Negara 2013', 11–13 June 2013, Terengganu.
146	**TANG, L.K., ANG, L.H., HO, W.M., HO, S.K. & LEE, D.K.** Enrichment planting in a greened slime tailings in Peninsular Malaysia. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
147	**TANG, L.K., HO, W.M. & ANG, L.H.** Species composition of natural regeneration under *Acacia mangium*, *Khaya ivorensis* and *Hopea odorata* grown on slime tailings in Peninsular Malaysia. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs",11–12 November 2013, Kuala Lumpur.
148	**TARIQ MUBARAK, H., MOHD. NASIR, H., AZHARIZAN, M.N. & MOHD. RIZUWAN, M.** 'Kesan penambakan tanah selut ke atas nyireh batu (*Xylocarpus moluccensis*) di Sg. Hj. Dorani, Selangor'. Poster presented at the 'Seminar Kebangsaan Hutan Pesisiran Pantai Negara 2013: Pemulihan Hutan Pesisiran Pantai 2013', 11–13 Jun 2013, Kuala Terengganu.
149	**TARIQ MUBARAK,H., NORAISHAH, S., MOHD. RIZUWAN, M. & AZHARIZAN, M.N.** Penilaian stok karbon di hutan paya laut kukup. Poster presented at the 'Seminar Kebangsaan Hutan Pesisiran Pantai Negara 2013: Pemulihan Hutan Pesisiran Pantai 2013', 11–13 June 2013, Kuala Terengganu.
150	**THENMOLI, T., PARIDAH, M.T., HAMDAN, H., MOHD KHAIRUN ANWAR, U., HNG, P.S., ADRIAN, C.C.Y., ZAIDON, A., EDI SUHAIMAI, B. & NOR FADHLIA FARHAN, A.B.** Merchanical properties of nodes and internodes of bamboo strips. Poster presented at th 2nd International Conference of Kenaf and Allied, 3 December 2013, Bangi.
151	**WAN ASMA, I., ZULKAFLI, H. & JOHARIZAL, A.** Composite pellets from MSW plastics and EFB for renewable energy. Poster presented at the 24th International Invention, Innovation & Technology Exhibition, 9–11 May 2013, Kuala Lumpur.
152	**WAN ASMA, I., ZULKAFLI, H., JOHARIZAL, J. & AHMAD, S.** Municipal soil waste (MSW) plastics and empty fruit bunches (EPF) fuel pellets for power generation. Poster presented at the 'Pameran Sains, Teknologi dan Inovasi Selangor (SITEX)', 4–6 April 2013, Shah Alam.
153	**WAN ASMA, I., ZULKAFLI, H., JOHARIZAL, J., AHMAD, S. & SHAMSURI, M.S.** Composite pellets from plastics and EFB for renewable energy. Poster presented at the International Invention, Innovation and Technology Exhibition 2013 (ITEX), 9–11 May 2013, Kuala Lumpur.
154	**WAN RASIDAH, K., ROZITA, A., MOHD FAKHRI, I. & SUHAIMI, W.C.** 'Kesan pencemaran ke atas kualiti tanah hutan bakau di pesisir pantai Semenanjung Malaysia'. Poster presented at the 'Seminar Kebangsaan Pemuliharaan Hutan Pesisiran Pantai Negara 2013', 11–13 June 2013, Terengganu.
155	**WEERATUNGA, S., ASIAH, O., HU, N.J., WANG, C., SVARD, S., JONES, M.K. & HOFMANN, A.** Alpha-1 giardin is an annexin with highly unusual calcium-regulated mechanisms. Poster presented at the 38th Lorne Conference on Protein Structure and Function, 10–14 February 2013, Lorne.
156	**YAHARA, T., TAGANE, S., TOYOMA, H., FUSE, K., NAGAMASU, H., SUZUKI, E., FUJII, S., NAIKI, A., PHOURIN, C., DARNAEDI, D., ARDIYANI, M., SYAMSUARDI, A., SAW, L.G., LIM, C.L., SUDDEE, S., RUEANGRUEA, S., MAROD, D. & DANG, S.** Plant diversity assessments using a standardised transact method in Cambodia, Indonesia, Malaysia, Thailand and Vietnam. Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
157	**YAO, T.L.** A taxonomic revision of Peninsular Malaysian *Thottea* (Aristolochiaceae). Paper presented at the 9th International Flora Malesiana Symposium, 27–31 August 2013, Bogor.
158	**YONG, W.S.Y., LAU, K.H., CHUA, L.S.L., HAMIDAH, M. & CHAN, Y.C.** Conservation of threatened plants in Universiti Teknologi PETRONAS. Poster presented at the signing of Memorandum of Understanding between MFRDB-UTP, 21 November 2013, Seri Iskandar.



159	**ZAHIDAH, Z., NORLIA, B., NOR HASNIDA, H. & NORWATI, M.** Isolation of partial phosphate synthase-like gene from root of tongkat ali (*Eurycoma longifolia*). Poster presented at the 10th Malaysia Genetics Congress, "Advances in Genetics, Biotechnology and Genomics", 3–5 December 2013, Putrajaya.
160	**ZAHIDAH, Z., NORLIA, B., NOR HASNIDA, H. & NORWATI, M.** Isolation of partial sequalene synthase gene from root of tongkat ali (*Eurycoma Longifolia*). Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
161	**ZAMREE, M.S., MOHD FARHAN, A.R., TAN, H.P., MOHD KAMAL, N.H., PIN, K.Y., NURHAZWANI, M.H., TAN, A.L., NURNIDA, M.K., LING, S.K., NORHAYATI, A., DARYL, J.A., ADIB,M Z.R., NOOR RASYILA, M.N., HADA MASAYU, I. & RASADAH, M.A.** Optimization of extraction parameter on extraction yield of *Senna alata* using response surface methodology techniques. Poster presented at the Conference on Forestry and Forest Products Research 2013 "Forestry R, D & C: Meeting National and Global Needs", 11–12 November 2013, Kuala Lumpur.
162	**ZARIDAH, M.Z., NOR AZAH, M.A., MAILINA, J., ABD. MAJID, J., MOHD FARIDZ, Z., MOHD IRMANSYAH, M. & ROHANI, A.** *Clausena excavata*: potential biopesticidal plant. Poster presented at the 'Seminar Agri-Dana 2013: "R&D Perhutanan: Sumber Kekayaan Baharu"', 10–11 September 2013, Shah Alam.
	ARTIKEL SEPARA TEKNIKAL/SEMI-TECHNICAL ARTICLES
1	**NORDAHLIA, A.S. HAMDAN, H. & ANWAR, U.M.K.** Wood properties of selected plantation species: *Khaya ivorensis (african mahogany), Azadirachta excelsa (sentang) Endospermum malaccense (sesendok) and Acacia mangnium*.Timber Technology Bulletin No. 51, Forest Research Institute Malaysia, Kepong. 8 pp.
2	**FAUZIAH, A., TAN, A.L., LING, S.K., CHANG, Y.S., SALBIAH, M., TAN, H.P. & ZUNOLIZA, A.** Authentication of herbal raw materials: *Labisia pumila* (kacip fatimah). *FRIM Technical Information No. 71*, Forest Research Institute Malaysia, Kepong. 10 pp.
3	**ONG, C.B. & KHAIRUL, A.** Good practices in producing laminated scantling. Timber Technology Bulletin No. 52, Forest Research Institute Malaysia, Kepong.
	ARTIKEL BUKAN TEKNIKAL/NON-TECHNICAL ARTICLES
1	**ANWAR, U.M.K., HAMDAN, H., PARIDAH, M.T. SITI RAFIDAH, M., NORDAHLIA, A.D., MOHD FAIZUL, M.S. & MAT YAACOB, C.W.** Bamboo now is stronger than ever. *FRIM in Focus*, September 2013. P. 10.
2	**CHEE, B.J. & LAU, K.H.** A legendary herb for the kitchen cupboard and medicine chest. *Garden Asia* 40: 66–67.
3	**CHEW, M.Y. & SYAHIDA EMIZA, S.** *Bayabusua clarkei* (King) W.J.de Wilde. *Flora Peninsular Malaysia Online Newsletter*: 130(4). 16 April 2013.
4	**CHEW, M.Y. & TNAH, L.H.** Budding photographers hone their skills. *FRIM in Focus*, December 2012, P. 7.
5	**CHEW, M.Y., SAW, L.G. & KAMARUL, H.M.** Pulau Tioman, a lush tropical paradise revisited. *Conservation Malaysia* 17. Pp. 1–5.
6	**CHUNG, R.C.K.** Flora: Pengenalan. *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong. P. 125.
7	**GAN, K.S. & AZAHARIZAN, M.N.** FRIM towards reducing its carbon footprint. *FRIM in Focus*, September 2013, P. 2.
8	**JULIUS, A.** *Aegiceras corniculatum* (L.) Blanco. *Flora Peninsular Malaysia Online Newsletter*: 127(1). 22 January 2013.
9	**JULIUS, A.** *Bauhinia bassacensis* Pierre ex Gagnep. var. *bassacensis*. *Flora Peninsular Malaysia Online Newsletter* : 128(2). 18 February 2013.
10	**KAVIARASU, M. & SHAHFIZ, M.A.** A new snake discovered at FRIM campus. *FRIM in Focus*, September 2013. P. 11 .
11	**KHAIRUL, M., MOHD NOOR, M. & ABDUL HAMID, S.** Sesenduk klon. *Dewan Kosmik*, May 2013. Pp 20–21.
12	**KIEW, R., TAN, J.P.C., & VERMEULAN, J.M.** Gunung Kanthan; conservation management of limestone hills in Perak. *The Malaysian Naturalist*, September 2013. Pp. 52–57.
13	**LAU, K.H.** *Geostachys decurvata* (Baker) Ridl. *Flora of Peninsular Malaysia Online Newsletter*: 133 (7). 18 July 2013.
14	**LIM, H.F., NORINI, H., NORSHAKILA, Y., INTAN NURULHANI, B., NIK MUSA'ADAH, M., TAN, A.L. & NURUL HUSNA, Z.** Traditional knowledge documentation: who should provide prior informed consent? *FRIM in Focus*, March 2013. Pp. 14–15.
15	**NADIAH, I.** *Orthosiphon aristatus* (Blume) Miq. *Flora Peninsular Malaysia Online Newsletter*: 132(6). 10 June 2013.
16	**NIK ADLIN, N.M.S., WAN TARMEZE, W.A. & MUHAMMAD HAFIZ, Z.** Taman di dalam hutan, *FRIM in Focus*, September 2013. P. 13.
17	**NOOR AINI, Z. & ISMARIAH, A.** Input factor setback for national timber industry policy. *FRIM in Focus,* June 2013. Pp. 14–15
18	**NOOR AZRIEDA, A.R. & SALIMAH, U.** Klasifikasi ketahanan semula jadi kayu-kayan Malaysia. *Dewan Kosmik*, Januari 2013. Pp. 30–31.
19	**NOOR HAZMIRA, M., ISMARIAH, A. & LIM, H.F.** Malaysia's competitiveness in the European timber market. *FRIM in Focus*, September 2013. Pp. 14–15.
20	**NOR EZZAWANIS, A.T.** *Antrophyum parvulum* (Blume). *Flora Peninsular Malaysia Online Newsletter* : 131(5). 15 May 2013.
21	**NORDAHLIA, A.S., HAMDAN, H., ANWAR, U.M.K. & ABD. RAZAK, O.** Development of bamboo database at FRIM. *FRIM in Focus,* June 2013. P. 12.



