Think Science . Celebrate Technology . Inspire Innovation

Laporan Tahunan 2014 Annual Report

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Lampiran

Kami berusaha untuk

Menjadi Badan Pemikir yang diiktiraf bagi isu berkaitan sains, kejuruteraan, teknologi dan inovasi.
Memupuk kecemerlangan dalam bidang sains, kejuruteraan dan teknologi untuk kebaikan masyarakat keseluruhannya.

Misi

Menjadi peneraju pemikir

Menjadi Badan Penasihat *Apex* dalam hal berkaitan STI

Menjadi penggalak yang efektif terhadap kesedaran dan pemahaman awam tentang STI

Menjadikan STI sebagai asas bagi pembangunan ekonomi dan kesejahteraan masyarakat

Fungsi

Menasihati Kerajaan berkenaan hal STI yang berkepentingan kepada negara dan antarabangsa

Memupuk budaya kecemerlangan S&T di Malaysia

Membantu meningkatkan kapasiti teknologi sektor industri di Malaysia

Menggalakkan kesedaran dan pemahaman umum mengenai kepentingan STI dalam kehidupan seharian

Menjalin jaringan dan kerjasama antarabangsa

Penerbitan saintifik

Strategi

Memanfaatkan pemikiran saintifik untuk menentukan hala tuju STI negara

Memupuk budaya kecemerlangan STI

Memberikan input STI yang berwibawa dan tepat pada masanya

Menggalakkan penggunaan sains untuk kesejahteraan rakyat

Memudahcara pelaksanaan strategi ekonomi berasaskan inovasi

Menggalakkan penggunaan STI bagi pembangunan luar bandar

Aktiviti kami

Kajian Strategik STI

- Malaysia 2050
- Imbasan Horizon
- Penjelmaan Teknologi Baru
- Kelestarian Sains

Program Strategik STI

- Pembangunan Modal Insan
- Pengantara
- Konsortium Sains
- Fora perundingan

Pihak Berkepentingan

Dalaman

- Felo
- *Associates*
- *Young Scientists Network (YSN-ASM)*
- Pengurusan ASM

Luaran

- Jabatan Perdana Menteri dan Agensi Pusat
- MOSTI dan agensinya
- Kementerian lain dan agensi berkaitan
- Industri
- Institusi penyelidikan
- Institusi pengajian tinggi
- Badan profesional S&T
- Organisasi antarabangsa STI
- Komuniti bandar dan luar bandar

4 teras Piagam Pelanggan

1. Memberi khidmat nasihat yang bebas, boleh dipercayai berasaskan data yang tepat pada masanya
2. Komited dalam mewujudkan program yang berkualiti ke arah pembangunan asas STI negara yang kukuh
3. Mewakili Malaysia dan komuniti saintifiknya di arena antarabangsa
4. Menyebarkan pengetahuan saintifik

Prakata

Akademi Sains Malaysia (ASM) sebagai badan pemikir negara telah menunjukkan pencapaian yang membanggakan dalam kemajuan Sains, Teknologi dan Inovasi (STI) di Malaysia. ASM melengkapi peranan Kementerian Sains, Teknologi dan Inovasi (MOSTI) sebagai pemacu agenda STI ke arah penjanaan ilmu, kekayaan dan kesejahteraan rakyat.

Cetusan idea baru merupakan proses yang penting dalam meneraju negara ke arah mencapai kecemerlangan STI. Kementerian menerusi ASM memenuhi keperluan ini dengan pelaksanaan kajian yang mampu mengenal pasti peluang S&T untuk menjana pertumbuhan ekonomi dan berdaya saing di peringkat antarabangsa. Kajian Tinjauan Masa Hadapan dan penanda aras dijalankan secara berkala bagi memastikan inisiatif STI negara kekal relevan.

STI memainkan peranan strategik ke arah meningkatkan keupayaan teknologi dalam sektor perindustrian, justeru Kementerian menghargai usaha Akademi dalam menghasilkan Rangka Tindakan dan Pelan Pembangunan bagi menyokong inisiatif ini. ASM selaku titik tumpu komuniti saintifik negara bertindak sebagai medium di antara saintis Malaysia, badan saintifik dan pusat kecemerlangan antarabangsa sekaligus membuka peluang pendedahan dan kerjasama yang diperlukan.

Oleh itu, saya yakin bahawa ASM akan terus menyumbang kepakaran melalui ahli dan rangkaiannya ke arah pembentukan sebuah negara, yang bukan sahaja maju, berdaya saing dan inovatif, malahan lestari dan inklusif.



YB Datuk Dr Ewon Ebin
Menteri Sains, Teknologi dan Inovasi



> “Cetusan idea baru merupakan proses yang penting dalam meneraju negara ke arah mencapai kecemerlangan STI.”

Prakata



Kementerian Sains, Teknologi dan Inovasi (MOSTI) merupakan Kementerian yang bertanggungjawab dalam menggubal dasar dan meneroka bidang Sains, Teknologi dan Inovasi (STI) untuk pembangunan negara dan rakyat. Daripada 28 buah Agensi di bawah MOSTI, Akademi Sains Malaysia (ASM) merupakan satu-satunya badan berkanun yang memainkan peranan sebagai badan pemikir STI negara. Saya ingin mengucapkan tahniah kepada ASM kerana sekali lagi berjaya melaksanakan aktiviti-aktiviti STI sepanjang tahun 2014 seperti yang dilaporkan melalui Laporan Tahunan Ini.

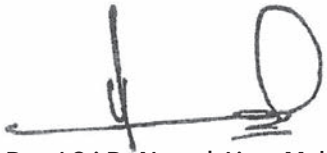
MOSTI sebagai sebuah kementerian yang menerajui isu-isu berkaitan STI sentiasa meninjau bidang baru yang boleh diteroka dan berpotensi untuk dimajukan. Aktiviti ASM seperti program Kajian Strategik STI 2014 merangkumi sektor Infrastruktur, Perumahan, Pengangkutan, Elektrik dan Elektronik, Alam Sekitar, Air dan Tenaga dilihat memenuhi keperluan ini.

Kajian ini melibatkan pelbagai pihak seperti penggubal dasar, penyelidik, akademik, industri dan badan profesional STI bagi memastikan Negara sentiasa berada di hadapan dalam kemajuan sains.

Sebagai usaha berterusan meningkatkan keupayaan masyarakat saintifik negara terutamanya golongan saintis muda, ASM menjalankan pelbagai program strategik STI antaranya program pertukaran saintifik, jaringan kerjasama, pengiktirafan kecemerlangan dan sains komunikasi. Para saintis ini merupakan aset bernilai bagi memacu negara dalam mencapai status negara maju pada masa hadapan.

Tahniah kepada ASM atas aktiviti kajian dan program strategik yang mampu mendukung cita-cita negara ke arah kecemerlangan bidang STI. Semoga usaha ini dapat diteruskan dan MOSTI terus memainkan peranan berkesan di arena nasional dan antarabangsa, seterusnya meletakkan Malaysia setaraf dengan negara-negara maju.

> **“MOSTI sebagai sebuah kementerian yang menerajui isu-isu berkaitan STI sentiasa meninjau bidang baru yang boleh diteroka dan berpotensi untuk dimajukan.”**



Dato’ Sri Dr Noorul Ainur Mohd Nur
Ketua Setiausaha
Kementerian Sains, Teknologi dan Inovasi

Titipan dari Presiden

Akademi Sains Malaysia (ASM) mengambil serius peranannya sebagai 'Peneraju Pemikir" dalam bidang sains, teknologi dan inovasi (STI) dan menerimanya sebagai satu tanggungjawab yang besar kepada rakyat dan negara. Segala hasil kerja dan aktiviti yang telah dilaksanakan, sejajar dengan bidang fokus dan aspirasi ASM, dititipkan di dalam Laporan Tahunan ini. Melalui aktiviti yang dijalankan, ianya membuktikan komitmen dalam menerajui kemajuan dan kecemerlangan STI demi pembangunan negara dan persaingan global.

ASM merealisasikan misi ini dengan melaksanakan kajian strategik STI serta program yang menggembleng pelbagai tenaga pakar, bukan sahaja di ASM tetapi juga menerusi jaringan kerjasama dengan rakan strategik antarabangsa. Kini, pada usia ASM yang menginjak ke 20 tahun sejak penubuhannya pada tahun 1995, sebagai Badan Berkanun di bawah Akta Parlimen, ASM telah mengorak jauh dalam menjadi suara utama bagi sains di Malaysia.

Felo dan Jaringan Pakar

Rangkaian tenaga pakar di bawah naungan ASM kini semakin berkembang, dengan 24 orang Felo Kanan, 234 orang Felo, 43 orang Associates, 57 orang ahli Young Scientists Network (YSN-ASM) dan 96 orang Top Research Scientists Malaysia (TRSM). Sumbangan dan komitment mereka yang tidak berbelah bagi adalah amat berharga dan merupakan faktor utama kejayaan pelbagai kajian strategik, program dan aktiviti ASM.

Tahun ini juga merupakan suatu tahun yang sangat bermakna bagi ASM dengan penganugerahan Felo Kehormat kepada YAB Perdana Menteri. Pemilihan beliau sebagai ahli ASM telah meningkatkan bilangan negarawan dan pemimpin ulung yang menjadi peneraju sains melalui ASM.

Dua platform dialog yang disediakan untuk Felo ASM dan jaringan pakar iaitu General Assembly dan IdeaXchange semakin mendapat perhatian. Kedua-dua platform ini berfungsi sebagai saluran untuk penjanaan idea ASM menerusi dialog yang konstruktif.

Input, Nasihat dan Saranan STI

ASM berpegang teguh dalam memberikan nasihat saintifik terbaik yang bebas, berwibawa, relevan dan bertepatan dengan keperluan semasa. Sejajar dengan itu, bagi tahun 2014, ASM telah mempertingkatkan usaha sebagai Badan Pemikir negara dengan menyediakan input saintifik, intelektual dan strategik yang berkualiti tinggi. Ini direalisasikan dengan proses penjanaan idea yang mantap menerusi saluran kreatif, kepelbagaian perspektif dan kepakaran. Ianya menyumbang kepada nasihat saintifik yang mengambil kira maklumbalas pelbagai sektor, tinjauan masa hadapan dan pendekatan yang merentasi sempadan disiplin konvensional.

Untuk tahun ini, ASM telah memuktamadkan sembilan kaji selidik yang merupakan keutamaan negara, manakala sembilan lagi masih dijalankan. Salah satu daripada kaji selidik utama ASM adalah Malaysia 2050 atau Kajian Mega Sains yang kini berada dalam fasa ketiga. Kaji selidik ini memberi gambaran Malaysia pada tahun 2050, yang mengambil kira elemen perubahan dari aspek sosial, ekonomi dan geopolitik serta memberikan saranan berkenaan ekosistem dan pelaburan STI yang perlu dibangunkan mengikut keutamaan untuk memastikan kejayaan negara. Kajian Mega Sains ini melihat secara menyeluruh gambaran masa hadapan yang kita inginkan dengan menekankan elemen kelestarian, perhubungan, kemakmuran, keamanan dan keharmonian yang menjamin kehidupan berkualiti untuk semua. Selain daripada itu, ianya turut membincangkan bagaimana untuk memanfaatkan STI dalam merangka masa depan yang diinginkan. Tahun ini, fasa kedua Kajian Mega Sains yang merangkumi sektor Perumahan, Infrastruktur, Pengangkutan, Elektrikal dan Electronik, dan Alam Sekitar telah disiapkan. Hasil laporan ini dibentangkan di Forum Kebangsaan Mega Sains untuk menerapkan pengaruh positif dalam penggubalan dasar, menyelaras usahasama dan mendapatkan perhatian terhadap kepentingan pelaburan STI yang strategik yang bakal dijalankan oleh pelbagai pihak berkepentingan.

ASM juga telah melancarkan laporan dwitahunan Science Outlook sebagai salah satu inisiatif utamanya untuk tahun 2014. Edisi pertama laporan tersebut mengandungi ulasan bebas berkenaan trend utama STI di Malaysia dan bakal diterbitkan dalam suku pertama tahun 2015. Science Outlook bertujuan untuk menyediakan pandangan berasaskan bukti dan perspektif baharu mengenai landskap STI Malaysia. Adalah diharapkan supaya Science Outlook dapat menjadi sumber rujukan yang berguna dalam membuat keputusan berdasarkan maklumat.

Advokasi Sains

ASM menyedari akan keperluan untuk memberikan khidmat melangkaui nasihat saintifik kepada penggubal dasar demi kepentingan tadbir urus STI yang mantap dan berdasarkan bukti, membuat keputusan berdasarkan maklumat dalam perancangan dan pengurusan STI. Dalam konteks ini, adalah penting untuk ASM melibatkan pihak berkepentingan (komuniti saintifik, akademik, pegawai kerajaan, pemimpin industri, pemimpin korporat, rakan kongsi dari organisasi dan institusi STI, pihak swasta dan orang awam) secara kreatif dan positif menerusi usaha yang dapat meningkatkan kepercayaan dan pengiktirafan, sekaligus meningkatkan pengaruh dan kesan bagi inisiatif dan aktiviti ASM.

Tahun ini telah menyaksikan ASM mengorak langkah dalam melaksanakan inisiatif ke arah keterlibatan dinamik dengan individu berkepentingan, kementerian, organisasi dan media. Selain daripada memajukan kertas cadangan ASM melalui platform rasmi kerajaan dan antarabangsa, ASM turut menggunakan rangkaian kerjasama Felo dan rakan strategik untuk memaksimumkan capaian ASM.

Sejajar dengan langkah Malaysia ke arah pertumbuhan ekonomi yang lebih mampan, tahun ini menyaksikan pelancaran Pelan Pembangunan "Establishment of Rare Earth-Based Industries in Malaysia — A Strategic New Source for Economic Growth". ASM yakin bahawa elemen nadir bumi dapat menjadi asas kepada pertambahan nilai kebanyakan industri hiliran bawah, terutamanya industri yang menyumbang kepada ekonomi hijau negara. Selain itu, Pelan Pembangunan ini memberikan panduan penubuhan dan pembangunan industri berasaskan nadir bumi di Malaysia dalam sektor hiliran atas, pertengahan dan bawah. Ia juga merangkumi usaha mengenalpasti pembangunan kapasiti yang diperlukan. Penubuhan industri berasaskan nadir bumi ini akan memacu agenda ekonomi hijau Malaysia ke hadapan.

Pengukuhan Kapasiti dan Keupayaan STI

Landskap sosioekonomi seluruh dunia kini sedang ditakrifkan semula menerusi globalisasi dan kebangkitan ekonomi berorientasikan inovasi. Antara cabaran utama yang dihadapi adalah seperti perubahan iklim, sekuriti tenaga, sekuriti makanan, sekuriti air dan sekuriti siber jelas memacu perubahan.

"Dalam usaha untuk mengekalkan daya saing di antara negara, perdagangan dan individu, kita perlu mendalami ilmu, membina jalinan kerjasama, membangun dan menggunakan bakat STI secara berkesan, bagi meningkatkan keupayaan saintifik dan teknologi negara."

ASM sentiasa berusaha menangani isu-isu utama negara dari perspektif STI. Salah satu contoh pencapaian cemerlang adalah kajian sektor air ASM yang telah dijalankan sejak tahun 2008, yang kini diiktiraf dan mendapat perhatian kebanyakan pihak berkepentingan daripada kementerian dan agensi kerajaan serta badan bukan kerajaan dalam dan luar negara. Kejayaan ini adalah merupakan susulan daripada Laporan Nasihat sektor air yang komprehensif yang berkeupayaan untuk menarik perhatian dan penglibatan pelbagai disiplin yang merentasi sektor kepakaran dari dalam dan luar negara, kepada platform perundingan umum.

Kajian ini telah diselia oleh Jawatankuasa Air ASM yang berdedikasi. Dengan mengguna pakai Integrated Water Resources Management (IWRM) sebagai teras utama dan atas sebab-sebab keperluan penggunaan yang praktikal di Malaysia, Jawatankuasa ini telah membahagikan IWRM kepada sebelas subtema yang berasingan. Seterusnya, setiap subtema ini dikaji lebih lanjut dan dimuktamadkan dalam pembentangan pelan strategi atau laporan nasihat bagi pertimbangan dan penerimaan pihak berkuasa yang berkenaan atau agensi yang bertanggungjawab untuk pelaksanaannya. Kajian ke atas tujuh subtema telah selesai, manakala lima lagi masih diteruskan.



Membangunkan Bakat STI

Antara amanat yang didukung ASM adalah untuk mewujudkan tenaga kerja saintifik negara yang jitu, pelbagai dan mampan. Oleh itu, pendidikan sains telah menjadi fokus utama ASM dan tanggungjawab ini digalas oleh Jawatankuasa Pendidikan Sains yang komited.

Kajian kes ke atas Inquiry Based Science Education (IBSE) telah dijalankan atas keprihatinan ASM tentang tahap pencapaian Malaysia dalam bidang sains, seperti yang ditunjukkan dalam keputusan Programme for International Student Assessment (PISA) 2009 dan 2012. Kajian ini bertujuan untuk meneliti kebolehlaksanaan IBSE sebagai inisiatif ke arah meningkatkan keberkesanan pengajaran dan pembelajaran sains di sekolah rendah, serta pemahaman pelajar terhadap matapelajaran sains. Hasil dapatan kajian mendapati bahawa ia diterima secara positif dari pihak guru dan murid, yang mana memberikan asas yang kukuh supaya IBSE diterima pakai sebagai cara untuk memajukan pendidikan sains. Laporan kajian akan dibentangkan kepada Kementerian Pendidikan (MOE) pada tahun 2015.

ASM memberikan tumpuan kepada pemupukan budaya kecemerlangan dalam STI menerusi penekanannya ke atas tiga elemen utama, iaitu bakat, perikatan dan pengiktirafan. Dalam fokus ASM terhadap perikatan strategik ke arah memupuk budaya kecemerlangan dalam STI, ASM berperanan sebagai pemudahcara pertukaran saintifik dan kerjasama dengan pusat kecemerlangan yang terkenal di dunia serta institusi STI. Tujuan inisiatif ini dijalankan adalah untuk menjadi pemangkin kepada pencapaian yang cemerlang dalam STI serta untuk membangunkan saintis Malaysia yang berkaliber tinggi dan mampu untuk memperoleh pengiktirafan antarabangsa. ASM memainkan peranan sebagai pemudahcara kerjasama di antara institusi Malaysia dengan pusat kecemerlangan yang terkemuka di dunia, yang mana bertujuan untuk membina kolaborasi penyelidikan dan program pembangunan sumber manusia yang akan menyokong usaha Kerajaan untuk membina kapasiti dan keupayaan dalam STI.

Tahun ini telah menyaksikan tujuh saintis muda berpeluang untuk menyertai Mesyuarat Tahunan Lindau bersama penerima Anugerah Nobel di Lindau, Jerman, serta program musim panas atau program sangkutan di Pusat Kecemerlangan yang terkemuka seperti European Organization for Nuclear Research (CERN). Selain daripada itu, National Centre for Particle Physics (NCPP) yang merupakan sebahagian daripada program International Research Consortium ASM, yang ditubuhkan pada tahun 2013, telah berkembang dengan baik tahun ini. Melalui NCPP, para penyelidik dalam bidang fizik zarah telah mula bekerjasama di peringkat antarabangsa. Sehubungan dengan itu, saya dengan sukacitanya memaklumkan bahawa pemasangan sistem pengkomputeran berprestasi tinggi di UM sedang dijalankan untuk memuat turun data daripada pusat penyelidikan CERN.

Fora Antarabangsa

Kekuatan dan pengaruh ASM terhasil daripada jaringan dan hubungan antarabangsa yang meluas. Menyedari akan hal ini, ASM telah mengendalikan pelbagai program pertukaran dua hala dan memudahcara beberapa kerjasama penyelidikan antarabangsa.

Selain daripada itu, ASM turut mengambil perhatian akan kemajuan yang pesat dalam penyelidikan saintifik terhadap isu kelestarian global dan pembasmian kemiskinan dalam konteks Asia. Dalam menangani isu yang kian mendesak ini, ASM telah menganjurkan persidangan antarabangsa 'Science Council of Asia (SCA)', yang bertemakan 'Future Earth'.

"Melihat kepada perjalanan ASM pada tahun ini, saya yakin bahawa ASM telah mengorak langkah ke hadapan dan berada di landasan yang tepat dalam meningkatkan keterlihatan, pengaruh dan impak. Dalam menterjemahkan etos kami, 'Think Science, Celebrate Technology and Inspire Innovation', kami telah berkembang bukan sahaja dalam jumlah penghasilan kajian strategik dan program yang dijalankan, malahan juga meningkatkan skala penglibatan pihak berkepentingan serta memperbanyakkan platform hebahan hasil kerja ASM."

Penghargaan

ASM amat menghargai sokongan dan kerjasama Kementerian, Institut Pengajian Tinggi Awam dan Swasta, institut penyelidikan, sektor industri dan korporat yang menjadi rakan kolaborasi ASM dalam mengemukakan dapatan yang positif serta berimpak menerusi pelbagai platform perhubungan. Adalah mustahil untuk kepimpinan ASM melalui Felonya menjayakan aktiviti ASM tanpa kerjasama dan kolaborasi yang signifikan daripada semua pihak.

Saya ingin merakamkan penghargaan yang tidak terhingga kepada semua Pengerusi dan ahli Jawatankuasa ASM, Badan Bertindak dan Kumpulan Kerja yang menyumbangkan masa dan kepakaran mereka tanpa jemu. Saya juga ingin mengucapkan ribuan terima kasih kepada warga Kerja ASM yang tekun dan berdedikasi dalam melaksanakan aktiviti ASM.

Perancangan Hadapan

Penguasaan dalam STI adalah kunci kepada kejayaan masa hadapan Malaysia. Oleh yang demikian, adalah penting untuk kita bertindak sekarang dan seterusnya berada di landasan yang betul demi manfaat STI pada masa akan datang. Saya menyedari akan tanggungjawab besar yang perlu digalas dan amat mengalu-alukan kolaborasi dengan anda dalam menjayakan peranan dan tanggungjawab ASM, serta memenuhi harapan semua pihak terlibat.

Bersama, kita mampu melakukan perubahan!



Tan Sri Dr Ahmad Tajuddin Ali FASc

“There are 3 things we need to do in achieving fast the aspirations of 2020. Firstly, we need to wake up and overcome our inner enemies - fear and doubt. Secondly, we need to be more forthcoming in our venture to become a nation of excellence. Finally, we need to take pride in our stride and work, but also be mindful in our actions and strategies that shape the future generation, of their role in continuing the aspirations of Vision 2020, whilst upholding national cultural and values that complete the identity of the new, progressive Malaysian.”

YAB Tun Dr Mahathir Mohamad
Felo Kehormat, ASM

MENASIHATI

PENGGUBAL DASAR

ASM memenuhi keperluan untuk satu rangka kerja yang mantap, bersepadu yang merangkumi kapasiti S&T, sumber dan ekosistem tempatan. Rangka kerja ini membolehkan ASM memberi khidmat nasihat kepada kerajaan khususnya dalam penerokaan kelestarian sains, ramalan tahap pembangunan Malaysia pada 2050 dan mengenalpasti penjelmaan teknologi baru.

Agenda Mega Sains

Malaysia 2050

Agenda Mega Sains menjangka masa depan yang kita impikan – lestari, makmur, aman, Malaysia yang progresif dan terhubung dengan rakyatnya melalui penggunaan STI secara optimum bagi memastikan pembangunan berterusan untuk 40 tahun yang akan datang. Bagi menguasai peluang STI di masa hadapan, tindakan segera perlu diambil.

Fasa kedua Kajian Mega Sains menjurus kepada lima sektor: Perumahan, Infrasruktur, Pengangkutan, Elektrik & Elektronik dan Alam Sekitar. Sektor-sektor ini mempunyai kecenderungan paling tinggi untuk pembangunan dan pertumbuhan STI yang lestari. Setiap sektor ini dibahagikan mengikut bidang tumpuan yang disokong dengan maklumat pasaran global dan data komersial yang berkaitan. Seterusnya, setiap bidang tumpuan diperincikan melalui rantaian nilai yang menjurus ke arah pemahaman dinamik yang menyeluruh.

Isu-isu yang perlu ditangani dengan segera adalah seperti berikut:

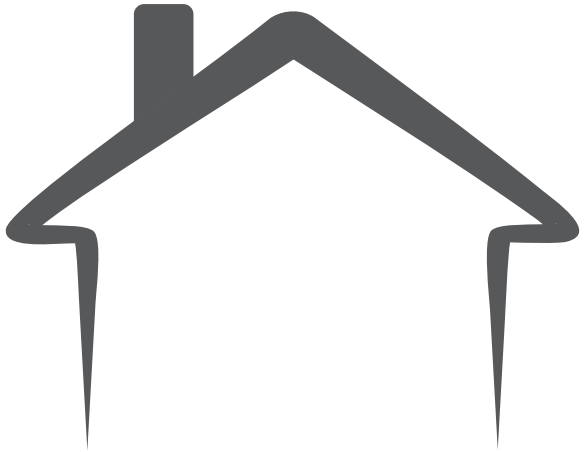
- Pewujudan data nasional bersepadu
- Perancangan nasional melangkaui 2020
- Input sains dan teknologi (S&T) dalam polisi nasional
- Hubungan antara disiplin
- Pelan tindakan menyeluruh
- Bidang tumpuan P&P dan dana
- Pekerja berpengetahuan dan berkemahiran
- Pelaksanaan, penilaian dan pemantauan

HALAMANFAKTA

Forum Nasional Mega Sains 2.0
Forum ini telah diadakan pada 6 November 2014, di mana hasil kajian daripada lima sektor telah dibentangkan oleh ketua sektor. Forum ini dihadiri oleh 268 peserta dari pelbagai kementerian, agensi, industri, pertubuhan bukan kerajaan dan badan berkanun.

Berdasarkan maklum balas hasil forum ini satu Laporan Bersepadu telah disediakan. Satu Memorandum Jemaah Menteri juga telah disediakan untuk dibentangkan kepada Kabinet.





Sektor **Perumahan**

Penempatan Penduduk Mega / Bandar Mega . Rumah Pintar, Bersih, Sihat dan Selamat Bahan dan Teknologi Bangunan Termaju

"Housing is a catalyst for socio-economic development and poverty reduction that cuts across almost every other indicator for human development. Access to adequate and affordable housing prevents injury, disease and premature death; increases household and national income; and provides socio political stability"

(UN, 2011)

Pelaburan Strategik untuk Sektor Perumahan

1 Perumahan untuk bandar padat dan 'Transit Oriented Development (TOD)'

Semua rumah perlu menggunakan teknologi hijau, mempunyai akses kepada sistem komunikasi berteknologi tinggi, kemudahan, mampu milik dan sesuai untuk pelbagai peringkat umur.

2 Sistem Rumah Pintar

Konsep RumahBestari / Komunti Bestari yang dibangunkan oleh MIMOS pada tahun 2005 perlu dikaji semula dan diperluaskan ke kawasan bandar dan luar bandar utama bagi mengurangkan penggunaan tenaga dan menyediakan kehidupan yang selesa. Aplikasi baru dalam rumah pintar ini termasuk penghasilan tenaga elektrik melalui penggunaan haba bahan buangan dan haba badan manusia.

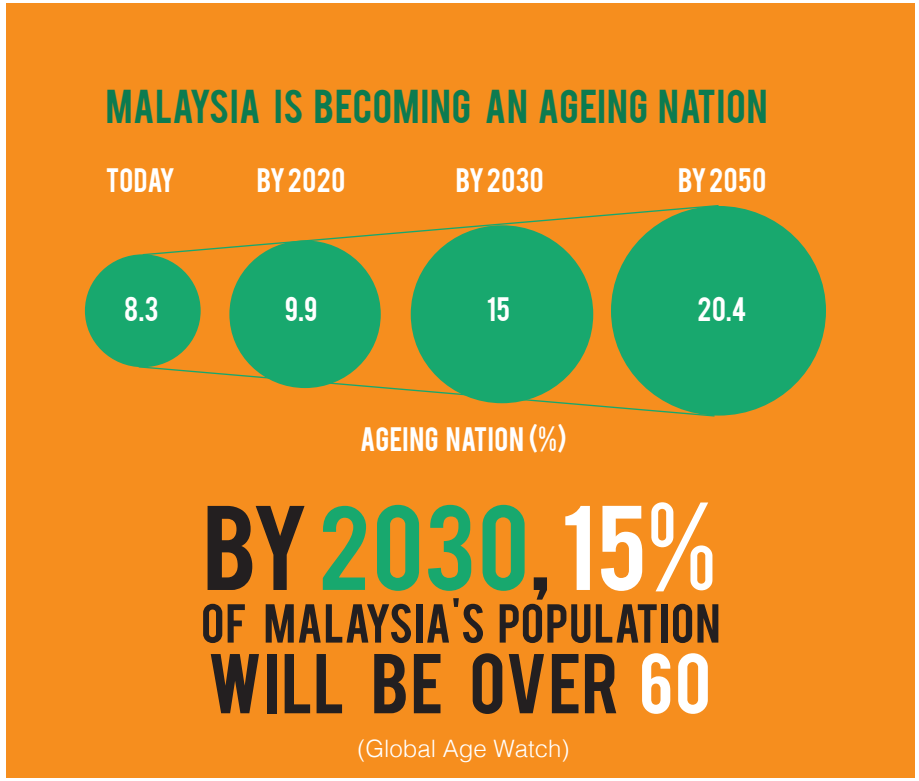
3 Bahan dan teknologi bangunan termaju

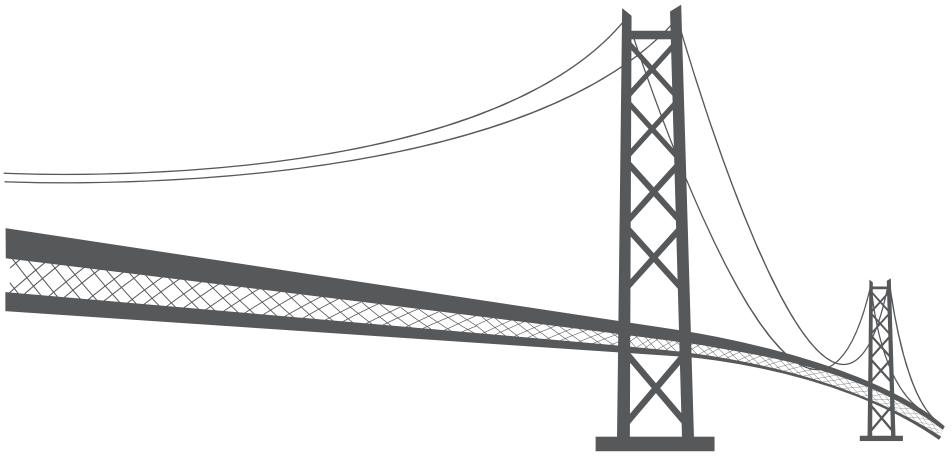
Kombinasi penggunaan bahan pasang siap (*prefabrication*) dan sistem modular perlu menerapkan bahan interaktif bangunan, automasi dan robotik serta prototaip pantas. Oleh yang demikian, Malaysia perlu berusaha untuk membangunkan industri bahan bangunan pintar yang lestari.

4 Rekabentuk rumah tahan bencana

Rekabentuk rumah tahan bencana harus digalakkan sebagai langkah persediaan negara menghadapi perubahan iklim yang mengakibatkan banjir besar, angin kencang, gempa bumi dan tsunami.

Menjelang tahun 2025, jumlah penduduk bandar di Malaysia dijangka meningkat sehingga 70%. Oleh itu, kerajaan perlu menyediakan perumahan yang mencukupi, mampu milik dan berkualiti. Tadbir urus yang baik, dasar perumahan yang menggalakkan, strategi dan pelan serta teknologi tinggi untuk kelestarian sosial adalah di antara perubahan yang diperlukan dalam sektor perumahan. Bagi memenuhi keperluan semasa, yakni seperti perubahan iklim dan pemeliharaan warisan budaya, pembentukan Panel Semakan Rekabentuk (*Design Review Panel*) adalah penting. Panel ini berperanan dalam menggalakkan rekabentuk inovatif dan mengawal selia piawaian rekabentuk.





Sektor **Infrastruktur**

Kejuruteraan, Perolehan dan Pembinaan (EPC)
Lapangan Terbang . Pelabuhan . Jalanraya & Lebuhraya . Landasan Kereta api

"The challenge for policy makers is to undertake infrastructure development in a manner that not only promotes equity, efficiency, participatory decision-making, sustainability and accountability but also develops domestic capabilities in science, technology and innovation."

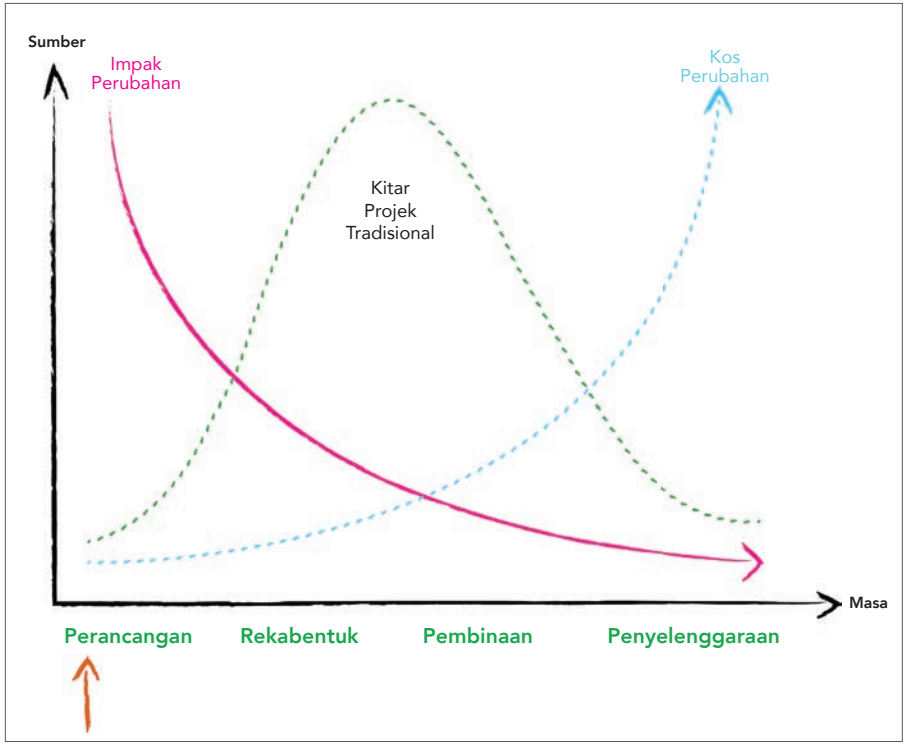
(Department for International Development, UK Government, 2002)

Pelaburan Strategik untuk Sektor Infrastruktur

1 Pembangunan Lestari berdasarkan Analisis Kitaran Hayat

Emphasis on planning since the biggest sustainability gains can be achieved if changes are made at this stage.

Analisis Kitaran Hayat Projek



2 Pelan Induk Infrastruktur Bersepadu

Terdapat keperluan untuk mengintegrasikan infrastruktur yang berbeza untuk memastikan pembangunan yang lestari. Sepanjang jangka hayat infrastruktur tersebut, isu-isu kelestarian perlu diberi perhatian.

3 Instrumen Penilaian Kelestarian Infrastruktur

Pengunaan Instrumen Penilaian Kelestarian Infrastruktur akan memastikan ciri bagi kedua-dua infrastruktur lestari dan kelestarian infrastruktur terpelihara melalui mekanisme yang diperlukan untuk penilaian, pengawalan dan pemantauan.