22	**NORDAHLIA, A.S.M LIM, S.C., MOHD ZAHARI, M.N. & ROHANA, I.** Kenali kayu-kayan tropika kita. *FRIM in Focus,* September 2013. P. 12.
23	**ONG, P.T.** Orchid gems on Tioman. *Conservation Malaysia* 17. P. 8.
24	**PHON, C.K.** Kupu-kupu 'The Golden Birdwing'. *FRIM Warisan Kebangsaan*. Institut Penyelidikan Perhutanan Malaysia, Kepong. P. 171.
25	**RAFIDAH, A.R. & SYAHIDA EMIZA, S.** *Jacquemontia paniculata* (Burm.f.) Hallier.f. *Flora Peninsular Malaysia Online Newsletter* : 129(3). 20 March 2013.
26	**ROSZAINI, K.** A sad adieu to the 82 year-old *Dyera costulata*. *FRIM in Focus*, September 2013. Pp. 8–9.
27	**RUSHDAN, I.** Biodegradable food container: a wise choice. *FRIM in Focus*. September 2013. P. 5.
28	**SHARMILLAH, S. & NOOR AZLIN, Y.** FRIM conducts school tree planting workshop in Sarawak. *News & Articles* (http://www.frim.gov.my/?p=9926).
29	**SITI AISAH, S. & MARRYANNA, L.** Hutan tadahan sumber air yang berkekalan. *Dewan Kosmik*, November 2013. Pp. 56–57.
30	**SITI MUNIRAH, M.Y.** Hunting *Rafflesia* in Juara-Paya. *Conservation Malaysia* 17. Pp. 6–7.
31	**SUHAIDA, M.** *Cotylelobium melanoxylon* (Hook. f.) Pierre. *Flora of Peninsular Malaysia Online Newsletter* : 136(10). 7 October 2013.
32	**SUHAIDA, M.** *Dipterocarpus costatus* Gaertn. f. *Flora of Peninsular Malaysia Online Newsletter* : 137(11). 23 October 2013.
33	**SYAHIDA EMIZA, S. & CHEW, M.Y.** *Champereia manillana* (Blume) Merrill var. *manillana*. *Flora of Peninsular Malaysia Online Newsletter* : 134(8). 30 August 2013.
34	**TAN, J.P.C.** *Begonia elisabetha:* the first record of a scented begonia from Malaysia. *The Begonian*. June 2013, Pp. 90–93.
35	**TAN, J.P.C.** The 'tortoise' of limestone hills in Peninsular Malaysia. *The Begonian* 82: 178–183.
36	**THINAGARAN, D., MOHANNA, Z.M., SHAH FADIR, I., NOR ANISAH, M.N., NABILAH, Z., NADAVIANA, A., LEE, C.T., CHENG, S.** Combating pest termites in Malaysia through innovative measures. *FRIM in Focus*, December 2013, Pp. 12–13.
37	**VAN DEN BOSCH, C.K., VAN DEN BOSCH, M., SREETHERAN, M. & NIELSEN, A.B.** Urban park perks' research rounded up and rated. *IUFRO's Spotlight 13,* May 2013.
38	**WAN ASMA, I., SHAHRUDIN, H., NUR ATIQAH, S., EDZIANI, R. & ROSDI, K.** Biofuel-FRIM campus goes green. *FRIM in Focus*, September 2013, Pp. 6–7.

TESIS/THESES

1	**MARY, K.G.H.** Investigation of troglitazone hepatotoxicity by a metabolomics approach. PhD. Thesis, University of Surrey, United Kingdom.
2	**MOHD FARHAN, A.R.** Optimisation of solid liquid extraction of bioactive compounds from *Orthosiphon stamineu*. MSc. Thesis, Universiti Putra Malaysia, Selangor.
3	**NUR FAIRUZ, M.Y.** User acceptance of information management system (IMS) among researchers . MSc. Thesis. Universiti Teknologi MARA, Shah Alam.
4	**SAIFUL ISKANDAR, K.** Development of tools for soil erosion risk mapping for Malaysian forest catchments. PhD. Thesis, Universiti Putra Malaysia, Selangor.
5	**MOHAMAD NASIR, M.A.** Pembangunan sensor kimia dan biosensor untuk penentuan racun serangga perosak pemetrin. PhD. Thesis, Universiti Kebangsaan Malaysia, Selangor.



PENGURUSAN KEWANGAN

Pendahuluan

Laporan ini bertujuan untuk memaklumkan tentang prestasi dan kedudukan kewangan Lembaga bagi tahun berakhir 31 Disember 2013. Prestasi kewangan Lembaga adalah sangat memuaskan dengan mencatat lebihan pendapatan sebanyak RM400 ribu berbanding defisit RM2.8 juta pada tahun 2012. Lembaga telah dapat membelanjakan hampir 100% peruntukan perbelanjaan Mengurus dan Pembangunan yang diluluskan bagi tahun 2013. Jumlah keseluruhan perbelanjaan bagi tahun 2013 sebelum cukai ialah sebanyak RM97.6 juta berbanding dengan pendapatan berjumlah RM98.0 juta. Kedudukan aset bersih Lembaga turut meningkat kepada RM237.6 juta pada akhir 2013, meningkat sebanyak RM29.5 juta atau 14% berbanding RM208.1 juta pada tahun 2012. Peningkatan tersebut berpunca daripada kedudukan tunai dan setara tunai yang bertambah kukuh dan pertambahan perbelanjaan modal bagi tahun tersebut.

Pendapatan

Pada tahun 2013, jumlah pendapatan yang diperoleh oleh Lembaga ialah RM98.0 juta iaitu meningkat sebanyak RM5.6 juta berbanding RM92.4 juta pada tahun 2012. Sebab utama peningkatan tersebut ialah peningkatan sumbangan kerajaan bagi peruntukan Projek Pembangunan Rancangan Malaysia Kesepuluh (Rmk-10) sebanyak RM20.5 juta dalam tahun 2013 berbanding RM7.7 juta bagi tahun sebelumnya. Lembaga dapat mengekalkan prestasi bagi jenis pendapatan-pendapatan yang lain. Analisis pendapatan atau sumber kewangan Lembaga untuk lima (5) tahun kebelakang adalah seperti berikut:

FINANCIAL MANAGEMENT

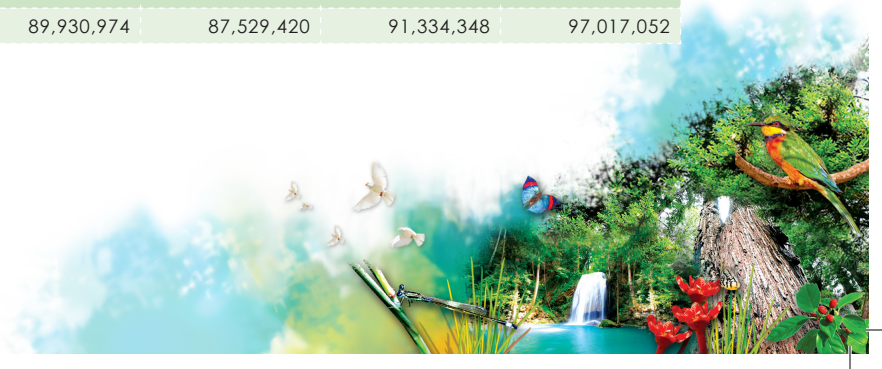
Introduction

This report is to inform on the Board's financial position and performance for the year ended 31 December 2013. Board's financial performance was very encouraging whereby the Board had recorded a surplus of RM400 thousand compared to a deficit of RM2.8 million in 2012. The Board had managed to spend almost 100% of the Operation and Development Expenditure allocated for the year 2013. Total expenditure before tax was RM97.6 million against revenue of RM98.0 million. The Board net asset position also increased to RM237.6 million or 14% as compared to RM208.1 million in 2013. The reason for the increased is due to the stronger cash and cash equivalent position and the increased in capital expenditure for the year.