Ini amat penting dalam memastikan sektor infrastruktur negara terus lestari, berdaya saing dan produktif ke arah 2050.
Berikut adalah persoalan penting yang disyorkan untuk penilaian komponen projek:

- Adakah infrastruktur ini benar-benar diperlukan?
- Apakah jenis infrastruktur yang diperlukan? Di manadan bilakah ia diperlukan?
- Pengutamaan infrastruktur
- Pemodelan kelestarian
- Mengesyorkan matriks kelestarian / parameter untuk model terpilih
- Memantau prestasi infratsruktur

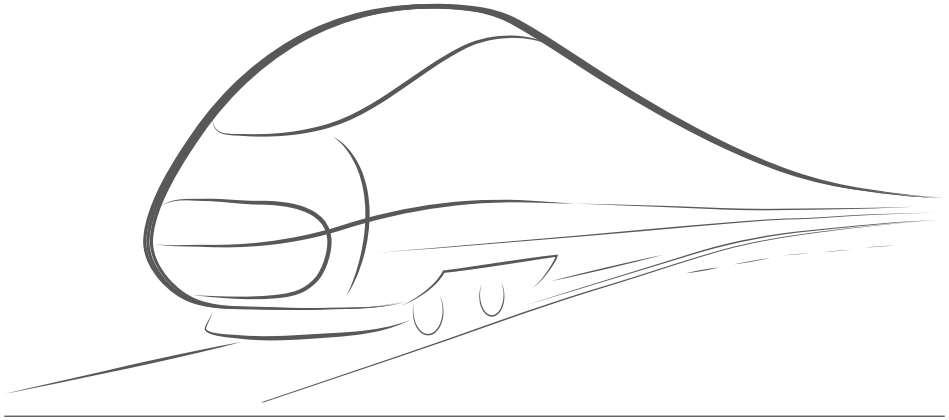
Sebagai sektor yang mampu mempengaruhi agenda pembangunan lestari negara, sektor infrastruktur adalah sektor yang penting dan strategik untuk dirancang dan diurus. Penentu utama dalam usaha negara mencapai pembangunan lestari adalah infrastruktur, dan intervensi STI adalah penting.

FOR THE LAST 5 YEARS THE GOVERMENT HAS SPENT A TOTAL AMOUNT OF **RM470 MILLION** FOR THE MAINTENANCE OF SLOPES THROUGHOUT THE COUNTRY.

TUNNELING,

PROBABLY, NEEDS TO BE SEEN AS AN ALTERNATIVE TO SOLVE THESE PROBLEMS.

(Speech of YB Datuk Seri Haji Fadillah Haji Yusof, Minister of Works, 2 September 2014)



Sektor **Pengangkutan**

Pengangkutan Rel . Pengangkutan Jalan Raya . Industri Aeroangkasa
Pengangkutan Laut dan Darat
Perkhidmatan Keselamatan dan Pengurusan Penguatkuasan (SEMS)

"We note that transportation and mobility are central to sustainable development. Sustainable transportation can enhance economic growth and improve accessibility. We recognise the importance of the efficient movement of people and goods. Access to environmentally sound, safe and affordable transportation improves social equity (fairness), health, resilience of cities, urban-rural linkages and productivity of rural areas"

(UN Conference on Sustainable Development, Rio+20)

Pelaburan Strategik untuk Sektor Pengangkutan

1. Sektor pengangkutan akan bermanfaat sekiranya konsep 'Elak – Beralih – Menambah baik' ', diterima pakai.

Elak
(mengurangkan keperluan perjalanan)

- Pembangunan komuniti perlu dirancang lebih baik dengan mengambil kira akses alternatif untuk pemanduan yang lebih mudah;
- Kerja dari rumah (*telecommuting*)
- Penggunaan tanah bersepadu – Pelan Induk Pengangkutan; dan
- Pengangkutan Berorientasikan Pembangunan (TOD).



HALAMANFAKTA

Pada tahun 1991, kekerapan perjalanan bagi kenderaan di Malaysia adalah hanya 13 juta perjalanan sehari. Namun pada tahun 2010, angka ini telah meningkat 300% kepada 40 juta perjalanan setiap hari, dan dijangka akan mencapai 133 juta pada tahun 2030 (SPAD, 2010).

Beralih
(Memilih mod pengangkutan yang lebih cekap)

- Sistem pengangkutan rel negara memerlukan perancangan awal. Ini penting untuk mengurus mobiliti, urbanisasi, kehidupan lestari, kesan alam sekitar, pengangkutan yang efisien dan populasi penduduk yang berlebihan.
- Merancang laluan perkapalan kutub bebas ais
  - Rangkaian Kereta Api Trans-Asia perlu disusuli dengan laluan Timur dan Barat yang dirancang dan dibina secara berperingkat.
  - Malaysia harus bersedia sekiranya laluan kutub menjadi bebas ais menjelang tahun 2100 untuk tujuan perkapalan yang merentasi perairan Malaysia. Dianggarkan masa pelayaran berkurangan dari 48 hari (laluan Suez Canal) ke 35 hari (laluan kutub) bagi kapal dalam perjalanan dari Rotterdam ke Dalian.
- Menggunakan pengangkutan awam sepenuhnya dari destinasi awal hingga ke destinasi akhir;
- Perkhidmatan Tram/ Bus Transit Cepat untuk pengangkutan dalam bandar;
- Mempertimbangkan pengangkutan air sebagai alternatif yang berdaya maju;
- Mengenakan caj Skim Kesesakan Jalan Raya (ACP)

HALAMANFAKTA

- **Industri angkasa** akan menjadi satu trend pengangkutan masa hadapan.
- Lebih 900 satelit akan dilancarkan menjelang tahun 2020

Frost & Sullivan Report, 2011

Menambah baik
(Memilih bahan api dan teknologi yang bersih)

- Membangunkan mod pengangkutan tanpa sempadan bersepadu yang merangkumi pengangkutan darat, aeroangkasa dan maritim;
- Integrasi kesemua mod pengangkutan di dalam sistem perjalanan *multimodal* yang dipermudahkan dengan teknologi maklumat;
- Memilih pengangkutan hijau dengan menghasilkan dan menggunakan kenderaan bersih, efisien, dikuasakan bahan api lestari rendah karbon dan tenaga seperti kenderaan bertenaga efisien, kenderaan elektrik dan kenderaan hibrid;
- Memanfaatkan teknologi berasaskan satelit komersil (ITS, GPS, navigasi kereta, kawalan trafik udara dan pendaratan automatik pesawat) untuk meningkatkan sistem navigasi bagi sektor pengangkutan agar kadar kemalangan, penggunaan bahan api dan masa perjalanan dapat dikurangkan secara signifikan;
- Membuka Jalan Tol Terbuka / Sistem Tol Aliran-bebas;
- Merangka Sistem Panduan Maklumat Parkir;
- Menubuhkan agensi tunggal yang bertanggungjawab bagi pengangkutan;
- Menyediakan perkhidmatan kereta api berkelajuan tinggi di seluruh negara; dan
- Mewujudkan *Automatic Dependent Surveillance Broadcast System (ADS-B)*

2. Mengutamakan P&P dalam sektor pengangkutan

i. Teknologi 'Internet of Things (IoT) / Internet of Vehicle (IoV)', diterima pakai untuk menghubungkan kenderaan ke kenderaan, kenderaan ke infrastruktur atau kenderaan dengan manusia. Ini membolehkan maklumat dan perkhidmatan *real-time* yang bermanfaat membantu sektor pengangkutan.

ii. Meningkatkan kecekapan pembuatan dalam industri aeroangkasa, pengangkutan darat dan maritim, penggunaan teknologi pembuatan tambahan yang lebih efisien patut digunakan.

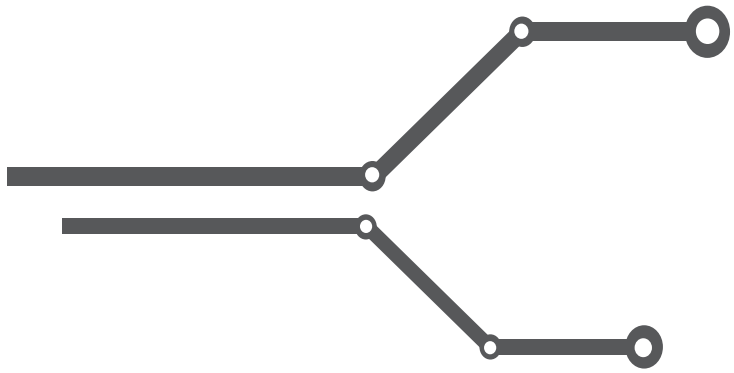
iii. Penggunaan Teknologi Reka bentuk Kenderaan perlu digiatkan secara berkesan untuk menghasilkan kenderaan mesra alam untuk pelbagai mod pengangkutan.

iv. Menubuhkan Institut Penyelidikan bertumpukan sektor pengangkutan.

HALAMANFAKTA

Pengangkutan: Peningkatan mobiliti ekoran peningkatan Keluaran Dalam Negara Kasar (KDNK) dan populasi penduduk

- Mobiliti sesebuah negara biasanya bertambah dengan peningkatan KDNK dan populasi penduduknya. Purata pertumbuhan tahunan sebanyak 6.3% dari 1971 ke 2010, di mana KDNK meningkat dari RM6,000 ke RM30,000 (SPAD, 2010).
- Menurut Rancangan Fizikal Kedua Negara, populasi penduduk Malaysia mencatatkan pertumbuhan tahunan sebanyak 2.2% dari tahun 2000 hingga 2008, membawa populasi penduduk dari 23.3 juta ke 27.7 juta. Menjelang tahun 2020, populasi penduduk Semenanjung Malaysia dianggarkan mencecah 28 juta.



Sektor
Elektrik dan Elektronik

Peranti Berasaskan Silikon dan Semikonduktor Gabungan
Penjanaan, Pengaliran dan Pengagihan Tenaga
Solar Sebagai Sumber Tenaga Boleh Diperbaharui yang Efisien

"The Electronics and Electrical sector has played a critical role in the development of an industrialised Malaysian economy. We now need to be a strategic E&E centre for leading global E&E players and domestic champions, offering high value for money and with a deep pool of talent."

(YB Dato' Sri Mustapa B. Mohamed,
Menteri Perdagangan Antarabangsa dan Industri)

Pelaburan Strategik untuk Sektor Elektrik dan Elektronik

1 Pembangunan peranti berasaskan silikon dan semikonduktor gabungan

Walaupun semikonduktor gabungan adalah pilihan yang menarik, silikon masih merupakan pilihan utama dalam industri elektronik. Tambahan pula, Malaysia kaya dengan pasir silika berkualiti tinggi yang merupakan bahan utama dalam peranti silikon.

2 Pewujudan produk eletronik jenama tempatan

Dengan membangunkan 'Sony' atau 'Samsung' versi Malaysia, kita dapat menyertai rangkaian industri bernilai tinggi yang membolehkan industri elektronik negara terus berkembang dan lestari pada masa hadapan. Ini akan memastikan barangan elektronik buatan tempatan berada dalam pasaran dan seterusnya menyokong ekosistem sektor elektronik. Selain itu, negara akan dapat meneroka dan memanfaatkan kepakarannya dalam P&P, reka bentuk Litar Bersepadu, fabrikasi, pembuatan dan pembangunan produk. Pihak universiti juga dapat memainkan peranan masing-masing dalam bidang P&P dan seterusnya mengurangkan bebanan ke atas syarikat baru atau GLC.

3 Penjanaan, penghantaran dan pengagihan tenaga

Untuk penjanaan, penghantaran dan pengagihan tenaga sehingga tahun 2020, perkara berikut telah diutarakan:

- Kecekapan Tenaga
- Komuniti Jaringan Neutral (Net Neutral Community) dan Transformasi Luar Bandar
- Grid Pintar dan Sistem Tenaga boleh Diperbaharui Tidak Berpusat

4 Penghasilan solar hidrogen untuk bekalan elektrik kawasan bandar dan luar bandar

Ia merupakan idea untuk teknologi boleh diperbaharui dan teknologi hijau. Selain daripada itu, idea-idea lain untuk dipertimbangkan adalah seperti pengenalan kepada Grid Pintar, Sistem Tidak Berpusat, serta penggunaan Tenaga Marin (Penukaran Tenaga Terma Luar Pesisir, Pasang Surut Air, Ombak dan Angin Luar Pesisir) serta penggunaan tenaga nuklear berteknologi tinggi (thorium sebagai sumber bahan api).

5 Kestabilan bekalan tenaga dan ekonomi hidrogen

Untuk kestabilan bekalan tenaga dan ekonomi hidrogen (untuk dilaksanakan pada 2031 dan seterusnya), ekonomi hidrogen berskala besar dan penggunaan sistem hidrogen boleh diperbaharui berteknologi tinggi dijangka akan dilaksanakan.

6 Solar sebagai tenaga boleh diperbaharui yang efisien

i. Berasaskan industri (sehingga tahun 2020), yang mengetengahkan perkara berikut:

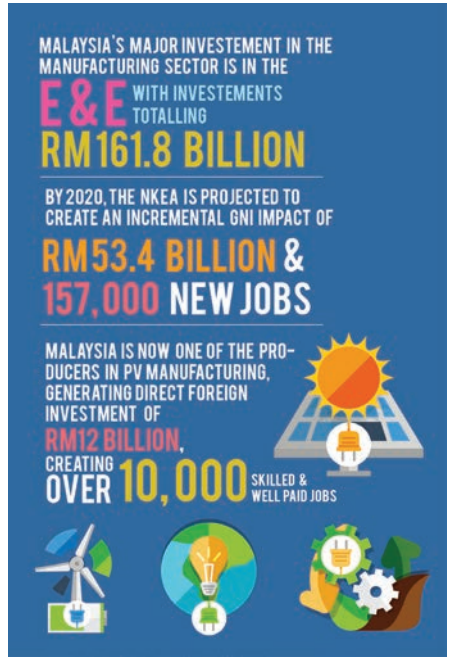
- Harga bahan mentah silikon yang lebih rendah
- Teknologi wafer silikon yang lebih nipis
- Filem nipis
- Penambahbaikan pemprosesan
- Peningkatan prestasi

ii. Berasaskan teknologi (sehingga tahun 2030), yang mengetengahkan perkara berikut:

- Filem nipis
- Penumpu
- Wafer silikon < 100 mikron
- Sel silikon melangkaui 25%

iii. Berasaskan penyelidikan asas (2031 ke 2050 dan seterusnya), yang mengetengahkan perkara berikut:

- Titik kuantum
- Multisimpangan
- Kajian Termofotonik
- Jalur pertengahan
- Bidang berinspirasikan biologi





Sektor
Alam Sekitar

Perubahan Iklim dan Karbon . Air . Tenaga
Bahan Buangan . Hutan dan Tanah

"Sustainable development recognises that growth must be both inclusive and environmentally sound to reduce poverty and build shared prosperity for people today and for future generations. While efforts to expand access to safe drinking water are on track to achieve this target in most regions, 2.5 billion people still lack access to improved sanitation. Land is still being degraded, forest lost and species endangered as carbon emissions continue to change the environment we live in."

(The World Bank)

Pelaburan Strategik untuk Sektor Alam Sekitar

1 Perubahan Iklim & Karbon

Menangani kesan karbon yang terhasil daripada hasil pengeluaran pertanian dan industri, bangunan dan bandar dengan:

- Menggunakan tenaga yang boleh diperbaharui untuk bekalan elektrik bagi menggantikan arang batu dan hidrokarbon seperti mana yang disarankan oleh UN
- Meningkatkan kecekapan penggunaan tenaga
- Mengurangkan pembaziran
- Menghentikan aktiviti penebangan hutan
- Menambah baik penyelenggaraan dan perancangan

2 Air

Menangani masalah pengurangan kawasan tadahan air dan kekurangan air termasuk kawasan pertanian intensif dengan:

- Membaiki dan menyelenggara sistem pengagihan untuk mengurangkan kebocoran
- Menambah baik sistem untuk menyimpan dan menggunakan air hujan dan banjir dengan efisien
- Meneroka dan menggunakan sumber air bawah tanah
- Meningkatkan penyusupan air hujan ke dalam tanah (mengurangkan kawasan permukaan tidak telap di kawasan bandar)
- Membersihkan dan mencegah pencemaran sungai.

3 Tenaga

Peningkatan jumlah karbon dioksida di atmosfera adalah berpunca daripada peningkatan permintaan tenaga. Oleh yang demikian, penggunaan tenaga yang boleh diperbaharui berasaskan kayu (tanam semula), solar dan angin di kawasan terpilih perlu digalakkan. Pengeluaran kayu untuk tenaga memerlukan pemfokusan semula di peringkat perancangan nasional untuk peralihan dari teknologi tinggi berpusat kepada teknologi rendah yang selamat dan tidak berpusat.

4 Bahan Buangan

Kos alam sekitar yang tinggi bagi pelupusan menggunakan tapak pelupusan. Bahan buangan dapat dikurangkan melalui rekaan dan perancangan produk (memperkenalkan Penilaian Kitar Hayat dalam pembuatan produk), kitar semula bahan buangan dengan pengenalan kepada mekanisme pengasingan dan kitar semula, sisa organik yang dijadikan baja kompos, manakala penggunaan tapak pembakaran dan pelupusan adalah sebagai pilihan terakhir dan digunakan pada tahap minimum.

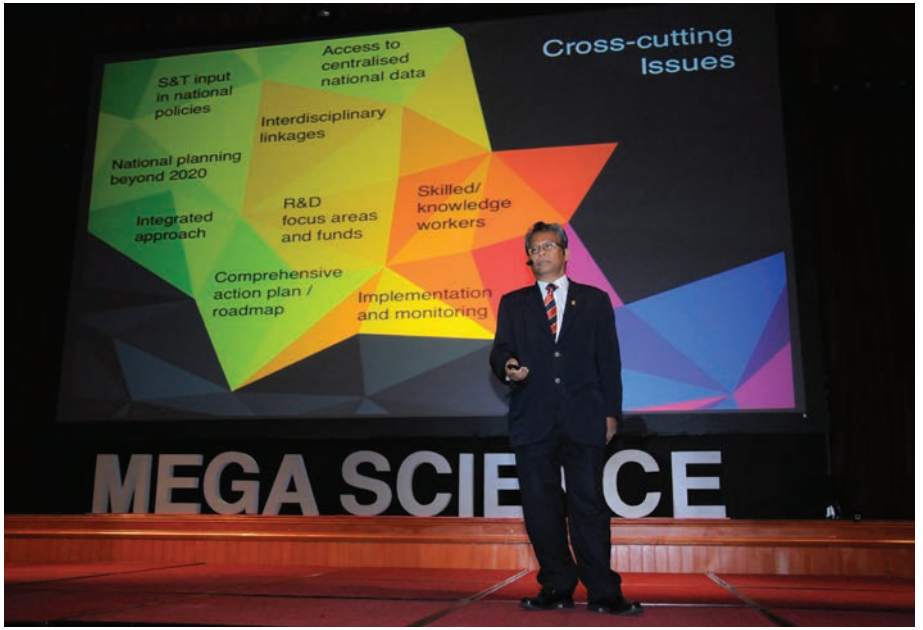
5 Hutan dan Tanah

Antara cadangan bagi mengatasi isu degradasi tanah adalah pengawalan dan penghentian aktiviti penebangan hutan dan peningkatan penggunaan tanah yang telah diteroka secara produktif. Selain itu, penumpuan kepada usaha penanaman semula dan pemuliharaan pokok sebagai sumber hijau komuniti yang penting harus digiatkan. Antara peluang-peluang STI yang disyorkan adalah seperti berikut:

- Penggunaan meluas dan penciptaan alat penjimatan tenaga
- Pembangunan sumber tenaga alternatif termasuk biojisim berasaskan kayu
- Peningkatan teknologi pengurusan air.
- Pembangunan inisiatif tempatan dalam menangani sisa bandar.
- Memperbaiki kaedah penanaman semula hutan, pengurusan pepohon kawasan bandar untuk pengeluaran kayu, dan perlindungan hutan bakau sebagai pelindung kepada alam sekitar kawasan pantai.











Forum Kebangsaan Mega Sains 2.0

Pelan Pembangunan **Industri Berasaskan Nadir Bumi di Malaysia**



Pelancaran rasmi 'Pelan Pembangunan Industri Nadir Bumi di Malaysia'oleh
Dato 'Sri Dr Noorul Ainur Mohd Nur, Ketua Setiausaha MOSTI, pada 8 Disember 2014

Dalam usaha berterusan untuk mengekalkan ekonomi negara, Malaysia sentiasa mencari peluang baru dalam perniagaan dan pertumbuhan ekonomi. Laporan Nasihat ASM yang berjudul, *Revitalising the Rare Earth Mineral Programme* in Peninsular Malaysia as a Strategic Industry, telah mengenalpasti industri nadir bumi sebagai sektor strategik bagi Malaysia, dan mengesyorkan agar Pelan Pembangunan Industri Nadir Bumi di Malaysia dihasilkan.

Peranan nadir bumi semakin penting dalam ekonomi global yang kini menuju ke arah penggunaan teknologi hijau. Penggunaan unsur nadir bumi di dalam pelbagai produk dan peranti seperti kereta elektrik dan solar foto-voltan jelas membuktikan keberkesanannya dalam penggunaan tenaga secara cekap dan efektif.

Dengan penubuhan kilang pemprosesan nadir bumi Lynas Corporation di Kuantan juga telah mendorong kepada penilaian yang lebih terperinci tentang peluang perniagaan nadir bumi, terutamanya bagaimana Malaysia boleh mengambil bahagian. Bagi mencapai matlamat ini, Badan Bertindak Nadir Bumi ASM yang ditubuhkan pada tahun 2013 telah menyediakan Pelan Pembangunan dengan peruntukan yang diberikan oleh Kementerian Sains, Teknologi dan Inovasi (MOSTI).

Pelan Pembangunan ini berperanan dalam menggariskan manfaat penubuhan dan pembangunan rantaian bekalan industri nadir bumi di Malaysia di peringkat aliran atasan, pertengahan dan bawahan secara menyeluruh. Ini juga merangkumi usaha mengenal pasti keperluan pembangunan kapasiti yang sewajarnya.

Pelan Pembangunan ini membincangkan rasional menceburi industri ini, termasuk risiko dan peluang yang terlibat. Ia turut menyediakan laluan untuk negara mempelopori bidang baru yang berpotensi ini dengan berkesan. Keperluan untuk pembangunan kapasiti ditonjolkan dalam Pelan Pembangunan ini bagi memastikan rakyat Malaysia yang terlatih dari peringkat vokasional / teknikal hinggalah ke peringkat graduan, dalam pelbagai bidang sains, kejuruteraan dan teknologi mencukupi untuk memenuhi keperluan industri.

Satu lagi strategi untuk Malaysia memacu industri ini ke hadapan ialah dengan menjalinkan hubungan kerjasama dengan rakan kongsi teknologi di peringkat antarabangsa, yang telah membuktikan keupayaan mereka dalam penyelidikan dan pembangunan nadir bumi seperti Australia, China, Jepun, Korea Selatan dan Amerika Syarikat.

Kajian AIR

Kajian air yang dijalankan oleh ASM bertujuan mencapai Pengurusan Sumber Air Bersepadu (IWRM) di Malaysia. ASM telah membahagikan pendekatan IWRM yang luas kepada beberapa komponen supaya kajian yang lebih mendalam dapat dijalankan.

Setiap kajian ini direka khusus untuk memberikan nasihat kepada kerajaan mengenai pelaksanaan IWRM secara progresif. Kajian terperinci kemudiannya dijalankan ke atas sub-set atau sub-tema ini supaya pelan strategi atau laporan nasihat dapat disediakan untuk pertimbangan pihak berkuasa atau agensi yang bertanggungjawab.

Kajian ini juga melalui proses rundingan strategik dengan institusi yang berkaitan, masyarakat dan pihak berkepentingan dari sektor swasta.



P&P Air

ASM telah menerbitkan Kertas Posisi bertajuk *"A Study on Current Status and Needs Assessment for Water Resouces Research in Malaysia"*. Kajian ini selesai dilaksanakan pada Mei 2014. Kajian ini mendapati bahawa penyelidikan dalam sektor air yang dijalankan selama ini adalah ad-hoc, tidak bersepadu dan tidak menyeluruh. Sebanyak 96 topik penyelidikan di bawah 21 tema yang berkaitan air telah dikenal pasti untuk memanfaatkan STI dalam menangani isu dan cabaran pengurusan air negara melalui rangka kerja P&P pelbagai disiplin yang selaras dan bersepadu.

Susulan daripada Kertas Posisi ini, Laporan Nasihat bertajuk *"Setting a National Agenda for Integrated Water Research"* telah diterbitkan pada akhir tahun 2014 dan empat syor telah dikemukakan. Syor-syor tersebut adalah seperti berikut:

1 Penyelidikan Air Bersepadu Kebangsaan (NIWR)

Sumber air sebagai penjana ekonomi negara

- Hidrologikal
- Polisi dan peraturan
- Hidrologi, limnologi dan model matematik berkaitan
- Hidrogeologi dan model air bawah tanah
- Eko-hidrologi dan sub-set IWRM berkaitan
- Perkhidmatan Ekosistem - peruntukan sumber, aliran persekitaran dan peraturan
- Biodiversiti dan produk semulajadi bersumberkan ekosistem daratan dan akuatik
- Sistem pesisiran pantai
- Kualiti air dan pencemaran
- Pengurusan Bersama
- Resolusi konflik
- Bahaya berpuncakan air
- Perubahan iklim
- Sumber untuk penjanaan ekonomi

Air untuk kehidupan dan Penjanaan Ekonomi

- Pembangunan dan pengurusan bekalan air yang mampan untuk pelbagai kegunaan
- Pengurusan Permintaan Air Bersepadu (IWDM)
- Pengurusan sisa air dan penggunaan semula
- Perparitan untuk pertanian
- Teknologi Hijau
- Neksus Air-Makanan-Tenaga
- Produk dan perkhidmatan untuk penjanaan ekonomi

2 Pilihan Tadbir Urus Penyelidikan Air

Pilihan 1

Penubuhan Pusat Penyelidikan dan Pembangunan Air Kebangsaan (WRDC) berstatus Badan Berkanun sebagai langkah penyelesaian jangka masa panjang, yang akan bertindak sebagai pusat sehenti untuk menguruskan semua aspek P&P air di negara ini.

Pilihan 2

Membentuk Konsortium Penyelidikan Air yang dianggotai oleh organisasi penyelidikan berkaitan air dalam sektor awam dan swasta bagi menyediakan penyelesaian jangka pendek dalam menyelaraskan penyelidikan berkaitan air. ASM mencadangkan Konsortium ini diketuai oleh Institut Penyelidikan Hidraulik Kebangsaan Malaysia (NAHRIM).

3 Penyediaan Sumber Manusia dan Sumber Kewangan yang mencukupi

Agenda penyelidikan yang dicadangkan memerlukan pengukuhan dalam pelaksanaan kapasiti. Pendekatan yang diambil adalah melalui penggunaan sumber manusia yang mencukupi dalam bidang khusus dan pengagihan dana yang memadai untuk pelaksanaan program dan inisiatif penyelidikan pelbagai aspek. Selain itu, peruntukan geran permulaan untuk menerajui Agenda NIWR disyorkan.

4 Pelaksanaan Agenda NIWR

Terdapat keperluan untuk pemegang amanah sumber air di negara ini menerajui pelaksanaan Agenda NIWR.

Air tidak mempunyai sumber alternatif seperti di dalam sektor tenaga.

Ketika ini, negara bergantung hampir sepenuhnya kepada air permukaan (97%), dan keadaan ini adalah tidak lestari untuk jangka masa panjang.

Laporan Nasihat: *A National Key Priority Area (NKEA) on Water*

Laporan Nasihat bertajuk *"A National Key Priority Area on Water"* telah disediakan untuk menyokong Wawasan Air Malaysia dan Dasar Sumber Air Negara untuk merealisasikan peranan penting air dalam kehidupan, keselamatan dan ekonomi negara. Air adalah sumber kehidupan. Oleh itu, ia perlu dianggap sebagai sumber penting yang berpotensi besar untuk menyumbang kepada kemanusiaan, ekonomi dan pembangunan masyarakat.

Menggunakan pendekatan Projek Permulaan (EPP) yang diterajui oleh PEMANDU yang menyokong Bidang ekonomi negara, kajian ini telah mengenalpasti 72 EPP bagi 'Air sebagai Sumber' dan 'Air sebagai Utiliti'. Projek ini berpotensi untuk menggalakkan peluang ekonomi, dan sekaligus memelihara sumber air negara. Kajian ini telah disiapkan dan akan diterbitkan pada tahun 2015. Laporan Nasihat ini mengemukakan empat syor seperti berikut:

1 Air Sebagai Agenda Negara

Aspek keselamatan dan kelestarian air mempengaruhi ekonomi dan kehidupan seharian. Oleh itu, adalah penting untuk air dijadikan sebagai Agenda Negara. Ini akan memastikan pengurusan air yang mampan di masa hadapan.

2 Menggalakkan Agenda P&P Air

Sumber air adalah sangat penting tetapi langkah untuk menangani masalah pengurusan air adalah mengecewakan. Oleh itu, bagi memastikan bekalan air mencukupi untuk semua penggunaan yang berfaedah, P&P air adalah kritikal. Terdapat juga keperluan untuk memastikan kesihatan ekologi sungai, tasik, dataran banjir, tanah paya dan muara sungai sentiasa terjamin untuk kegunaan kini dan masa hadapan.

3 Membangunkan Kepentingan Air

Sektor industri menyedari bahawa masalah yang berkaitan makanan, tenaga dan air akan mengancam pengeluaran dan kelestarian industri. Pada masa yang sama wujud peluang perniagaan dalam meningkatkan kecekapan dan pengurangan bahan buangan ke persekitaran.

4 Neksus Air-Makanan-Tenaga

Sektor pertanian tidak dapat menghasilkan makanan pada kadar yang seimbang dengan pertambahan populasi. Akibatnya, kos pengeluaran makanan semakin meningkat. Tambahan pula, catuan air yang memudaratkan pengeluaran hasil pertanian dan tenaga yang memacu ekonomi hanya akan meningkatkan kos pengeluaran, seterusnya membebankan rakyat. Oleh itu, terdapat keperluan untuk mencapai keseimbangan di antara neksus air,makanan dan tenaga. Air amat diperlukan sebagai NKPA bagi memastikan kemandirian negara ini di masa hadapan.

Perundingan STI

Laporan Status: Kelestarian Industri Minyak Sawit Malaysia Tahun 2013/2014

Pada tahun 2014, ASM telah menerbitkan hasil kajian: Laporan Status: Kelestarian Industri Minyak Sawit Malaysia 2013/2014". Ini merupakan projek perundingan untuk Majlis Minyak Sawit Malaysia (MPOC). Laporan ini merupakan hasil kajian bebas yang mengenengahkan maklumat asas mengenai status kelestarian industri minyak sawit Malaysia berdasarkan petunjuk pembangunan lestari.

Melalui projek perundingan ini, ASM telah membangunkan Indeks Pembangunan Lestari Minyak Sawit *(Palm Oil Sustainable Development Index (POSDI))*, sebagai mekanisme pemarkahan berdasarkan rangka kerja kelestarian. Laporan ini menganalisis dan membentangkan data berkaitan dengan industri minyak sawit Malaysia dan kelestariannya dari sudut ekonomi, sosial, alam sekitar dan kualiti hidup.

Laporan status ini telah dilancarkan oleh Dato' Lee Yeow Chor, Pengerusi MPOC, semasa Persidangan Antarabangsa Kelestarian Minyak Sawit (IPOSC) 2014.

Kaji Selidik P&P Kebangsaan 2014

Kaji selidik P&P Kebangsaan 2014 adalah kesinambungan daripada siri kaji selidik yang telah dijalankan sejak tahun 1994. Kajian ini bertujuan untuk menilai dan memantau pencapaian aktiviti P&P yang dijalankan oleh agensi dan Institut Penyelidikan Kerajaan (GRI), Institut Pengajian Tinggi (IPT) dan Perusahaan Perniagaan (BE) di Malaysia. ASM telah dilantik sebagai perunding kepada Pusat Maklumat Sains dan Teknologi Malaysia (MASTIC) untuk menjalankan kaji selidik ini.

Kaji selidik ini dijangka siap pada akhir tahun 2015.



Kajian Pelaksanaan **Pendidikan Sains melalui Amalan Inkuiri (IBSE)** di Sekolah Rendah yang terpilih

Satu penilaian terhadap pelaksanaan Pendidikan Sains Melalui Amalan Inkuiri (IBSE) di empat buah sekolah rendah yang terpilih di Daerah Hulu Langat telah dijalankan oleh ASM sebagai projek rintis dari 2012 – 2013. Penilaian ini dijalankan berdasarkan keprihatinan pihak ASM terhadap tahap pencapaian pendidikan sains di Malaysia, seperti yang dinyatakan di dalam keputusan *Programme for International Student Assessment (PISA)*, pada tahun 2009 dan 2012. Penilaian ini bertujuan untuk melihat kebolehlaksanaan IBSE dalam mengukuhkan keberkesanan pengajaran dan pembelajaran sains di peringkat sekolah rendah, serta pemahaman murid terhadap sains. Kajian ini dijalankan melalui pendekatan kualitatif dan kuantitatif.

Berdasarkan daripada *Fibonacci IBSE Self-Reflection Tool*, pemerhatian, sesi temubual bersama para guru dan keputusan peperiksaan akhir tahun murid, hasil penilaian projek rintis ini adalah seperti yang berikut:

1) Guru mempunyai pemahaman yang lebih baik terhadap IBSE selepas mengambil bahagian dalam bengkel latihan;
2) Guru kini mampu mengembangkan kemahiran proses sains di kalangan murid melalui kaedah IBSE;
3) Prestasi murid dalam subjek sains, terutamanya dalam kemahiran proses sains dan kemahiran penyelesaian masalah, turut meningkat; dan
4) Murid-murid juga menunjukkan perubahan tingkah laku yang positif terutamanya motivasi dan minat terhadap subjek sains pada akhir penilaian projek rintis ini.

Walaupun pelaksanaan IBSE pada mulanya dilihat sebagai satu cabaran, namun dengan panduan dan bimbingan yang diberikan semasa projek perintis ini, ia telah dapat meningkatkan keyakinan guru dalam melaksanakan kaedah IBSE. Hasil pemerhatian menunjukkan pengajaran dan pembelajaran berpusatkan guru kini cenderung ke arah pengajaran dan pembelajaran berpusatkan murid.

SeKILAS

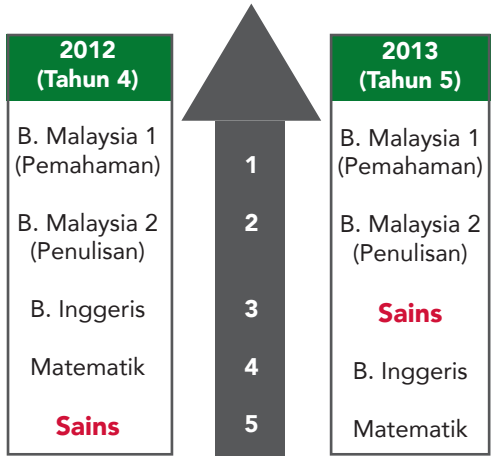
IBSE bertujuan membantu para guru untuk meneroka dan mengajar subjek S&T melalui pendekatan siasatan saintifik yang mampu merangsang minda saintifik, memahami alam dan kemahiran ekspresif di kalangan murid.

Peratusan Maklumbalas Positif Berdasarkan Persepsi Guru

Peranan Guru	
Membina idea murid	92.9
Menyokong penyiasatan oleh murid	93.9
Panduan analisis dan kesimpulan	80.6
Aktiviti Murid	
Menjalankan penyiasatan	68.6
Bekerjasama dengan rakan	92.9
Catatan Murid	
Hasil kerja murid	78.6
Catatan bertulis murid	71.4

* Keputusan *Fibonacci IBSE Self-Reflection Tool*

Penarafan Subjek (berdasarkan skor)



Bagi penilaian lanjut terhadap keberkesanan kaedah IBSE, ujian *Trends of International Mathematics and Science Study (TIMSS)* telah dijalankan terhadap murid yang terlibat dengan penilaian ini. Bagi tujuan perbandingan, murid dari dua kelas yang tidak melaksanakan kaedah IBSE turut menduduki ujian TIMSS.

Berdasarkan analisis skor murid bagi soalan objektif vs subjektif, murid IBSE telah mengatasi murid bukan IBSE. Murid IBSE mempunyai pemahaman yang lebih baik dan berupaya menyatakan dengan jelas jawapan mereka berbanding murid bukan IBSE, terutamanya untuk soalan subjektif. Ini juga mencerminkan fokus kaedah IBSE yang menekankan perkembangan bahasa melalui pembelajaran sains.

Penilaian projek rintis IBSE ini menekankan yang berikut:

1) IBSE merupakan satu langkah pengajaran dan pembelajaran sains yang dapat memotivasi dan merangsang minat dan keterujaan dalam pembelajaran;
2) IBSE mengembangkan pemikiran murid melalui penghujahan, hipotesis, penciptaan, kajian dan membuat kesimpulan di akhir eksperimen;
3) IBSE relevan dengan penekanan baru KPM terhadap pembangunan Kemahiran Berfikir Aras Tinggi (KBAT), serta sukatan pelajaran baru di dalam Kurikulum Standard Sekolah Rendah (KSSR);
4) IBSE selaras dengan KSSR yang menyokong perkembangan bahasa melalui pembelajaran sains;
5) IBSE menggalakkan pembangunan kemahiran insaniah melalui aktiviti kumpulan dan perbincangan;
6) IBSE adalah satu pendekatan yang praktikal, mudah dilaksanakan dan tidak memerlukan kos yang tinggi;
7) IBSE memberikan idea inovatif kepada guru untuk melaksanakan pengajaran secara inkuiri; dan
8) Memastikan pelaksanaan kaedah IBSE yang efektif, guru perlu diberikan latihan IBSE sekurang-kurangnya 60 jam.

HALAMANFAKTA

Seramai 20 orang guru telah menjalani latihan dengan menggunakan kaedah IBSE di *Regional Centre for Education in Science and Mathematics (RECSAM)*. Mereka juga telah diberikan latihan 30 jam secara berterusan melalui bengkel yang diadakan pada hujung minggu.

Objektif penilaian projek rintis:
- Untuk menilai pemahaman guru terhadap IBSE sebelum dan selepas latihan
- Untuk menilai keupayaan guru dalam IBSE dan mengembangkan kemahiran proses sains di kalangan murid
- Untuk menilai prestasi murid dalam bidang sains - kemahiran proses sains dan penyelesaian masalah
- Untuk menilai perubahan tingkah laku murid - motivasi dan minat pada akhir projek rintis

Empat sekolah rendah yang terlibat dan telah dikenalpasti oleh pihak KPM:
- SK Semenyih, Semenyih
- SK Bandar Sri Putra, Kajang
- SK Bandar Tasik Kesuma, Beranang
- SK Seksyen 7, Bandar Baru Bangi

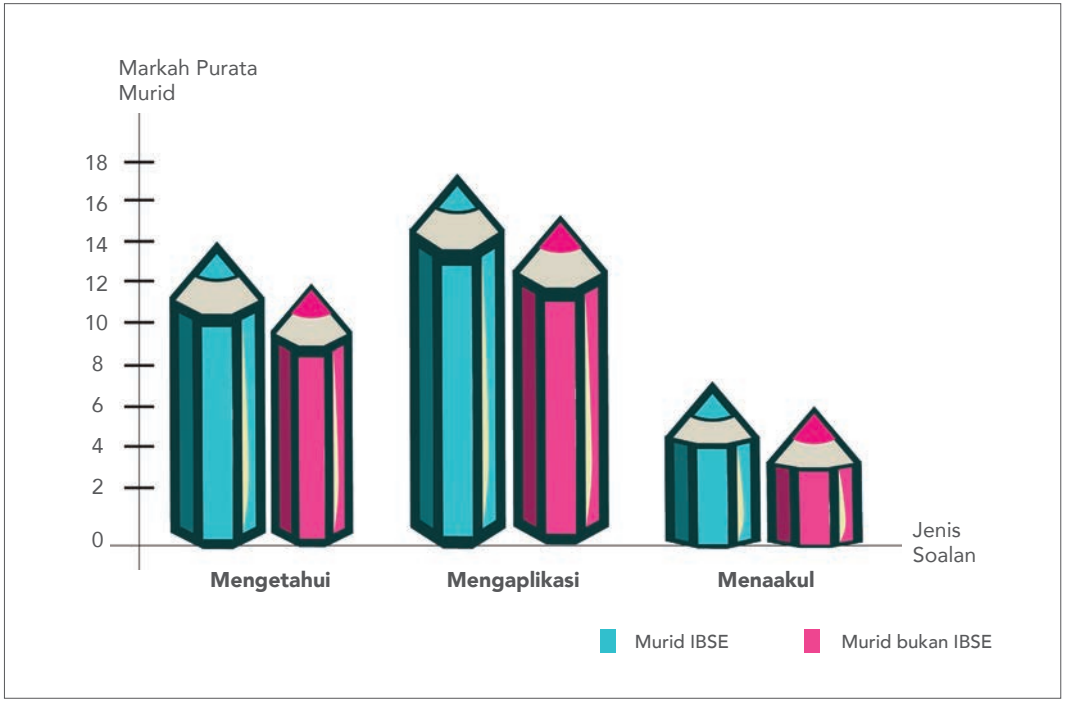


Guru membuat penyediaan untuk pengajaran IBSE



Murid IBSE mengambil bahagian dalam kelas praktikal

Perbandingan Prestasi Antara Murid IBSE dan Murid Bukan IBSE



HALAMANFAKTA

Penilaian TIMSS merupakan satu ukuran piawaian untuk pencapaian trend antarabangsa dalam matematik dan sains di tahun empat dan tahun lapan, yang dibangunkan oleh *International Association for the Evaluation of Educational Achievement (IEA).*

Soalan TIMSS terdiri daripada soalan objektif dan subjektif yang terbahagi kepada 3 kategori utama:

i) Soalan berbentuk mengetahui
ii) Soalan berbentuk mengaplikasi
iii) Soalan berbentuk menaakul

Sampel Ujian TIMSS:
293 murid IBSE
280 murid bukan IBSE dari sekolah yang sama

Instrumen:
50 soalan Grade 4 Released Items bagi Ujian TIMSS yang diterjemah ke Bahasa Malaysia

Science Outlook

Menganalisis Landskap STI

ASM telah memulakan Science Outlook bagi tujuan menyediakan laporan bebas berkenaan trend utama dalam STI di Malaysia. Laporan ini adalah berdasarkan DSTIN, 2013-2020 melalui enam terasnya.

Science Outlook merujuk kepada data sejarah, prestasi di pelbagai peringkat pembangunan STI serta jurang yang berkaitan dengan sasaran yang ditetapkan oleh polisi. ASM juga meneliti beberapa amalan terbaik, membandingkan dan membezakannya dengan model pelbagai negara dan mengemukakan cadangan dan tindakan masa hadapan untuk dipertimbangkan.

ASM menggunakan pelbagai kaedah kajian untuk pengumpulan data dan melaksanakan analisis untuk mendapatkan gambaran dan perspektif berkenaan landskap STI di Malaysia.

SeKILAS

Hansard adalah prosiding Parlimen yang merupakan transkrip pertukaran rasmi di antara ahli politik di Parlimen.

Antara kajian yang dijalankan pada tahun 2014 adalah seperti:

1. Kesedaran STI di kalangan Ahli Parlimen di Malaysia

Kesedaran STI adalah penting bagi pembuat keputusan negara kerana pengetahuan S&T merupakan instrumen yang berkuasa untuk merangsang pertumbuhan ekonomi di Malaysia. Oleh itu, satu analisis telah dijalankan dengan menggunakan data Hansard (2008-2013) bagi menilai kesedaran STI di kalangan ahli Parlimen, isu-isu STI yang kerap dibincangkan, serta menilai tahap keamatan dan kualiti perbincangan.

Penemuan awal analisis adalah seperti berikut:

a) **Sektor dan isu STI yang kerap dibincangkan**
Sektor STI yang menarik minat di kalangan ahli parlimen adalah perubatan dan kesihatan, pertanian serta tenaga alternatif. Manakala, isu STI merangkumi projek angkasawan, banjir, pendidikan sains dan Lynas.

b) **Kualiti soalan**
Pemeriksaan jenis soalan berkaitan dengan STI mendedahkan bahawa majoriti adalah soalan *ex-post*, menunjukkan bahawa ahli parlimen memainkan peranan pasif dalam menentukan hala tuju STI negara.

c) **Corak perbincangan**
Kebanyakan perbincangan berdasar kepada agenda parti politik, topik yang mendapat perhatian media dan isu yang berkaitan kawasan mereka.

2. Menganalisis Elemen STI dalam Dasar Negara

Pelaksanaan aktiviti ini adalah untuk menganalisis kewujudan elemen STI dalam 81 dasar negara. Walaupun Malaysia telah mempunyai dasar STI sejak tahun 1980-an, kebanyakan dasar yang wujud sebelum DSTN 1986 tidak jelas merujuk kepada STI. Walaubagaimanapun, terdapat peningkatan yang besar dalam dasar dari tahun 1986 ke 2014 yang mengandungi unsur STI; iaitu dari 20% kepada 91%. Ini menunjukkan satu anjakan paradigma terhadap reka bentuk dasar yang boleh dikaitkan dengan pelancaran DSTN pertama pada tahun 1986. Kebanyakan dasar pasca 1986 mengandungi istilah semasa seperti P&P, yang tidak wujud di dalam dasar yang sebelumnya.

3. Sasaran Dasar STI

Analisis telah dilakukan ke atas dasar STI dan sasaran bagi setiap dasar tersebut untuk mengesan perkembangan STI di Malaysia. Analisis ini menunjukkan bahawa dokumen rasional dan data adalah terhad dalam menyokong sasaran dan hasil daripada dasar STI.

Analisis Elemen STI dalam Dasar Negara

Dasar	Dengan Elemen STI	Tanpa Element STI
Pra 1986	**20%**	**80%**
Pasca 1986	**91%**	**9%**

Carta Falsafah Science Outlook
Laporan Bebas Berkenaan Kecenderungan STI di Malaysia



Bagi memenuhi pelbagai sasaran dan potensi untuk muncul sebagai sebuah negara berkuasa STI, kapasiti dan keupayaan semasa STI Malaysia perlu ditentukan. Ini dilakukan melalui kajian dasar (*base-line*) atau melalui kajian mendalam berkenaan pelbagai polisi STI sebelum memulakan peralihan kepada dasar dan sasaran baru. Ini menunjukkan perlunya satu mekanisme penilaian, pemantauan yang kukuh selain daripada memberi keutamaan kepada proses penjanaan idea STI.

4. Status Semasa, Trend dan Jurang dalam Lanskap Penyelidikan, Pembangunan dan Pengkomersilan (P,P&P) di Malaysia

Sesi Temubual telah diadakan dengan pihak pengurusan tertinggi dari kementerian dan agensi kerajaan, institusi pengajian tinggi, Badan Perlesenan Teknologi (TLO), dan wakil industri untuk memahami perspektif mereka terhadap landskap STI negara. Di samping itu analisis juga dilakukan ke atas data P,P&P yang diperolehi daripada Jabatan Perangkaan Malaysia (DOSM), MOSTI, KPM, Perbadanan Harta Intelek Malaysia (MyIPO) dan lain-lain untuk mengenal pasti status semasa, trend dan jurang dalam P,P&P di Malaysia.

5. Permintaan Tenaga Kerja Mahir

Satu analisis telah dijalankan menggunakan model *Global Trade Analysis Project (GTAP)*, di mana Malaysia telah dibandingkan dengan 11 rantau yang lain.

Hasil analisis menunjukkan bahawa peningkatan peruntukan, pembangunan sumber manusia, dan perkembangan pesat teknologi dan inovasi di Malaysia akan mendorong *Skilled-biased Technical Change (SBTC)*. Peningkatan SBTC di Malaysia diandaikan akan merangsang permintaan yang lebih besar untuk tenaga kerja mahir berbanding tenaga kerja tidak mahir secara relatif.

Kajian ASM mengenai impak peningkatan kemahiran teknologi kepada industri dan pertumbuhan ekonomi di Malaysia menunjukkan terdapat penambahbaikan kecekapan teknologi di kalangan pekerja mahir terutamanya dalam tiga sektor ekonomi berikut:

i) Kewangan, perniagaan, pendidikan dan perkhidmatan awam
ii) Pengangkutan dan komunikasi
iii) Pembuatan berat

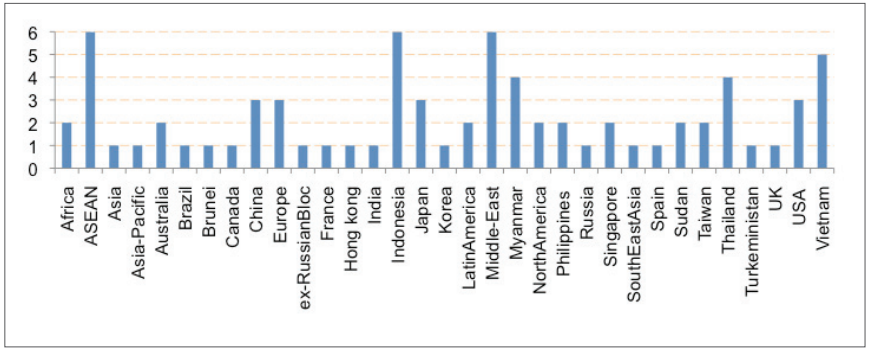
Sektor-sektor ini akan mempunyai impak positif yang signifikan dari segi *welfare gain*, KDNK dan imbangan dagangan negara. Keputusan analisis perbandingan sektor menunjukkan bahawa permintaan untuk tenaga kerja mahir adalah paling ketara dalam sektor Pengangkutan dan Komunikasi.

6. Persepsi Industri terhadap STI

Kaji selidik melalui teknik *purposive sampling* telah dijalankan di kalangan pihak berkepentingan yang paling mempengaruhi atau dipengaruhi oleh industri berasaskan STI di Malaysia. Keputusan kaji selidik yang berdasarkan pandangan 49 orang peneraju industri adalah seperti berikut:

- OECD (2013) menyatakan bahawa hanya 5.5% (terutamanya syarikat multinasional (MNC)) firma mengambil bahagian secara aktif dalam P&P. Bagaimanapun, kaji selidik mendapati kesediaan industri (termasuk Perusahaan Kecil dan Sederhana (PKS)) untuk mengaplikasi inovasi dalam teknologi terbukti melalui kesediaan mereka memperuntukkan dana dan menjalankan penyelidikan, di samping mewujudkan kerjasama luar dengan universiti dan institut penyelidikan.
- 47.6% menekankan keupayaan syarikat mereka untuk berinovasi dan menghasilkan teknologi baru, manakala 19.1% pula menggunakan khidmat luar untuk aplikasi teknologi dan 9.5% lagi memperoleh teknologi dalam bentuk *turnkey* kerana ketidakupayaan mereka untuk membuat sebarang penyesuaian.
- Tiga pasaran utama dunia yang mempunyai potensi besar dari segi pulangan perolehan dalam tempoh satu hingga tiga tahun akan datang adalah ASEAN, Timur Tengah dan Indonesia. Oleh yang demikian, adalah penting untuk mengukuhkan jalinan strategik antarabangsa dalam STI dengan rantau ini.

Pasaran Dunia Berpotensi Menyumbang Pulangan Perolehan Tinggi dalam Tempoh 1 hingga 3 Tahun Akan Datang

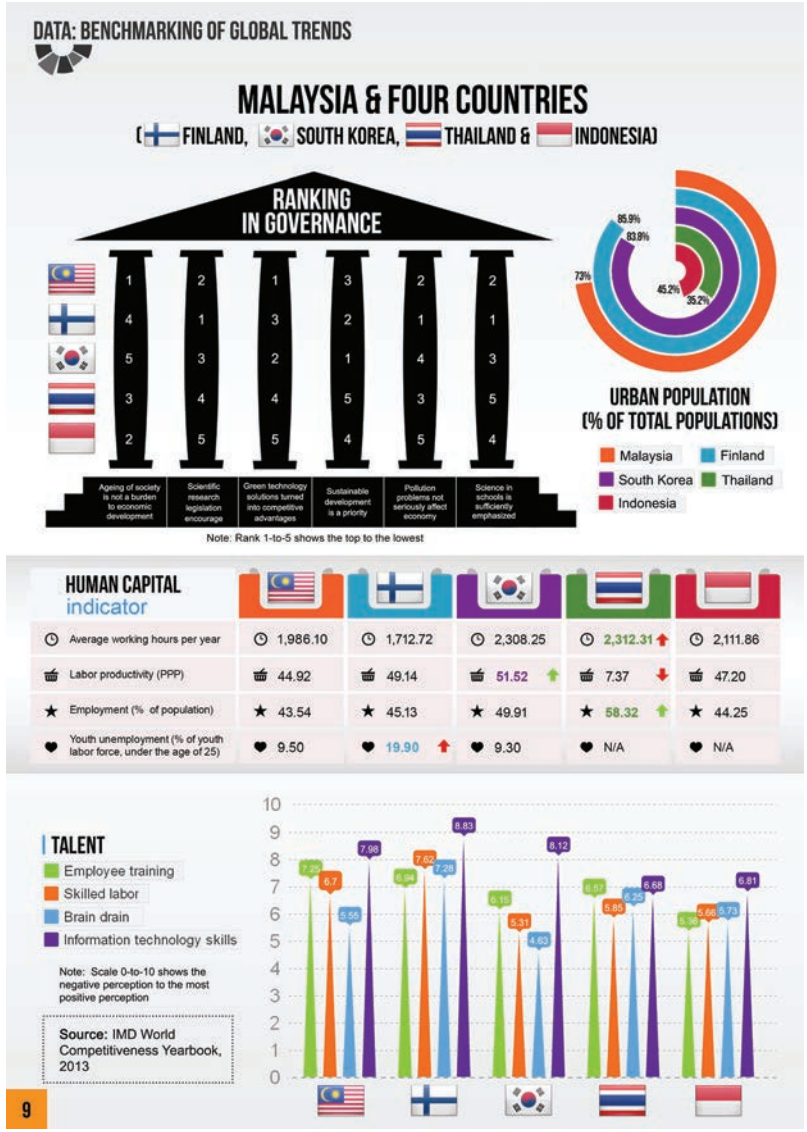


STI@3d

data.design.direction

STI@3d merupakan satu platform perkongsian atas talian berkenaan perkembangan trend STI di peringkat nasional dan global. Sumber maklumat diperolehi daripada kajian strategik STI (ASM), IMD, World Bank, OECD dan lain-lain. Inisiatif ini dijalankan sebagai projek rintis dan telah disebarkan di kalangan Felo ASM, *Associates* dan anggota YSN-ASM untuk penambahbaikan dan maklum balas.

STI@3d yang diterbitkan setiap suku tahunan bertujuan untuk membantu pihak berkepentingan untuk memahami isu berkaitan STI (politik, ekonomi, sosial dan alam sekitar) dan seterusnya membantu dalam membuat keputusan. Isi kandungan STI@3d dipersembahkan dalam bentuk infografik, halaman fakta dan rumusan yang mudah difahami. STI@3D boleh dimuat turun di http://www.akademisains.gov.my/sti3d/.



Kajian yang sedang dijalankan

Pengurusan Permintaan Air

Badan Bertindak ini melaksanakan kajian komprehensif mengenai status terkini Pengurusan Permintaan Air di Malaysia. Ini termasuk pengenalpastian kelemahan dan jurang perbandingan norma prinsip-prinsip IWRM dan Amalan Pengurusan Terbaik. Kajian ini juga akan menghasilkan kerangka strategi dan pelan tindakan yang menyeluruh dan lestari dalam Pengurusan Permintaan Air. Laporan Nasihat ini dijangka siap pada tahun 2015.

Air dan Pertanian

Objektif Badan Bertindak ini adalah untuk mengkaji penggunaan air dalam sektor pertanian. Seterusnya, hasil kajian akan disyorkan sebagai strategi untuk menggiatkan semula sektor ini. Laporan Nasihat ini dijangka siap pada tahun 2015.

Bekalan Air dan Pengurusan Sisa Air

Badan Bertindak ini diwujudkan bagi menyediakan satu kajian komprehensif berkenaan status terkini bekalan air dan pengurusan sisa air, dalam usaha untuk mengenalpasti kelemahan dan jurang berbanding norma prinsip-prinsip IWRM dan Amalan Pengurusan Terbaik. Selain itu, kajian ini juga akan mengenalpasti bidang dan peluang dalam aplikasi STI untuk 'Penjanaan Kekayaan' dan 'Kelestarian Sumber' dalam sub-sektor ini. Laporan Nasihat dijangka siap pada tahun 2015.

Pengurusan Lembangan Sungai Bersepadu (IRBM)

Kertas Posisi mengenalpasti status IRBM, kelemahan dan jurang IRBM dijangka siap pada tahun 2015.

Dasar dan Undang-undang berkaitan Air

Kumpulan Kerja ini berperanan mengenalpasti jurang di dalam Dasar Sumber Air Negara (NWRP) dengan menjalankan tinjauan kritis terhadap NWRP. Ia mengenalpasti kapasiti dasar dalam menghadapi perubahan cuaca serta transformasi sosial dan ekonomi; menilai kapasiti penyesuaian institusi sumber air, terutamanya dalam tahap penggunaan S&T serta P&P; membangunkan kerangka kerja yang menghubungkan institusi sumber air dengan institusi lain bagi membolehkan NWRP bertindak sebagai pelopor Pengurusan Sumber Air Bersepadu, serta mengenalpasti jurang dan isu yang berkaitan dengan NWRM dan undang-undang. Laporan Nasihat berkenaan Kapasiti Penyesuaian dijangka siap pada tahun 2015.

Kesan El Nino terhadap Sosio-Ekonomi

Badan Bertindak ini diwujudkan bagi menyediakan laporan kajian jangka pendek berkenaan kesan El Nino terhadap sosio-ekonomi Malaysia. Seterusnya, Kertas Posisi akan dikemukakan kepada MOSTI di mana Nota Kabinet akan disediakan untuk pertimbangan Kabinet. Kertas Posisi ini dijangka siap pada tahun 2015.

Penggunaan dan Kecekapan Tenaga dalam Pengangkutan

Badan Bertindak ini telah ditubuhkan untuk menangani isu dan jurang berkenaan kecekapan tenaga dalam pengangkutan. Ia juga bertujuan untuk mengumpul maklumat daripada pihak berkepentingan yang berkaitan dan seterusnya menggalakkan perkongsian di kalangan mereka. Laporan tempatan dan antarabangsa berkaitan tenaga telah dikaji semula dan dibincangkan oleh ahli Badan Bertindak untuk gambaran yang lebih jelas berkenaan status semasa penggunaan dan kecekapan tenaga dalam pengangkutan di Malaysia. Adalah diharapkan bahawa Laporan Nasihat ini yang akan siap pada tahun 2015, akan membolehkan pihak berkepentingan yang berkaitan mendapatkan butiran, statistik, maklumat dan saranan profesional bagi meletakkan Malaysia dalam kedudukan yang lebih baik dalam agenda kecekapan tenaga terutamanya dalam pengangkutan.

HALAMANFAKTA

Sektor pengangkutan adalah sektor kedua terbesar dalam penggunaan tenaga selepas sektor perindustrian yang mencakupi 40% daripada jumlah penggunaan tenaga di Malaysia. Ianya juga merupakan salah satu sektor paling intensif tenaga di Malaysia dengan hampir 98% daripada jumlah penggunaan bergantung kepada produk petroleum.

Pelan Hala Tuju Tenaga Bebas Karbon di Malaysia

Peningkatan pelepasan gas rumah hijau seperti Karbon Dioksida (CO_2) telah mengakibatkan pemanasan global yang semakin buruk. Kementerian Sumber Asli dan Alam Sekitar (NRE) telah melaporkan pelepasan CO_2 daripada penggunaan tenaga dalam industri tersebut menyumbang peratusan tertinggi (35%), diikuti dengan Pengangkutan (21%). Permintaan terhadap bahan api fosil akan menurun di masa hadapan apabila perubahan iklim memaksa kerajaan untuk mengurangkan pengeluaran karbon. Terdapat keperluan segera untuk merangka masa depan tenaga bebas karbon.

Pelan hala tuju untuk tenaga bebas karbon di Malaysia akan merangkumi mekanisme yang diperlukan untuk pembiayaan dan program wacana umum. Bidang tumpuan kajian terdiri daripada tujuh sumber tenaga boleh diperbaharui iaitu Solar, Angin, *Ocean Thermal Energy Conversion (OTEC)*, Geoterma, Biojisim, Ombak & Air Pasang Surut dan Kuasa Hidro.

Pelan hala tuju ini mengandungi matlamat tenaga yang diingini dan garis panduan tindakan strategik untuk membimbing kerajaan ke arah tenaga bebas karbon menjelang tahun 2050 dan dijangka siap pada tahun 2015.

Pelan Pembangunan untuk Industri Sel Bahan Api di Malaysia

Badan Bertindak ini ditubuhkan dengan matlamat berikut:

- Mengenalpasti pihak berkepentingan utama dalam teknologi dan pembangunan Sel Bahan Api
- Mengenalpasti jurang di antara pihak berkepentingan dan industri
- Membincangkan piawaian dan dasar baru industri Sel Bahan Api
- Mengenalpasti aspek pembangunan modal insan yang dapat menyokong pertumbuhan industri; dan
- Merangka pelan pembangunan untuk industri Sel Bahan Api di Malaysia termasuk peluang pasaran dan mekanisme pembiayaan atau insentif

Ini akan menjadi satu titik permulaan untuk mengetengahkan tindakan yang perlu diambil dalam jangka masa pendek (5 tahun), jangka masa sederhana (15 tahun), dan jangka masa panjang (lebih 15 tahun). Bagi membolehkan sel-sel bahan api untuk bersaing dengan bahan api fosil, strategi utama yang telah dikenal pasti adalah:

- Teknologi
- P&P
- Pembiayaan dan Insentif Tenaga Baru
- Pembangunan Piawaian dan Dasar
- Persaingan Kos dan Peningkatan Pasaran
- Kesedaran dan Pembangunan Kapasiti

Rangka Tindakan ini dijangka siap pada tahun 2015.

HALAMANFAKTA

Kajian yang dilakukan oleh Chakraborty et al. (2000) dan Spence (2005) melaporkan pelepasan CO_2 di peringkat global telah meningkat 30%, manakala suhu pula telah meningkat sebanyak 0.3-0.6°C dalam abad ke-20. Pada masa kini, pembakaran arang batu yang digunakan dalam penjanaan elektrik dan petroleum yang digunakan untuk pengangkutan dikenal pasti sebagai dua sumber utama pelepasan CO_2.

SeKILAS

Sel bahan api merupakan peranti yang menukarkan tenaga dengan kecekapan yang tinggi dan pelepasan yang rendah atau sifar. Ianya semakin mendapat perhatian beberapa dekad kebelakangan ini berikutan permintaan tenaga yang tinggi, penyusutan bahan api fosil, dan pencemaran alam sekitar.

“While technology plays a vital role as a catalyst in transforming life and work in this new economy, it is imperative that we do not lose sight from its real concerns - to provide sustainable job opportunities and a better quality life. Technology is a mechanism of STI excellence. People should come first. Those are the things that need to be taken into consideration.”

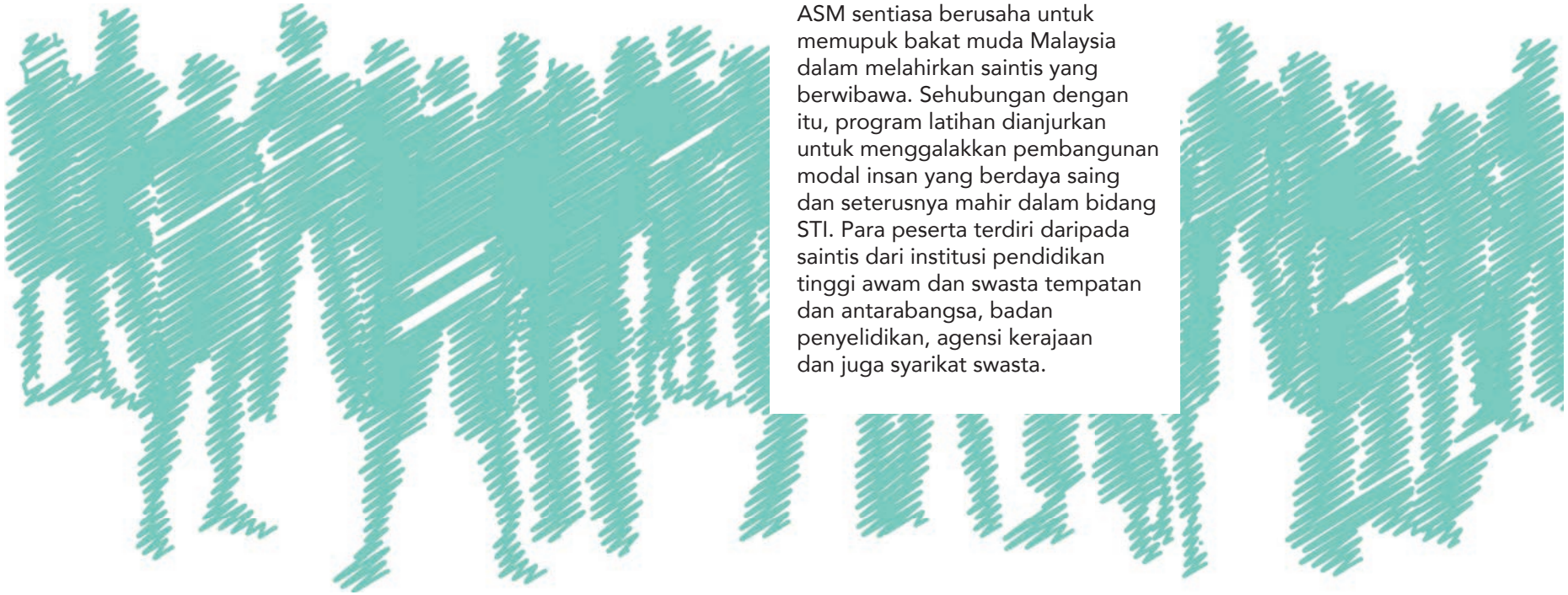
YAB Dato’ Sri Mohd Najib Tun Abdul Razak
Perdana Menteri Malaysia
Felo Kehormat, ASM

MEMPERKASA
KOMUNITI SAINTIFIK

ASM memperkasakan komuniti saintifiknya melalui Program STI.
Empat platform utama, iaitu pembangunan modal insan, konsortium sains,
pengantara dan fora perundingan disasarkan untuk memudahcara
elemen pengiktirafan, bakat dan pakatan kerjasama dalam lanskap STI.

Pembangunan **Modal Insan**

Selaras dengan agenda pembangunan negara. ASM sentiasa berusaha untuk memupuk bakat muda Malaysia dalam melahirkan saintis yang berwibawa. Sehubungan dengan itu, program latihan dianjurkan untuk menggalakkan pembangunan modal insan yang berdaya saing dan seterusnya mahir dalam bidang STI. Para peserta terdiri daripada saintis dari institusi pendidikan tinggi awam dan swasta tempatan dan antarabangsa, badan penyelidikan, agensi kerajaan dan juga syarikat swasta.



Program Latihan

ASM telah memulakan siri bengkel latihan antarabangsa *"Mathematical Modelling for Application"* bagi meningkatkan jumlah pakar dalam bidang ini. Ini merupakan latihan tambahan selain latihan lain yang dijalankan oleh Akademi.

Pembangunan Saintis Muda

Modal insan STI merupakan pemangkin kepada pembangunan sesebuah negara. Oleh itu, terdapat keperluan untuk membangunkan golongan saintis dan penyelidik muda yang bakal menjadi peneraju STI yang lebih berdaya saing di peringkat global pada masa hadapan. ASM bekerjasama dengan pusat kecemerlangan antarabangsa untuk membangunkan saintis muda berwibawa yang mampu memperoleh pengiktirafan antarabangsa dan menyumbang kepada pembangunan global STI.

Melalui kerjasama ini, saintis muda Malaysia berpeluang menimba ilmu pengetahuan yang berguna, disamping memperoleh pengalaman penyelidikan dan latihan yang sangat berharga dalam usaha mencapai kecemerlangan STI. Program ini dilaksanakan dalam pelbagai bentuk seperti lawatan sambil belajar, latihan industri dan program mentor-mentee.

CERN Summer Student Program (CSSP)

Program ini menawarkan peluang kepada mahasiswa dalam bidang Fizik, Pengkomputeran dan Kejuruteraan untuk menyertai pasukan penyelidik CERN dalam aktiviti teoritikal dan eksperimental di Geneva, Switzerland. Selain pengalaman penyelidikan yang diperolehi sepanjang program ini, mahasiswa juga berpeluang bekerja dalam persekitaran yang terdiri daripada pelbagai disiplin dan budaya.

Program ini memberi motivasi kepada mahasiswa untuk mencapai kecemerlangan dalam bidang sains dan seterusnya membentuk jaringan kerjasama dengan rakan antarabangsa. Selain itu, mahasiswa juga berpeluang meneroka trend penyelidikan terkini dan keupayaan teknologi masa hadapan dalam bidang fizik.

9
Program Latihan

41
peserta agensi kerajaan

73
peserta Institusi Pendidikan Tinggi

37
peserta syarikat swasta

39
peserta organisasi penyelidikan

19
peserta antarabangsa

280
peserta *STI Management Training Course for Researchers in OIC Countries* sejak tahun **2005**

HALAMANFAKTA

- 40 peserta dari universiti dan institut penyelidikan tempatan termasuklah peserta *CERN Summer Student Program* telah menghadiri *National School on Nuclear and Particle Physics* di UM. Tujuan program ini adalah untuk melatih mahasiswa dalam teori asas bidang nuklear dan fizik zarah.
- Lee Chun Hao (UKM), Audiya Fatihah Wan Saffiey (UKM) dan Fatin Hazwani Hashim (USIM) telah terpilih untuk menyertai *CERN Summer Student Program 2014*.
- 9 pelajar telah menyertai *CERN Summer Student Program* sejak 2012.

SeKILAS

CERN ialah pertubuhan penyelidikan Eropah yang mengendalikan makmal fizik zarah terbesar di dunia. CERN terdiri daripada ahli fizik dan jurutera yang menjalankan penyelidikan asas alam semesta. Ditubuhkan pada tahun 1954, makmal CERN terletak di sempadan Franco-Swiss berdekatan Geneva. Ia merupakan salah satu kolaborasi terawal negara Eropah dan kini mempunyai 21 negara anggota.

IIASA Young Scientists Summer Program (IIASA YSSP)

International Institute for Applied Systems Analysis (IIASA) merupakan institut penyelidikan sains yang menjalankan penyelidikan berorientasikan polisi bagi menangani masalah global. Antara masalah dikenal pasti adalah perubahan iklim dunia, tenaga, sumber makanan dan air, serta kemiskinan dan ekuiti yang merupakan isu kompleks untuk diselesaikan bersendirian. YSSP adalah program tahunan yang dianjurkan oleh IIASA selama tiga bulan di Laxenburg, Austria. ASM merupakan wakil kebangsaan (NMO) sejak tahun 2011. YSSP menawarkan peluang unik untuk saintis muda Malaysia bagi menjalankan penyelidikan di bawah penyeliaan saintis IIASA yang berpengalaman. Dengan pasukan penyelidik dalam pelbagai disiplin, YSSP menggunakan pelbagai pendekatan eksperimental (simulasi) untuk memahami trend ekonomi atau lain-lain fenomena yang kompleks (seperti pencemaran, udara, air, tenaga) di mana penggunaan teknik analisis matematik semata-mata adalah tidak memadai. Selain itu, saintis muda tersebut memperoleh pengetahuan baru berkenaan teknologi maklumat terkini serta teknik pemodelan sosial dan ekonomi bersepadu.

HALAMANFAKTA

- Seramai 5 orang saintis muda Malaysia telah menyertai program ini sejak tahun 2011.
- Nur Aulia Rosni dari Universiti Islam Antarabangsa Malaysia (UIAM) telah terpilih untuk menyertai *IIASA Young Scientist Summer Program 2014* di bawah *Ecosystem Services and Management Program (ESM).*

Lindau Nobel Laureate Meeting

- Educate, Inspire & Connect

Sejak tahun 2004, 49 saintis muda Malaysia telah terpilih untuk menyertai *Lindau Nobel Laureate Meeting*. Mereka berpeluang bertemu dengan pemenang Anugerah Nobel dalam bidang Fizik, Fisiologi & Perubatan dan Kimia. Perjumpaan ini menawarkan platform dialog antara generasi dan merupakan saluran terbaik untuk menimba pengetahuan, memperkukuhkan jaringan kerjasama dengan pemenang Anugerah Nobel dan rakan saintis muda lain dari seluruh dunia. Saintis muda yang terpilih merupakan yang terbaik daripada institusi akademik dan penyelidikan daripada lebih 80 negara di dunia.

HALAMANFAKTA

- 3 saintis muda Malaysia (Dr Chau De Ming dari UPM, Ng Kim Tien dari UM and Jaslyn Soo Sian Siu dari UM) telah terpilih untuk menyertai *64th Lindau Nobel Laureate Meeting 2014.*
- 37 pemenang Anugerah Nobel berkumpul di Lindau bagi menghadiri *64th Lindau Nobel Laureate Meeting 2014.*
- *64th Lindau Nobel Laureate Meeting 2014* didedikasikan untuk disiplin Fisiologi/Perubatan and diadakan dari 29 Jun hingga 4 Julai 2014 di Lindau, Jerman. Delegasi Malaysia diketuai oleh Profesor Dato 'Dr Asma Ismail FASc, Naib Presiden ASM dan Pengerusi Jawatankuasa Pemilihan untuk *Lindau Nobel Laureate Meetings with Young Scientists.*
- 600 saintis muda dari 80 negara telah menyertai program ini.