Revenue

In the year 2013, total revenue received by the Board was RM98.0 million increasing by RM5.6 million compared to RM92.4 million in 2012. The increased was mainly caused by the increased in the government allocation for the development project under the Tenth Malaysian Plan (10thMP), totaling RM20.5 million compared to RM7.7 million in the year before. The Board was able to sustain the level on the other types of revenue. Analysis of revenue and sources of income for the last five (5) years is as follows:

Sumber pendapatan/ Sources of income	2009	2010	2011	2012	2013
Mengurus/Operation	47,206,600	42,751,800	50,521,200	52,469,450	53,620,800
Pembangunan/R&D Development/R&D	20,766,639	20,853,558	19,366,825	15,980,675	24,129,821
Agensi Luar/External Agencies	26,541,150	16,113,844	7,076,776	9,188,750	6,325,655
Perkhidmatan/Service	10,143,232	6,351,472	6,794,004	9,319,666	7,816,198
Sumber lain/Other income	5,342,916	3,860,300	3,770,617	4,375,807	5,124,578
Jumlah/Total	110,000,537	89,930,974	87,529,420	91,334,348	97,017,052



Perbelanjaan

Jumlah keseluruhan perbelanjaan Lembaga dalam tahun 2013 telah meningkat kepada RM97.6 juta berbanding RM95.2 juta pada tahun 2012. Seperti pada tahun-tahun lepas, perbelanjaan emolumen dan caruman pencen merupakan komponen terbesar, mewakili RM51.5 juta atau 53% daripada keseluruhan jumlah perbelanjaan Lembaga, meningkat RM2.3 juta berbanding dengan tahun sebelumnya. Lebih-lebih lagi dengan pelaksanaan penyelarasan gaji bagi penjawat-penjawat awam oleh Kerajaan. Bagi perbelanjaan-perbelanjaan lain, ia menunjukkan peningkatan disebabkan pertambahan aktiviti projek pembangunan R&D Rmke-10 yang telah menerima peruntukan yang lebih tinggi dalam tahun 2013 dan tekanan harga semasa bagi perkhidmatan dan bekalan yang perlu diperoleh. Analisis prestasi perbelanjaan Lembaga untuk lima (5) tahun terakhir adalah seperti yang berikut:

Expenditure

Total Board's expenditure in 2013 had increased to RM97.6 million as compared with RM95.2 million in 2012. As in the previous years, expenditure for emolument was the biggest component representing RM51.5 million or 53% out of Board's total expenditure. This is more so with the salary adjustment for public sector employee by the Government. For other types of expenditure, it shows an increased because of the increased in the R&D development projects activities that had received bigger allocation in 2013 and current price pressure for supplies and services that the Board had to acquire. Analysis of Board's expenditure for the past five (5) years is as follow:

Perbelanjaan/ *Expenditure*	2009	2010	2011	2012	2013
Emolumen/ *Emolument*	37,204,756	38,926,831	39,392,840	44,525,010	46,578,569
Perkhidmatan dan Bekalan/ *Supplies and Services*	34,485,387	31,512,137	27,903,065	31,065,510	34,539,234
Pendapatan-pendapatan lain/ *Other expenditures*	26,542,636	17,595,691	22,499,333	19,595,436	16,477,681
Cukai pendapatan/ *Income taxes*	369,153	(854,143)	496,117	527,796	613,104
Jumlah/ *Total*	98,601,932	87,180,516	90,291,356	95,713,752	98,208,588

Aliran Tunai dan Pelaburan

Lembaga dijangka tidak mengalami masalah aliran dan kecairan tunai dan dapat menyelaraskan semua tanggungjawab kewangan pada masa yang ditetapkan. Ini adalah kerana perbelanjaan Lembaga adalah berdasarkan peruntukan diluluskan dan pendapatan yang telah diterima sahaja. Lembaga telah melaburkan tunai yang diterima tetapi masih belum digunakan dalam simpanan tetap di bank-bank tempatan dan instrumen lain yang diluluskan oleh Kementerian Kewangan.

Laporan Ketua Audit Negara

Ketua Audit Negara telah memperakukan penyata kewangan Lembaga tahun 2013 dengan memberi Sijil Bersih Audit dan berpendapat bahawa Penyata Kewangan tersebut telah memberi gambaran yang benar dan saksama mengenai kedudukan

Cash Flow and Investment

The Board did not have any cash flow or liquidity problem and had always been able to fulfill all financial obligations on time. This is because Board's expenditure was based on the budget provision approved and on the cash received. The Board had also invested in the cash still not be used in fixed deposit in local banks and financial institution approved by Ministry of Finance.

Auditors General Report

The Auditor General had certified the Board's Financial Statement for 2013 with a Clean Audit Report and their opinion the statement had given a true and far view of the financial position of the Board as at 31 December 2013, its operation and cash flows for that year in accordances with approved accounting standard.



kewangan Lembaga pada 31 Disember 2013, hasil operasi dan aliran tunainya untuk tahun tersebut berdasarkan piawaian perakaunan yang diluluskan.

Kunci Kira-Kira

Aset tetap milik Lembaga mempunyai nilai buku sebanyak RM143.5 juta pada 31 Disember 2013 berbanding RM140.6 juta pada tahun yang sama 2012. Selain pertambahan pembelian harta modal, jumlah pelaburan simpanan tetap turut meningkat daripada RM60.4 juta kepada RM91.0 juta. Liabiliti Lembaga sehingga 31 Disember 2013 kekal dalam lingkungan RM7.0 juta. Ini telah menjadikan aset bersih Lembaga meningkat kepada RM237.6 juta daripada RM208.0 juta atau RM29.6 juta iaitu 14% daripada baki aset bersih 2012. Nisbah-nisbah kewangan juga menunjukkan kedudukan kewangan Lembaga adalah baik dan memberangsangkan. Nisbah-nisbah kewangan Lembaga untuk lima (5) tahun kebelakang adalah seperti yang berikut:

Balance Sheet

The Board's fixed asset book value was RM143.5 million at 31 December 2013 against RM140.6 million at the same time in 2012. Other than the increased in capital expenditure, total investment in fixed deposit also increased from RM60.4 million to RM91.0 million. Board's liabilities as at 31 December 2013 maintain at around RM7.0 million. This had resulted in the Board's net asset increasing to RM237.6 million from RM208.0 million or RM29.6 million that is 14% from the total net asset in 2012. Financial ratio indicated Board's financial position is good and encouraging. Financial ratio for the last past five (5) years is as follow:

Nisbah Kewangan/ *Financial Ratio*	2009	2010	2011	2012	2013
Aset Semasa/ Tanggungan Semasa *Current asset/ Current liabilities*	17.51	10.21	25.91	10.30	13.28
Aset Mudah Cair/ Tanggungan Semasa *Liquid asset/ Current liabilities*	16.11	9.57	24.62	9.59	12.81
Jumlah Hutang/ Jumlah Aset *Total liabilities/ Total assets*	0.02	0.03	0.01	0.03	0.03
Modal Digunakan/ Jumlah Tanggungan *Capital employed/ Total liabilities*	45.59	28.36	69.37	29.16	31.01
Modal Digunakan/ Aset Tetap *Capital employed/ Fixed assets*	1.43	1.44	1.46	1.50	1.66



Nota / Notes



Nota / Notes



Nota / Notes





PENYATA KEWANGAN

LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA

BAGI TAHUN BERAKHIR
31 DISEMBER 2013

INSTITUT PENYELIDIKAN PERHUTANAN MALAYSIA
FOREST RESEARCH INSTITUTE MALAYSIA

LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA
MALAYSIAN FORESTRY RESEARCH AND DEVELOPMENT BOARD

KEMENTERIAN SUMBER ASLI DAN ALAM SEKITAR
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

LAPORAN KETUA AUDIT NEGARA
MENGENAI PENYATA KEWANGAN
LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA
BAGI TAHUN BERAKHIR 31 DISEMBER 2013

Laporan Mengenai Penyata Kewangan

Penyata Kewangan Lembaga Penyelidikan Dan Pembangunan Perhutanan Malaysia bagi tahun berakhir 31 Disember 2013 telah diaudit oleh wakil saya yang merangkumi Lembaran Imbangan pada 31 Disember 2013 dan Penyata Pendapatan, Penyata Perubahan Dalam Ekuiti serta Penyata Aliran Tunai bagi tahun berakhir pada tarikh tersebut, ringkasan polisi perakaunan yang signifikan dan nota penjelasan lain.

Tanggungjawab Lembaga Pengarah Terhadap Penyata Kewangan

Lembaga Pengarah bertanggungjawab terhadap penyediaan dan persembahan penyata kewangan tersebut yang saksama selaras dengan piawaian pelaporan kewangan yang diluluskan di Malaysia dan Akta Lembaga Penyelidikan Dan Pembangunan Perhutanan Malaysia (Akta 319), 1985. Lembaga Pengarah juga bertanggungjawab terhadap kawalan dalaman yang ditetapkan perlu oleh pengurusan bagi membolehkan penyediaan penyata kewangan yang bebas daripada salah nyata yang ketara sama ada disebabkan oleh fraud atau kesilapan.