Penglibatan Sains

National Science Challenge

National Science Challenge (NSC) merupakan sebuah pertandingan sains yang direka untuk menggalakkan kefahaman, kesedaran dan penghayatan terhadap SET di kalangan pelajar sekolah menengah. Hadiah utama pertandingan ini termasuklah "Trofi Cabaran Perdana Menteri", lawatan sambil belajar ke Stockholm, Sweden dan peluang untuk menyaksikan Majlis Penyampaian Anugerah Nobel.

NSC dianjurkan oleh ASM dengan kerjasama Subsidiari ExxonMobil di Malaysia, KPM, YSN-ASM dan Universiti Putra Malaysia (UPM).





Peserta NSC di peringkat separuh akhir

Saintis Muda sebagai Pemimpin STI Masa Hadapan

YSN-ASM berfungsi menggembleng saintis muda Malaysia yang cemerlang ke arah satu wahana perundingan umum dengan matlamat:

- Mewakili suara saintis muda Malaysia dalam isu kebangsaan dan antarabangsa serta menyediakan platform bagi mempengaruhi keputusan polisi
- Memudahcara peluang jaringan kerjasama antara saintis muda dan senior untuk wacana ilmu dan pengalaman
- Melibatkan saintis muda dalam membincangkan isu kepentingan negara dengan menggunakan ilmu S&T melalui pendekatan pelbagai disiplin.
- Menggalakkan kerjaya dalam bidang sains sebagai kerjaya pilihan di kalangan belia untuk memastikan kemajuan dan kelestarian sains negara

Program utama YSN-ASM adalah:

- Jangkauan Sains
- Sains Kewartawanan
- Kepimpinan Penyelidikan
- Polisi Sains
- Jaringan Antarabangsa



Ahli YSN-ASM di *2014 Colloquium* bertema *Science Building Bridges*

11
ahli
Perubatan & Sains Kesihatan

7
ahli
Sains Kimia

8
ahli
Biologi, Sains Pertanian & Alam Sekitar

5
ahli
Matematik, Fizik & Sains Bumi

26
ahli
Kejuruteraan & Sains Komputer

57
ahli ***YSN-ASM***
sehingga kini

i-INOVA'14

Ekspo Inovasi Islam ke-5 2014 (i-INOVA'14) telah dianjurkan oleh Universiti Sains Islam Malaysia (USIM) untuk mempromosi dan meningkatkan kesedaran berkenaan inovasi berasaskan Islam serta menggalakkan penciptaan produk inovatif.

2014 merupakan tahun kedua penglibatan ASM dalam i-INOVA'14 yang melibatkan penyertaan dari institusi pengajian tinggi dan institut penyelidikan tempatan dan antarabangsa. *ASM Innovation Award* diberikan kepada rekacipta terbaik bagi mengiktiraf penciptaan produk inovatif yang bermanfaat kepada negara. *ASM Innovation Award* telah dimenangi oleh Universiti Malaya menerusi penciptaan *'Multicore Flat Fibre'*.

HALAMANFAKTA

- Tema i-INOVA'14 adalah *'Commercialization of Innovation for Ummah Well-Being'*
- Pemenang – *Multicore Flat Fibre*
  - Meningkatkan kapasiti penghantaran gentian optik untuk meningkatkan kapasiti jalur lebar sehingga 6 kali dengan *crosstalk intercore* yang kurang daripada -74 dB.

Sciencebuzz.my

Sciencebuzz.my adalah sebuah portal yang menggalakkan minat dan penghargaan terhadap sains melalui penyampaian maklumat dalam bentuk yang ringkas dan mudah difahami. Portal ini mensasarkan golongan dewasa dan muda berumur 13- 40 tahun dan merangkumi kandungan berunsur tempatan seperti berikut:

- Artikel Bertema
  Artikel yang menerangkan sains dalam kehidupan seharian dan isu semasa berkaitan sains.
- *Faces of Science@my*
  Penampilan tokoh sains Malaysia yang memberikan inspirasi kepada rakyat melalui sumbangan mereka dalam bidang STI
- *Photo of the Day*
  Penerangan konsep sains ringkas melalui gambar
- *ScienceBuzz.my TV*
  Saluran khas yang memaparkan video bercirikan didik hibur serta maklumat sains yang ringkas dan menarik. (http://sciencebuzz.my/en/explore/sciencebuzzmy-tv)

SeKILAS

I'm a Scientist, Get Me Out of Here merupakan program realiti atas talian yang diadaptasi dari United Kingdom. Program ini menyediakan platform interaksi di antara murid dan saintis melalui perbualan bertema secara atas talian.

Pemenang bagi program ini adalah di kalangan saintis dan ditentukan oleh murid melalui undian atas talian.

32
artikel baru

22
artikel mengenai tokoh sains Malaysia

3
video dimuat naik di ***Sciencebuzz.my TV***

2
siri pertandingan ***Brainbuzzter*** (kuiz atas talian)

21
penyertaan untuk **pertandingan poster**

2
siri ***I'm a Scientist, Get Me Out of Here, Malaysia (IAS)'***
April: Zon Bumi & Zuhrah
November: Zon Musytari & Marikh
Penyertaan:
18 buah sekolah
437 murid
22 saintis

Sciencebuzz.my
mencatatkan

143, 518
pelawat unik

65, 312
pelawat umum

Social License

Penganjuran wacana umum ini adalah merupakan satu langkah proaktif ASM untuk mendekati dan mendidik masyarakat serta pihak berkepentingan mengenai isu kritikal yang berkaitan. Antara isu yang dikenalpasti adalah seperti tenaga bersih, kanser dan pembangunan modal insan STI.

Platform baru ini merupakan salah satu daripada strategi komunikasi sains yang membolehkan:

- Perkongsian maklumat
- Cetusan pendapat, keprihatinan dan idea

SeKILAS

Social License merujuk kepada tahap penerimaan masyarakat setempat dan pihak berkepentingan terhadap sebarang isu kritikal yang berkaitan.

Top Research Scientists Malaysia Round Table: *'Are You Delivering Value for Money?'*

Output dan *outcome* P&P yang tidak dapat diukur dan kurang dari segi pulangan pelaburan negara, merupakan isu yang mendapat perhatian utama negara pada masa kini.

Sehubungan dengan ini, satu perbincangan meja bulat melibatkan TRSM telah diadakan bagi mengenalpasti jurang, menangani isu dan seterusnya menyediakan saranan penyelesaian. Antara saranan diberikan adalah:

- Memperkukuh dasar yang merapatkan jurang di antara ahli akademik, industri dan pelbagai kementerian
  (cth. MOE, MOSTI, MOA);
- Membina pusat sehenti yang menghubungkan semua peneraju utama; dan
- Meningkatkan pengetahuan pekerja melalui program PhD industri memenuhi keperluan semasa dan seterusnya menyumbang kepada pengkomersilan produk P&P.

Pengiktirafan

Top Research Scientists Malaysia (TRSM)

Top Research Scientists Malaysia (TRSM) merupakan pengiktirafan kepada saintis penyelidik Malaysia. Ia merupakan usaha ASM untuk membina budaya kecemerlangan di kalangan komuniti saintifik negara. Setiap tahun, saintis penyelidik yang mempunyai sumbangan yang cemerlang bagi lima tahun kebelakangan di dalam bidang masing-masing diiktiraf sebagai saintis penyelidik unggul di Malaysia.

Tahun ini merupakan pusingan ketiga bagi pelaksanaan TRSM. Seramai 34 saintis penyelidik telah dianugerahkan sebagai TRSM pada 2014 yang menjadikan jumlah keseluruhan TRSM sebanyak 96.

ASM menyediakan pelbagai platform untuk para saintis TRSM seperti peluang akses kepada geran penyelidikan *top down*, fasilitasi bagi geran penyelidikan antarabangsa dan program latihan di pusat kecemerlangan antarabangsa untuk meningkatkan tahap penyelidikan mereka. Mereka juga dirujuk sebagai pakar dalam bidang masing-masing.

Pengkalan TRSM

751
pengguna berdaftar, merangkumi
64 pengguna umum
687 pemohon

2,287
jumlah pengguna berdaftar sejak 2012, merangkumi
194 pengguna umum
2093 pemohon

Data Lengkap

301
data

661
jumlah data sejak 2012

Bidang Kepakaran Utama Penerima TRSM 2012 - 2014



Anugerah dan Geran Penyelidikan

Anugerah dan geran penyelidikan adalah pengiktirafan kepada saintis tempatan dan antarabangsa bagi menggalakkan penyelidikan saintifik yang membawa kepada penciptaan dan penyelesaian kepada masalah tempatan dan global. Ini juga membolehkan Malaysia berada pada kedudukan yang strategik dalam arena saintifik global. Felo-felo ASM berkhidmat sebagai ahli panel penilaian dan pemantauan bagi pelbagai anugerah dan geran.

Mahathir Science Award

Mahathir Science Award Foundation (MSAF) menganugerahkan *Mahathir Science Award* dalam Pertanian Tropika, Perubatan Tropika, Sumber Asli Tropika dan Senibina dan Kejuruteraan Tropika.

Anugerah antarabangsa ini mengiktiraf sumbangan dan inovasi yang cemerlang terhadap penemuan baru dalam penyelidikan tropika atau penyelesaian inovatif yang membawa kesan positif terhadap kesejahteraan masyarakat.

MAKNA Cancer Research Award

Geran penyelidikan ini dianugerahkan kepada penyelidik muda Malaysia oleh Majlis Kanser Nasional (MAKNA) untuk menjalankan penyelidikan berkaitan kanser dan seterusnya meningkatkan penglibatan Malaysia dalam mencari penawar kanser. Dr Lim Yat Yuen dari Universiti Malaya, Norlaily Mohd Ali dari Universiti Tunku Abdul Rahman dan Kalaivani Muniandy dari USM telah terpilih sebagai penerima bagi MAKNA Cancer Research Award 2014.

Anugerah Saintis Muda Negara

MOSTI mengiktiraf sumbangan dan pencapaian saintis muda Malaysia dalam bidang penyelidikan dan pembangunan. Penerima Anugerah Saintis Muda Negara 2014 adalah Dr Lim Jit Kang dari USM.

Anugerah Juruteknologi Negara

Anugerah Juruteknologi Negara ini dianugerahkan kepada juruteknologi dan tenaga separa profesional seperti juruteknik dan pembantu makmal di atas sumbangan dan pencapaian mereka dalam bidang S&T. Anugerah Juruteknologi Negara 2014 telah dimenangi oleh Kasro Ahmad dari MARDI.

Permohonan Program Flagship, Peruntukan Khas Agensi dan *ScienceFund* di bawah Platform ASM

Program Flagship, Peruntukan Khas Agensi dan *ScienceFund* ditawarkan kepada agensi di bawah MOSTI untuk memudahkan pelaksanaan penyelidikan di agensi masing-masing. Sehubungan dengan ini, ASM menerusi Felo-felonya telah mengemukakan lapan kertas cadangan strategik yang seiring dengan bidang fokus ASM untuk pertimbangan pembiayaan.

HALAMANFAKTA

ANUGERAH

Mahathir Science Award
- 156 pencalonan diterima dari 25 buah negara (2005 – 2014)
- 8 penerima anugerah sehingga kini dengan jumlah hadiah bernilai RM 1,200,000
- 16 pencalonan diterima dari 10 buah negara (2014)

MAKNA Cancer Research Award
- 371 permohonan diterima (2001 – 2014)
- 41 penerima anugerah sehingga kini dengan jumlah geran bernilai RM 1,355,000
- 3 pemohon dianugerahkan geran bernilai RM30,000 setiap satu (2014)

Anugerah Saintis Muda Negara
- 3 saintis muda telah menerima anugerah (2012-2014)
- 36 pencalonan diterima dengan seorang penerima (2014)

Anugerah Juruteknologi Negara
- 10 pencalonan diterima dan seorang penerima (2014)

HALAMANFAKTA

GERAN PENYELIDIKAN

Program Flagship DSTIN oleh Felo ASM
- 2 kertas konsep dikemukakan kepada MOSTI
- 1 projek diluluskan oleh MOSTI - *Moving up the Value Chain and Environmentally Friendly Processes in silicon photovoltaic technology: Non-toxic Processes, Wafering and Crystal Growth*

Program Flagship MOSTI oleh Felo ASM
- 2 kertas konsep dikemukakan kepada MOSTI
  - *Disaster & Climate Change Extremes: An Integrated Research Framework for Malaysia*
  - *Developing a Plant Made Protein Sector for Malaysia – Efficient, Halal, Sustainable Technologies for the Production of Pharmaceutical Proteins*

Peruntukan Khas Agensi oleh Felo ASM
- 4 kertas konsep dikemukakan kepada MOSTI
- 1 projek diluluskan oleh MOSTI - *Development of Yeast System for Flavonoid Production*

Projek *ScienceFund* di bawah Platfom ASM
- 1 projek tamat pada Februari 2014
  - *Geopolymer Cement from Ground POFA by Alkali Activation Method.*
- 1 projek masih berterusan - *Time Dependent Changes of Morphology and Molecular Characterization Around the Intracerebellar Haemorrhage (ICbH) Penumbra in C57B6/J Mice Brain Slices.*

Pasukan Pemantauan Projek (PMT) di bawah Rancangan Malaysia Kesepuluh (RMKe-10)

ASM telah dilantik sebagai Pasukan Pemantauan Projek (PMT) oleh MOSTI bagi memantau pelaksanaan projek R&D yang telah diluluskan di bawah Rancangan Malaysia Kesepuluh (RMKe-10). Felo ASM berkhidmat sebagai ahli Pasukan Pemantauan Projek (PMT).

Jawatankuasa Penilaian Strategik di bawah Klaster Teras S&T, MOSTI

ASM telah dilantik sebagai salah satu ahli Jawatankuasa Penilaian Strategik di bawah Klaster Teras S&T, MOSTI untuk menyemak keputusan penilaian teknikal bagi geran di bawah MOSTI. Cadangan daripada jawatankuasa ini akan dibentangkan kepada pihak pengurusan tertinggi MOSTI untuk kelulusan.

Tabung Amanah Penyelidikan Perubatan Dr Ranjeet Bhagwan Singh

ASM dipertanggungjawabkan oleh MOSTI untuk merancang dan menjalankan program di bawah Tabung Amanah Penyelidikan Perubatan Dr Ranjeet Bhagwan Singh. Tabung amanah ini menggalakkan penyelidikan dalam bidang perubatan dan bioperubatan di kalangan saintis muda Malaysia. Antara program yang dianjurkan dibawah tabung amanah ini adalah seperti geran penyelidikan perubatan dan bengkel penyelidikan. Pada tahun 2014, geran penyelidikan perubatan telah dianugerahkan kepada Dr Oon Chern Ein dari Institut Penyelidikan Perubatan Molekul (INFORMM), Universiti Sains Malaysia.

HALAMANFAKTA

PMT di bawah RMKe-10
- 16 projek merangkumi:
  - 4 projek Program *Flagship*
  - 6 projek *TechnoFund*
  - 6 projek *Community Innovation Fund*

HALAMANFAKTA

Geran Penyelidikan Perubatan RBS
- 64 permohonan diterima (2014)
- 1 pemenang dianugerahkan geran berjumlah RM30,000 (2014)

Pengantara

Seorang saintis yang berjaya bukan sahaja bergantung kepada kecemerlangan dalam penyelidikan tetapi juga memerlukan sokongan rangkaian STI antarabangsa. Menyedari akan keperluan ini, ASM telah mengambil inisiatif dengan bertindak sebagai salah sebuah gerbang utama untuk saintis tempatan menempatkan diri mereka di peringkat antarabangsa. Ini adalah bertujuan untuk memberi peluang kepada saintis Malaysia berkongsi ilmu pengetahuan, hasil penyelidikan, meningkatkan kepakaran, mewujudkan rangkaian kerjasama dan seterusnya memperkukuhkan lagi keupayaan saintifik dan teknologi.

Melalui platform ini, saintis muda Malaysia dapat berhubung dengan saintis antarabangsa dari 106 akademi sains dan 22 organisasi STI di seluruh dunia.

Kerjasama STI Antarabangsa

InterAcademy Partnership (IAP)

InterAcademy Partnership adalah merupakan platform kolaboratif di antara InterAcademy Council (IAC), InterAcademy Medical Panel (IAMP) dan InterAcademy Panel. Melalui rangkaian globalnya yang terdiri daripada 130 ahli, penubuhan IAP akan dapat memanfaatkan pengaruh serta kepakaran saintifik kesemua Akademi tersebut.

Sempena penubuhan IAP, satu perjanjian telah dimeterai pada bulan Mei 2014 untuk mengekalkannya sebagai organisasi induk. Rakan kerjasama sedia ada distruktur semula untuk menjadi lebih eksklusif dan fokus, pada masa yang sama mengekalkan identitinya, seperti berikut:

- *InterAcademy Panel* sebagai IAP for Science
- InterAcademy Medical Panel (IAMP) sebagai IAP for Health
- InterAcademy Council (IAC) sebagai IAP for Research

IAP juga berperanan mempromosikan kecemerlangan dalam pendidikan sains, terutamanya di sekolah rendah dan menengah. Ini dilaksanakan melalui pembaharuan dan pembangunan pendidikan sains menggunakan platform *IAP Science Education Programme (IAP-SEP).*

Antara aktiviti yang dijalankan:

1. *KAST-ASM-IAP International Workshop on Science Literacy: Science Communication and Science Outreach*
   - Bengkel ini bertujuan untuk membincangkan dan mencadangkan kaedah penambahbaikan literasi sains dalam membentuk pendidikan dan komunikasi sains yang efektif, terutamanya dalam bidang Sains, Kesihatan, Alam Sekitar dan Risiko (SHER), seterusnya meningkatkan kesedaran awam mengenai S&T
   - Penceramah utama, Academician Dato' Ir Lee Yee Cheong FASc, telah menyampaikan ceramah bertajuk *"Science, Engineering and Technology and the UN sustainable Development Goals 2016-2030".*
   - Sebanyak 100 orang peserta telah menghadiri bengkel ini. Ia juga melibatkan 18 orang penceramah dari pelbagai negara yang merupakan pakar dalam bidang komunikasi sains.

2. *IAP-SEP Biennial Conference on Challenges, Opportunities of IBSE / Science, Technology, Engineering and Mathematics (STEM) Conference*
   - Persidangan ini merupakan acara penting IAP-SEP yang mengenalpasti IBSE sebagai pedagogi yang efektif dalam meningkatkan mutu pendidikan sains di sekolah.
   - Ianya dihadiri oleh 100 orang peserta dan penceramah yang terdiri daripada ahli *IAP-SEP Global Council* serta tenaga pakar dalam bidang IBSE, Teknologi Pendidikan, Penilaian dan Pencapaian Murid, Jangkauan Sains dan Masyarakat.
   - Persidangan ini diakhiri dengan deklarasi yang merumuskan semua isu berbangkit dan saranan supaya orientasi Pendidikan Sains beralih kepada Literasi Sains.
   - Pada masa yang sama, satu Mesyuarat *IAP-SEP Global Council* telah diadakan di mana draf Deklarasi Beijing telah diumumkan untuk edaran serta mendapatkan sokongan dari UNESCO.

HALAMANFAKTA

Mesyuarat *IAP-SEP Global Council 2015* akan diadakan di Hotel Istana, Kuala Lumpur dan dianjurkan oleh ASM.

SeKILAS

Felo Kanan ASM, Academician Professor Ulung Datuk Dr Looi Lai Meng FASc adalah merupakan Pengerusi Bersama IAMP. Antara isu yang diketengahkan di bawah kepimpinannya adalah seperti *"Antimicrobial Resistance"* dan *"Science for Poverty Eradication & Sustainable Development".*

The International Science, Technology and Innovation Centre for South-South Cooperation (ISTIC)

ISTIC di bawah naungan UNESCO telah dilancarkan pada tahun 2008. Antara agenda utama ISTIC adalah:

- Merangka polisi sains dan teknologi kebangsaan, implementasi dan pemantauan;
- Kawal selia infrastruktur;
- Latihan *Technopreneurship* untuk saintis dan penyelidik; dan
- Pendidikan STEM / IBSE.

Pada tahun 2014, ISTIC menganjurkan 6 program latihan dan menerbitkan 6 laporan.

International Council for Science (ICSU) Regional Offices

International Council for Science ataupun ICSU adalah merupakan sebuah organisasi bukan kerajaan yang berperanan memperkukuhkan sains antarabangsa demi kebaikan sejagat. Ini dilaksanakan ICSU dengan menggunakan sumber dan pengetahuan yang dimiliki oleh komuniti saintifik antarabangsa. Antara aktiviti yang dijalankan adalah:

- Kolaborasi Penyelidikan Antarabangsa
- Sains untuk Polisi
- Kesejagatan Sains

Rentetan daripada program flagship ASM, dua buah yayasan telah ditubuhkan sebagai entiti berasingan bagi mengurus dan menerajui program berkenaan. Yayasan tersebut adalah seperti berikut:

Mahathir Science Award Foundation (MSAF)

Yayasan ini menggalakkan kecemerlangan dalam penyelidikan sains tropika yang bermanfaat kepada negara tropikal dan komuniti global. Anugerah Sains Mahathir diberikan kepada para penyelidik yang telah membuat penemuan yang diiktiraf di peringkat antarabangsa dalam penyelidikan rintis tropika.

Yayasan Penyelidikan Antartika Sultan Mizan (YPASM)

Yayasan ini berperanan dalam mempromosikan dan membangunkan kerjasama nasional dan antarabangsa dalam penyelidikan serta konservasi rantau kutub, terutamanya di benua Antartika. Penyertaan Malaysia adalah penting untuk mengekalkan penglibatan Malaysia dalam penyelidikan Kutub dan seterusnya memperkukuhkan kemampuan penyelidikan dalam bidang sains global bersempadan.

Kerjasama Antara Malaysia & Maghribi Dalam Bidang Tenaga Boleh Diperbaharui dan Pendidikan Sains dan Matematik

Lanjutan daripada memorandum persefahaman yang telah ditandatangani antara ASM dan Hassan II Academy of Science and Technology (AHIIST) pada tahun 2010, kedua-dua negara amat berharap agar program kerjasama dalam bidang tenaga boleh diperbaharui dan pendidikan sains dan matematik dapat diwujudkan.

Delegasi Maghribi yang terdiri daripada dua kumpulan iaitu kumpulan tenaga dan kumpulan pendidikan telah berkunjung ke Malaysia. Delegasi telah mengenalpasti beberapa program kerjasama yang berpotensi bagi kedua-dua negara susulan dari bengkel, mesyuarat strategik dan lawatan kerja ke beberapa organisasi. Berikutan itu, AHIIST telah menjemput ASM ke Maghribi untuk mengukuhkan program kerjasama yang dikenalpasti.

ASM dan AHIIST telah mengenalpasti beberapa projek yang berpotensi untuk dilaksanakan oleh Malaysia dan Maghribi. Antaranya:

i) Tenaga
- Kerjasama penyelidikan
- Pertukaran pakar dan kepakaran
- Pertukaran kakitangan dan pelajar melalui dasar sedia ada
- Pemeriksa luar dan penyeliaan bersama

ii) Pendidikan
- e-kerjasama antara sekolah
- e-kerjasama antara Institut Pendidikan Guru Malaysia dan *Ecole Normale Supérieure*
- Program Pertukaran Guru Pelatih
- Bengkel Khas untuk Guru Pelatih
- Pertukaran Pelajar cemerlang

Konsortium Sains

Konsep Konsortium Sains Kebangsaan menawarkan platform untuk kerjasama dalam bidang strategik STI menerusi pusat sains kebangsaan yang bertindak sebagai penghubung utama dalam kerjasama saintifik sesama institusi tempatan dengan badan antarabangsa.

Pusat kebangsaan yang dikenalpasti di institusi tempatan bertanggungjawab menyelaras inisiatif penyelidikan kebangsaan. ASM akan menghubungkan konsortium dengan rakan strategik antarabangsa yang seterusnya membolehkan penyelidik tempatan mengikuti projek penyelidikan *frontier science*. Ini membolehkan para penyelidik diiktiraf di peringkat antarabangsa menerusi penerbitan berimpak tinggi dan seterusnya melahirkan saintis berwibawa.

National Centre for Particle Physics

Selaku tuan rumah, UM telah menerajui penyelidikan fizik zarah di Malaysia menerusi penyertaan dalam kumpulan penyelidikan Compact Muon Solenoid (CMS) di CERN pada tahun 2013.

Para penyelidik dan peneraju industri dalam bidang fizik zarah di Malaysia dapat memanfaatkan kemudahan dan rangkaian antarabangsa NCPP.

SeKILAS

CMS adalah pengesan zarah di Large Hadron Collider, CERN, yang merupakan pemecut zarah terbesar dan berkuasa tinggi di dunia

- 7 pelajar ijazah muda dari NCPP menyertai penyelidikan sangkutan di CERN
- 7 pelajar sarjana, 3 pelajar Phd telah menyertai penyelidikan sangkutan di CERN

Fora Perundingan

ASM menyediakan platform bagi wacana intelek, menggalakkan advokasi pembangunan S&T, serta meningkatkan pengiktirafan global untuk pakar tempatan dan antarabangsa.

Biothreats & Biorisks: Bridging Science and Security

Menyedari kepentingan bidang biokteknologi, Malaysia sentiasa mencari kaedah terbaik dalam membangunkan bidang tersebut tanpa menggugat biokeselamatan dan biosekuriti. Isu biokeselamatan penting bagi melindungi negara kita daripada sebarang kerugian, kecurian, salah guna, penyelewangan atau pelepasan patogen dan toksin dengan sengaja.

Oleh itu, kerajaan Malaysia kini dalam proses menerima pakai akta yang akan membantu negara dalam memenuhi kewajipannya, seperti yang termaktub di bawah *Biological Weapons Convention (BWC)*. Ini akan memastikan pengurusan agen penyakit adalah selamat tanpa memudaratkan sebarang usaha penyelidikan biologi yang disahkan.

Bersandarkan matlamat ini, *"National Academic Seminar on Biothreats and Biorisk: Bridging Science and Security"* telah diadakan di antara ahli akademi, industri dan sektor sekuriti untuk bertemu, bekerjasama dan menggalakkan penyelarasan merentasi bidang. Ini seterusnya akan meningkatkan keupayaan biokeselamatan dan biosekuriti Malaysia terutamanya dalam penyediaan draf akta berkenaan.

Seminar kebangsaan ini berperanan mewujudkan persefahaman terhadap perlaksanaan kawalan biosekuriti dan risiko atau strategi mitigasi, serta mengetengahkan cabaran semasa dalam menangani isu keselamatan, sekuriti dan etika, ketika menjalankan penyelidikan biologi. Seminar ini diakhiri dengan ulasan akta internal, sesi dialog mengenai draf rang undang-undang biosekuriti Malaysia dan cabaran utama dalam perlaksanaannya.

HALAMANFAKTA

- 8 penceramah antarabangsa & 2 penceramah tempatan
- 75 peserta

HALAMANFAKTA

- BWC adalah perjanjian pelucutan senjata pelbagai hala pertama yang mengharamkan pembangunan, pengeluaran dan simpanan stok semua kategori senjata pemusnah, dan telah dibuka untuk ditandatangani pada 10 April 1972.
- BWC berkuat kuasa pada 26 Mac 1975.
- Sebanyak 110 buah negara dan 170 buah negeri termasuk Malaysia telah menandatangani perjanjian ini.
- Malaysia telah menandatangani perjanjian ini pada tahun 1972 and memperbaharuinya pada September 1991.

Future Earth: Research for Global Sustainability and a Holistic Understanding of Sustainable Development in Asia

Persidangan *Future Earth: Research for Global Sustainability and a Holistic Understanding of Sustainable Development in Asia* telah menyediakan platform antara disiplin bagi saintis di rantau ini untuk membentangkan laporan yang berkaitan dengan tiga tema penyelidikan seperti berikut:

- Planet yang Dinamik
- Pembangunan Global
- Transformasi ke arah Kelestarian

Tema untuk Persidangan SCA ke-14 adalah lanjutan daripada Persidangan UN mengenai Pembangunan Lestari (Rio+20) yang telah berlangsung di Rio de Janeiro, Brazil pada bulan Jun 2012, 20 tahun selepas persidangannya yang pertama di Rio pada tahun 1992.

Lebih daripada 100 saintis dari 20 negara telah membincangkan kemajuan penyelidikan saintifik ke atas kemampanan global dan pembasmian kemiskinan dalam konteks Asia. Antara isu yang dibincangkan ialah kelestarian global, kejayaan penyelidikan antara disiplin, kerjasama penyelidikan dan dialog merentasi sains semulajadi, sosial dan kejuruteraan untuk menangani aspek ekonomi, sosial dan alam sekitar yang saling berhubung-kait dengan pembangunan di Asia.



Peserta *14th SCA Conference*

SeKILAS

Future Earth merupakan inisiatif penyelidikan antarabangsa selama 10 tahun yang menggembleng tenaga ribuan saintis dan mengukuhkan kerjasama dengan penggubal dasar serta pihak berkepentingan yang lain untuk menyediakan alternatif dan penyelesaian lestari, sejajar dengan deklarasi Rio +20.

Ini adalah merupakan kali kedua Malaysia menganjurkan Persidangan Antarabangsa SCA. Persidangan Antarabangsa SCA pertama kali dianjurkan Malaysia pada 13-15 Mei 2002 dengan tema *"Urgent Agenda for Asian Sustainability: Operationalising the Vision"*.

“All over the world, in both developing and developed nations alike, there is a pressing need to nurture young scientific talent in meeting the critical demand for a scientifically savvy, skilful, creative and innovative human capital capable of driving economies in this innovation-led era.”

YB Datuk Dr Ewon Ebin
Menteri Sains, Teknologi dan Inovasi

WACANA

Penjanaan pengetahuan sering kali datangnya dari perhimpunan ilmiah yang membolehkan pembelajaran, pengembangan rangkaian, pengwujudan informasi dan perkongsian. ASM menganjurkan pelbagai wacana yang berteraskan objektif ini dan ianya diterima dengan positif.

Ia merupakan perhimpunan terbesar Felo ASM yang diadakan dengan agenda yang lebih tertumpu kepada perbincangan berkenaan isu STI berkepentingan nasional.

Perhimpunan Tahunan

Perhimpunan Tahunan ke5

Tema:

'Matching Talent with Economic Transformation Programme (ETP)'

Program Transformasi Ekonomi (ETP) berperanan untuk memacu Malaysia menjadi sebuah negara maju menjelang 2020. Namun begitu, dalam keterujaan kita untuk mencapai matlamat ini, timbul isu mengenai syarikat multinasional tidak mengambil rakyat tempatan untuk bekerja, terutamanya bagi jawatan teknikal ekoran kurang kemahiran. Ini seterusnya menimbulkan persoalan samada Malaysia mempunyai tenaga mahir yang mencukupi bagi mencapai aspirasi negara berpendapatan tinggi. Ini merupakan isu yang serius dan penyelesaian komprehensif perlu dirangka bagi menangani permasalahan ini.

Moderator:
Dr Ahmad Ibrahim FASc
Ketua Pengarah Eksekutif, ASM

Ahli Panel:
Profesor Dr Awang Bulgiba Awang Mahmud FASc
Timbalan Naib Canselor (Penyelidikan dan Inovasi), UM
'Producing quality human capital for the workforce'

Encik Lokman Baharuddin
Pengarah (Sumber Manusia), ExxonMobil Subsidiaries Malaysia
'Are Malaysian graduates fulfilling the needs of oil and gas industry?'

Profesor Dato' Dr Hassan Said FASc
Naib Canselor & Presiden, Taylor's University College
'Human capital development in education'

Puan Agnes Maria Sam
Pengurus Besar (Inisiatif Dasar), Talent Corporation Malaysia Berhad
'TalentCorp: Meeting the talent needs of the economic transformation programme'

Encik Tan Eng Hoo
Pengurus Kanan, Bahagian Strategi & Dasar, Multimedia Development Corporation Sdn Bhd
'Talent Mobility in the ICT Industry'

Perhimpunan Tahunan ke6

Tema:

'Malaysia Beyond 2020'

Tidak dapat dinafikan kelestarian negara merupakan agenda utama Malaysia. Sehubungan itu, adalah menjadi matlamat ASM untuk memastikan kelestarian pertumbuhan dan pembangunan yang inklusif dicapai, serta merangkumi semua sektor masyarakat. Sesi dialog bertajuk *"Malaysia Beyond 2020"* membuktikan bahawa terdapatnya keperluan untuk negara merangka pelaburan di dalam strategi yang tepat sekarang. Berdasarkan statisitik terkini, Malaysia tidak mempunyai masalah untuk mencapai sasaran negara berpendapatan tinggi menjelang 2020, tetapi bagaimana pula selepas itu?

Moderator:
Encik Kamarul Bahrin Haron
Penolong Kanan Timbalan Presiden ASTRO Awani

Ahli Panel:
Puan Liew Siew Lee
Pengarah, Industri Pembuatan Sains dan Teknologi, Unit Perancang Ekonomi
'Innovation to Action (11MP)'

Encik Kamel Mohamad
Setiausaha Kanan Bahagian (Perancangan), MOSTI
'Science & Technology Chapter (11MP)'

Datuk Dr Mazlan Othman FASc
Pengarah Projek MegaScience 3.0
'Malaysia Beyond 2020- Mega Science Chapter'

Dato' Saw Choo Boon
Presiden, Federation of Malaysian Manufacturers (FMM)
'Malaysia Beyond 2020- Industry Chapter'

Mesyuarat Agung Tahunan

Mesyuarat Agung Tahunan ke-19 ASM telah dihadiri oleh 103 orang Felo ASM. Mesyuarat ini telah meluluskan Laporan Tahunan 2013, kenyataan kewangan (berakhir 31 Disember 2013) dan melantik juruaudit luar. Pemilihan telah dijalankan untuk Ahli Majlis ASM, untuk tempoh 2014 – 2016, Felo dan Felo Kehormat.

IdeaXchange

IdeaXchange menghimpunkan ahli ASM untuk berbincang hal-hal berkaitan antara disiplin dan berbahas berkenaan isu-isu STI. Antara topik yang telah dibincangkan adalah yang berikut:

- *The InterAcademy Panel (IAP) Science Education Program (SEP) and its implications on host academy and Malaysia*, oleh Academician Dato' Ir Lee Yee Cheong FASc, Pengerusi, *IAP SEP Global Council*
- *Strategizing Research, Development and Commercialization (RDC) priority areas for the nation,* oleh Dr Ahmad Ibrahim FASc
- *Science 2 Action (S2A) Initiatives*, oleh Emeritus Professor Tan Sri Dato' Sri Dr Zakri Abdul Hamid FASc, Penasihat Sains kepada Perdana Menteri Malaysia
- *Soil Erosion and Sedimentation*, oleh Dato' Ahmad Fuad Embi
- *Graphene*, oleh Dr Rezal Khairi Ahmad, Ketua Pengarah Eksekutif of NanoMalaysia

“It is indeed most gratifying to see so many sectors represented here through the presence of members of the scientific community and academia , policy makers and government officials, industry captains, corporate stalwarts, partners from STI organisations as well as other stakeholders from the public and private sectors. Your presence here is a reflection of the valuable partnership we share to further the STI agenda of the nation.”

YBhg Tan Sri Dr Ahmad Tajuddin Ali FASc
Presiden, ASM

KEAHLIAN

Keahlian ASM adalah terdiri daripada pelbagai kepakaran bidang sains dan sains sosial.

Felo Kehormat

YAB Dato' Sri Mohd Najib Tun Abdul Razak, Perdana Menteri Malaysia telah dianugerahkan Felo Kehormat di Majlis *Conferment of Fellowship 2014*, bagi mengiktiraf sumbangan beliau dalam memacu Negara ke hadapan melalui inisiatif progresif dan dinamik dalam bidang STI. Beliau telah dipilih di Mesyuarat Agung Tahunan ke-19.

Felo Kanan

Pada tahun 2014, dua orang Felo telah dilantik sebagai Felo Kanan:

- **Academician Datuk Ir Hong Lee Pee FASc,** atas sumbangan cemerlang beliau dalam membangunkan ciptaan baru cerucuk untuk asas bangunan dan industri pembinaan geoteknikal di negara ini.
- **Academician Professor Dato' Dr Khairul Anuar Abdullah FASc,** atas sumbangan cemerlang beliau dalam mendiagnosis penyakit berjangkit dan pembangunan kaedah pendidikan perubatan yang inovatif di Malaysia.