Tanggungjawab Juruaudit

Tanggungjawab saya adalah memberi pendapat terhadap penyata kewangan tersebut berdasarkan pengauditan yang dijalankan. Pengauditan telah dilaksanakan mengikut Akta Audit 1957 dan piawaian pengauditan yang diluluskan di Malaysia. Piawaian tersebut menghendaki saya mematuhi keperluan etika serta merancang dan melaksanakan pengauditan untuk memperoleh jaminan yang munasabah sama ada penyata kewangan tersebut bebas daripada salah nyata yang ketara.

Pengauditan meliputi pelaksanaan prosedur untuk memperoleh bukti audit mengenai amaun dan pendedahan dalam penyata kewangan. Prosedur yang dipilih bergantung kepada pertimbangan juruaudit, termasuk penilaian risiko salah nyata yang ketara pada penyata kewangan sama ada disebabkan oleh fraud atau kesilapan. Dalam membuat penilaian risiko tersebut, juruaudit mempertimbangkan kawalan dalaman yang bersesuaian dengan entiti dalam penyediaan dan persembahan penyata kewangan yang memberi gambaran yang

benar dan saksama bagi tujuan merangka prosedur pengauditan yang bersesuaian tetapi bukan untuk menyatakan pendapat mengenai keberkesanan kawalan dalaman entiti tersebut. Pengauditan juga termasuk menilai kesesuaian polisi perakaunan yang diguna pakai dan kemunasabahan anggaran perakaunan yang dibuat oleh pengurusan serta persembahan penyata kewangan secara menyeluruh.

Saya percaya bahawa bukti audit yang saya peroleh adalah mencukupi dan bersesuaian untuk dijadikan asas bagi pendapat audit saya.

Pendapat

Pada pendapat saya, penyata kewangan ini memberikan gambaran yang benar dan saksama mengenai kedudukan kewangan Lembaga Penyelidikan Dan Pembangunan Perhutanan Malaysia pada 31 Disember 2013 dan prestasi kewangan serta aliran tunainya bagi tahun berakhir pada tarikh tersebut selaras dengan piawaian pelaporan kewangan yang diluluskan di Malaysia.

(NOR HASIMAH BINTI RAHMAT)
b.p KETUA AUDIT NEGARA
MALAYSIA

PUTRAJAYA
12 JUN 2014

PENYATA PENGERUSI DAN SEORANG AHLI LEMBAGA PENGARAH

Kami, **Ybhg. Dato' Sri Zoal Azha bin Yusof** dan **Dato' Dr. Abd. Latif bin Mohmod,** yang merupakan Pengerusi dan salah seorang Ahli **Lembaga Penyelidikan dan Pembangunan Perhutanan Malaysia** dengan ini menyatakan bahawa, pada pendapat Lembaga, Penyata Kewangan yang mengandungi Lembaran Imbangan, Penyata Pendapatan, Penyata Perubahan Ekuiti dan Penyata Aliran Tunai yang dikemukakan pada mukasurat 3 hingga 20 berserta dengan nota-nota kepada Penyata Kewangan di dalamnya, adalah disediakan untuk menunjukkan pandangan yang benar dan saksama berkenaan kedudukan **Lembaga Penyelidikan dan Pembangunan Perhutanan Malaysia** pada **31 Disember 2013** dan hasil kendaliannya serta perubahan kedudukan kewangannya bagi tahun berakhir pada tarikh tersebut.

Bagi pihak Lembaga

.....

YBHG. DATO' SRI ZOAL AZHA BIN YUSOF

Pengerusi Lembaga

Tarikh : 20 Mei 2014

Lembaga Penyelidikan dan Pembangunan Perhutanan Malaysia

Institut Penyelidikan Perhutanan Malaysia

52109 Kepong

SELANGOR DARUL EHSAN

Bagi pihak Lembaga

.....

DATO' DR. ABD. LATIF BIN MOHMOD

Ahli Lembaga / Ketua Pengarah FRIM

Tarikh : 20 Mei 2014

Lembaga Penyelidikan dan Pembangunan Perhutanan Malaysia

Institut Penyelidikan Perhutanan Malaysia

52109 Kepong

SELANGOR DARUL EHSAN

PENGAKUAN OLEH PEGAWAI UTAMA YANG BERTANGGUNGJAWAB KE ATAS PENGURUSAN KEWANGAN LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA

Saya, **MOHD ZAMSHARI BIN HJ. ABD RAHMAN** No. Kad Pengenalan **620312-08-5005**, pegawai utama yang bertanggungjawab ke atas pengurusan kewangan dan rekod-rekod perakaunan **Lembaga Penyelidikan dan Pembangunan Perhutanan Malaysia** dengan ikhlasnya mengakui bahawa Lembaran Imbangan, Penyata Pendapatan, Penyata Perubahan Ekuiti dan Penyata Aliran Tunai dalam kedudukan kewangan berserta dengan nota-nota kepada Penyata Kewangan yang dikemukakan pada muka surat 3 hingga 20 adalah mengikut sebaik-baik pengetahuan dan kepercayaan saya, adalah betul dan saya membuat ikrar ini dengan sebenarnya mempercayai bahawa ia adalah benar dan atas kehendak-kehendak Akta Akuan Berkanun, 1960.

Sebenarnya dan sesungguhnya)
Diakui oleh Mohd Zamshari bin Hj. Abd Rahman) .....
Di **Mahkamah Selayang** Selangor)
Pada 20 MAY 2014)

Di hadapan saya

PESURUHJAYA SUMPAH MALAYSIA
A-B 119
SURAYAH BINTI SUGI
MAHKAMAH SESYEN
SELAYANG
20 MAY 2014

LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA (MFRDB)
(Ditubuhkan di bawah Akta MFRDB 1985)

LEMBARAN IMBANGAN PADA 31 DISEMBER 2013

	NOTA	**2013**	2012
		RM	RM
HARTANAH, LOJI DAN PERALATAN	4	**143,483,623**	140,640,892
PINJAMAN DAN PEMBIAYAAN	5	**1,756,681**	1,812,763
ASET SEMASA			
Pelbagai penghutang, deposit dan prabayar	6	**1,702,134**	3,164,255
Pelbagai pendahuluan	7	**127,277**	181,775
Pelaburan Jangka Pendek	8	**6,508,966**	6,253,928
Simpanan tetap	9	**91,060,119**	60,396,843
Wang tunai dan baki di bank	10	**872,959**	2,890,364
		100,271,455	72,887,165
LIABILITI SEMASA			
Pelbagai pemiutang, deposit dan akruan	11	**7,671,814**	7,124,510
Peruntukan cukai		**213,104**	126,100
ASET SEMASA BERSIH		**92,386,537**	65,636,555
ASET BERSIH		**237,626,841**	208,090,210
Dibiayai oleh :			
Kumpulan Wang Mengurus		**59,618,075**	59,926,290
Kumpulan Wang Pembangunan		**108,397,460**	95,841,466
Kumpulan Wang Tabung		**14,490,280**	14,958,453
Kumpulan Wang Amanah		**45,689,140**	27,932,115
Kumpulan Wang Pembiayaan Pinjaman Kakitangan		**9,431,886**	9,431,886
KUMPULAN WANG TERKUMPUL	12	**237,626,841**	208,090,210

Nota-nota yang disertakan merupakan sebahagian dari penyata kewangan ini.

LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA (MFRDB)
(Ditubuhkan di bawah Akta MFRDB 1985)

PENYATA PENDAPATAN
BAGI TAHUN BERAKHIR 31 DISEMBER 2013

	Nota	2013	2012
		RM	RM
PENDAPATAN			
Sumbangan Kerajaan Malaysia		**78,765,261**	69,500,125
Sumbangan dan bayaran organisasi luar		**6,325,655**	9,188,750
Bayaran perkhidmatan		**7,816,198**	9,319,666
Diskaun dan jualan		**596,978**	477,803
Sewaan		**806,010**	716,312
Faedah atas simpanan tetap		**441,499**	536,646
Keuntungan atas simpanan tetap perbankan Islam		**2,110,916**	1,667,753
Keuntungan pembiayaan pinjaman kakitangan		**70,091**	78,222
Denda dan hukuman		**76,569**	191,982
Hasil-hasil lain		**1,022,515**	707,089
JUMLAH PENDAPATAN		**98,031,692**	92,384,348
PERBELANJAAN			
EMOLUMEN			
Gaji dan upahan		**32,453,529**	29,915,608
Elaun tetap		**10,529,448**	10,285,302
Sumbangan berkanun untuk kakitangan		**1,235,320**	1,208,360
Elaun lebih masa		**470,808**	399,935
Imbuhan tetap tahunan		**1,644,523**	2,333,398
Faedah-faedah kewangan lain		**244,942**	382,407
		46,578,570	44,525,010
PERKHIDMATAN DAN BEKALAN			
Perbelanjaan perjalanan dan sara hidup kakitangan		**3,740,935**	3,566,293
Pengangkutan barang-barang		**5,046**	7,607
Perhubungan		**384,172**	383,398
Utiliti		**2,899,132**	2,991,557
Sewaan		**1,508,787**	1,701,561
Bekalan bahan mentah dan bahan-bahan untuk penyelenggaraan dan pembaikan		**2,262,537**	2,098,484
Bekalan dan bahan-bahan lain		**4,510,483**	3,050,743
Penyelenggaraan dan pembaikan kecil		**6,676,728**	4,572,223
Perkhidmatan ikhtisas, perkhidmatan-perkhidmatan lain dan hospitaliti		**12,551,415**	12,693,644
		34,539,235	31,065,510

Nota-nota yang disertakan merupakan sebahagian dari penyata kewangan ini.

LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA (MFRDB)
(Ditubuhkan di bawah Akta MFRDB 1985)

	Nota	2013	2012
		RM	RM
PERBELANJAAN-PERBELANJAAN LAIN			
Pencen dan ganjaran		**4,897,014**	4,680,007
Cukai dan insuran		**552,359**	546,166
Susutnilai	**4**	**8,476,565**	8,723,797
Perbelanjaan-perbelanjaan lain		**2,551,742**	5,645,466
		16,477,680	19,595,436
JUMLAH PERBELANJAAN		**97,595,485**	95,185,956
LEBIHAN / (KURANGAN) SEBELUM CUKAI		**436,207**	(2,801,608)
Cukai pendapatan	**13**	**(613,104)**	(527,796)
KURANGAN UNTUK TAHUN		**(176,897)**	(3,329,404)

Nota-nota yang disertakan merupakan sebahagian dari penyata kewangan ini.

LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA (MFRDB)
(Ditubuhkan di bawah Akta MFRDB 1985)

PENYATA PERUBAHAN DALAM EKUITI BAGI TAHUN BERAKHIR 31 DISEMBER 2013

KUMPULAN WANG	Kumpulan Wang Mengurus	Kumpulan Wang Pembangunan	Kumpulan Wang Tabung	Kumpulan Wang Amanah	Kumpulan Wang Pembiayaan Pinjaman Perumahan	Kumpulan Wang Pembiayaan Pinjaman Kenderaan	Kumpulan Wang Pembiayaan Pinjaman Komputer	Jumlah Kumpulan Wang
	RM	RM	RM	RM	RM	RM	RM	RM
Baki pada 1 Januari 2012	61,378,919	100,517,854	14,929,221	29,838,122	4,131,886	4,800,000	500,000	216,096,002
Keuntungan / (kerugian) bersih bagi tahun semasa	4,964,852	-	(6,388,249)	(1,906,007)	-	-	-	(3,329,404)
Pindah (daripada) / kepada	(6,417,481)	-	6,417,481	-	-	-	-	-
Geran kerajaan belum dilunaskan	-	(4,676,388)	-	-	-	-	-	(4,676,388)
Baki pada 31 Disember 2012	**59,926,290**	**95,841,466**	**14,958,453**	**27,932,115**	**4,131,886**	**4,800,000**	**500,000**	**208,090,210**
Keuntungan / (kerugian) bersih bagi tahun semasa	**5,759,832**	**-**	**(6,536,220)**	**599,491**	**-**	**-**	**-**	**(176,897)**
Pindah (daripada) / kepada	**(6,068,047)**	**-**	**6,068,047**	**-**	**-**	**-**	**-**	**-**
Geran kerajaan belum dilunaskan	**-**	**12,555,994**	**-**	**17,157,534**	**-**	**-**	**-**	**29,713,528**
Baki pada 31 Disember 2013	**59,618,075**	**108,397,460**	**14,490,280**	**45,689,140**	**4,131,886**	**4,800,000**	**500,000**	**237,626,841**

Nota-nota yang disertakan merupakan sebahagian dari penyata kewangan ini.

LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA (MFRDB)
(Ditubuhkan di bawah Akta MFRDB 1985)

PENYATA ALIRAN TUNAI
BAGI TAHUN BERAKHIR 31 DISEMBER 2013

	Nota	2013	2012
		RM	RM
ALIRAN TUNAI DARI AKTIVITI OPERASI			
Lebihan / (Kurangan) atas pendapatan		**436,207**	(2,801,608)
Pelarasan untuk:			
Susutnilai		**8,476,565**	8,723,797
Geran pembangunan belum dilunaskan		**29,713,528**	(4,676,388)
Tunai dari aktiviti operasi		**38,626,300**	1,245,801
Tambahan / (kurangan) dalam modal kerja			
Pembiayaan pinjaman kakitangan		**56,082**	335,387
Pelbagai penghutang, deposit dan prabayar		**1,462,121**	(1,648,035)
Pelbagai pendahuluan		**54,498**	318
Pelbagai pemiutang, deposit dan akruan		**547,304**	4,292,534
		2,120,005	2,980,204
Bayaran cukai		**(526,100)**	(554,494)
Tunai bersih dari aktiviti operasi		**40,220,205**	3,671,511
ALIRAN TUNAI DARI AKTIVITI PELABURAN			
Pelaburan		**(255,038)**	(182,072)
Pembelian hartanah, loji dan peralatan		**(13,980,112)**	(7,106,331)
Pelarasan / (pelupusan) hartanah, loji dan peralatan		**2,660,816**	(503,364)
Tunai bersih digunakan dalam aktiviti pelaburan		**(11,574,334)**	(7,791,767)
Pertambahan / (pengurangan) bersih tunai dan kesetaraan tunai		**28,645,871**	(4,120,256)
Tunai dan kesetaraan tunai pada awal tahun		**63,287,207**	67,407,463
Tunai dan kesetaraan tunai pada akhir tahun		**91,933,078**	63,287,207
Terdiri dari:			
Simpanan tetap	**9**	**91,060,119**	60,396,843
Wang tunai dan baki di bank	**10**	**872,959**	2,890,364
		91,933,078	63,287,207

Nota-nota yang disertakan merupakan sebahagian dari penyata kewangan ini.

LEMBAGA PENYELIDIKAN DAN PEMBANGUNAN PERHUTANAN MALAYSIA (MFRDB)
(Ditubuhkan di bawah Akta MFRDB 1985)

NOTA-NOTA KEPADA PENYATA KEWANGAN BAGI TAHUN BERAKHIR 31 DISEMBER 2013

1. AKTIVITI UTAMA

Lembaga Penyelidikan dan Pembangunan Perhutanan Malaysia (MFRDB) telah ditubuhkan di bawah Akta Lembaga Penyelidikan dan Pembangunan Perhutanan Malaysia 1985, Akta 319 pada 1 Oktober 1985. Aktiviti utama Lembaga adalah menjana pengetahuan dan teknologi dalam bidang perhutanan melalui Penyelidikan dan Pembangunan (R&D) dan menjalankan fungsi-fungsi yang telah ditetapkan di bawah Akta.

2. DASAR-DASAR PERAKAUNAN YANG PENTING

2.1 Asas Perakaunan

Penyata Kewangan ini telah disediakan mengikut kelaziman kos sejarah dan diselaraskan dengan penilaian semula beberapa aset tetap dan mematuhi piawaian perakaunan yang terpakai dan diluluskan di Malaysia.

2.2 Asas Penyatuan

Penyata kewangan ini telah menggabungkan jumlah aset dan tanggungan serta pendapatan dan perbelanjaan Kumpulan Wang Mengurus, Pembangunan, Tabung Amanah, Pembiayaan Perumahan, Pembiayaan Kenderaan dan Pembiayaan Komputer Kakitangan Lembaga.

2.3 Pengiktirafan Geran dan Peruntukan

Kumpulan Wang Mengurus

Geran Mengurus yang diterima bagi membiayai perbelanjaan operasi adalah diambilkira sebagai pendapatan dalam penyata pendapatan (Kumpulan Wang Mengurus) tahun semasa.

Kumpulan Wang Pembangunan

Geran Pembangunan yang diterima bagi membiayai kos projek pembangunan dan penyelidikan adalah hanya diambilkira sebagai pendapatan dalam penyata pendapatan (Kumpulan Wang Pembangunan) tahun ianya digunakan atau untuk perbelanjaan modal bagi tempoh hayat aset yang diperolehi mengikut jumlah pindahan tahunan yang sepadan dengan caj susutnilai.

Kumpulan Wang Pembiayaan Pinjaman Kenderaan

Geran yang diterima untuk tujuan membiayai pinjaman kenderaan kepada kakitangan adalah dikreditkan ke Kumpulan Wang Pembiayaan Pinjaman Kenderaan.

2.3 Pengiktirafan Geran dan Peruntukan (sambungan)

Kumpulan Wang Pembiayaan Pinjaman Komputer

Geran yang diterima atau untuk tujuan membiayai pinjaman komputer kepada kakitangan adalah dikreditkan ke Kumpulan Wang Pembiayaan Pinjaman Komputer.

Kumpulan Wang Tabung

Kumpulan Wang Tabung yang diwujudkan oleh Lembaga untuk tujuan tertentu adalah dibiayai melalui lebihan hasil bukan geran Kumpulan Wang Mengurus.

2.4 Sumbangan dan Bayaran Organisasi Luar

Sumbangan dan bayaran yang diterima daripada organisasi dalam dan luar negara termasuk sumbangan kerajaan untuk tujuan membiayai kos penyelidikan, seminar atau projek-projek tertentu adalah hanya diambilkira sebagai pendapatan dalam penyata pendapatan (Kumpulan Wang Amanah) mengikut jumlah yang dibelanjakan dalam tahun ianya digunakan atau untuk perbelanjaan modal bagi tempoh hayat aset yang diperolehi mengikut jumlah pindahan tahunan yang sepadan dengan caj susutnilai.

2.5 Hartanah, Loji dan Peralatan serta Susutnilai

Hartanah, loji dan peralatan dinyatakan pada kos atau penilaian semula setelah ditolak susutnilai terkumpul. Polisi pengiktirafan dan pengukuran kerugian terjejas adalah seperti yang dinyatakan di nota 2.6.

Tanah milik bebas tidak disusutnilaikan. Pelunasan bagi tanah pegangan pajakan masing-masing dikira mengikut jangkamasa antara 60 hingga 99 tahun. Bagi kerja-kerja dalam pelaksanaan atau pembinaan, perbelanjaan modal dikira berdasarkan kepada peratusan penyempurnaan. Projek-projek ini tidak disusut nilaikan sehingga ianya selesai.