2014 Conferment of Fellowship and Announcement of TRSM pada 8 Disember 2014

Felo

Setiap tahun, ASM mengenalpasti warganegara Malaysia unggul yang mempunyai pencapaian cemerlang dan luar biasa dalam bidang SET sebagai ahlinya.

Keahlian ini dianugerahkan berdasarkan proses pemilihan yang ketat dalam enam bidang yang berbeza: Sains Perubatan dan Kesihatan; Sains Kejuruteraan dan Komputer; Biologi, Sains Pertanian dan Alam Sekitar; Sains Matematik, Fizik dan Bumi; Sains Kimia dan Pembangunan S&T dan Industri.

Seramai 21 orang Felo baru telah dipilih di Mesyuarat Agung Tahunan ke-19, dan mereka telah diraikan dalam *Majlis Conferment of Fellowship 2014*. Daripada jumlah itu, seramai 16 orang adalah dari institut pengajian tinggi, dua dari institut penyelidikan, satu dari agensi kerajaan dan dua dari sektor swasta.

Pemilihan Felo baru adalah penting untuk kelestarian tenaga pakar ASM. Melalui pengetahuan, kepakaran, rangkaian dan kebijaksanaan Felo ASM, ianya membolehkan ASM meneruskan aktivitinya, menyumbang secara berkesan dalam memberikan input STI kepada kerajaan dan pihak berkepentingan serta memenuhi misi Akademi.

Associates

Peningkatan Ilmu yang bersifatkan interdisiplin menjadi pemangkin bagi permintaan pakar dalam pelbagai bidang sains dan sains sosial. Oleh itu, pada tahun 2010, keanggotaan ASM telah diperluaskan untuk merangkumi *Associates*.

Ahli Majlis ASM melantik *Associates* bagi tempoh dua tahun dan memperbaharui pelantikan ahli yang aktif. *Associates* mewakili ASM di mesyuarat luar, menyumbang dan mengambil bahagian dalam pelbagai kajian dan jawatankuasa. Pada tahun 2014, Akademi telah melantik semula 12 orang *Associates*, menjadikan jumlahnya 43 orang.

SeKILAS

Felo baru digalakkan untuk menyampaikan syarahan Felo dalam bidang kepakaran masing-masing kepada masyarakat awam dan komuniti saintifik. Berikut adalah dua orang Felo yang telah menyampaikan syarahan mereka:

Dr Saw Leng Guan FASc
Malaysian Palms: Prince of the Plant Kingdom

Profesor Dr Shamshuddin Jusop FASc
Sustainable Rice Cultivation: Steps towards Sustainable Practices

HALAMANFAKTA

Felo 2014

Dato' Dr Abd Latif Mohmod FASc
Datuk Ir (Dr) Abdul Rahim Hashim FASc
Profesor Dr Abdul Rahman Mohamed FASc
Profesor Dato' Ir Dr Abdul Wahab Mohammad FASc
Profesor Dr Agamutu Pariatamby FASc
Profesor Dato' Ir Dr Badhrulhisham Abdul Aziz FASc
Profesor Dato' Dr Burhanuddin Yeop Majlis FASc
Profesor Dr Jamunarani S Vadivelu FASc
Profesor Dr Jinap Selamat FASc
Ir Lalchand Gulabrai FASc
Profesor Dato' Dr Mohd Yusof Haji Othman FASc
Datuk Dr Mohd Yusoff Sulaiman FASc
Profesor Dato' Dr Musa Ahmad FASc
Profesor Dr Ng Kwan Hoong FASc
Profesor Dr Noorsaadah Abd Rahman FASc
Profesor Datuk Dr Rohana Yusof FASc
Profesor Dr Shamshuddin Jusop FASc
Profesor Dr Tan Soon Guan FASc
Dr Teo Soo Hwang FASc
Profesor Dr Wan Azman Wan Ahmad FASc
Dato' Dr Yap Kok Seng FASc

Dalam Memori

Tan Sri Dato' Dr Hj Ani Arope FASc

17 Mei 1932 – 20 Disember 2014



Timbalan Pengarah Pertama, Institut Penyelidikan Dan Kemajuan Pertanian Malaysia (MARDI) (1969-1972)
Pengarah, Institut Penyelidikan Getah Malaysia (RRIM) (1985)
Pengerusi, Bank Simpanan Nasional (1986-1988)
Ketua Eksekutif Kumpulan, Kumpulan Guthrie Bhd (1987-1992)
Pengarah, Guthrie Ropel Bhd (1988)
Pengerusi, Highlands & Lowlands (1988)
Pengerusi, Majlis Institut Teknologi MARA (1989-1992)
Ahli Majlis (Sektor Awam), Malaysian Business Council (1991)
Pengerusi, Majlis Universiti Sains Malaysia (1992)
Presiden, Council of Malaysia-New Zealand (1992)
Pengerusi Eksekutif, Tenaga Nasional Berhad (TNB), (1992-1996)
Pengerusi, Ahli Lembaga Pengarah, Universiti Sains Malaysia (1992-2010)
Pengerusi, Majlis Minyak Sawit Malaysia (MPOC) (1995)
Penasihat Kanan Antarabangsa, ASEAN General Electric (GE) (1997)

Tan Sri Ani Arope dilahirkan pada 17 Mei 1932 di Seberang Perai, Puala Pinang. Beliau dikenali atas kepimpinan dan komitmen beliau dalam membangunkan modal insan di beberapa organisasi STI seperti Institut Penyelidikan Getah Malaysia (RRIM), Institut Penyelidikan Dan Kemajuan Pertanian Malaysia (MARDI) dan Tenaga Nasional Berhad (TNB).

Beliau menamatkan pengajian di University of Canterbury, New Zealand dengan memperoleh Ijazah dalam bidang Sains Pertanian pada tahun 1960. Beliau telah dianugerahkan dengan biasiswa Fulbright dan meneruskan pengajiannya di Universiti Vermont, Amerika Syarikat dan memperolehi Ijazah Sarjana Sains (Agronomi dan Pengeluaran Ekonomi) pada tahun 1966.

Beliau memulakan kerjaya sebagai ahli agronomi dan seterusnya telah mengetuai beberapa pertubuhan berasaskan pertanian yang diiktiraf di Malaysia. Tan Sri Ani Arope juga memainkan peranan penting dalam meletakkan Malaysia di peringkat global melalui peranan RRIM sebagai peneraju utama dalam bidang industri getah.

Sebagai pengiktirafan terhadap kecemerlangannya, beliau dianugerahkan Ijazah Kehormat Kedoktoran dari beberapa universiti tempatan dan antarabangsa. Sesungguhnya, beliau adalah merupakan salah seorang tokoh dan pemimpin korporat yang amat disegani di negara ini.

Tan Sri Ani Arope merupakan Felo Asas ASM dalam Disiplin Pembangunan S&T dan Industri. Selain daripada itu, beliau juga merupakan Ahli Majlis ASM yang pertama. Semangat dan sumbangan beliau dalam memperjuangkan pembangunan masyarakat akan sentiasa diingati.

Beliau akan sentiasa dikenang.
Al-Fatihah.

Dalam Memori



Ir Dr Ma Ah Ngan FASc

17 Mei 1948 – 15 Ogos 2014

Ahli Associate, Institut Kimia Malaysia
Ahli Majlis dan Bendahari, Reka Cipta dan Reka Bentuk Malaysia (MINDS)
Ahli, Persatuan Pengurusan Alam Sekitar dan Penyelidikan Malaysia (ENSEARCH)
Ahli, Rangkaian Serantau Pengurusan dan Penggunaan Sisa di Asia Tenggara dan Pasifik
Ahli, Institut Jurutera Kimia, UK
Ahli, Jawatankuasa Industri Asas Tani Kebangsaan
Ahli Majlis, Persatuan Saintis dan Para Teknologi Minyak Malaysia (MOSTA)
Pengarah dan Ahli Lembaga Pengarah , Pusat Teknologi Alam Sekitar (CETEC)

Ir Dr Ma Ah Ngan dilahirkan pada 17 Mei 1948 di Kampar, Perak dan telah menghabiskan seluruh kerjaya beliau sebagai seorang penyelidik yang berdedikasi. Beliau telah menamatkan pengajiannya di Universiti Malaya (UM) dengan Ijazah Sarjana Muda dalam bidang Teknologi Kimia (1972) dan menerima Ijazah Sarjana dalam bidang Kejuruteraan Kimia dari University of Birmingham, United Kingdom (1979). Pada tahun 1993, beliau telah dianugerahkan Ijazah Kedoktoran (PhD) dalam bidang Kejuruteraan Kimia dari University of Surrey, United Kingdom.

Kerjaya beliau bermula apabila dipanggil berkhidmat sebagai Pegawai Penyelidik di Institut Penyelidikan dan Kemajuan Pertanian Malaysia (MARDI) pada tahun 1972 dan beliau telah memulakan penyelidikan berkenaan rawatan anaerobik bagi merawat efluen kilang minyak sawit. Pada tahun 1979, beliau berkhidmat di Institut Penyelidikan Minyak Sawit Malaysia (PORIM) dan telah membangunkan teknologi pelepasan sifar untuk kilang minyak sawit dengan menggunakan pelbagai teknologi penguapan.

Semasa perkhidmatan beliau sebagai Pengarah di Bahagian Kejuruteraan dan Pemprosesan, MPOB, beliau telah menunjukkan kepimpinan yang cemerlang terutamanya dalam Pembangunan dan Penyelidikan (P&P) dalam aspek kejuruteraan dan pemprosesan industri minyak sawit. Penglibatan Dr Ma dalam bidang alam sekitar dan aplikasi sains dan teknologi terutamanya P&P dalam menyelesaikan masalah pencemaran dalam industri minyak sawit telah membantu industri ini mengekalkan kelestarian alam sekitar.

Secara keseluruhan, Dr Ma sangat dihormati dalam komuniti saintifik dan telah membuat sumbangan yang besar kepada industri minyak sawit. Beliau telah dipilih sebagai Felo Akademi di bawah kumpulan Disiplin Kejuruteraan dan Sains Komputer pada tahun 2003.



Dato' Dr Khoo Kah Lin FASc

18 Disember 1938 – 07 November 2014

Visiting Fellow, Academy of Medicine Singapore, 1973
Felo, Royal College of Physicians (Ireland), 1982
Felo, Royal College of Physicians (Glasgow), 1984
Pengarah, Yayasan Jantung Malaysia (dari 1987)
Presiden (2002-2002) Persatuan Jantung Kebangsaan Malaysia
Felo, Akademi Perubatan Malaysia, 1998
Felo, American College of Cardiology, 2002
Presiden ASEAN Heart Foundation, 2002 - 2004
Ahli Majlis, Akademi Perubatan Malaysia, 2003
Felo, Royal College of Physicians (Edinburgh), 2004
Felo, European Society of Cardiology, 2005
Felo, Royal College of Physicians (London), 2006
Presiden, Persatuan Perubatan Malaysia, 2007-2009
Felo, Akademi Sains Malaysia, 2009

Dato' Dr Khoo Kah Lin FASc dilahirkan pada 18 November 1938 di Pulau Pinang. Beliau dikenali sebagai seorang pakar kardiologi dan merupakan perintis dalam penubuhan Unit Penjagaan Koronari yang pertama di Malaysia.

Beliau memperolehi Ijazah Sarjana Muda Perubatan (Surgeri) dari University of Singapore pada tahun 1963 dan memulakan kerjaya beliau sebagai doktor pelatih di Hospital Alor Setar. Beliau meneruskan perkhidmatan sebagai Pegawai Perubatan di beberapa Hospital Kerajaan antaranya di Alor Setar, Langkawi , Kulim dan Kuala Kangsar. Pada tahun 1983, beliau menerima Ijazah Kedoktoran dalam bidang perubatan dari National University of Singapore (NUS).

Selain menjadi seorang pakar klinikal, beliau turut memberi sumbangan yang besar dalam bidang penyelidikan perubatan terutamanya berkenaan *familial hypercholesterolaemia (FH)*. Beliau telah menerbitkan beberapa topik berkaitan *lipid disorders* dalam jurnal tempatan dan antarabangsa. Beliau turut menyumbangan kepakaran beliau dengan menjadi ahli dalam beberapa kumpulan Panel Pakar dan dilantik dalam beberapa jawatankuasa kebangsaan dan antarabangsa.

Pada tahun 2004, beliau telah menubuhkan Pusat Dialisis Sau Seng Lum (sistem kesihatan yang tidak berasaskan keuntungan) untuk menyumbang kepada masyarakat.

Beliau berusaha keras untuk mewujudkan kesedaran di kalangan FH di seluruh negara, dan juga dalam mendiagnosis dan merawat pesakit FH. Sebagai pengiktirafan kepada penyelidikan dan pencapaian beliau yang cemerlang dalam bidang FH, Kelab Rotary Malaysia telah menganugerahkan *'Research Gold Medal Award'* kepada beliau, yang telah disampaikan oleh Sultan Selangor. Beliau turut menerima anugerah *'Outstanding Person of the Year'* dari Persatuan Perubatan Malaysia, sebagai pengiktirafan sumbangan beliau kepada komuniti perubatan dan orang ramai.

Dato' Dr Khoo Kah Lin merupakan seorang yang baik hati dan sentiasa meluangkan masa untuk sahabat dan rakan sekerja beliau. Beliau akan sentiasa diingati atas sumbangan beliau kepada Negara dan akan dikenang sebagai seorang doktor yang peramah dan mesra.

“To accomplish great things we must dream as well as act.”

Anatole France

PERANCANGAN

HADAPAN

Dalam usaha menyusun langkah bagi mencapai aspirasi ASM sebagai sebuah badan unggul yang mewakili komuniti saintifik ia memerlukan pelan pelaksanaan yang dinamik. Perancangan yang teliti, koordinasi yang efisien dalam menjalankan peranan untuk mencapai kepuasan bersama, ASM dengan ini melakarkan beberapa perancangan program untuk tahun akan datang.


2015

Mega Sains 3.0

2015-2016

Kaji Selidik Mega Sains 3.0 memfokuskan lima sektor berikut:

- Industri Automotif
- Industri Kreatif
- Industri Perabot
- Industri Plastik dan Komposit
- Industri Pelancongan

Sejajar dengan kaji selidik ini, ASM juga akan melaksanakan aktiviti Foresight bertajuk *'Envisioning Malaysia in 2050'* yang bertujuan untuk membangunkan Rangka Kerja Masyarakat Malaysia 2050. Inisiatif ini akan dijalankan oleh sebuah pasukan tidak rasmi yang terdiri daripada beberapa 'Badan Pemikir' negara serta organisasi kerajaan yang dikenali sebagai *'Foresight Alliance'*. Aktiviti Foresight ini seterusnya akan mewajarkan kepentingan komponen berikut:

- S&T
- Ekonomi dan Kewangan
- Masyarakat dan Budaya
- Geopolitik

STI *TrendWatch*

2015-2016

Projek Big Data Analytics (BDA)
'STI *TrendWatch*' menyediakan maklumat boleh-tindak bagi pembuat keputusan di semua peringkat untuk memperkukuhkan asas pembangunan negara seperti sektor ekonomi dan sosial. Aplikasi BDA yang komprehensif mampu memberikan data dan analisis sahih terutamanya dalam memperkukuhkan keputusan berkaitan STI untuk negara. Ianya berpotensi mendorong Malaysia untuk menjadi negara yang mempunyai ekonomi berorientasikan maklumat dan seterusnya mencapai aspirasi Ekonomi Digital 2020.
Projek ini merangkumi:

- Membangunkan Domain Pengetahuan STI
- Membangunkan Sistem Analisis STI
- Penggunaan Sistem Analisis STI

Future Malaysia Forum

Think. Share. Act

April 2015

Forum Juruanalisa NST merupakan platform untuk badan pemikir negara berkongsi hasil analisis dan penemuan bagi membantu pelbagai pihak berkepentingan seperti Kementerian dan Agensi Kerajaan membuat keputusan bermaklumat untuk perancangan polisi sosio-ekonomi jangka panjang.

Global R&D Leaders and CEOs Forum 2015

Injecting Soul into R&D

5 - 6 Ogos 2015

Ini merupakan satu inisiatif untuk mewujudkan interaksi dengan peneraju P&P global dalam membangun dan mencari penyelesaian terhadap isu global yang kompleks seperti keselamatan makanan, pencemaran dan kemerosotan alam sekitar serta kemiskinan. Situasi ini memerlukan komitmen untuk meningkatkan P&P melangkaui keuntungan komersil.

Bidang tindakan forum ini adalah:

- Pencarian Keprihatinan di dalam P&P
- Pembiayaan Lestari dan Pelaburan Berimpak
- Penghasilan Penyelesaian Berasaskan Nilai secara Bersama
- Perkongsian Teknologi
- Memanfaatkan Inovasi Sosial dan Keusahawanan

A year in review

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What we strive for

To be the Think Tank of the nation for matters related to science, engineering, technology and innovation.
To pursue excellence in the fields of science, engineering and technology for the benefit of all.

Mission

To be a thought leader

To be an Apex Advisory Body on STI matters

To be an effective promoter of public understanding and awareness of STI

To make STI a basis for economic development and societal well being

Functions

Providing advice to the Government on matters related to STI of national and international importance

Fostering a culture of excellence in science, engineering and technology in Malaysia

Assisting in upgrading technological capabilities of Malaysian industrial sectors

Promoting public awareness in understanding of science

Enhancing international networking and collaboration

Scientific publications

Strategies

Harnessing scientific minds to charter STI direction for the country

Fostering culture of excellence in STI

Ensuring independent authoritative and timely STI input

Promoting the utilization of science for societal well being

Facilitating the implementation of the innovation-led economy strategy

Promoting the application of STI for rural development

What we do

STI Strategic Studies

- Malaysia 2050
- Horizon Scanning
- Emerging Technology
- Sustainable Science

STI Strategic Programmes

- Human Capital Development
- Gateway
- Science Consortium
- Consultative Fora

Stakeholders

Internal

- Fellows
- Associates
- Young Scientists Network (YSN-ASM)
- ASM Management

External

- Prime Minister's Department and Central Agencies
- MOSTI and its agencies
- Other Ministries and relevant agencies
- Industry organizations
- Research institutions
- Higher Learning Institutions
- STI Professional Bodies
- STI International organizations
- Public and Rural communities

4 point Client Charter

1. Provide independent, evident based, reliable and timely advice
2. Committed in initiating quality programmes towards developing strong STI foundation for the nation
3. Represent Malaysia and its scientific community at the international arena
4. Disseminate scientific knowledge

Foreword



The Academy of Sciences Malaysia (ASM) has recorded commendable achievements as the national think tank for the advancement of science, technology and innovation (STI) in Malaysia. ASM fulfils the Ministry of Science, Technology and Innovation (MOSTI) role as the driver of STI agenda towards knowledge generation, economic and societal well-being of the nation.

Ideation is a process that drives the nation towards achieving excellence in STI. In this regard, the Ministry through ASM bridges this need by undertaking studies to identify the S&T opportunities for economic growth and to remain competitive globally. Foresight studies and benchmarking exercise would be carried out periodically to ensure STI initiatives remain relevant.

STI plays a strategic role in increasing the technological capabilities for the industrial sectors and the Ministry is very pleased that the Academy has come up with the necessary blueprints and roadmaps to support this initiative. ASM as a national focal point for scientific community acts as a gateway for Malaysian scientists to reach out to international scientific bodies and centre of excellence, thus providing the necessary exposures and collaborative opportunities.

I am confident that ASM will continuously contribute their expertise through their members and networks towards the creation of a nation that is not only developed, competitive and innovative but sustainable and inclusive as well.



YB Datuk Dr Ewon Ebin
Minister of Science, Technology and Innovation

> “Ideation is a process that drives the nation towards achieving excellence in STI.”

Foreword

Ministry of Science, Technology and Innovation (MOSTI) is responsible in formulating Science, Technology and Innovation (STI) policy as well as to explore and harness STI for societal and economic wellbeing of the nation. Among the 28 Agencies under the purview of MOSTI, the Academy of Sciences Malaysia (ASM) is the sole statutory body that acts as the national STI think tank. Thus, I would like to take this opportunity to congratulate ASM for its success in undertaking STI activities throughout 2014 as reported in this Annual Report.

As the leading Ministry in championing STI related issues, MOSTI pursues new areas of science which has potential to be explored and developed. ASM activities such as the 2014 STI Strategic Studies on Infrastructure, Housing, Transportation, Electrical and Electronics, Environment, Water and Energy sector fulfils this need. This study involves various stakeholders such as policy makers, researchers, academics, industries and STI professional bodies to ensure that we are always in the frontier of science.

To enhance the capacity of the national scientific community, particularly the young scientists, ASM conducts various STI Strategic programmes, among others, scientific exchange, networking and collaboration, recognition of excellence and promotion of science communication. They are our valuable assets in propelling the country towards a developed nation in the near future.

I would like to congratulate ASM on its strategic studies and programmes which are capable of achieving the country's aim towards excellence in STI. It is my aspiration that these efforts must persist so that MOSTI continues to play a more active and effective role in the national and international arena and in doing so, place the country on par with developed countries.



Dato' Sri Dr Noorul Ainur Mohd Nur
Secretary-General
Ministry of Science, Technology and Innovation



> "As the leading Ministry in championing STI related issues, MOSTI pursues new areas of science which has potential to be explored and developed."

A Word from President

The Academy of Sciences Malaysia considers its role as a "Thought Leader" in the science, technology and innovation (STI) arena as an immense responsibility to our society and nation.This Annual Report captures and communicates our work in the context of the Academy's focus areas and aspirations. The Academy is committed to relentlessly champion STI advancement and excellence for national development and global competitiveness.

The Academy translates this mission into action by undertaking strategic STI studies and delivering programmes that mobilise a wide spectrum of expertise not only within the Academy but also its network of prominent international partners and linkages. As we approach the two decade milestone since the inception of the Academy in 1995, as a Statutory Body through an Act of Parliament, it is evident that we have made great strides as a significant voice for science in the nation.

The Fellowship and Expert Network

The Academy's network of expertise has now expanded, bringing the total to 24 Senior Fellows, 234 Fellows, 43 Associates, 57 Young Scientists Network members and 96 Top Research Scientists Malaysia. Their valuable contributions and utmost commitment are the core success factor of the various strategic studies, programmes and activities of the Academy.

This year is also significant for the Academy with the conferment of our Prime Minister as an Honorary Fellow. His election to the membership of the Academy adds to the pool of prominent statesmen and leaders championing science through the Academy.

The two platforms for dialogue that have been initiated for our Fellows and expert network namely, the General Assembly and Idea Xchange sessions have seen growing interest and participation. These platforms have served as an avenue to fuel the ideation process of the Academy through constructive dialogue.

STI Advice

The Academy believes in providing the best scientific advice that is independent, credible, relevant and timely in nature. Accordingly, in 2014, we have enhanced our efforts to deliver the highest quality of scientific, intellectual and strategic input as a national STI Think Tank. This is made possible through the cultivation of a robust ideation process that explores creative avenues, different perspectives and diverse expertise. This has resulted in scientific advice that takes into account multi-sectorial feedback, a futuristic outlook and approaches that transcend conventional discipline boundaries.

This year we have finalised nine studies which are of national priority, while nine more are ongoing. One of the Academy's flagship studies is the Malaysia 2050 or The Mega Science Study which is currently in its 3rd phase. This study is about envisioning Malaysia in 2050, deliberating on the social, economic and geo-political drivers of change and making recommendations on the ecosystem that needs to be nurtured and the STI investments that need to be prioritized in order to succeed in the future. The Mega Science Study looks at the big picture of the future we desire, evidenced by sustainability, connectivity, prosperity, peace and harmony to ensure a high quality of life for all. The study then deliberates on how to leverage on STI to devise the desired future.
This year, the second phase of the Mega Science Study on five sectors namely, Housing, Infrastructure, Transportation, Electrical and Electronics, and Environment were completed.

The completion of the study also culminated in a National Forum on Mega Science to engage various stakeholders to positively influence policy-making, synergise concerted effort and draw attention to requisite strategic STI investments.

Another flagship initiative that the Academy has embarked on this year is a biennial Science Outlook report. The inaugural edition that provides an independent review of key trends in science, technology and innovation in Malaysia is being finalized and is expected to be ready in the first quarter of 2015. The Science Outlook is aimed at providing evidence-based insights and new perspectives on the Malaysian STI landscape. It is hoped that the Science Outlook will be a useful reference for informed decision-making.

Science Advocacy

The Academy recognises the need to broaden our scope beyond just providing scientific advice to policy advocacy in the interest of promoting sound STI governance and evidence-based, informed decision making in STI planning and management. In this context, it is imperative for the Academy to engage our stakeholders (scientific community, learned Academia, Government officials, industry captains, corporate stalwarts, partners from STI institutions and organizations as well as other stakeholders from the public and private sectors) creatively and positively through efforts that will earn trust and recognition. This will increase influence and impact of the initiatives and activities of the Academy.

As such, this year we have embarked on initiatives towards dynamic engagement with key people, ministries, organisations and the media. Apart from the formal platforms of our submissions to the Government as well as international consortiums and linkages, much of this work is also carried out behind the scenes through the networks of our Fellows and affiliates.

The year witnessed the launching of the Blueprint for The Establishment of Rare Earth-Based Industries in Malaysia — A Strategic New Source for Economic Growth. The Academy strongly advocates that the Rare Earth (RE) elements can form the basis of many value-added downstream industries in the country, especially for those industries which can contribute to the green economy of the nation. Apart from that, this Blueprint provides an outline in establishing and developing RE-based industries in Malaysia in the upstream, mid-stream and downstream sectors. This also comprises of efforts in identifying the necessary capacity building needs. The setting up of RE-based industries will move Malaysia's green economy agenda forward.

Strengthening STI capacity and capabilities

The entire socio-economic landscape of the world is being redefined by globalization and the rise of the innovation-led economy. Grand challenges such as climate change, energy security, food security, water security and cyber security are driving change like never before.

"In order to sustain competitiveness among nations, businesses and individuals in this era, it is imperative that we deepen knowledge, build networks, develop and deploy STI talents effectively, to improve our scientific and technological capabilities."

The Academy has always addressed the nation's highest concerns from the STI perspective. One outstanding example is the Academy's water sector studies that has been carried out since 2008 and is now recognized and sought after by most stakeholders both from Government ministries and agencies as well as non-governmental organisations. This success is due to the comprehensiveness of the Academy's water sector Advisory Reports arising from the ability to draw a unique, multi-disciplinary and cross-sectoral blend of expertise both locally and internationally to a common consultative platform.

The studies have been overseen by a dedicated ASM Water Committee. Adopting Integrated Water Resources Management (IWRM) as the central thrust, the Committee has for practical application in the Malaysian context, broken down IWRM into around eleven discrete sub-themes. Each of these sub-themes is then subjected to in-depth studies culminating in the preparation of a strategy plan or advisory report for consideration and adoption by the relevant authority or agency responsible for their implementation. Studies on seven sub-themes have been completed while another five are on-going.



Developing STI Talents

An important part of our work is to build and sustain a strong, diverse scientific workforce for the nation. As such science education is an important focus of the Academy and this is driven by a committed Science Education Committee.

The case study on the Inquiry Based Science Education (IBSE) was carried out due to concerns on the level of Malaysian achievement in science, as reflected in the results of the Programme for International Student Assessment (PISA) 2009 and 2012. The study aimed to review the feasibility of implementing IBSE as an initiative towards enhancing the effectiveness of teaching and learning of science in primary schools, including the student's understanding of science. The findings of this case study were very positive both from the teachers and students standpoint and provides good grounds for IBSE as the way forward to enhance science education. This study report will be presented to the Ministry of Education (MOE) in 2015.

The Academy focuses on fostering a culture of excellence in STI through an emphasis on three key elements that are talent, alliance and recognition. As part of its focus on strategic alliance towards fostering a culture of excellence in STI, ASM facilitates scientific exchange and collaboration with world renowned centres of excellence and science, technology and innovation (STI) institutions. The aim of such an endeavour is to catalyse the achievement of excellence in STI as well as develop high calibre Malaysian scientists who are capable of gaining international recognition. ASM plays the role of facilitating partnerships between Malaysian institutions and world renowned centres of excellence for the purpose of research collaboration and human capital development programmes that would support the Government's drive to build capacity and capability in STI.

Through this endeavour, this year saw seven young scientists having the opportunity to participate in the Annual Lindau Meeting with Nobel Prize Winners in Lindau, Germany, and summer programmes or attachments at world renowned Centres of Excellence such as the European Organization for Nuclear Research (CERN). The National Centre for Particle Physics (NCPP) that is part of the Academy's International Research Consortium programme, established in 2013, has progressed well this year. Through the NCPP, researchers in the field of particle physics have begun collaborating at the international level. I am pleased to inform that the installation of a high performance computing system at UM to download research data from CERN is underway.

International Fora

The strength and influence of the Academy is largely due to its vast international networks and linkages. Realising this, the Academy has administered numerous bilateral exchange programmes and facilitated several international research collaborations.

The rapid progress of scientific research on global sustainability and poverty alleviation in the Asian context has also caught the interest of the Academy. In addressing these pressing needs, the Academy hosted the Science Council of Asia (SCA) International Conference, themed 'Future Earth'.

"As I reflect on this year, I am convinced that the Academy has progressed well in steering the course to greater visibility, influence and impact. In translating our ethos of 'Think Science, Celebrate Technology and Inspire Innovation', we have expanded not only in the volume of strategic studies and programmes carried out but the level of engagement with stakeholders and the scale of communicating the work of the Academy."

Appreciation

The Academy highly values and appreciates the support and co-operation of all Government Ministries, Public and Private Institutions of Higher Learning, Research institutes, members of the Industry and Corporate sectors that partner with the Academy to bring forth positive and impactful outcomes through our various platforms of engagement. The scientific leadership of the Academy and its Fellows would not be possible without this crucial partnership and collaboration.

I also wish to record my heartfelt appreciation to all Chairpersons and members of the Academy's Committees, Task Forces and Working Groups who give generously of their time and expertise. My appreciation is also extended to the diligent and dedicated management team and all staff of the Academy for their efforts towards bringing the Academy's activities to fruition.

Looking Forward

The future success of our society and nation is very much dependent on its proficiency in science, technology and innovation. We have to do it right today to reap the benefits of STI in the future. I am mindful of the heavy responsibility and am looking forward to partnering with all of you ensure that the Academy fulfills its roles and responsibilities well and lives up to the expectations of all stakeholders.

Together, let us make a difference.



Tan Sri Dr Ahmad Tajuddin Ali FASc

“There are 3 things we need to do in achieving fast the aspirations of 2020. Firstly, we need to wake up and overcome our inner enemies - fear and doubt. Secondly, we need to be more forthcoming in our venture to become a nation of excellence. Finally, we need to take pride in our stride and work, but also be mindful in our actions and strategies that shape the future generation, of their role in continuing the aspirations of Vision 2020, whilst upholding national cultural and values that complete the identity of the new, progressive Malaysian.”

YAB Tun Dr Mahathir Mohamad
Honorary Fellow, ASM

ADVISING

THE POLICY MAKERS

ASM meets the needs for a robust and integrated STI Framework which encompasses S&T capacity, resources and local ecosystem. This framework enables ASM to advice the government on exploring Sustainability Science, forecasting Malaysia in 2050, identify Emerging Technologies and producing Science Outlook.

Mega Science Agenda

Malaysia 2050

The Mega Science Agenda is about envisioning the future we desire – sustainable, prosperous, peaceful, a progressive and connected Malaysia through its people, with the maximum use of STI to ensure continuous development in the next 40 years. We need to act now to capture future STI opportunities.

The second phase of the Mega Science Studies focused on five sectors: Housing, Infrastructure, Transportation, Electrical and Electronics, and Environment. These sectors were deemed to have the highest propensity for STI sustainable development and growth. Each of the sectors was compartmentalised into focus areas that were supported by Global Market Information and relevant commercial data. Each focus area was then scrutinised through a value chain towards a comprehensive understanding of the dynamics involved.

Cross-cutting issues that need to be urgently addressed were highlighted as follows:

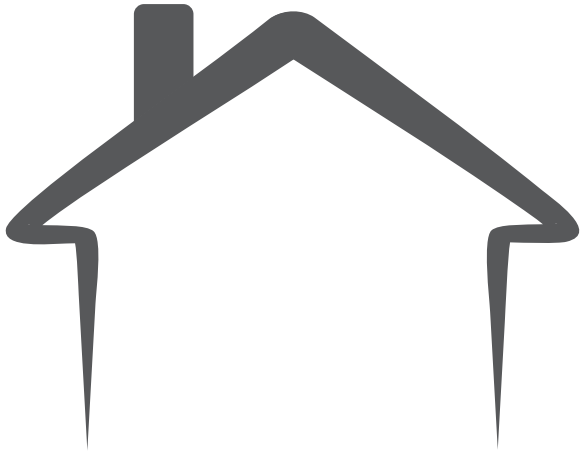
- Availability of integrated national data
- National planning beyond 2020
- S&T input in national policies
- Interdisciplinary linkages
- Comprehensive action plan / roadmap
- R&D focus areas and funds
- Knowledge and skilled workers
- Implementation, evaluation and monitoring

FACTSHEET

National Forum on Mega Science 2.0
The National Forum was held on 6 November 2014 where the findings of the five Sectors were presented by the Sectoral Leaders. The forum was attended by 268 participants from various Ministries, agencies, industries, non-governmental organisations and statutory bodies.

Based on the feedback received, an Integrated Report was prepared and the suggestions were incorporated. A Cabinet Memorandum was also prepared.





Housing Sector

Mega Human Settlement/ Megacities . Intelligent, Healthy and Safe Homes
Advanced Building Materials and Technology

"Housing is a catalyst for socio-economic development and poverty reduction that cuts across almost every other indicator for human development. Access to adequate and affordable housing prevents injury, disease and premature death; increases household and national income; and provides socio political stability"

(UN, 2011)

Strategic Investments for Housing Sector

1 Housing for compact city and Transit Oriented Development (TOD)

All homes should adopt green technology, and have access to high-tech communication system, amenities, affordable, and easily adaptable and appropriate for all age groups.

2 Smart Home System

The BestariHome / Bestari Community concept developed by MIMOS in 2005 should be revisited and expanded in key urban and rural areas to provide comfortable living and reduce energy consumption. The new application in smart homes includes the use of waste heat and human body heat to produce electricity.

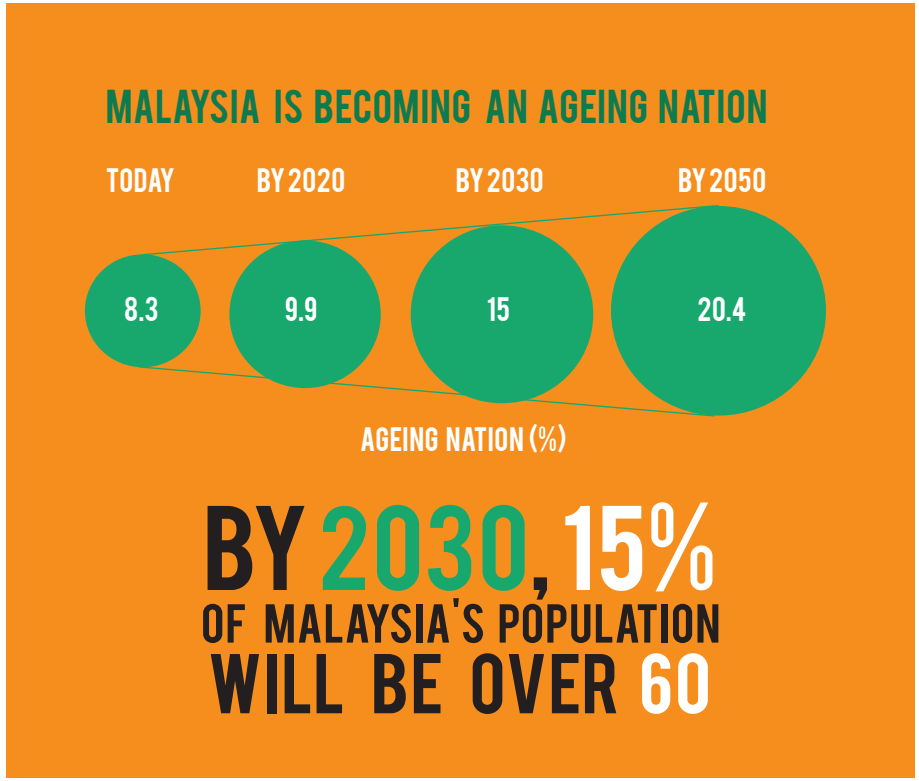
3 Advanced building materials and technology

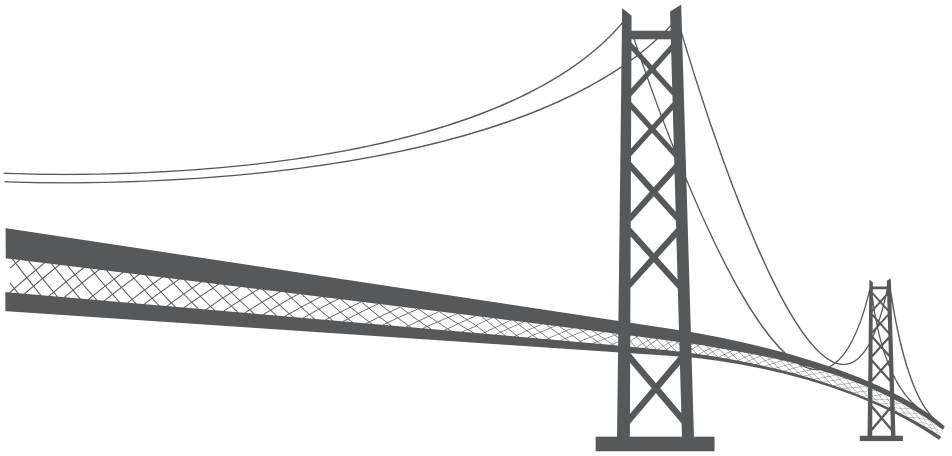
The combined use of prefabrication and a modular system, assisted by interactive building materials, automation and robotics as well as rapid prototyping should be adopted. Hence, Malaysia should strive to develop its sustainable smart building materials industry.

4 Housing designs for disasters

As the nation prepares for impending climate change leading to major floods, strong winds, earthquakes and tsunamis, good housing designs for disaster-resilience should be encouraged.

The urban population in Malaysia is expected to increase up to 70% of the country's total population by 2025. As such, the Government needs to provide not only adequate housing, but also affordable quality living. This calls for drivers of change in the housing sector such as good governance, supportive housing policies, strategies and plans and high technology for social sustainability. Consequently, the formation of a Design Review Panel to promote innovative design and control design standards is crucially required to address current needs such as climate change and preserving cultural heritage.





Infrastructure Sector

Engineering, Procurement and Construction (EPC)
Airports . Ports . Roads & Highways . Railways

"The challenge for policy makers is to undertake infrastructure development in a manner that not only promotes equity, efficiency, participatory decision-making, sustainability and accountability but also develops domestic capabilities in science, technology and innovation."

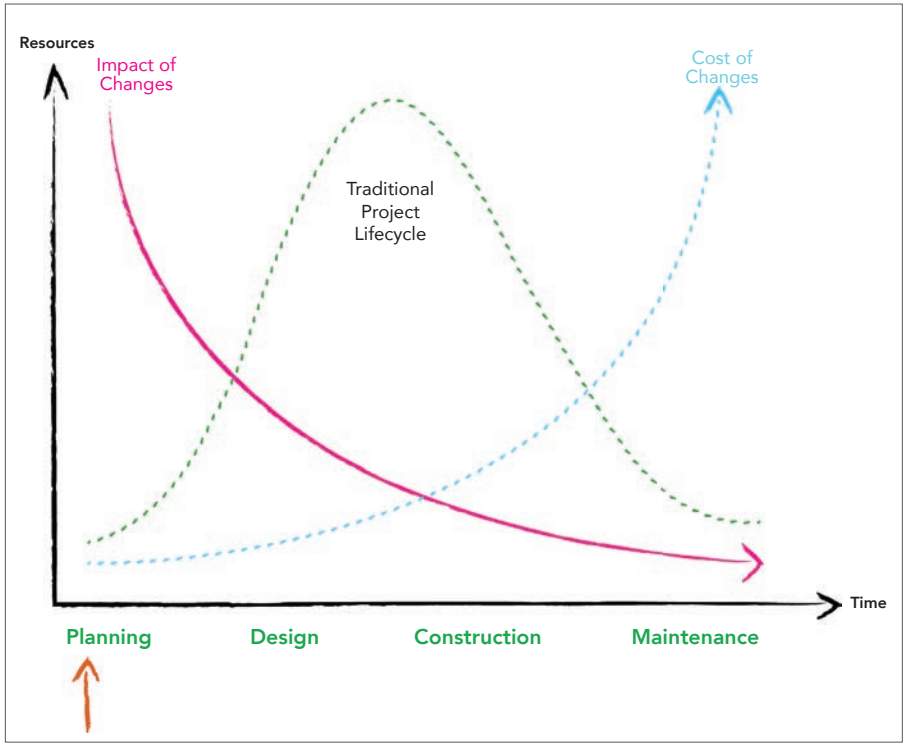
(Department for International Development, UK Government, 2002)

Strategic Investments for Infrastructure Sector

1 Sustainable Development Based on the Lifecycle Analysis

Emphasis on planning since the biggest sustainability gains can be achieved if changes are made at this stage.

Project Lifecycle Analysis



2 Integrated Infrastructure Master Plan

There is a need to integrate the different infrastructure to ensure sustainable development. The issues of sustainability should be addressed throughout the lifecycle of the infrastructure.

3 Sustainable Infrastructure Rating Tool

The adoption of the Sustainable Infrastructure Rating Tool will ensure that the attributes of both sustainable infrastructure and infrastructure sustainability can be preserved with requisite mechanism for evaluation, control and monitoring.

This is most critical in ensuring that our infrastructure sector remains sustainable, and yet competitive and productive towards 2050.
The following are important component in evaluating a project:

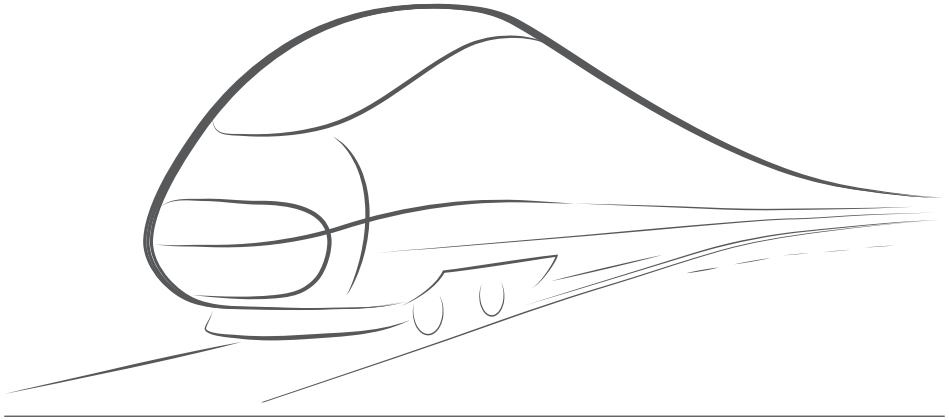
- Is the infrastructure really needed?
- What kind of infrastructure, where and when is it needed?
- Infrastructure prioritising
- Sustainability modelling
- Recommend sustainability metrics / parameters for the chosen model
- Monitor performance of the infrastructure

As a sector that can strongly influence the nation's sustainable development agenda, the infrastructure sector is an important and strategic sector to plan and manage. Infrastructure is a key determinant to support the nation's pursuit of sustainable development and STI intervention would play a crucial role.

FOR THE LAST 5 YEARS THE GOVERMENT HAS SPENT A TOTAL AMOUNT OF RM470 MILLION FOR THE MAINTENANCE OF SLOPES THROUGHOUT THE COUNTRY.

TUNNELING, PROBABLY, NEEDS TO BE SEEN AS AN ALTERNATIVE TO SOLVE THESE PROBLEMS.

(Speech of YB Datuk Seri Haji Fadillah Haji Yusof, Minister of Works, 2 September 2014)



Transportation Sector

Rail Transport . Road Transport . Aerospace Industry
Marine and Inland Water Transport
Safety and Enforcement Management Services (SEMS)

"We note that transportation and mobility are central to sustainable development. Sustainable transportation can enhance economic growth and improve accessibility. We recognise the importance of the efficient movement of people and goods. Access to environmentally sound, safe and affordable transportation improves social equity (fairness), health, resilience of cities, urban-rural linkages and productivity of rural areas"

(UN Conference on Sustainable Development, Rio+20)

Strategic Investments for Transportation Sector

1. The transportation sector would benefit from the adoption of the concept of 'Avoid – Shift – Improve'.

Avoid
(reduce the need to travel)

- Communities need to be better designed to include accessible and convenient alternatives to driving;
- Work from home / Telecommuting;
- Integrated land use – Transportation Master Plan; and
- Transit Oriented Development (TOD).



FACTSHEET

In 1991, the demand for vehicle travel in Malaysia was only at 13 million trips a day. However, in 2010, this figure increased by 300% to 40 million trips per day, and is expected to reach 133 million in 2030, (SPAD, 2010).

Shift
(choose more efficient transport modes)

- Manage mobility, urbanisation, sustainable living, environmental effect, efficient transport as well as over population, rail-based transportation systems, of which would need to be planned early nationwide;
- Plan for ice-free polar shipping:
  - Trans-Asian Railway Network should be followed up with the eastern and western routes already planned and built in phases;
  - Malaysia to be ready in the event the polar route becomes ice-free in 2100 for shipping (estimated to cut shipping time from 48 days (Suez Canal route) to 35 days (polar route) for ships travelling from Rotterdam to Dalian, of which potentially by-passing Malaysian sea ports;
- Use public transport fully from the first to the last mile;
- Introduce Tram / Bus Rapid Transit (BRT) for urban transportation;
- Consider the water transport as a viable alternative; and
- Impose Area Congestion Pricing (ACP).

FACTSHEET

- Space industry will be one of the trends of the future.
- Over 900 satellites will be launched by 2020 (Frost & Sullivan Report 2011)

Improve
(opt for clean fuels and technologies)

- Development of a seamless integration of all transportation modes encompassing land, aerospace, and maritime;
- Integration of all modes should be facilitated by information technology and embedded in a multimodal travel system;
- Opt for green transportation by producing and using clean, highly efficient vehicles powered by sustainable low carbon fuels and electricity such as energy efficient vehicles (EEV), electric vehicles and hybrid vehicles;
- Leverage on commercial satellite-based technology (ITS, GPS, automobile navigation, air-traffic control and automated aircraft-landing) to enhance the navigation system for the transportation sector towards significantly reducing accidents, fuel consumption and travel time;
- Open Road Tolling / Free-flow Toll System;
- Design a Parking Guidance Information System;
- Creation of a sole agency in charge of transportation;
- Availability of nationwide high speed train services; and
- Formulation of an Automatic Dependent Surveillance Broadcast System (ADS-B).

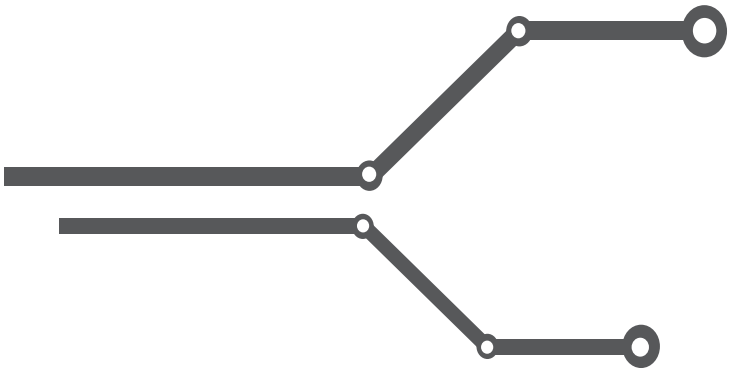
2. Prioritise R&D in the transportation sector:

i. Internet of Things (IoT) / Internet of Vehicle (IoV) technology to be adopted to enhance vehicle-to-vehicle, vehicle-to-infrastructure or vehicle-to-human connectivity. This enable beneficial real-time information and services to support the transportation sector;
ii. Efficient additive manufacturing technology which is the industrial version of 3D printing can be applied to improve manufacturing efficiency for the aerospace, land transportation and maritime industries;
iii. Vehicle Design Technology should be effectively deployed to produce clean, safe and silent vehicles for all different modes of transport; and
iv. Establish a Transportation-focused Research Institute.

FACTSHEET

Transportation: Increased Mobility Due to the Increase of Real Gross Domestic Product (GDP) and Population

- A country's mobility usually grows with increasing GDP and its population. In terms of GDP, an average annual growth of 6.3 % was observed from 1971 to 2010 (40 years), where the per capital GDP increase from RM6,000 to RM30,000 (SPAD, 2010).
- According to the National Physical Plan 2, Malaysia's population has been experiencing an annual growth of 2.2% from 2000 to 2008, bringing the population from 23.3 million to 27.7 million. By 2020, the population in Peninsular Malaysia will be approximately 28 million.



Electrical and Electronics Sector

Silicon-based Devices Together with Compound Semiconductors
Energy Generation, Transmission and Distribution
Solar as an Efficient Renewable Energy

"The Electronics and Electrical sector has played a critical role in the development of an industrialised Malaysian economy. We now need to be a strategic E&E centre for leading global E&E players and domestic champions, offering high value for money and with a deep pool of talent."

(YB Dato' Sri Mustapa B. Mohamed
Minister of International Trade and Industry (MITI))

Strategic Investments for Electric and Electronic Sector

1 Development of silicon-based devices together with compound semiconductors

Even though compound semiconductors are attractive, silicon is still the de facto standard in electronic industries. Furthermore, Malaysia is blessed with high-quality silica sand which is the main ingredient in silicon devices.

2 The establishment of a locally-made consumer electronic products brand

By developing Malaysia's own 'Sony' or 'Samsung', we are able to participate in the higher value chain that will further enable our electronic industry to grow continuously and sustainably in the future. This will lead to the availability of locally-made consumer electronic products and will support the complete ecosystem in the electronic sector. Furthermore, the nation can explore and capitalize on its expertise in R&D, Integrated Circuit design, fabrication, manufacturing and product development. Universities can play their respective roles in the research and development. Thus, reducing the burden on the new company or GLCs.

3 Energy generation, transmission and distribution

For energy generation, transmission and distribution up to 2020, the following points were highlighted:

- Energy Efficiency
- Net Neutral Community and Rural Transformation
- Smart Grid and Decentralized Renewable Energy System

4 Production of solar hydrogen for urban and rural electrification – an idea for renewable and green technologies.

Additionally, other ideas for consideration include the introduction of the Smart Grid, Decentralized Systems, tapping Marine Energy (Offshore Thermal Energy Conversion, Tidal, Wave and Offshore wind) as well as the use of advanced nuclear (using thorium as a fuel source)

5 Energy supply stability and the hydrogen economy

For energy supply stability and the hydrogen economy (for implementation in 2031 onwards), the full-scale hydrogen economy and advanced renewable hydrogen systems would be expected to be implemented.

6 Solar as an efficient renewable energy

i. Industry driven (up to year 2020), highlights as follows:

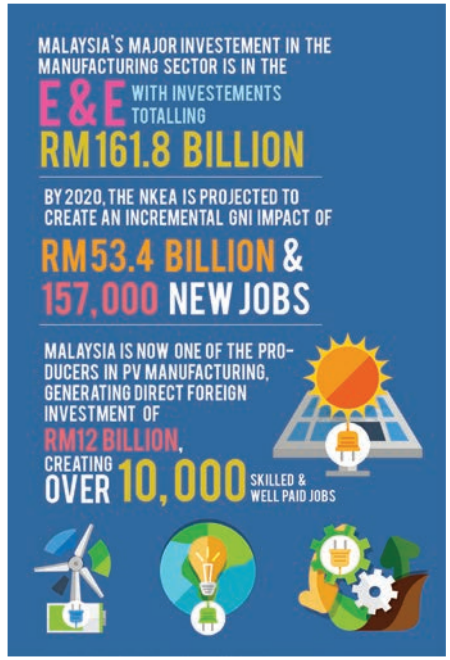
- Lower Silicon feedstock prices
- Thinner Silicon wafer technology
- Thin films
- Improved processing
- Improved performance

ii. Technology driven (up to year 2030), highlights as follows:

- Thin films
- Concentrators
- Silicon wafer < 100 micron
- Silicon cells beyond 25%

iii. Basic research driven (year 2031 to 2050 and beyond) to focus on:

- Quantum dots
- Multi-junctions
- Thermophotonics
- Intermediate band
- Bio-inspired areas





Environment
Sector

Climate Change and Carbon . Water . Energy
Waste . Land and Forests

"Sustainable development recognises that growth must be both inclusive and environmentally sound to reduce poverty and build shared prosperity for people today and for future generations. While efforts to expand access to safe drinking water are on track to achieve this target in most regions, 2.5 billion people still lack access to improved sanitation. Land is still being degraded, forest lost and species endangered as carbon emissions continue to change the environment we live in."

(The World Bank)

Strategic Investments for Environment Sector

1 Climate Change and Carbon

Combat contribution to the Carbon footprint by the production of every agricultural and industrial product, buildings and townships by:

- Following the UN Recommendation of replacing coal and hydrocarbons for electrification with renewable energy
- Improve efficiency in use of energy
- Reduce wastage
- Halt deforestation
- Improve maintenance and planning.

2 Water

Address diminishing water catchment areas and shortages of water needs including areas of intensive agriculture by:

- Repairing and maintaining distributions systems to reduce leakages
- Improve systems to store and use rain and storm water efficiently
- Explore and use ground water resources
- Improve rain water infiltration in ground (reduce impermeable surface areas in cities)
- Clean up and prevent pollution of rivers.

3 Energy

Increase of carbon dioxide in atmosphere due to increase energy demand. Hence, a need to promote renewable energy e.g. wood, solar and wind (in selected areas).
The production of wood for energy needs national refocusing of energy planning away from 'high-tech' centralised to low-tech, safe and distributed wood energy.

4 Waste

High environmental cost of disposal through the use of landfills.
Therefore, reduce waste by designing and planning of products (introduce Life cycle Assessment in product manufacture), recycling waste with mechanisms in place for separation and recycling, organic waste composted into fertilizer while usage of incineration and landfills should be last options and kept to a minimum.

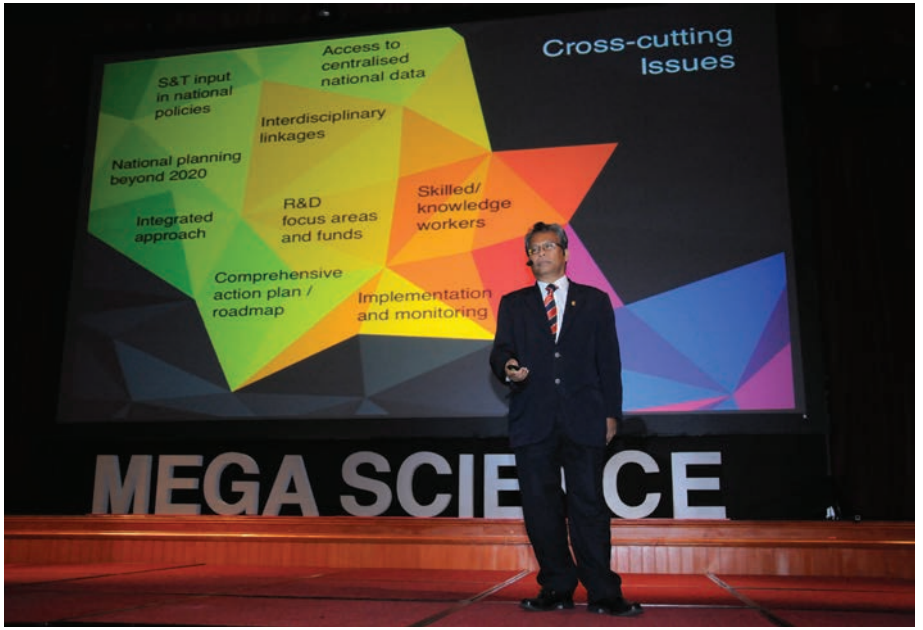
5 Land and Forests

Control and halt deforestation, improve productive use of deforested land, refocus on regeneration and conservation refocus on use of wood and trees as community green resources are suggestion to address land degradation issue. Among the STI opportunities suggested are as follows:

- Widespread use and invention of energy-saving devices
- Development of alternative energy sources including wood biomass
- Improvement of water-management technologies.
- Development of local-initiatives in dealing with urban waste.
- Improve reforestation methodologies, management of urban trees for wood production, protection of mangroves as coastal environmental defences.











National Forum on Mega Science 2.0

Blueprint on the **Establishment of Rare Earth-Based Industries Malaysia**



The official launching of "Blueprint on the Establishment of Rare Earth-Based Industries Malaysia" by Dato' Sri Dr Noorul Ainur Mohd Nur, Secretary-General of MOSTI on 8 December 2014

In an ongoing effort to sustain the nation's economy, Malaysia is always on the lookout for new business opportunities and economic growth areas. ASM's Advisory Report entitled, "Revitalising the Rare Earth Mineral Programme in Peninsular Malaysia as a Strategic Industry", identified the rare earths business as a strategic sector for Malaysia and recommended that a Blueprint on the Establishment of Rare Earth-Based Industries Malaysia be produced.

As the world embraces green technology, the role of rare earths has become increasingly significant in the global economy. The rare earth elements find wide use in a range of products and gadgets which demonstrate the efficient use of energy as well as a more effective deployment of renewable energy including electric cars and solar photo-voltaic.

The establishment of the rare earths processing, Lynas Corporation's plant is in Kuantan, has also prompted a more detailed evaluation of rare earths business opportunities, especially on how best Malaysia can participate. Towards this end, the ASM Task Force on Rare Earths, established in 2013, developed the Blueprint with an allocation given by MOSTI.

The Blueprint aims to outline the benefits of establishing and developing a total supply chain of rare earth industry in Malaysia for the upstream, midstream and downstream sectors, which includes identifying the necessary capacity building needs.

This Blueprint discusses the rationale for venturing into the industry, including the risks and opportunities involved. This also provides a pathway for the nation to effectively enter this new opportunities involved. This also provides a pathway for the nation to effectively enter this new potential growth area.

The need for capacity building is highlighted in the Blueprint to ensure that there are sufficient and fully-trained Malaysians from the vocational/technical levels to graduates in various science, engineering and technological fields to fulfil the expected industrial demand.

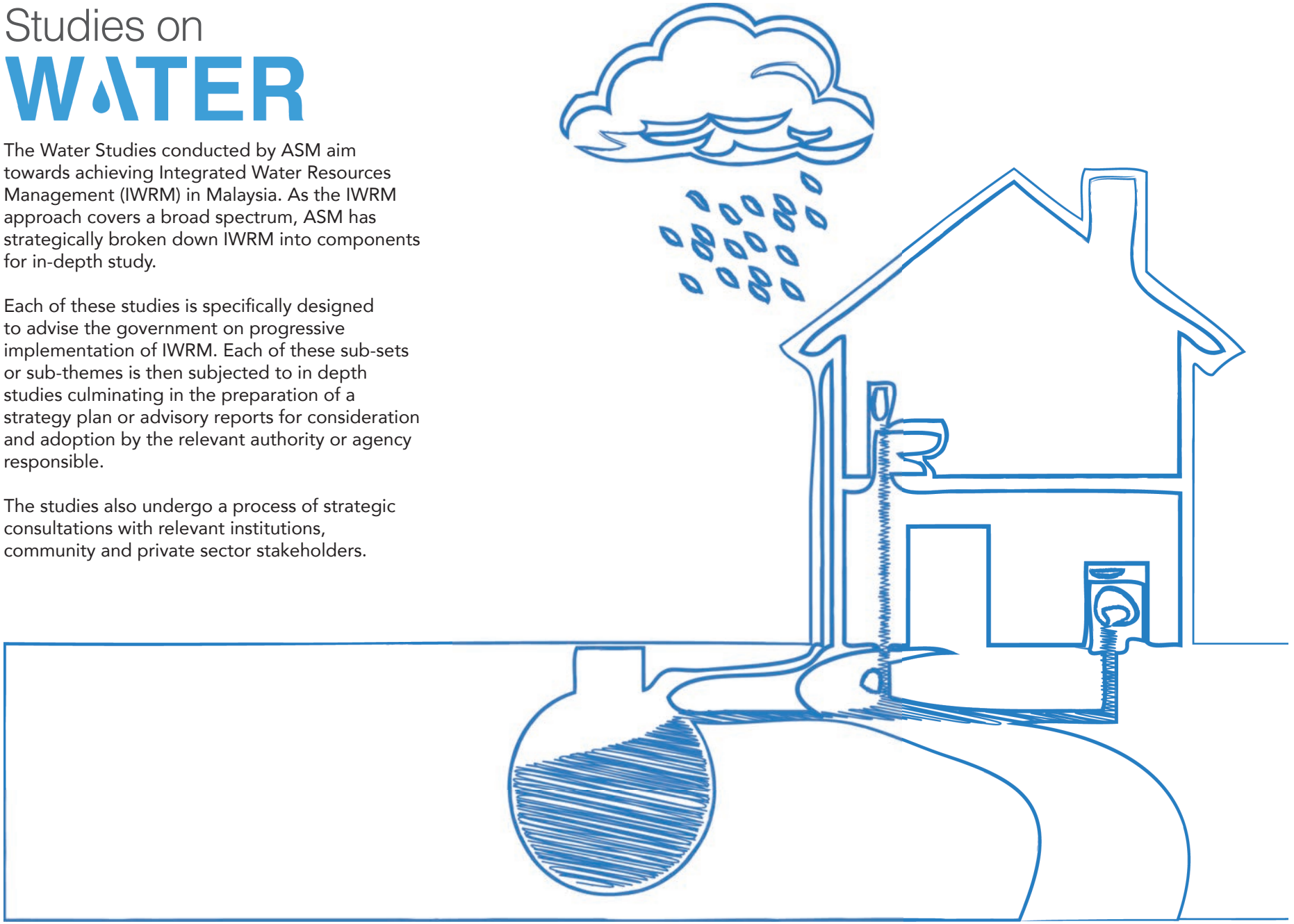
Another strategy to move forward in this industry would be for Malaysia to forge collaborations with international technological partners that have proven capabilities in rare earths research and development, such as Australia, China, Japan, South Korea and USA.

Studies on WATER

The Water Studies conducted by ASM aim towards achieving Integrated Water Resources Management (IWRM) in Malaysia. As the IWRM approach covers a broad spectrum, ASM has strategically broken down IWRM into components for in-depth study.

Each of these studies is specifically designed to advise the government on progressive implementation of IWRM. Each of these sub-sets or sub-themes is then subjected to in depth studies culminating in the preparation of a strategy plan or advisory reports for consideration and adoption by the relevant authority or agency responsible.

The studies also undergo a process of strategic consultations with relevant institutions, community and private sector stakeholders.



Water R&D

In leading up to this Advisory Report, ASM had earlier commissioned a Position Paper entitled "A Study on Current Status and Needs Assessment for Water Resources Research in Malaysia". This study was completed in May 2014 and found that past and current research on water in Malaysia had been largely ad-hoc, fragmented, and often undertaken with a limited and narrow focus. This study identified 96 research topics related to 21 water themes to harness STI in addressing the country water management issue and challenges through an integrated and coordinated multi-disciplinary R&D framework.

The Water R&D Advisory Report entitled, "Setting a National Agenda for Integrated Water Research" was published in 2014. From that, four recommendations were highlighted, which are as follows:

1 Adoption and dissemination of the National Integrated Water Research (NIWR) Agenda

Water as a Resource and Related Wealth Creation

- Hydrological
- Policy and regulation
- Hydrology, limnology and associated mathematical modelling
- Hydrogeology and groundwater modelling
- Eco-hydrology and relevent IWRM sub-sets
- Ecosystems services - resource provision, environmental flows and regulation
- Biodiversity and natural products of terrestrial and aquatic ecosystems
- Coastal systems
- Water quality and pollution
- Participatory management
- Conflict resolution
- Water-related hazards
- Climate change
- Resource for wealth creation

Water for Livelihood and Wealth Creation

- Sustainable water supply development and management for multi-purpose use
- Integrated Water Demand Management
- Wastewater management and reuse
- Agricultural drainage
- Green technology
- Water-Food-Energy Nexus
- Products and services for wealth creation

2 Water Research Governance Options

Option 1

Establishment of a National Water Research and Development Centre (WRDC), a statutory body as a long-term solution to act as a clearing house and one-stop centre to manage all aspects of water R&D in the country.

Option 2

Forming a Water Research Consortium led by the National Hydraulic Research Institute of Malaysia (NAHRIM) among existing water-related public and private sector research organisations. This acts as a short-term solution to facilitate coordinated water-related research.

3 Provision of Adequate Human and Financial Resources

The proposed research agenda requires the strengthening of implementation capacity through deployment of adequate human resources in specialised areas and appropriation of adequate funding to implement the multifaceted research programmes and initiatives. It is also recommended that a launching grant be allocated to spearhead the NIWR Agenda.

4 Implementation of NIWR Agenda

There is a need for the custodian of water resources in the country to take the lead in implementing the NIWR Agenda.

Unlike energy, there is no alternative to water resources.

At present, the country relies almost entirely on surface water (97%), and this situation is obviously untenable in the long run for water security.

Advisory Report: A National Key Priority Area (NKEA) on Water

The Advisory Report was prepared to underpin the Malaysian Water Vision and the Malaysian Water Resources Policy to realise the crucial role of water for life, national security and the economy. Water is life, and therefore, it is necessary to regard water as an integral resource with great potential to contribute to humanity, the economy and societal development.

Similar to the Entry Point Projects of the Performance Management Delivery Unit (PEMANDU), the study has identified 72 possible Entry Projects for 'Water as a Resource' and 'Water as a Utility'. This could potentially promote economic opportunities, while safeguarding our water resources. The study has been completed and the report is expected to be published in 2015. Following are the recommendations:

1 Water as a National Agenda

Water security and sustainability underline our economy and livelihood. Therefore, it is imperative for the country to have a National Water Agenda. This will lead to determining and addressing all aspects of water management in ensuring a sustainable water future.

2 Promote Water Research and Development Agenda

It is increasingly difficult to argue for a business as usual scenario when the stakes are so high while responses to water management issues are low. Emphasis on water research and development is important to ensure water sufficiency for all beneficial uses. There is also a need to achieve significant improvements in the ecological health of rivers, lakes, floodplains, wetlands and estuaries so that the many water sources and services they provide are maintained for the present and future use.

3 Develop Water Benefits

The industries are aware that the inter-related problems of food, energy and water are threatening their own industrial sustainability and production. Meanwhile, there is a business opportunity created in the need to increase efficiency and reduce waste in the environment.

4 Water-Food-Energy Nexus

The agricultural sector is not producing food at a rate that is proportionate with the population growth. As a result, cost of food production is increasingly more expensive. Furthermore, water rationing which is detrimental to agricultural and energy production will only increase the cost of production leading to more hardship for the people. The cost of energy production which drives the economy will also rise at the expense of the consumers. Therefore, there is a necessity to strive for a balance between the nexus tripod. Thus, water will be needed as a NKPA for the future survival of the country.

STI Consultancy Provider

Status Report: Sustainability of Malaysian Palm Oil Industry 2013/2014

ASM completed the "Status Report: Sustainability of Malaysian Palm Oil Industry 2013/2014". This is a consultancy work with the Malaysian Palm Oil Council (MPOC). The report is to provide an independent baseline data on the status of sustainability in Malaysian palm oil industry based on sustainable development indicators.

Through this consultancy work, ASM has developed the Palm Oil Sustainable Development Index (POSDI); a sustainable development indicator scoring tool which is designed based on the sustainability framework. The report analyses and presents data relevant to the Malaysian palm oil industry and its sustainability across economic, social, environmental and quality of living dimensions. The status report was launched by Dato' Lee Yeow Chor, Chairman, MPOC during the International Palm Oil Sustainability Conference (IPOSC) 2014.

National Survey of R&D in Malaysia 2014

The National Survey of R&D in Malaysia 2014 is a continuation of series of survey that has been conducted since 1994. The survey aims to measure and monitor the achievement of R&D activities conducted by agencies and Government Research Institutes (GRI), Institute of Higher Learning (IHL) and Business Enterprises (BE) in Malaysia. ASM has been appointed as the consultant for the Malaysian Science and Technology Information Centre (MASTIC).

The study is expected to be completed by the end of 2015.



Study on the Implementation of Hands-On **Inquiry-Based Science Education (IBSE)** in selected Primary Schools

A study on the implementation of IBSE at four selected primary schools in Hulu Langat was conducted by ASM as a pilot project from 2012 - 2013. The study was carried out based on ASM's concern for the level of Malaysian educational attainment in science, as reflected in the results of Programme for International Student Assessment (PISA) 2009 and 2012. The study aims to look into the feasibility of implementing IBSE towards enhancing the effectiveness of teaching and learning of science in primary schools, as well as the student's understanding of science. The study was carried out through a qualitative and quantitative approach.

The findings of the study based on the Teacher Self-Reflection Tool, observation, interview sessions with teachers and students year-end examination assessment are as follows:

1) Teachers have better understanding of IBSE after participating in the training workshops;
2) Teachers are now capable in developing science process skills among pupils through IBSE method;
3) Pupils' performance in science especially science process skills and problem solving had also increased; and
4) Pupils also showed a positive behaviour change especially in their motivation and interest in science at the end of pilot study.

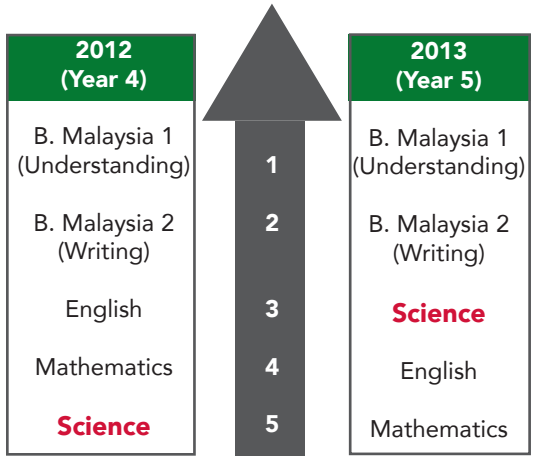
Although the implementation of IBSE was initially perceived as a challenge, the guidance and mentoring that took place during the pilot project had increased teachers' confidence to implement the IBSE method. The tendency of change from teacher-centred to pupil-centred learning and teaching was clearly observed.

Percentage of Positive Response on Teacher's Perception

Teacher's Role	
Building on pupils' ideas	92.9
Supporting pupils' own investigation	93.9
Guiding analysis and conclusion	80.6
Pupil Activities	
Carrying out investigations	68.6
Working with others	92.9
Pupil's Records	
Record of pupils' work	78.6
Pupils' written records	71.4

* Result of Fibonacci IBSE Self-Reflection Tool

Ranking of Subject (based on score)



iNBRIEF

IBSE aims to assist teachers to discover and teach science and technology by implementing investigation approach in education that can stimulate scientific mind, understanding of the world and expression skills in student.

To further assess the effectiveness of IBSE method, the Trends of International Mathematics and Science Study (TIMSS) assessment was conducted among the pupils that were involved in the IBSE Study. For comparison purpose, pupils from two non-IBSE classes also underwent the TIMSS assessment on 30 October 2014.

Based on the analysis of pupils' scores for objective vs subjective questions, IBSE pupils outperformed non-IBSE pupils for both types of questions. It can be inferred from this data that IBSE pupils have a better understanding and ability to articulate answers compared to non-IBSE students especially for subjective questions. This also reflects the focus of IBSE method which emphasises the development of language through the learning of science.

The IBSE pilot project has highlighted the following:

1) IBSE is the way forward in teaching and learning of science as its creates motivation, interest and excitement in learning;
2) IBSE develops students' thinking through argumentation, hypothesizing, designing, conducting investigation and making final conclusion;
3) IBSE is very relevant to new emphasis on development of Higher Order Thinking Skills (HOTS) by MOE as well as the new syllabus in Primary School Standard Curriculum (KSSR);
4) IBSE is in line with KSSR which supports the development of language through the learning of science;
5) IBSE promotes the development of soft skills through group activities and discussion;
6) IBSE is a practical, feasible approach and inexpensive. It uses cheap and recycled materials;
7) IBSE provides innovative ideas to teachers in conducting inquiry; and
8) To ensure effective implementation of IBSE, there is a need for teachers to be trained for at least 60 hours on IBSE.

FACTSHEET

20 teachers were trained with IBSE method in Regional Centre for Education in Science and Mathematics (RECSAM) and given a continuous training of 30 hours through weekend workshops.