Bagi semua hartanah, loji dan peralatan lain, susutnilai diperuntukkan mengikut kaedah garis lurus untuk menghapuskan kos aset berkenaan sepanjang hayat kegunaannya. Kadar tahunan susutnilai adalah seperti berikut:-

Bangunan	2% - 4%
Infrastruktur	4%
Kenderaan	20%
Perabot dan kelengkapan	20%
Mesin dan alat-alat	20%
Peralatan Muzium	20%

2.6 Rosotnilai aset-aset

Nilai yang dibawa oleh aset-aset, disemak bagi tujuan rosotnilai bila ada tanda-tanda menunjukkan aset tersebut mengalami kemerosotan nilai. Rosotnilai diukur melalui membandingkan nilai yang dibawa oleh aset dengan amaun yang akan diperolehi semula. Amaun yang akan diperolehi semula adalah jumlah yang lebih tinggi diantara harga jualan bersih dan nilai kegunaannya, dimana diukur dengan merujuk kepada aliran tunai masa depan yang didiskaunkan. Amaun yang diperolehi semula dianggarkan bagi setiap aset tersebut, atau jika ianya mustahil, bagi setiap unit tunai yang dihasilkan oleh aset-aset tertentu.

2.6 Rosotnilai aset-aset (sambungan)

Kerugian rosotnilai dikenakan di dalam penyata pendapatan serta merta, melainkan jumlah aset yang telah dibawa pada nilaian semula. Sebarang kerugian rosotnilai bagi aset yang dinilai semula dianggap sebagai penurunan penilaian semula, tetapi ianya terhad kepada lebihan penilaian semula yang diiktiraf sebelum ini untuk aset yang sama.

Peningkatan yang berikutnya di dalam amaun yang akan diperolehi semula dianggap sebagai penolakan daripada kerugian rosotnilai yang sebelum ini sehingga amaun dibawa bagi aset tersebut ditentukan (bersih daripada pelunasan dan susutnilai) tidak mempunyai kerugian rosotnilai yang diiktiraf di dalam penyata pendapatan serta merta, melainkan aset yang dinyatakan pada nilaian semula. Penolakan daripada kerugian rosotnilai atas aset yang dinilai semula dikredit secara terus kepada lebihan penilaian semula. Walau bagaimanapun, ianya terhad kepada kerugian rosotnilai bagi aset yang dinilai semula yang diiktiraf sebagai belanja dalam penyata pendapatan sebelum ini, penolakan daripada kerugian rosotnilai diiktiraf sebagai pendapatan dalam penyata pendapatan.

Bagi tahun semasa, nilai aset-aset Lembaga adalah pada nilai buku dan tiada tanda-tanda menunjukkan aset-aset tersebut mengalami rosotnilai.

2.7 Penghutang

Penghutang perniagaan dan pelbagai penghutang dinyatakan berdasarkan jumlah yang diinbois atau yang dibuktikan sepatutnya diterima setelah ditolak jumlah yang tidak boleh dikutip. Anggaran untuk peruntukan hutang ragu dibuat apabila kutipan kesemua jumlah tidak dapat dilakukan. Tiada peruntukan dan penghapusan hutang ragu dibuat bagi tahun semasa.

2.8 Tunai dan Kesetaraan Tunai

Tunai dan kesetaraan tunai seperti dicatat dalam penyata aliran tunai adalah terdiri dari wang tunai, baki di bank dan simpanan tetap.

2.9 Pengiktirafan Pendapatan

Pendapatan daripada hasil jualan dan perkhidmatan serta hasil-hasil lain diiktiraf berasaskan akruan kecuali hasil pendapatan atas keuntungan tetap perbankan secara Islam telah diiktiraf berasaskan tunai iaitu pendapatan hanya diambilkira apabila simpanan tetap tersebut matang.

2.10 Faedah Kakitangan

Faedah Jangka Pendek

Upah, gaji dan bonus diiktiraf sebagai perbelanjaan pada tahun yang mana perkhidmatan berkaitan diberikan oleh kakitangan Lembaga. Bayaran Gantian Cuti Rehat (GCR) yang tidak dapat diambil akan dibayar setakat 5 bulan pada tarikh kakitangan bersara dan diiktiraf sebagai perbelanjaan pada tahun tersebut.

2.10 Faedah Kakitangan (sambungan)

Caruman Tetap dan Faedah Jangka Panjang

Pihak Lembaga telah membuat caruman kepada Kumpulan Wang Simpanan Pekerja (KWSP) sebanyak 12% daripada gaji dan elaun untuk kakitangannya yang telah memilih Skim KWSP. Lembaga juga telah memperuntukkan 17.5% daripada gaji pokok kepada Kumpulan Wang Amanah Pencen kepada kakitangannya yang telah memilih Skim Pencen. Caruman-caruman ini diiktiraf sebagai perbelanjaan di dalam Penyata Pendapatan seperti ditanggung dan setelah caruman dibayar pihak Lembaga tidak menanggung apa-apa obligasi bayaran lagi. Faedah kewangan kepada pesara Lembaga tidak diperuntukkan dan akan diiktiraf sebagai perbelanjaan apabila tuntutan dibuat.

2.11 Penyelidikan dan Pembangunan (R&D)

Semua kos berkaitan dengan penyelidikan dan pembangunan (R&D) tidak dipermodalkan dan dianggap perbelanjaan bagi tahun yang berkaitan kecuali Lembaga menjangkakan kos tersebut akan menjana pendapatan di masa akan datang.

2.12 Peruntukan Cukai

Mulai tahun taksiran 2002, Lembaga telah mendapat pengecualian cukai pendapatan hanya ke atas pendapatan-pendapatan berikut:

i. Geran Kerajaan;
ii. Yuran untuk perbelanjaan operasi; dan
iii. Sumbangan dan derma yang diterima.

2.13 Matawang Asing

Urusniaga dalam matawang asing telah ditukar ke Ringgit Malaysia mengikut kadar pertukaran pada tarikh urusniaga itu berlaku dan di mana ianya belum diselesaikan pada 31 Disember 2013, mengikut kadar pertukaran yang berkuatkuasa pada tarikh tersebut adalah seperti berikut:

	2013	**2012**
	RM	RM
British Pound	5.20	4.94
US Dollar	3.23	3.09

2.14 Angka-angka Perbandingan

Jika terdapat perubahan, angka-angka bandingan akan dikelaskan semula supaya menurut pembentangan tahun semasa.

3. INSTRUMEN KEWANGAN

Objektif dan Polisi Pengurusan Risiko Kewangan

Objektif Pengurusan Risiko Kewangan Lembaga adalah bertujuan memastikan sumber kewangan dan bukan kewangan mencukupi untuk menjalankan operasi-operasinya dengan lancar. Pihak Lembaga telah membiayai operasinya dengan dana sumbangan Kerajaan, sumbangan agensi luar serta dana dalaman dan oleh itu, tidak terdedah kepada risiko kadar faedah dari pinjaman bank. Pihak Lembaga tidak melabur di dalam saham disebutharga dan oleh itu, tidak terdedah kepada risiko pasaran akibat turun naik instrumen kewangan berikutan perubahan harga pasaran.

3.1 Risiko Mudah Tunai

Pihak Lembaga mengamalkan pengurusan risiko mudah tunai yang berhemat untuk meminimumkan ketidakpadanan aset dan liabiliti kewangan dan untuk mewujudkan tahap tunai dan bersamaan tunai yang mencukupi bagi memenuhi keperluan modal kerja.

3.2 Nilai Saksama

Nilai dibawa tunai bersamaan tunai, pelbagai penghutang, deposit dan prabayar dan lain-lain pemiutang, pelbagai belum bayar, deposit dan akruan menunjukkan nilai saksama kerana sifat instrumen kewangan yang berjangka pendek.