Objectives of the pilot study:
- To assess teachers' understanding of IBSE pre- and post - training
- To assess teachers' capability in IBSE and developing science process skills among pupils
- To assess pupil's performance in science – science process skills and problem solving
- To assess pupil's behaviour change – motivation and interest at the end of pilot

The four selected primary schools identified by the Ministry of Education (MOE) that were involved in the study are:
- SK Semenyih, Semenyih
- SK Bandar Sri Putra, Kajang
- SK Bandar Tasik Kesuma, Beranang
- SK Seksyen 7, Bandar Baru Bangi

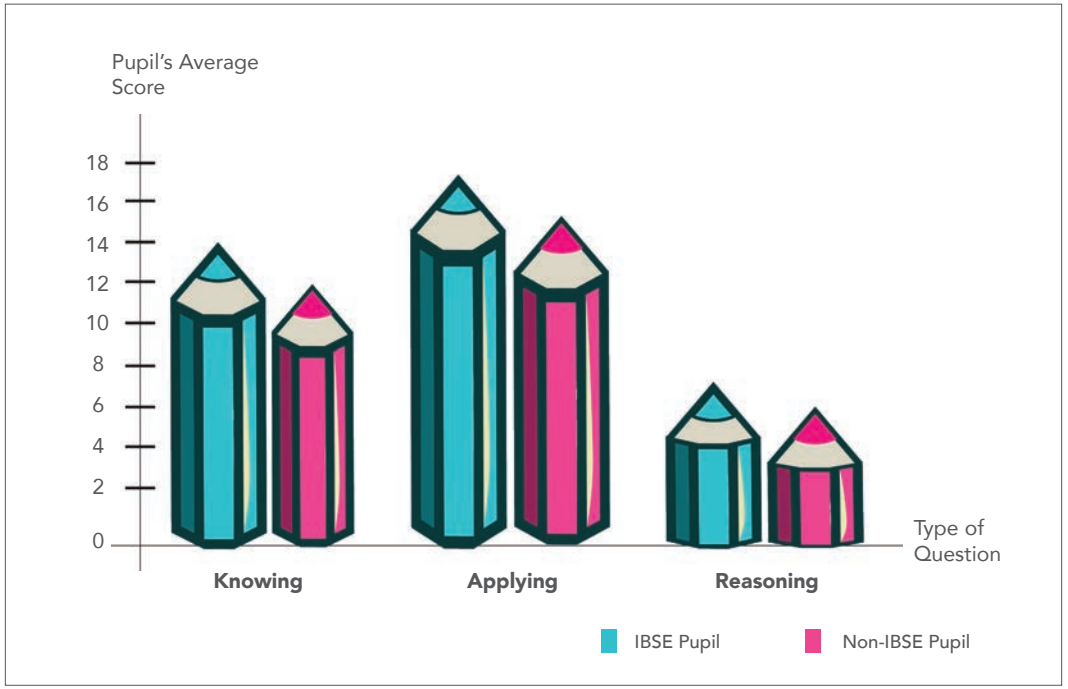


Teachers preparing for IBSE lesson



IBSE pupils taking part in a practical lesson

Performance comparison between IBSE and Non-IBSE Pupil



FACTSHEET

TIMSS Assessment is a standard measurement for international trends in mathematics and science achievement at the fourth and eighth grades, as established by the International Association for the Evaluation of Educational Achievement (IEA).

The TIMSS questions comprised of objective and subjective questions that were divided into 3 main categories:
i) Questions on knowing
ii) Questions on applying
iii) Questions on reasoning

Sample of TIMSS Assessment:
293 IBSE pupils
280 non IBSE pupils from the same schools

Instrument:
50 questions of Grade 4 Released Items of TIMSS assessment that were translated into Bahasa Malaysia

Science Outlook

Analysing STI Landscape

ASM embarked on the Science Outlook exercise towards providing an independent review of key trends in STI in Malaysia based on the NPSTI, 2013-2020 and its six pillars.

The Science Outlook looked at historical data, the performance of STI development and gaps vis-à-vis the targets at various stage set out by the Policy. It is also our effort to take note of some best practices, compare and contrast various country models, submit recommendations and propose way forward solutions for consideration.

ASM has deployed various research methodologies for data collection and analysis, which may not be exhaustive, but sufficient to gain insights and perspectives on the STI landscape of Malaysia. For that, there were several analysis and survey undertaken to identify the current scenario, capacity and capabilities of STI. The analysis and survey conducted in 2014 are as follows:

iNBRIEF

Hansard is the Parliamentary proceedings which are highly structured transcripts of exchanges between politicians in the Parliament

1. STI Awareness among Members of Parliament in Malaysia

STI awareness is important for the decision makers of the country because scientific knowledge and technology is a powerful instrument to spur extensive economic growth for Malaysia. Hence, an analysis was conducted using Hansard data (2008-2013) to measure the STI awareness among members of Parliament (ruling and non-ruling members), frequently discussed STI issues as well as assess the intensity and quality of discussions.

Preliminary findings of the analysis are as below;

a) **Frequently discussed STI sectors and issues**
The STI sectors that gained interest among parliamentarians were medical and health, agriculture and alternative energy issues, while the specific STI issues included the Angkasawan Project, Flooding, Science education and Lynas.

b) **Quality of the questions**
The examination of the type of questions associated with STI revealed that a majority of the questions used were of ex-post questions; suggesting that parliamentarians play a passive role in charting the STI direction of the nation.

c) **Pattern of the discussion**
Discussions are always based on their party agenda, hot topics in the media and issues that concern at constituency level.

2. Analysing STI Elements in Existing Nnational Policies

The exercise is to analyse the existence of STI elements in the 81 national policies. Though Malaysia has had an STI policy since the 1980s, most policies that predates the 1986 NSTP does not have explicit reference to STI.

Based on the analysis findings, there was a vast increase of the national policies with STI elements from 1986 to 2014; from 20% to 91% respectively. This suggests a paradigm shift in policy design that may be attributed to the launch of the first NSTP in 1986 as most of post-1986 policies contains current terms such as R&D that is absent from older policies.

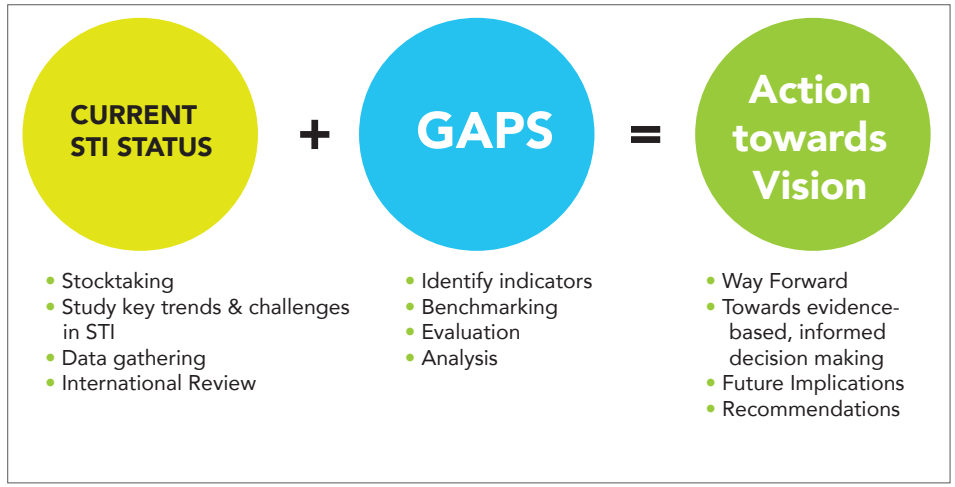
3. Targets of STI policies

An analysis was done on National STI policies, as shown in figure below, and the targets of each policy to track progression of STI in the nation. This analysis revealed that there was limited documented rationale and data to support targets as well as expected outcomes of STI policies.

Analysis of STI Elements in Malaysian National Policies

Policies	With STI Elements	Without STI Elements
Pre 1986	**20%**	**80%**
Post 1986	**91%**	**9%**

Philosophy of Science Outlook Diagram
An independent review on key trends on STI in Malaysia



Malaysia's current STI capacity and capability to meet various targets and its potential to emerge as a STI-powered nation must be determined through base-line studies or in-depth review of various STI Policies prior to transitioning to a new policy and targets. This raises the need to establish a sound evaluation and monitoring mechanism as well as invest in the ideation process.

4. Current Status, Trends and Gaps in Malaysia's RDC Landscape

Interviews were conducted with top management from Government Ministry and agency, Institution of higher learning, Technology Licensing Office (TLO), industry representative to understand their perspective on the STI landscape of the country. In addition analysis was also done on RDC data obtained from Department of Statistics Malaysia (DOSM), MOSTI, MOE, Malaysian Intellectual Property Office (MyIPO) and others to identify the current status, trends and gaps in Malaysia's RDC development.

5. Demand for Skilled Labour

An analysis was done using Global Trade Analysis Project (GTAP) Model, where Malaysia was modelled as a single country and compared to 11 regions.

The analysis indicated that capital deepening, human resource development, technology augmentation and innovation in Malaysia may induce a rise in technical change which is biased towards skilled labour. A presumed increase in Skill-biased Technical Change (SBTC) in Malaysia will induce greater relative demand for skilled labour over unskilled labour.

ASM studies on the impact of technology upskilling on industry and economic gnb v Malaysia showed that improvement in technology efficiency among skilled workers particularly in the three sectors of the economy:

i) Financial, business, education and public services
ii) Transportation and communication
iii) Heavy manufacturing

These sectors would have substantial positive impacts to the country in terms of welfare gain, GDP and trade balances. Results from the comparative analysis of sectors indicated that the demand for skilled labour is most pronounced for Transportation and Communication sector.

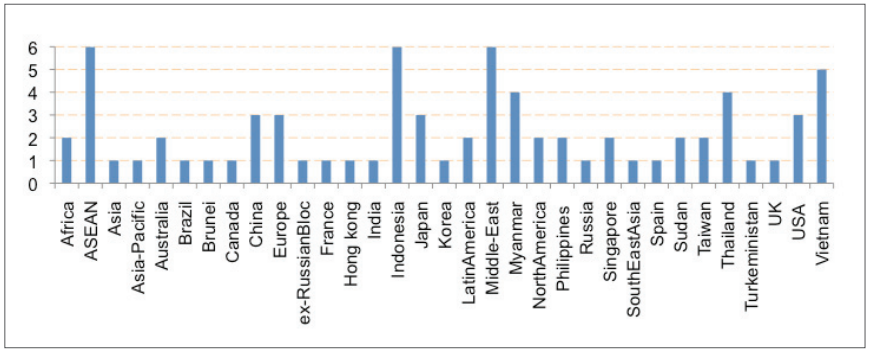
6. Industry Perception on STI

The survey reflects the viewpoints of 49 industry leaders in Malaysia and was conducted. Purposive sampling technique was used to cover stakeholders that most influence or are influenced by the STI industry.

Based on the survey;

- Although OECD (2013) stated that only 5.5% of firms actively participate in R&D, mainly multinational corporations (MNCs). The survey found that industry (also including Small and Medium Enterprises (SMEs) preparedness in adopting technological innovation is evident in their willingness to allocate funds and undertake research, apart from establishing external collaborations with universities and research institutes.
- 47.6% of the surveyed industry players highlighted their firms' capacity to innovate and produce new technologies, whereas 19.1% of them outsource the use of technology and 9.5% acquire technology in turnkey form due to their incapability to make any adaptations.
- Top three geographic markets that hold great potential in terms of revenue contributions over the next 1-3 years are ASEAN, Middle East and Indonesia. Therefore, it would be important to strengthen strategic international alliances in STI in these regions.

World markets that hold great potential in terms of revenue contributions over the next 1-3 years

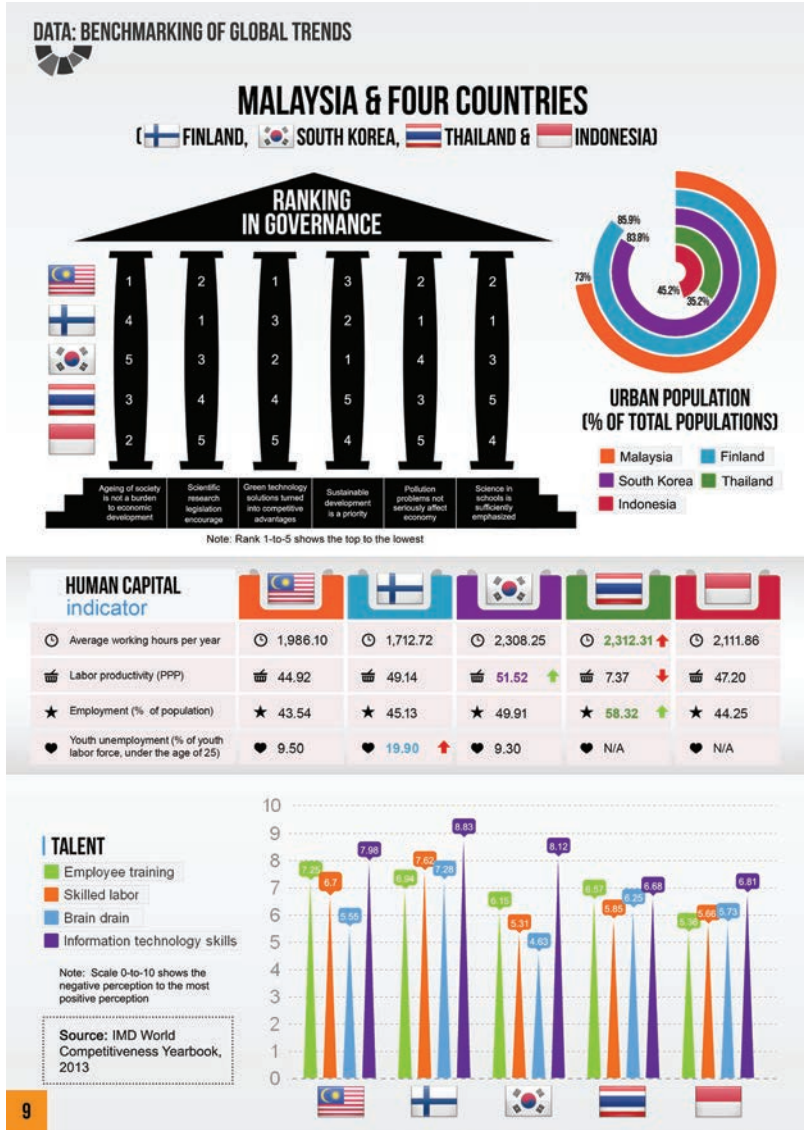


STI@3d

data.design.direction

STI@3d is an online sharing platform aimed to package and disseminates timely and relevant information on emerging global and national trends of STI development. Source of information used are from ASM STI strategic studies and secondary data from credible source such as IMD, World Bank, OECD and etc. This was carried out as a pilot project and disseminated to ASM Fellows, Associates and members of YSN-ASM for feedback and improvisation.

The STI@3d published quarterly is aimed to help ASM stakeholders and decision-makers understand STI related issues (political, economic, social and environmental) as well as in making informed decisions. Contents are presented through easily digestible infographics, simplified factsheets and summaries. It is available at http://www.akademisains.gov.my/sti3d/.



Studies in Progress

Water Demand Management

The Task Force is undertaking a comprehensive review of the current status of Water Demand Management in Malaysia. This includes identification of shortcomings and gaps as against norms of sound IWRM principles and Best Management Practices. It is also developing a preliminary conceptual framework of strategies and broad action plans for holistic and sustainable Water Demand Management. The Advisory Reports are expected to be completed in 2015.

Water and Agriculture

The objective of the Task Force is to review agricultural water use. Following this, the results will be recommended as strategies to revitalise the sector. The Advisory Report is expected to be completed in 2015.

Water Supply and Wastewater Management

The establishment of this Task Force is aimed at providing a comprehensive study to identify the present status of water supply and wastewater management, in the effort of identifying the shortcomings and gaps against the norms and sound application of IWRM principles and Best Management Practices. Apart from that, the research will also identify areas for opportunities in the application of STI for 'wealth creation' and in 'sustaining the resource' within this sub-sector. The Advisory Report is expected to be completed in 2015.

Integrated River Basin Management (IRBM)

A Position Paper identifying the status of IRBM, issues and gaps faced by IRBM will be published in 2015.

Water-related Policies and Legislation

This Working Group identifies gaps within the National Water Resources Policy (NWRP). Its objectives are to conduct critical reviews of the NWRP. It pinpoints the advancement of adaptive capacity for climate change as well as other social and economic transformation; assesses the adaptive capacity of water resource institutions, particularly with respect to their level of knowledge, usage of S&T as well as R&D; develops a framework that links water resource institutions to enable the NWRP to serve as a precursor that promotes integrated natural resources management, as well as to identify gaps and emerging issues of relevance to NWRP and related legislation. The Advisory Report on Adaptive Capacity is expected to be completed in 2015.

Impact of El Nino on Socio-Economy

The Task Force was established to produce a short-term study on the impact of El Nino on the Malaysian socio-economy. Subsequently, a Position Paper will be presented to MOSTI from which a Cabinet Note will be prepared for the Cabinet's consideration. The Position Paper is expected to be completed by 2015.

Energy Usage and Energy Efficiency in Transportation

This task force was established to address issues and gaps on energy efficiency in transportation. It is also aimed to gather inputs from relevant stakeholders and encourage partnership among them. Local and international energy related reports have been reviewed and discussed by the task force members for clearer view on the current status of energy usage and energy efficiency in transportation in Malaysia. It is hoped that this Advisory Report which is to be completed in 2015, will enable relevant stakeholders to gain details, statistics, information and professional opinion towards better positioning of Malaysia in the energy efficiency agenda, particularly in transportation.

FACTSHEET

Transportation sector is the second most energy consuming sector after industrial sector, accounting for 40% of total energy consumption in Malaysia. The transportation sector is one of the most energy intensive sectors in the country and relies primarily on petroleum products, which in total account for nearly 98% of the total consumption in the sector.

Roadmap of Carbon Free Energy in Malaysia

Increase in emission of greenhouse gases such as Carbon Dioxide (CO_2) has led to worsening of global warming. The Ministry of Natural Resources and Environment (NRE) has reported that the CO_2 emissions from energy usage in industries constituted the highest percentage (35%) followed by transportation (21%). Sooner or later, climate change will force government to slash carbon emissions and that will lead to plummeting demand for fossil fuels. Therefore there is an urgent need to map a carbon free energy future. This task force has undertaken a study to prepare a roadmap for carbon free energy in Malaysia including requisite mechanisms for funding and public engagement programmes. The focus areas in this study comprise of seven sources of renewable energy which are Solar, Wind, Ocean Thermal Energy Conversion (OTEC), Geothermal, Biomass, Wave & Tidal and Hydropower.

The carbon free energy roadmap will consist of desired energy goals and outlines of a strategic action plan to progressively guide the government towards carbon free energy by 2050. This roadmap is expected to be published in 2015.

Blueprint for Fuel Cell Industry in Malaysia

This task force was established to facilitate the following:

- Identify major stakeholders involved in Fuel Cell technology and development
- Identify gaps between stakeholders and the Fuel cell industry
- Deliberate on new standards and policy for the Fuel Cell industry
- Identify human capital development aspects that can support the growth of the fuel cell industry and;
- Develop a blueprint for fuel cell industries in Malaysia including the market opportunities and funding/incentive mechanism

This would provide a starting point to highlight actions that need to be undertaken within the Short Term (5 years), Medium Term (15 years), and Long Term (beyond 15 years). In order for fuel cells to be competitive with fossil fuels, the main strategies that have been identified are:

- Technology
- Research and Development
- New Energy Funding and Incentives
- Standards and Policy Development
- Cost Competitiveness and Market Enhancement
- Awareness and Capacity Building

The Blueprint is expected to be ready in 2015.

FACTSHEET

Studies done by Chakraborty et al. (2000) and Spence (2005) reported that global CO_2 emission has increased 30% and temperature has risen by 0.3-0.6°C during the 20th century. Presently, burning coal used in electricity generation and petroleum used for motor transport are identified as two main sources of CO_2 emissions.

iNBRIEF

Fuel cells are the energy converting devices with a high efficiency and low or zero emission. They have been attracting more and more attention in recent decades due to high-energy demands, fossil fuel depletions, and environmental pollution.

“While technology plays a vital role as a catalyst in transforming life and work in this new economy, it is imperative that we do not lose sight from its real concerns - to provide sustainable job opportunities and a better quality life. Technology is a mechanism of STI excellence. People should come first. Those are the things that need to be taken into consideration.”

YAB Dato’ Sri Mohd Najib Tun Abdul Razak
Prime Minister of Malaysia
Honorary Fellow, ASM

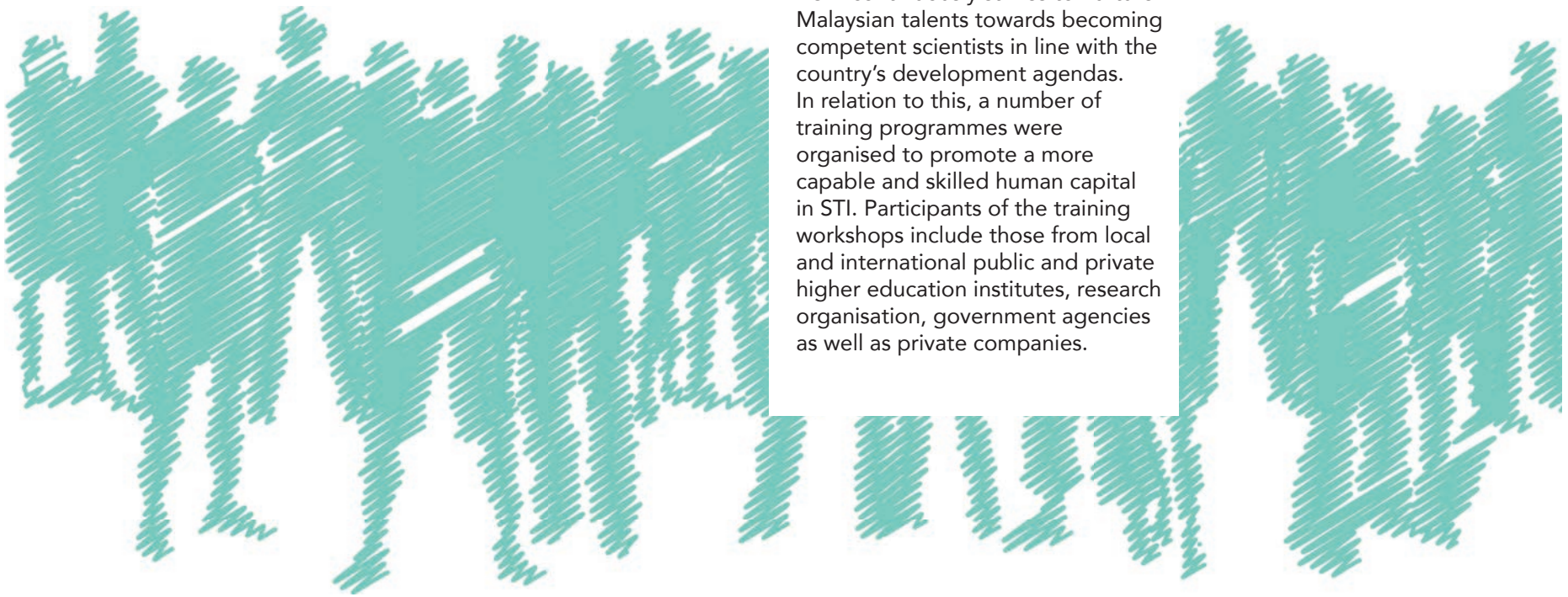
EMPOWERING

THE SCIENTIFIC COMMUNITY

ASM empowers the scientific community through its STI Programmes channeled through four major platforms which are capacity-building, science consortium, global linkage gateway and consultative fora. These channels are targeted to facilitate the elements of recognition, talent and alliance in the STI landscape.

Human Capital Development

ASM continuously strives to nurture Malaysian talents towards becoming competent scientists in line with the country's development agendas. In relation to this, a number of training programmes were organised to promote a more capable and skilled human capital in STI. Participants of the training workshops include those from local and international public and private higher education institutes, research organisation, government agencies as well as private companies.



Training Programmes

In 2014, while maintaining the flagship training programmes, ASM has also embarked on a series of international workshops on Mathematical Modelling for Application to enhance the pool of talent in critical and emerging fields.

Young Scientists Development

One of the vital assets to a country is STI human capital. Hence, there's a need to invest in young, early-career scientists and researchers who are the future drivers of our nation's global competitiveness in STI. ASM partners actively with global centres of excellence to develop high-calibre young scientists capable of gaining international recognition and contributing to global advancement of STI.

Through this collaboration, Malaysian young scientists will get an opportunity to gain valuable knowledge, research and training experience towards achieving excellence in STI. These exchange programmes come in various forms such as study visits, organisational attachments and mentor-mentee engagements.

CERN Summer Student Program (CSSP)

The CERN Summer Student Program (CSSP) offers undergraduate students of Physics, Computing and Engineering a unique opportunity to join in the day-to-day work of research teams participating in theoretical and experimental particle physics and computing at CERN in Geneva, Switzerland. Beyond the outstanding first-class scientific value of their stay, the selected students will find working in a multidisciplinary and multicultural environment an extremely enriching personal experience. This programme acts as a form of motivation to our Malaysian students to achieve excellence in science and to build valuable contacts with their other international counterparts. In addition, these students get to witness the latest research trends or future of technology capabilities in the area of physics.

9
Training Programmes

73
Higher Education Institute participants

39
Research Organisation participants

41
Government Agency participants

37
Private Company participants

19
International participants participants

280
STI Management Training Course for Researchers in OIC Countries participants since **2005**

FACTSHEET

- 40 participants from local universities and research centres which include applicants of the CERN Summer Student Programme attended the National School on Nuclear and Particle Physics in UM. The purpose of this school is to train the students on the theoretical foundation in nuclear and particle physics.
- Lee Chun Hao (UKM), Audiya Fatihah Wan Saffiey (UKM) and Fatin Hazwani Hashim (USIM) were selected to participate in the 2014 CERN Summer Student Programme.
- 9 students have participated in the CERN Summer Student Programme since 2012.

iNBRIEF

The European Organization for Nuclear Research (CERN), is a European research organisation that operates the largest particle physics laboratory in the world. CERN is comprised of physicists and engineers who conduct fundamental research of the universe. Founded in 1954, the CERN laboratory sits astride the Franco-Swiss border, near Geneva. It was one of Europe's first joint ventures and now has 21 member States.

IIASA Young Scientists Summer Program

International Institute for Applied Systems Analysis (IIASA) is an international scientific institute that conducts policy-oriented research which tackles global problems, such as climate change, energy, food and water, as well as poverty and equity that are too large or too complex to be solved by a single country. YSSP is an annual 3-month programme organised by IIASA in Laxenburg, Austria. Malaysia is represented by ASM as one of the National Member Organisation (NMO) of IIASA since 2011. YSSP offers a unique chance for our Malaysian young scientists to conduct independent research under the direct supervision of IIASA experts. With an interdisciplinary team of researchers, YSSP provides Malaysian talents in using various experimental approaches (simulations) to understand the behaviour of an economy or other complex phenomenon (e.g. air pollution, water, energy) where mathematical analysis techniques are inadequate. Besides that, the young scientists acquire new information technologies and integrated social, as well as economic modelling techniques.

FACTSHEET

- 5 Malaysian young scientists have attended the programme since 2011.
- Nur Aulia Rosni from the International Islamic University Malaysia (IIUM) was selected to attend the IIASA Young Scientists Summer Program 2014 under the Ecosystem Services and Management Program (ESM) area.

Lindau Nobel Laureate Meetings with Young Scientists

- Educate, Inspire & Connect

Since 2004, this programme has inspired 49 Malaysian young scientists who have participated in the Lindau Nobel Laureate Meetings. The young scientists get to meet esteemed Nobel Prize Winners from the fields of Physics, Physiology & Medicine, and Chemistry. This meeting offers inter-generational dialogue and excellent avenue to gain knowledge, enhance interaction, and be motivated by Nobel Laureates as well as scientific peers from around the world. Participants at the Lindau Nobel Laureate Meeting are chosen from among the best in academic institutions and foundations from over 80 countries around the world.

FACTSHEET

- 3 Malaysian young scientists (Dr Chau De Ming from UPM, Ng Kim Tien from UM and Jaslyn Soo Sian Siu from UM) were selected to participate in the 64th Lindau Nobel Laureate Meeting 2014.
- 37 Nobel Laureates congregated in Lindau for the 64th 2014 Lindau Nobel Laureate Meeting.
- The 64th 2014 Lindau Nobel Laureate Meeting was dedicated to Physiology/ Medicine discipline, which was held from 29th June to 4th July 2014 at Lindau, Germany. The Malaysian delegation was led by Professor Dato' Dr Asma Ismail FASc, Vice President of ASM and Chairman of the Selection Committee for Lindau Nobel Laureate Meetings with Young Scientists
- 600 young scientists from 80 countries participated in the meeting.

Engagement

National Science Challenge

National Science Challenge (NSC) is a science competition designed to promote understanding, awareness and appreciation of SET among secondary school students. The Grand Prize includes the Prime Minister's Challenge Trophy, a Study Visit to Stockholm and the opportunity of witnessing the Nobel Prize Award Ceremony.

NSC was organised in collaboration with ExxonMobil Subsidiaries in Malaysia, MOE, YSN-ASM and Universiti Putra Malaysia (UPM).





NSC participants at Semi Finals

Young Scientists as Future STI Leaders

YSN-ASM functions as an avenue to bring together outstanding Malaysian young scientists to a common consultative platform that aims to:

- represent the voice of young Malaysian scientists on national and international issues and give them a platform to influence policy decisions
- facilitate networking opportunities among young and senior scientists to exchange knowledge and experiences
- engage young scientists to be involved in addressing national issues using scientific knowledge and technology through interdisciplinary approach
- promote career in science as the choice for young people to ensure the scientific progress and sustainability in the country

YSN-ASM flagship programmes are:

- Science Outreach
- Science Journalism
- Research Leadership
- Science Policy
- International Network



YSN-ASM members at the 2014 Colloquium themed Science Building Bridges

11
Medical & Health Sciences
members

7
Chemical Sciences
members

8
Biological, Agricultural & Environmental Sciences
members

5
Mathematics, Physics & Earth Sciences
members

26
Engineering & Computer Sciences
members

57
YSN-ASM
members to date

i-INOVA'14

The 5th Exposition on Islamic Innovation 2014 (i-INOVA'14) was organised by Universiti Sains Islam Malaysia (USIM) to promote and enhance awareness in Islamic based innovation, as well as to encourage the invention of innovative products.

2014 is ASM's second year of involvement in i-INOVA'14 which involved 104 participations from local and international institutions of higher learning (IHLs) and research institutes (RIs). The ASM Innovation Award was given to the best invention to recognise the invention of innovative products that benefits the nation. ASM Innovation Award was won by University of Malaya for the invention of 'Multicore Flat Fibre'.

FACTSHEET

- Theme for i-INOVA'14 was 'Commercialization of Innovation' for Ummah Well-Being".
- Descriptions of winning innovation - Multicore Flat Fibre (MCFF):
  Enhance transmission capacity of optical fibres to improve the bandwidth capacity up to 6 times, with significantly low intercore crosstalk of less than -74 dB.

Sciencebuzz.my

Sciencebuzz.my promotes interest and appreciation of science by presenting information in a digestible and understandable form. The portal targets young adults aged 13 - 40 years which comprises of local flavoured contents are as follows:

- Thematic articles
  Articles that explain science in daily life and current issues
- Faces of Science@my
  Appearance of Malaysian outstanding scientists that inspires the nation through their STI contributions
- Photo of the Day
  Science explanation through photos
- ScienceBuzz.my TV
  A dedicated science channel that features entertaining and informative science snippets
  (http://sciencebuzz.my/en/explore/sciencebuzzmy-tv)

32
new articles

22
articles on outstanding Malaysian scientists

3
uploaded videos on **Sciencebuzz.my TV**

2
series of **Brainbuzzter** (online quiz)

21
Poster Contest entries

2
seasons of **I'm a Scientist, Get Me Out of Here, Malaysia (IAS)'**
April: *Bumi & Zuhrah* zones
November : *Musytari & Marikh* zones
Participation:
18 schools
437 students
22 scientists

Sciencebuzz.my recorded

143, 518
unique visitors

65, 312
visitors

iNBRIEF

I'm a Scientist, Get Me Out of Here is an online reality programme adapted from UK that provides a platform for interaction between students and scientists through online thematic chatting.

Winners of the programme include scientists who are determined by students through online voting.

Social License

ASM organises public discourse to proactively engage and educate society and stakeholders on critical issues which are at the heart of the community. Among the issues identified include clean energy, cancer and STI human capital.

This new platform is one of the science communication strategies which enables:

- Sharing of information
- Expressing opinions, concerns and ideas

iNBRIEF

Social License refers to a level of acceptance or approval by local communities and stakeholders towards relevant critical issues.

Top Research Scientists Malaysia Round Table: 'Are You Delivering Value for Money?'

The Return of Investment (ROI) of R&D outputs and outcomes which are intangible and lacking in terms of successful monetary returns to the country, are the current nation's concern.

Subsequently, a round table was organised among the TRSM to address the issues, gaps and provide recommendation. Among the recommendations provided are as follows:

- strengthen policies that encourage bridging gaps between the academia, industries and various ministries (e.g. MOE, MOSTI, MOA);
- build a one-stop centre linking all these players; and
- enhance the knowledge workers through the industrial PhD programmes where the research can complement current industrial needs, and subsequently contribute to the commercialisation of R&D products.

Recognition

Top Research Scientists Malaysia (TRSM)

The Top Research Scientists Malaysia (TRSM) is a recognition given to Malaysian research scientists in an effort to build a culture of excellence among Malaysian scientific fraternity. Each year, research scientists with outstanding contribution for the last five years in respective fields are recognised by ASM as Top Research Scientists Malaysia.

This year marks the 3rd cycle of TRSM implementation. 34 research scientists were awarded TRSM in 2014, which brings the total of TRSM to 96.

ASM provides TRSM scientists access to top down research, facilitation to international grants and attachment in centre of excellence and many other opportunities to further elevate their work. They are also the point of reference in their area of expertise.

TRSM Database

751
registered users, comprising of
64 public users
687 applicants

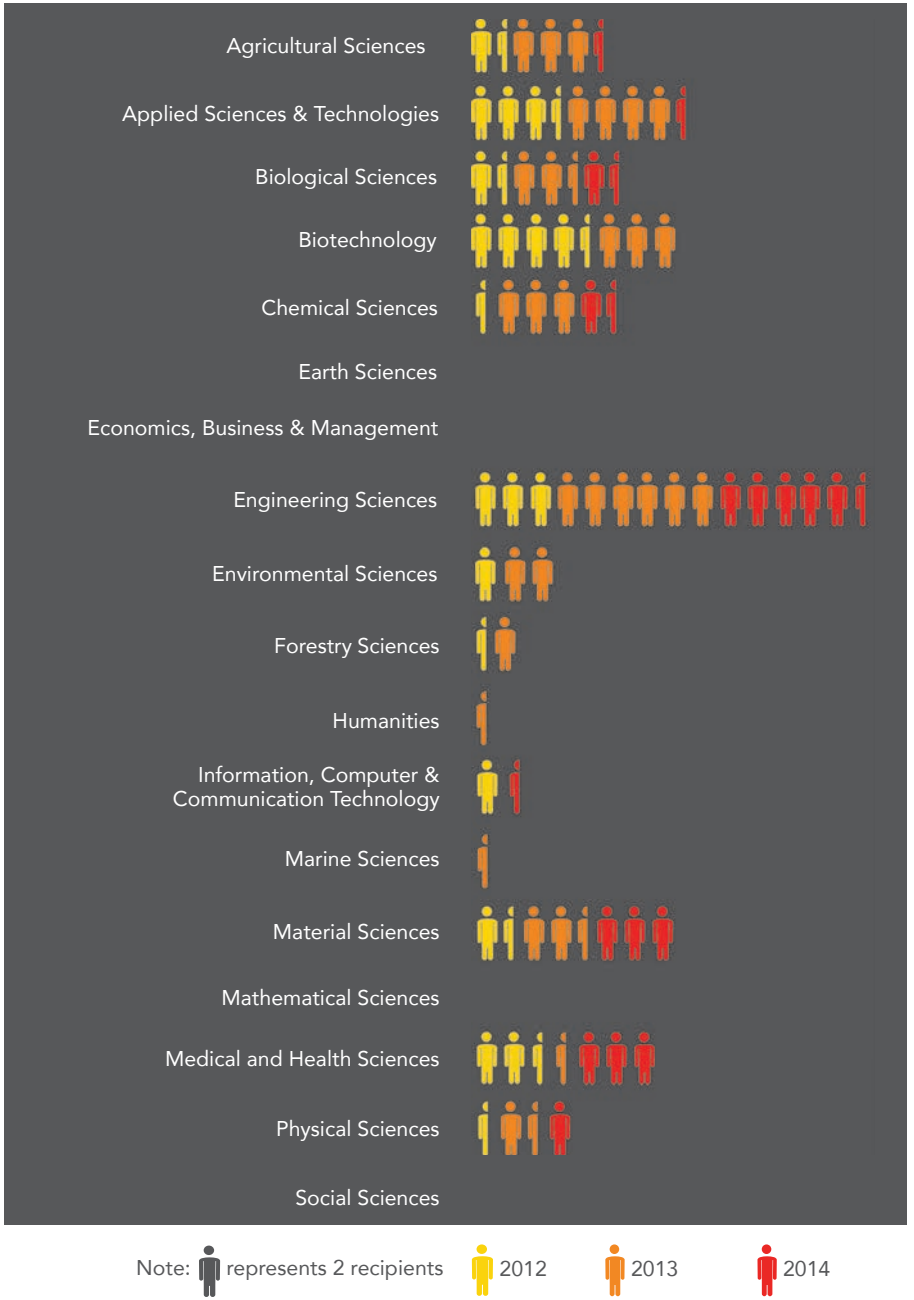
2,287
total registered users since 2012, comprising of
194 public users
2093 applicants

Completed Data

301
data

661
total data since 2012

TRSM Recipients by Main Area of Expertise 2012 - 2014



Awards and Grants

Awards and grants are important recognitions for scientists locally and internationally which encourage meritorious scientific research that may lead to inventions and solutions for local and global problems. This also enables Malaysia to be strategically positioned in the global scientific arena. ASM draws upon the expertise of her Fellows to serve as member of evaluation panels for various awards and grants.