4. HARTANAH, LOJI DAN PERALATAN	Tanah	Bangunan	Infrastruktur	Kenderaan	Perabot dan Kelengkapan	Mesin dan Alat-alat	Peralatan Muzium	Kerja-kerja dalam pelaksanaan	Jumlah
	RM	RM	RM	RM	RM	RM	RM	RM	RM
2013									
Kos									
Pada 1 Januari 2013	**60,036,107**	**72,334,478**	**13,764,906**	**6,132,556**	**17,618,693**	**59,058,893**	**345,129**	**3,003,200**	**232,293,962**
Penambahan	**-**	**-**	**6,799,444**	**573,629**	**1,806,690**	**4,140,699**	**-**	**659,650**	**13,980,112**
Pelarasan atas pelupusan / penilaian semula aset	**-**	**307,241**	**-**	**(356,576)**	**(428,107)**	**(1,647,308)**	**-**	**(3,003,200)**	**(5,127,950)**
Pada 31 Disember 2013	**60,036,107**	**72,641,719**	**20,564,350**	**6,349,609**	**18,997,276**	**61,552,284**	**345,129**	**659,650**	**241,146,124**
Susutnilai terkumpul									
Pada 1 Januari 2013	**2,605,900**	**10,368,129**	**4,438,659**	**5,495,256**	**15,095,194**	**53,367,407**	**282,525**	**-**	**91,653,070**
Susutnilai dikenakan	**653,206**	**1,919,556**	**819,017**	**442,046**	**1,412,737**	**3,175,048**	**54,955**	**-**	**8,476,565**
Pelarasan atas pelupusan/ penilaian semula aset	**-**	**(358,400)**	**-**	**(305,401)**	**(332,524)**	**(1,470,809)**	**-**	**-**	**(2,467,134)**
Pada 31 Disember 2013	**3,259,106**	**11,929,285**	**5,257,676**	**5,631,901**	**16,175,407**	**55,071,646**	**337,480**	**-**	**97,662,501**
Nilai Buku Bersih									
Pada 31 Disember 2013	**56,777,001**	**60,712,434**	**15,306,674**	**717,708**	**2,821,869**	**6,480,638**	**7,649**	**659,650**	**143,483,623**
2012									
Kos									
Pada 1 Januari 2012	60,036,107	72,066,513	12,099,699	6,017,136	16,209,926	59,085,302	345,129	-	225,859,812
Penambahan	-	89,755	529,779	236,921	1,241,612	2,005,064	-	3,003,200	7,106,331
Pelarasan atas pelupusan / penilaian semula aset	-	178,210	1,135,428	(121,501)	167,155	(2,031,473)	-	-	(672,181)
Pada 31 Disember 2012	60,036,107	72,334,478	13,764,906	6,132,556	17,618,693	59,058,893	345,129	3,003,200	232,293,962
Susutnilai terkumpul									
Pada 1 Januari 2012	1,952,695	8,537,345	3,707,396	5,204,704	13,403,235	51,072,443	227,000	-	84,104,818
Susutnilai dikenakan	653,205	1,890,285	549,595	412,050	1,836,182	3,326,955	55,525	-	8,723,797
Pelarasan atas pelupusan/ penilaian semula aset	-	(59,501)	181,668	(121,498)	(144,223)	(1,031,991)	-	-	(1,175,545)
Pada 31 Disember 2012	2,605,900	10,368,129	4,438,659	5,495,256	15,095,194	53,367,407	282,525	-	91,653,070
Nilai Buku Bersih									
Pada 31 Disember 2012	57,430,207	61,966,349	9,326,247	637,300	2,523,499	5,691,486	62,604	3,003,200	140,640,892

Nota-nota yang disertakan merupakan sebahagian dari penyata kewangan ini.

5. PINJAMAN DAN PEMBIAYAAN	**2013** **RM**	2012 RM
Pinjaman dan pembiayaan kepada kakitangan adalah seperti berikut:		
Pembiayaan dan pinjaman perumahan	**814,275**	932,376
Pembiayaan pinjaman kenderaan	**925,040**	860,355
Pembiayaan pinjaman komputer	**17,366**	20,032
	1,756,681	1,812,763

6. PELBAGAI PENGHUTANG, DEPOSIT DAN PRABAYAR	**2013** **RM**	2012 RM
Mengurus		
Pelbagai penghutang perniagaan	**140,888**	46,290
Faedah terakru (simpanan tetap)	**75,102**	82,275
Belanja prabayar	**29,701**	30,789
Pelbagai penerimaan lain	**81,714**	117,166
	327,405	276,520
Tabung		
Pelbagai penerimaan lain	**5,000**	-
	5,000	-
Amanah		
Pelbagai penghutang perniagaan	**1,368,225**	2,886,231
Pelbagai penerimaan lain	**1,504**	1,504
	1,369,729	2,887,735
Jumlah Besar	**1,702,134**	3,164,255

7. PELBAGAI PENDAHULUAN	**2013** **RM**	2012 RM
Pendahuluan diri kakitangan	**107,818**	138,086
Deposit dibayar	**19,459**	43,689
	127,277	181,775

8. PELABURAN JANGKA PENDEK

Pihak Lembaga telah melaburkan dana di dalam satu Akaun Amanah Institusi yang dikelolakan oleh Amanah Raya Berhad, satu syarikat awam liabiliti terhad yang telah ditubuhkan di Malaysia. Kadar dividen kasar bolehterima oleh Lembaga ialah 5% setahun dan tempoh matang pelaburan ialah tiga tahun. Jumlah pelaburan bagi tahun berakhir 31 Disember 2013 adalah sebanyak RM6,508,966 (RM6,253,928 pada tahun 2012)

NOTA-NOTA KEPADA PENYATA KEWANGAN BAGI TAHUN BERAKHIR 31 DISEMBER 2013

9. SIMPANAN TETAP	**2013** **RM**	2012 RM
Simpanan dengan bank berlesen	**57,483,345**	37,646,421
Simpanan dengan institusi kewangan yang diluluskan	**33,576,774**	22,750,422
	91,060,119	60,396,843

10. WANG TUNAI DAN BAKI DI BANK	**2013** **RM**	2012 RM
Akaun bank semasa	**847,459**	2,861,864
Panjar wang runcit	**25,500**	28,500
	872,959	2,890,364

11. PELBAGAI PEMIUTANG, DEPOSIT DAN AKRUAN	**2013** **RM**	2012 RM
Mengurus		
Pemiutang dan akruan	**1,584,784**	1,731,688
Deposit diterima	**144,254**	281,739
	1,729,038	2,013,427
Pembangunan		
Pemiutang dan akruan	**3,469,423**	1,602,223
Deposit diterima	**38,107**	57,307
	3,507,530	1,659,530
Tabung		
Pemiutang dan akruan	**699,334**	798,090
Deposit diterima	**-**	29,614
	699,334	827,704
Amanah		
Pemiutang dan akruan	**1,550,825**	2,580,589
Deposit diterima	**185,087**	43,260
	1,735,912	2,623,849
Jumlah Besar	**7,671,814**	7,124,510

12. KUMPULAN WANG TERKUMPUL

	Kumpulan Wang Mengurus	Kumpulan Wang Pembangunan	Kumpulan Wang Tabung Nota (i)	Kumpulan Wang Amanah	Kumpulan Wang Pembiayaan Pinjaman Perumahan Nota (ii)	Kumpulan Wang Pembiayaan Pinjaman Kenderaan Nota (iii)	Kumpulan Wang Pembiayaan Pinjaman Komputer Nota (iv)	Jumlah Kumpulan Wang
	RM	RM	RM	RM	RM	RM	RM	RM
2013								
Baki pada 1 Januari 2013	59,926,290	95,841,466	14,958,453	27,932,115	4,131,886	4,800,000	500,000	208,090,210
Campur:								
Sumbangan Kerajaan Malaysia	53,620,800	24,129,821	-	1,014,640	-	-	-	78,765,261
Sumbangan dan Bayaran organisasi luar	-	-	-	6,325,655	-	-	-	6,325,655
Hasil-hasil lain	8,655,558	-	-	4,285,218	-	-	-	12,940,776
Jumlah pendapatan	62,276,358	24,129,821	-	11,625,513	-	-	-	98,031,692
Tolak:								
Perbelanjaan	55,337,477	18,364,121	6,030,668	9,999,758	-	-	-	89,732,024
Susutnilai Tahun ini	1,179,049	5,765,700	505,552	1,026,264	-	-	-	8,476,565
Jumlah Perbelanjaan	56,516,526	24,129,821	6,536,220	11,026,022	-	-	-	98,208,589
Lebihan / (Kurangan) Pendapatan Atas Perbelanjaan	5,759,832	-	(6,536,220)	599,491	-	-	-	(176,897)
Pindahan (daripada) / kepada	(6,068,047)	-	6,068,047	-	-	-	-	-
Geran kerajaan belum dilunaskan	-	12,555,994	-	17,157,534	-	-	-	29,713,528
Baki Pada 31 Disember 2013	59,618,075	108,397,460	14,490,280	45,689,140	4,131,886	4,800,000	500,000	237,626,841
DIWAKILI OLEH:								
Hartanah, Loji dan Peralatan	51,583,773	81,884,735	2,043,605	7,971,510	-	-	-	143,483,623
Pinjaman dan pembiayaan	-	-	-	-	814,275	925,040	17,366	1,756,681
Pelbagai Penerimaan dan Pelbagai Pendahuluan	450,382	3,000	6,300	1,369,729	-	-	-	1,829,411
Simpanan Tetap / Pelaburan Jangka Pendek, Wang di Bank & dalam tangan	9,526,061	30,017,256	13,139,709	38,083,813	3,317,611	3,874,960	482,634	98,442,044
Tolak:	-	-	-	-	-	-	-	-
Pemiutang	(1,729,037)	(3,507,531)	(699,334)	(1,735,912)	-	-	-	(7,671,814)
Peruntukan Cukai	(213,104)	-	-	-	-	-	-	(213,104)
ASET BERSIH	59,618,075	108,397,460	14,490,280	45,689,140	4,131,886	4,800,000	500,000	237,626,841

12. KUMPULAN WANG TERKUMPUL

	Kumpulan Wang Mengurus	Kumpulan Wang Pembangunan	Kumpulan Wang Tabung Nota (i)	Kumpulan Wang Amanah	Kumpulan Wang Pembiayaan Pinjaman Perumahan Nota (ii)	Kumpulan Wang Pembiayaan Pinjaman Kenderaan Nota (iii)	Kumpulan Wang Pembiayaan Pinjaman Komputer Nota (iv)	Jumlah Kumpulan Wang
	RM	RM	RM	RM	RM	RM	RM	RM
2012								
Baki pada 1 Januari 2012	61,378,919	100,517,854	14,929,221	29,838,122	4,131,886	4,800,000	500,000	216,096,002
Campur:								
Sumbangan Kerajaan Malaysia	52,469,450	15,980,675	-	1,050,000	-	-	-	69,500,125
Sumbangan dan Bayaran organisasi luar	-	-	-	9,188,750	-	-	-	9,188,750
Hasil-hasil lain	8,264,193	-	-	5,431,280	-	-	-	13,695,473
Jumlah pendapatan	60,733,643	15,980,675	-	15,670,030	-	-	-	92,384,348
Tolak:								
Perbelanjaan	54,439,668	10,298,486	5,720,774	16,531,027	-	-	-	86,989,955
Susutnilai Tahun ini	1,329,123	5,682,189	667,475	1,045,010	-	-	-	8,723,797
Jumlah Perbelanjaan	55,768,791	15,980,675	6,388,249	17,576,037	-	-	-	95,713,752
Lebihan / (Kurangan) Pendapatan Atas Perbelanjaan	4,964,852	-	(6,388,249)	(1,906,007)	-	-	-	(3,329,404)
Pindahan (daripada) / kepada	(6,417,481)	-	6,417,481	-	-	-	-	-
Geran kerajaan belum dilunaskan	-	(4,676,388)	-	-	-	-	-	(4,676,388)
Baki Pada 31 Disember 2012	59,926,290	95,841,466	14,958,453	27,932,115	4,131,886	4,800,000	500,000	208,090,210
DIWAKILI OLEH:								
Hartanah, Loji dan Peralatan	52,633,936	80,580,463	2,085,938	5,340,555	-	-	-	140,640,892
Pinjaman dan pembiayaan	-	-	-	-	932,376	860,355	20,032	1,812,763
Pelbagai Penerimaan dan Pelbagai Pendahuluan	429,865	20,880	1,300	2,893,985	-	-	-	3,346,030
Simpanan Tetap / Pelaburan Jangka Pendek, Wang di Bank & dalam tangan	9,002,016	16,899,653	13,698,919	22,321,424	3,199,510	3,939,645	479,968	69,541,135
Tolak:								-
Pemiutang	(2,013,427)	(1,659,530)	(827,704)	(2,623,849)	-	-	-	(7,124,510)
Peruntukan Cukai	(126,100)	-	-	-	-	-	-	(126,100)
ASET BERSIH	59,926,290	95,841,466	14,958,453	27,932,115	4,131,886	4,800,000	500,000	208,090,210

(i) Kumpulan Wang Tabung	Baki pada 1 Januari	Pindahan Kumpulan Wang	Perbelanjaan	Baki Pada 31 Disember
	RM	RM	RM	RM
2013				
Tabung Pengurusan dan Peruntukan *One-off*	**8,572,698**	**3,458,397**	**(4,194,334)**	**7,836,761**
Tabung Penyelidikan Luar Jangka	**1,000,000**	**10,000**	**(23,026)**	**986,974**
Tabung Penyelidikan Fellowship	**134,980**	**115,020**	**(136,943)**	**113,057**
Tabung Pendahuluan FRIM	**500,000**	**-**	**(4,550)**	**495,450**
Tabung Penyelidikan Bersama	**250,000**	**-**	**-**	**250,000**
Tabung Anugerah Saintis FRIM	**10,000**	**-**	**(1)**	**9,999**
Tabung Research Assistantship	**636,571**	**163,429**	**(71,902)**	**728,098**
Tabung MS ISO	**39,525**	**210,475**	**(225,573)**	**24,427**
Tabung Penyelenggaraan Peralatan Penyelidikan	**112,444**	**387,556**	**(212,867)**	**287,133**
Tabung Pengambilan Kerja Semula Pesara FRIM	**(9,791)**	**509,791**	**(460,117)**	**39,883**
Tabung Geran Penyelidikan	**2,086,894**	**413,106**	**(158,905)**	**2,341,095**
Tabung Rekacipta FRIM	**-**	**50,000**	**(50,000)**	**-**
Tabung Ijazah Lanjutan Kakitangan FRIM	**500,000**	**-**	**-**	**500,000**
Tabung Penyelenggaraan Stesen Penyelidikan FRIM	**80,309**	**415,096**	**(447,926)**	**47,479**
Tabung Penambahbaikan & Operasi Aktiviti Pameran FRIM	**200,320**	**49,680**	**(153,287)**	**96,713**
Tabung Pengurusan Kemudahan FRIM	**100,395**	**149,605**	**(170,785)**	**79,215**
Tabung Saguhati Untuk Penilai (Reviewers) Dan Penulis Jemputan JTFS	**12,393**	**17,607**	**(28,517)**	**1,483**
Tabung Bayaran Insentif Lembaga	**383,000**	**117,000**	**(196,847)**	**303,153**
Tabung Perbelanjaan Perubatan Khas	**250,000**	**-**	**-**	**250,000**
Tabung Penerbitan Artikel Dalam Jurnal Antarabangsa	**98,715**	**1,285**	**(640)**	**99,360**
	14,958,453	**6,068,047**	**(6,536,220)**	**14,490,280**

	Baki pada 1 Januari	Pindahan Kumpulan Wang	Perbelanjaan	Baki Pada 31 Disember
	RM	RM	RM	RM
2012				
Tabung Pengurusan dan Peruntukan *One-off*	8,530,967	3,561,671	(3,519,940)	**8,572,698**
Tabung Penyelidikan Luar Jangka	800,000	280,000	(80,000)	**1,000,000**
Tabung Penyelidikan Fellowship	137,908	112,092	(115,020)	**134,980**
Tabung Pendahuluan FRIM	500,000	-	-	**500,000**
Tabung Penyelidikan Bersama	250,000	-	-	**250,000**
Tabung Anugerah Saintis FRIM	5,000	5,000	-	**10,000**
Tabung Research Assistantship	556,667	243,333	(163,429)	**636,571**
Tabung MS ISO	45,034	204,966	(210,475)	**39,525**
Tabung Penyelenggaraan Peralatan Penyelidikan	399,283	100,717	(387,556)	**112,444**
Tabung Pengambilan Kerja Semula Pesara FRIM	(106,272)	500,000	(403,519)	**(9,791)**
Tabung Geran Penyelidikan	2,407,434	92,566	(413,106)	**2,086,894**
Tabung Rekacipta FRIM	50,000	-	(50,000)	**-**
Tabung Ijazah Lanjutan Kakitangan FRIM	499,301	699	-	**500,000**
Tabung Penyelenggaraan Stesen Penyelidikan FRIM	486,418	13,582	(419,691)	**80,309**
Tabung Penambahbaikan & Operasi Aktiviti Pameran FRIM	290,336	250,000	(340,016)	**200,320**
Tabung Pengurusan Kemudahan FRIM	68,230	181,770	(149,605)	**100,395**
Tabung Saguhati Untuk Penilai (Reviewers) Dan Penulis Jemputan JTFS	8,915	21,085	(17,607)	**12,393**
Tabung Bayaran Insentif Lembaga	-	500,000	(117,000)	**383,000**
Tabung Perbelanjaan Perubatan Khas	-	250,000	-	**250,000**
Tabung Penerbitan Artikel Dalam Jurnal Antarabangsa	-	100,000	(1,285)	**98,715**
	14,929,221	6,417,481	(6,388,249)	**14,958,453**

(ii) Kumpulan Wang Pembiayaan Pinjaman Perumahan

Kedudukan baki yang boleh diberi pinjam adalah seperti berikut:-

	2013	2012
	RM	RM
Baki pada 1 Januari	**3,199,510**	3,088,192
Campur: Bayaran Balik Pinjaman	**118,101**	111,318
Baki Akhir	**3,317,611**	3,199,510

(iii) Kumpulan Wang Pembiayaan Pinjaman Kenderaan

Kedudukan baki yang boleh diberi pinjam adalah seperti berikut:-

	2013	2012
	RM	RM
Baki pada 1 Januari	**3,939,645**	3,719,877
Campur: Bayaran Balik Pinjaman	**341,315**	407,543
Tolak: Pemberian pinjaman	**(406,000)**	(187,775)
Baki Akhir	**3,874,960**	3,939,645

(iv) Kumpulan Wang Pembiayaan Pinjaman Komputer

Kedudukan baki yang boleh diberi pinjam adalah seperti berikut:-

	2013	2012
	RM	RM
Baki pada 1 Januari	**479,968**	475,667
Campur: Bayaran Balik Pinjaman	**10,466**	12,901
Tolak: Pemberian pinjaman	**(7,800)**	(8,600)
Baki Akhir	**482,634**	479,968

13. CUKAI PENDAPATAN	**2013** **RM**	2012 RM
Cukai pendapatan Institut	**613,104**	527,796
Lebihan / (kurangan) daripada pendapatan tidak dikecualikan cukai	**246,065**	(690,793)
Cukai pada kadar berkanun 25%	**61,516**	(172,698)
Perbelanjaan tidak dibenarkan cukai	**413,299**	243,562
Elaun modal diserap	**(474,815)**	(70,864)
Pendapatan keatas faedah dikenakan cukai	**613,104**	527,796
Cukai tahun semasa	**613,104**	527,796

14. PENGLIBATAN MODAL

Penglibatan modal bagi kontrak-kontrak dalam pelaksanaan yang tidak diperuntukkan bagi tahun berakhir 31 Disember 2013 berjumlah RM947,808 (RM4,254,568 bagi tahun 2012)

15. BILANGAN KAKITANGAN

Bilangan kakitangan tetap (tidak termasuk ahli lembaga pengarah) pada akhir tahun 2013 adalah seramai 683 orang (tahun 2012 seramai 684 orang)

16. PENGESAHAN PENYATA KEWANGAN

Penyata Kewangan bagi tahun berakhir 31 Disember 2013 yang telah diaudit telah diluluskan oleh ahli-ahli Lembaga Penyelidikan dan Perhutanan Malaysia melalui resolusi pekeliling yang bertarikh 16 Mei 2014

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Cetakan oleh:

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