Mahathir Science Award

The Mahathir Science Award is given for the category of Tropical Agriculture, Tropical Medicine, Tropical Natural Resources and Tropical Architecture and Engineering.

This international award given by The Mahathir Science Award Foundation recognises remarkable contributions and innovations in pioneering tropical research discovery or innovative solution that have brought positive impact to the well-being of society.

MAKNA Cancer Research Award

This research grant by the National Cancer Council (MAKNA) awarded to young Malaysian researchers to undertake cancer related research, and subsequently increase Malaysia's participation in finding a cure for cancer. Dr Lim Yat Yuen from University of Malaya, Norlaily Mohd Ali from Universiti Tunku Abdul Rahman and Kalaivani Muniandy from Universiti Sains Malaysia were selected as the 2014 MAKNA Cancer Research Award recipients.

Anugerah Saintis Muda Negara

MOSTI recognises young Malaysian scientists for their contribution and achievement in R&D. The recipient of the 2014 Anugerah Saintis Muda Negara was Dr Lim Jit Kang from Universiti Sains Malaysia.

Anugerah Juruteknologi Negara

The Anugerah Juruteknologi Negara recognises technologists and semi-professional's, such as technicians and laboratory assistants, for their contribution and achievement in the field of science and technology. The 2014 Anugerah Juruteknologi Negara was won by Kasron Ahmad from the Malaysian Agricultural Research and Development Institute (MARDI).

Application of Flagship Programmes, Special Allocation for Agencies and ScienceFund through ASM Platform

The Flagship Programmes, Special Allocation for Agencies and ScienceFund were offered to the agencies under MOSTI to facilitate the implementation of research in respective agencies. In relation to this, ASM through its Fellows, has forwarded eight strategic proposals that are aligned with ASM's focus areas for consideration of the funding.

FACTSHEET

AWARDS

Mahathir Science Award
- 156 nominations received from 25 countries (2005 – 2014)
- 8 awardees to date, with total prize worth RM 1,200,000
- 16 nominations received from 10 countries (2014)

MAKNA Cancer Research Award
- 371 applications received (2001 – 2014)
- 41 awarded to date with total grants worth RM 1,355,000
- 3 were awarded with a total grant worth RM30,000 each (2014)

Anugerah Saintis Muda Negara
- 3 young scientists awarded to date (2012-2014)
- 36 nominations received with 1 recipient (2014)

Anugerah Juruteknologi Negara
- 10 nominations received and 1 awarded (2014)

FACTSHEET

GRANTS

DSTIN Flagship Programme by ASM Fellows
- 2 concept papers submitted to MOSTI
- 1 project approved by MOSTI - Moving up the Value Chain and Environmentally Friendly Processes in silicon photovoltaic technology: Non-toxic Processes, Wafering and Crystal Growth

MOSTI Flagship Programme by ASM Fellows
- 2 concept papers submitted to MOSTI
  - Disaster & Climate Change Extremes: An Integrated Research Framework for Malaysia
  - Developing a Plant Made Protein Sector for Malaysia – Efficient, Halal, Sustainable Technologies for the Production of Pharmaceutical Proteins

Special Allocation for Agencies by ASM Fellows
- 4 concept papers submitted to MOSTI
- 1 project approved by MOSTI - Development of Yeast System for Flavonoid Production

ScienceFund Project under ASM Platform
- 1 project completed in February 2014
  - Geopolymer Cement from Ground POFA by Alkali Activation Method.
- 1 on-going project - Time Dependent Changes of Morphology and Molecular Characterization Around the Intracerebellar Haemorrhage (ICbH) Penumbra in C57B6/J Mice Brain Slices.

Project Monitoring Team (PMT) under the 10th Malaysia Plan (10th MP)

ASM was appointed by MOSTI as the project monitoring team to monitor the implementation of approved R&D projects under the 10th MP. ASM Fellows serve as Project Monitoring Team members.

Jawatankuasa Penilaian Strategik under the S&T Core Cluster, MOSTI

ASM was appointed as one of the members of Jawatankuasa Penilaian Strategik under the S&T Core Cluster of MOSTI to review the technical evaluation results of MOSTI's grants.
The recommendation of this committee will be tabled to MOSTI's higher management for approval.

Dr Ranjeet Bhagwan Singh Medical Research Trust Fund

ASM was entrusted by MOSTI to plan and implement programmes under the Dr Ranjeet Bhagwan Singh (RBS) Medical Research Trust Fund. This trust fund promotes medical or biomedical research among young scientists in Malaysia. The programmes organised under this trust fund are medical research grants and research workshops. In 2014, the medical research grant was awarded to Dr Oon Chern Ein from the Institute for Research in Molecular Medicine (INFORMM), Universiti Sains Malaysia.

FACTSHEET

Project Monitoring Team (PMT) under the 10th Malaysian Plan (10th MP)
- 16 projects monitored under the PMT:
  - 4 Flagship Programme projects
  - 6 TechnoFund projects
  - 6 Community Innovation Fund projects

FACTSHEET

RBS Medical Research Grant
- 64 applications received
- 1 grant recipient (RM30,000)

Gateway

We strongly believe that besides pursuing excellence in research, another useful key ingredient to become a successful scientist is through STI international linkages. One of the means is to foster the development of STI by serving as an international gateway for local scientists to be at global level. The main purposes are to provide opportunities for Malaysian scientists to share their knowledge, impacts of research, to build expertise and network, as well as strengthen scientific and technological capabilities.

Through this platform, young and prominent scientists get to connect with their other international counterparts with 106 world science academies and 22 STI international organization.

International STI Alliance

InterAcademy Partnership (IAP)

The InterAcademy Partnership (IAP), a collaborative platform between InterAcademy Council (IAC), InterAcademy Medical Panel (IAMP) and InterAcademy Panel. Through its global network of some 130 members, the newly formed InterAcademy Partnership is able to harness the power and authority of these academies and access their combined scientific talent.

An agreement to establish the Partnership was made in May 2014 to retain IAP as the umbrella organization. The existing partners are repositioned as below to become closed, focused while maintaining its own identity:

- InterAcademy Panel will now be called IAP for Science
- InterAcademy Medical Panel (IAMP) will now be called IAP for Health
- InterAcademy Council (IAC) will now be called IAP for Research

IAP also seeks to promote excellence in science education especially in primary and secondary schools by reforming and developing science education through its platform called, IAP Science Education Programme (IAP-SEP).

The activities under the IAP-SEP are as below:

1. KAST-ASM-IAP International Workshop on Science Literacy: Science Communication and Science Outreach
   - The aim of this workshop is to discuss and propose better ways to improve science literacy in order to develop effective education and communication of science for scientific literacy and to develop effective communication for Science, Health, Environment and Risk (SHER) for public understanding of science and technology.
   - The keynote speaker, Academician Dato' Ir Lee Yee Cheong FASc, spoke on "Science, Engineering and Technology and the UN sustainable Development Goals 2016-2030".
   - There were 18 other speakers from Korea and various countries, comprising experts on science communication and 100 participants.

2. IAP-SEP Biennial Conference on Challenges, Opportunities of Inquiry Based Science Education (IBSE) / Science, Technology, Engineering and Mathematics (STEM) Conference
   - This conference is an important event of IAP SEP which has identified IBSE as an effective pedagogy in enhancing science education in schools.
   - It was attended by about 100 participants with speakers comprise mainly members of IAP SEP Global Council as well as experts in the field of IBSE, Technology Education, Assessment and Student Outcomes, Science Outreach and Society.
   - The Conference concluded with a declaration which summarised issues raised and one of the proposed recommendations is to move 'Science Education' orientation to 'Science Literacy' based education.
   - Concurrently, the IAP – SEP Global Council meeting was held and they affirmed with a draft Beijing Declaration which would be disseminated widely including to gain support from UNESCO.

FACTSHEET

The 2015 IAP SEP Global Council Meeting will be held at Istana Hotel, Kuala Lumpur and hosted by ASM.

iNBRIEF

ASM's Senior Fellow, Academician Distinguised Professor Datuk Dr Looi Lai Meng FASc holds co-chairmanships of IAMP. Under her chairmanship, the issues that have been discussed and called for joint statements are "Antimicrobial Resistance" and "Science for Poverty Eradication & Sustainable Development"

The International Science, Technology and Innovation Centre for South-South Cooperation (ISTIC)

ISTIC under the Auspices of UNESCO was launched in 2008. The priority agenda of ISTIC are:

- National science and technology policy formulation, implementation and monitoring;
- Maintenance of infrastructure;
- Technopreneurship training of scientists and researchers; and
- IBSE/STEM Education.

In 2014, ISTIC conducted 6 training programs and produced 6 reports.

International Council for Science (ICSU) Regional Offices

The International Council for Science (ICSU) is a non-governmental organisation with a mission to strengthen international science for the benefit of society.ICSU mobilises knowledge and resources of the international scientific community to strengthen international science for the benefit of society. The activities of ICSU are:

- International Research Collaboration
- Science for Policy
- Universality of Science

Based on ASM's flagship programme, two Foundation was established as a separate entity to manage and champion the programme.
The Foundations are:

Mahathir Science Award Foundation (MSAF)

The Foundation encourage excellence in tropical science research that will accord direct benefits to countries in the tropics and the global community. The Mahathir Science Award is bestowed by the Foundation to researchers who have made internationally recognised breakthroughs in pioneering tropical research.

Yayasan Penyelidikan Antartika Sultan Mizan (YPASM)

The Foundation aims to promote and develop national and international collaboration in research and conversation of the polar regions, especially in the Antarctic Continent. Malaysia's participation is important to sustain Malaysia's presence in Polar research and strengthen research capacity in the area of global frontier sciences.

Collaboration between Malaysia and Morocco in Renewable Energy and Science & Mathematics Education

Following the Memorandum of understanding (MOU) signed between ASM and the Hassan II Academy of Science and Technology (AHIIST) in 2010, both countries look forward for the establishment of collaboration programmes in renewable energy and science & mathematic education.

Two groups of Moroccan Delegation comprising of the Energy and Education Group had visited Malaysia. The delegation, through workshops, strategic meetings and site visits organised during the visit, had identified potential collaboration programmes. AHIIST invited ASM to visit Morocco for a follow up meeting. Subsequently, the Malaysian delegation visited Morocco to firm-up on the establishment of collaboration programmes between Malaysia and Morocco in renewable energy and science education.

ASM and AHIIST had identified the following potential projects for Malaysia and Morocco to embark on:

i) Energy
- Research collaboration
- Exchange of experts and expertise
- Staff and student mobility using the existing policies
- External examiners and co-supervision

ii) Education
- e-collaboration between schools
- e-collaboration between Malaysian Institute of Teacher Education & Ecole Normale Supérieure
- Trainee Teacher Exchange Programme
- Specialised Workshops for Teacher Trainers
- Brilliant Student Exchange

Science Consortium

The concept of the National Science Consortium is to have a mutual platform of collaboration in STI strategic areas through national science centres that act as the national focal point for inter-institutional and international scientific exchanges.

The national centres will be hosted by identified local institutions that are responsible to coordinate national research initiative. The Academy will link this consortium with strategic international partners that will enable Malaysians to be involved in frontier research project. This will ultimately provide our researchers to be recognised internationally through high impact publication and high calibre scientists.

National Centre for Particle Physics

The National Centre for Particle Physics (NCPP) hosted at UM has spearheaded particle physics research in Malaysia with its participation in the Compact Muon Solenoid (CMS) Research Group at CERN in 2013.

Researchers and industry players in the field of particle physics in Malaysia can tap on NCPP's facilities, international linkages and network.

iNBRIEF

CMS is one of the particle detectors in CERN's Large Hadron Collider, the world's largest and most powerful particle collider.

- 7 NCPP undergraduate students were sent for research attachment at CERN
- 7 Master students and 3 PhD students were sent for research attachment at CERN

Consultative Fora

ASM paves a platform to initiate intellectual discourses, promote advocacy in S&T development, and boost global recognition for both international and national science experts.

Biothreats & Biorisks: Bridging Science and Security

Malaysian is also looking into ways to promote the biotechnology field without endangering biological safety and security. The biosafety issue is important in protecting our security against loss, theft, misuse, diversion or intentional release of pathogens and toxins.

In relation to this, the Malaysian government is in the process of adopting legislation to help the country meet its non-proliferation obligations under the Biological Weapons Convention (BWC). To that end, the legislation intends to ensure secure management of disease agents without interfering in valid biological research efforts.

With this purpose, the National Academic Seminar on Biothreats and Biorisk: Bridging Science and Security had provided a forum for participants from academia, industry, and security sectors to converge, collaborate and promote cross-sector coordination and enhance Malaysia's biosafety and biosecurity capabilities in preparation for its draft legislation.

The national seminar was also designed to promote common understanding on implementation of biosecurity measures and biosecurity risks or mitigation strategies, and to highlight the current challenges in addressing safety, security, and ethics, while conducting biological research.

The seminar concluded with an internal legislation review and dialogue among co-hosts and participants of Malaysia's draft biosecurity bill and key challenges for its implementation.

FACTSHEET

- 8 International speakers & 2 local speakers
- 75 total participants

FACTSHEET

- BWC is the first multilateral disarmament treaty banning the development, production and stockpiling of an entire category of weapons of mass destruction, was opened for signature on 10 April 1972.
- The BWC entered into force on 26 March 1975.
- There are a total of 110 signatory states and 170 state parties including Malaysia.
- Malaysia had signed the treaty in 1972 and was ratified in September 1991.

Future Earth: Research for Global Sustainability and a Holistic Understanding of Sustainable Development in Asia

The Future Earth: Research for Global Sustainability and a Holistic Understanding of Sustainable Development in Asia conference provided an interdisciplinary platform for scientists from the region to report on the following three broad and integrated research themes:

- dynamic planet
- global development
- transformations toward sustainability

The theme of 14th SCA Conference was derived from UN Conference on Sustainable Development (Rio+20) which took place in Rio de Janeiro, Brazil in June 2012 – twenty years after the landmark 1992 Earth Summit in Rio.

More than 100 scientists from 20 countries gathered to discuss on the progress of scientific research on global sustainability and poverty alleviation in Asian context. Among the issues discussed were global sustainability, successful interdisciplinary research, research collaboration and dialogue across natural, social and engineering sciences to address interrelated economic, social and environmental aspects of development in Asia.



Participants of the 14th SCA Conference

iNBRIEF

Future Earth is a 10-year international research initiative which mobilises thousands of scientists while strengthening partnerships with policy-makers and other stakeholders to provide sustainability options and solutions in the wake of Rio+20.

This was Malaysia's second time hosting the SCA International Conference. The previous SCA Conference, hosted by Malaysia was on 13-15 May 2002, themed, "Urgent Agenda for Asian Sustainability: Operationalising the Vision".

“All over the world, in both developing and developed nations alike, there is a pressing need to nurture young scientific talent in meeting the critical demand for a scientifically savvy, skilful, creative and innovative human capital capable of driving economies in this innovation-led era.”

YB Datuk Dr Ewon Ebin
Minister of Science, Technology & Innovation

GATHERING

Knowledge generation often comes from gathering of minds to enable learning, networking, content-creation and sharing. We host various intellectual discourses throughout the year and to date it has been very receptive in achieving our objectives.

This is the largest assembly of ASM Fellows which is organised with a more focused agenda to deliberate on STI issues of national importance.

The General Assembly

The 5th General Assembly

Theme:

'Matching Talent with Economic Transformation Programme (ETP)'

The Economic Transformation Programme's (ETP) goal is to elevate the country to developed-nation status by 2020. While we are in the mood of accomplishing this goal, there is issue of less Malaysian are being hired by multinational companies especially for core technical role due to lack of competencies. Thus, the question of; do we have enough Malaysian talent to enable the country to reach its aspiration of a high-income nation was raised. A comprehensive method on how to overcome this issue must be looked seriously.

Moderator:
Dr Ahmad Ibrahim FASc
Chief Executive Officer,
ASM

Panelists:
Professor Dr Awang Bulgiba Awang Mahmud FASc
Deputy Vice-Chancellor,
(Research and Innovation), UM
'Producing quality human capital for the workforce'

Mr Lokman Baharuddin
Director (Human Resource),
ExxonMobil Subsidiaries Malaysia
'Are Malaysian graduates fulfilling the needs of oil and gas industry?'

Professor Dato' Dr Hassan Said FASc
Vice-Chancellor & President,
Taylor's University College
'Human capital development in education'

Ms Agnes Maria Sam
General Manager (Policy Initiatives),
Talent Corporation Malaysia Berhad
'TalentCorp: Meeting the talent needs of the economic transformation programme'

Mr Tan Eng Hoo
Senior Manager, Policy & Strategy
Department, Multimedia Development
Corporation Sdn Bhd
'Talent Mobility in the ICT Industry'

The 6th General Assembly

Theme:

'Malaysia Beyond 2020'

There is no doubt that sustaining the nation is the country's biggest agenda. Thus, our planning must aim is to achieve sustainable growth and development with inclusiveness, which covers all sectors of society. The dialogue on "Malaysia Beyond 2020" proved that there is a need for us to invest in the right strategy now. Based on current statistics; the nation should not have much problem achieving the high-income target set for 2020, but how about the years after 2020?

Moderator:
Mr Kamarul Bahrin Haron
Senior Assistant Vice President,
ASTRO Awani

Panelists:
Madam Liew Siew Lee
Director, Manufacturing Industry
Science and Technology Section,
Economic Planning Unit (EPU)
'Innovation to Action (11MP)'

Mr Kamel Mohamad
Senior Undersecretary,
(Planning), MOSTI
'Science & Technology Chapter (11MP)'

Datuk Dr Mazlan Othman FASc
Project Director, MegaScience 3.0
'Malaysia Beyond 2020- Mega Science Chapter'

Dato' Saw Choo Boon
President, Federation of
Malaysian Manufacturers (FMM)
'Malaysia Beyond 2020- Industry Chapter'

Annual General Meeting

ASM's 19th Annual General Meeting assembled 103 ASM Fellows. The meeting approved the 2013 Annual Report, the financial statements (ending 31 December 2013) and the appointement of the external auditors. The ASM Council members for the term 2014 – 2016, new Fellows and Honorary Fellow were also elected.

IdeaXchange

In 2014, 4 IdeaXchange sessions were held discussing on the following topics:

- The InterAcademy Panel (IAP) Science Education Program (SEP) and its implications on host academy and Malaysia, presented by Academician Dato' Ir Lee Yee Cheong FASc, Chair, IAP SEP Global Council
- Strategizing Research, Development and Commercialization (RDC) priority areas for the nation, presented by Dr Ahmad Ibrahim FASc
- Science 2 Action (S2A) Initiatives, presented by Emeritus Professor Tan Sri Dato' Sri Dr Zakri Abdul Hamid FASc, Science Advisor to the Prime Minister of Malaysia
- Soil Erosion and Sedimentation, presented by Dato' Ahmad Fuad Embi
- Graphene, presented by Dr Rezal Khairi Ahmad, Chief Operating Officer of NanoMalaysia

“It is indeed most gratifying to see so many sectors represented here through the presence of members of the scientific community and academia , policy makers and government officials, industry captains, corporate stalwarts, partners from STI organisations as well as other stakeholders from the public and private sectors. Your presence here is a reflection of the valuable partnership we share to further the STI agenda of the nation.”

YBhg Tan Sri Dr Ahmad Tajuddin Ali FASc
President, ASM

MEMBERSHIP

The Academy's membership is a wide spread of expertise
from various field of science to social sciences

Honorary Fellow

ASM conferred YAB Dato' Sri Mohd Najib Tun Abdul Razak, the Prime Minister of Malaysia, the Honorary Fellow, in recognition of his invaluable contribution in driving the nation forward through progressive and dynamic initiatives in STI at the 2014 ASM Conferment of Fellowship. He was elected at the 19th AGM.



2014 Conferment of Fellowship and Announcement of TRSM on 8 December 2014

Senior Fellows

In 2014, the following two Fellows were conferred as Senior Fellows:

- **Academician Datuk Ir Hong Lee Pee FASc,** for his outstanding contribution in developing new invention for piling and geotechnical construction industry in the country
- **Academician Professor Dato' Dr Khairul Anuar Abdullah FASc,** for his outstanding contributions in infectious diseases diagnosis and to the development of innovative medical education method in Malaysia

Fellows

Each year, ASM identifies highly distinguished Malaysians, who by virtue of their respective achievements in the field of SET are regarded as being of exceptional merit and distinction.

Fellowship is awarded based on the stringent selection process in six different disciplines: Medical and Health Sciences; Engineering and Computer Sciences; Biological, Agricultural and Environmental Sciences; Mathematics, Physics and Earth Sciences; Chemical Sciences and Science & Technology development and Industry.

21 new Fellows were elected at the 19th AGM and they were conferred at the 2014 ASM Conferment of Fellowship. Of the batch, 16 are from higher learning institutes, two from research institutes, one from a government agency and two from the private sector.

The election of new Fellows is essential for the sustainability of ASM experts. By tapping the ASM Fellows' knowledge, expertise, network and wisdom, it enables ASM to sustain its activities, effectively contribute to provide STI input to the government and relevant stakeholders; of which fulfils the mission of the Academy.

Associates

The increasing interdisciplinary nature of knowledge demands a pool of experts ranging from various fields: from science to social sciences. Thus, in 2010, the membership of ASM was extended to include the Associates category.

The ASM Council appoints Associates for a two year term and renews the appointment of active members. This distinguished line of Associates represent ASM at external meetings, contribute and participate in various studies and committees. In 2014, the Academy reappointed 12 Associates, hence, making the total of 43 Associates.

iNBRIEF

The newly elected Fellows are encouraged to deliver lectures within their field of expertise to the public and scientific community. As such, the following two Fellows who have delivered their talk are:

Dr Saw Leng Guan FASc
Malaysian Palms: Prince of the Plant Kingdom

Professor Dr Shamshuddin Jusop FASc
Sustainable Rice Cultivation: Steps towards Sustainable Practices

FACTSHEET

2014 Fellows

Dato' Dr Abd Latif Mohmod FASc
Datuk Ir (Dr) Abdul Rahim Hashim FASc
Professor Dr Abdul Rahman Mohamed FASc
Professor Dato' Ir Dr Abdul Wahab Mohammad FASc
Professor Dr Agamutu Pariatamby FASc
Professor Dato' Ir Dr Badhrulhisham Abdul Aziz FASc
Professor Dato' Dr Burhanuddin Yeop Majlis FASc
Professor Dr Jamunarani S Vadivelu FASc
Professor Dr Jinap Selamat FASc
Ir Lalchand Gulabrai FASc
Professor Dato' Dr Mohd Yusof Haji Othman FASc
Datuk Dr Mohd Yusoff Sulaiman FASc
Professor Dato' Dr Musa Ahmad FASc
Professor Dr Ng Kwan Hoong FASc
Professor Dr Noorsaadah Abd Rahman FASc
Professor Datuk Dr Rohana Yusof FASc
Professor Dr Shamshuddin Jusop FASc
Professor Dr Tan Soon Guan FASc
Dr Teo Soo Hwang FASc
Professor Dr Wan Azman Wan Ahmad FASc
Dato' Dr Yap Kok Seng FASc

In Memorium

Tan Sri Dato' Dr Hj Ani Arope FASc

17 May 1932 – 20 December 2014

First Deputy Director, Malaysian Agricultural Research and Development Institute (MARDI) 1969-1972
Director, Rubber Research Institute of Malaysia (RRIM) 1985
Chairman, Bank Simpanan Nasional 1986-1988
Group Chief Executive, Kumpulan Guthrie Bhd 1987-1992
Director, Guthrie Ropel Bhd 1988
Chairman, Highlands & Lowlands 1988
Chairman, Mara Institute of Technology Council 1989-1992
Council Member (Public Sector), Malaysian Business Council 1991
Chairman, Universiti Sains Malaysia Council 1992
President, Council of Malaysia-New Zealand 1992
Executive Chairman, Tenaga Nasional Berhad (TNB) 1992-1996
Chairman, Board of Directors, Universiti Sains Malaysia 1992-2010
Chairman, Malaysian Palm Oil Council (MPOC) 1995
International Senior Advisor, ASEAN General Electric (GE) 1997



Tan Sri Ani Arope was born on 17 May 1932 in Seberang Perai, Penang. He was well-known for his leadership and commitment in developing human capital in STI related organisations namely RRIM, MARDI and TNB.

He graduated from the University of Canterbury, New Zealand with a Bachelor in Agricultural Science (1960). He was awarded the Fulbright scholarship and continued his studies in the United States, where he earned a Master in Science (Agronomy and Production Economics) at the University of Vermont in 1966.

He began his career as an Agronomist and moved on to lead some of the most recognised agriculture-related organizations in Malaysia. Tan Sri Ani Arope was instrumental in positioning Malaysia globally via RRIM as a lead player in the rubber industry.

In recognition of his significant achievements, he was awarded several honorary doctoral degrees from local and international universities. He was undeniably a well-respected corporate leader in the country.

Tan Sri Ani Arope was a Foundation Fellow of ASM under the S&T Development and Industry discipline group and was a member of the first ASM Council. He will always be remembered for his passion in championing development of people.

His absence will be greatly missed and contributions fondly remembered.

Al-Fatihah.

In Memoriam



Ir Dr Ma Ah Ngan FASc

17 May 1948 – 15 August 2014

Associate Member, Malaysian Institute of Chemistry
Council Member and Treasurer, Malaysian Invention and Design Society (MINDS)
Member, Environmental Management and Research Association of Malaysia (ENSEARCH)
Member, Regional Network for Management and Utilisation of Wastes in South East Asia and Pacific
Member, Institution of Chemical Engineers, UK
Member, National Agro-based Industry Committee
Council Member, Malaysia Oil Scientists' and Technologists' Association (MOSTA)
Director and Board Member, Centre for Environmental Technology (CETEC)

Ir Dr Ma Ah Ngan was born on 17 May 1948 in Kampar, Perak and spent his entire career as a dedicated researcher.
He graduated from University of Malaya with a Bachelor in Chemical Technology (1972) and received his Master's Degree in Chemical Engineering from University of Birmingham, United Kingdom (1979). In 1993, he received his PhD in Chemical Engineering from University of Surrey, United Kingdom.

His career began in 1972 when he joined Malaysian Agricultural Research and Development Institute (MARDI) as a Research Officer and initiated research on anaerobic treatment of palm oil mill effluent treatment. In 1979, he joined Palm Oil Research Institute of Malaysia (PORIM) and developed zero discharge technology using multiple evaporation technology for palm oil mills.

During his tenure as the Director of the Engineering and Processing Division at MPOB, he had shown excellent leadership in R&D, especially on the engineering and processing aspects of the palm oil industry. Dr Ma's involvement in the environmental field and the application of science and technology, especially R&D in solving pollution problems in the palm oil industry has helped the industry to remain environmentally sustainable.

Overall, Dr Ma was highly regarded in the scientific community and contributed tremendously to the palm oil industry. He was elected as a Fellow of the Academy under the Engineering and Computer Sciences Discipline group in 2003.



Dato' Dr Khoo Kah Lin FASc

18 December 1938 – 07 November 2014

Visiting Fellow, Academy of Medicine Singapore, 1973
Fellow, Royal College of Physicians (Ireland), 1982
Fellow, Royal College of Physicians (Glasgow), 1984
Director, Heart Foundation of Malaysia since 1987
Fellow, Academy of Medicine Malaysia 1998
Fellow, American College of Cardiology 2002
President, National Heart Association 2002-2002
President, ASEAN Heart Foundation 2002-2004
Fellow, Royal College of Physicians (Edinburgh) 2004
Fellow, European Society of Cardiology 2005
Fellow, Royal College of Physicians (London) 2006
President, Malaysian Medical Association 2007-2009
Fellow, Academy of Sciences Malaysia 2009

Dato' Dr Khoo Kah Lin FASc was born on 18 November 1938 in Penang. He was an iconic cardiologist and a pioneer in the establishment of the First Coronary Care Unit in Malaysia.

He obtained his Bachelor of Medicine (Surgery) from the University of Singapore (1963), and began his career at the Alor Setar General Hospital as a House Officer. He continued serving as a Medical Officer in various government hospitals in Alor Setar, Langkawi, Kulim and Kuala Kangsar. In 1983, he received his Doctorate in Medicine from the National University of Singapore.

Apart from being a clinician, he contributed tremendously in medical research, especially in familial hypercholesterolaemia (FH). He has contributed to the work of lipid disorders, through publications and as an expert in committees at both national and international level.

In 2004, he established the Sau Seng Lum Dialysis Centre (a non-profit health system) in his effort to contribute back to the society. He worked tirelessly right across the country to create awareness in all circles of FH, as well as the diagnosis and treatment of FH patients. In honour of his outstanding research and development work in the field of FH, the Rotary Club of Malaysia awarded him the Research Gold Medal Award, conferred by the Sultan of Selangor. He also received the Outstanding Person of the Year award from the Malaysian Medical Association in recognition of his many contributions to the medical community and to the general public.

As a person Dr Khoo was a very kind and gentle person and always had time to listen to friends and colleagues. He will be remembered for his contribution to the nation and profoundly missed.

“To accomplish great things we must dream as well as act.”

Anatole France

LOOKING

AHEAD

Knowing what lies ahead is a progressive step towards attaining ASM's aspiration to maintain as strong voice representing the scientific community. It takes a dynamic execution of play. Thus, it is a matter of well-thought planning, efficient coordination of delegated tasks and finally, a nod of satisfaction from all. With this, ASM presents some of our anticipated works in progress for the upcoming years.


2015

Mega Science 3.0

2015-2016

The Mega Science 3.0 study will focus on the following five sectors:

- Automotive Industry
- Creative Industry
- Furniture Industry
- Plastics and Composites Industry
- Tourism Industry

In parallel, with this Study, ASM will undertake a Foresight exercise entitled "Envisioning Malaysia in 2050" which will develop the societal framework of Malaysia 2050. This initiative will be carried out by an informal group of various national "think-tanks" and government organisations called the 'Foresight Alliance'. The Foresight exercise will underpin the following 4 components:

- Science and Technology
- Economics and Finance
- Society and Culture
- Geopolitics

STI TrendWatch

2015-2016

The Big Data Analytics (BDA) project entitled 'STI TrendWatch' is initiated to provide action-able information that can be used by decision makers at all levels to improve the important foundations of the nation such as economy and social. A comprehensive BDA will provide reliable data and analysis that could strengthen the STI decision making for the nation. It is indeed an enabler for Malaysia to become data-driven economy and achieve aspiration of the Digital Economy 2020. The scopes of the project are:

- Domain Knowledge development in STI
- STI analytics system development
- STI analytics system usage

Future Malaysia Forum

Think . Share . Act

April 2015

The NST Analysts Forum is a platform for local think tanks to come together and share their analysis and findings to help the various stakeholders make informed decisions for long term socio-economic policy planning.

Global R&D Leaders and CEOs Forum 2015

Injecting Soul into R&D

5 - 6 August 2015

This is an initiative to engage global R&D players to develop and find solutions for complex global issues such as food security, healthcare environmental degradation and poverty faced by the bottom billion. It calls for a commitment to elevate R&D beyond commercial gains.

The five action areas of the Forum are:

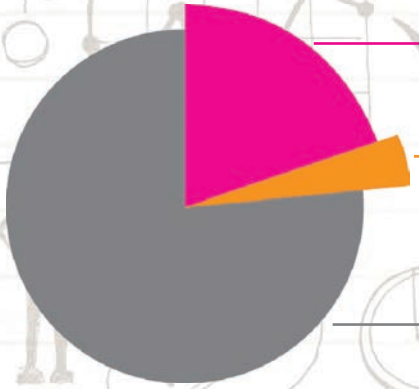
- Finding the Soul in R&D
- Sustainable Financing and Impact Investing
- Co-producing Values-based Solutions
- Technology Sharing
- Leveraging Social Innovation and Entrepreneurship

Income & Expenditure

PENDAPATAN
INCOME

PERBELANJAAN
EXPENDITURE

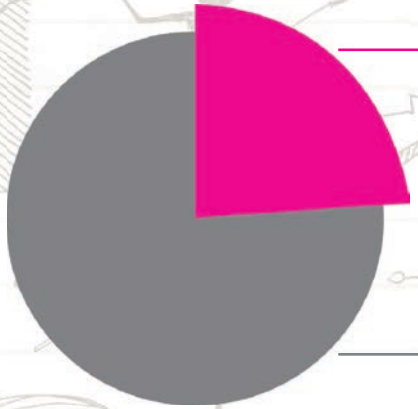
2014



Geran Operasi
Operating Grant
18%
RM8.60mil

Lain-lain
Others
5%
RM2.41mil

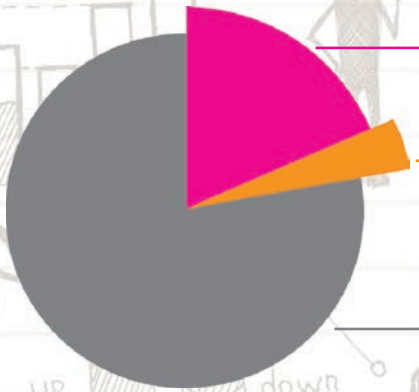
Geran Program
Programme Grant
77%
RM35.86mil



Perbelanjaan Operasi
Operating Expenditure
24%
RM11.79mil

Perbelanjaan Program
Programme Expenditure
76%
RM36.69mil

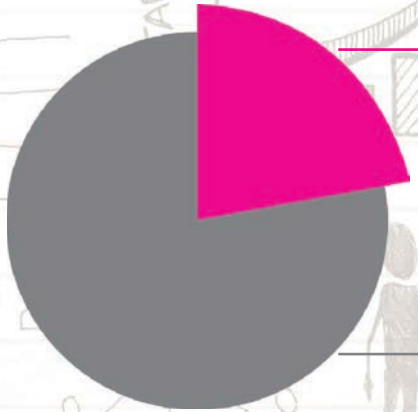
2013



Geran Operasi
Operating Grant
16%
RM8.82mil

Lain-lain
Others
5%
RM2.97mil

Geran Program
Programme Grant
79%
RM43.08mil



Perbelanjaan Operasi
Operating Expenditure
20%
RM10.76mil

Perbelanjaan Program
Programme Expenditure
80%
RM43.98mil

LAPORAN KETUA AUDIT NEGARA
MENGENAI PENYATA KEWANGAN
AKADEMI SAINS MALAYSIA
BAGI TAHUN BERAKHIR 31 DISEMBER 2014

Laporan Mengenai Penyata Kewangan

Penyata Kewangan Akademi Sains Malaysia telah diaudit oleh wakil saya, yang merangkumi Lembaran Imbangan pada 31 Disember 2014 dan Penyata Pendapatan, Penyata Perubahan Ekuiti dan Penyata Aliran Tunai bagi tahun berakhir pada tarikh tersebut, ringkasan polisi perakaunan yang signifikan dan nota penjelasan lain.

Tanggungjawab Majlis Akademi Terhadap Penyata Kewangan

Majlis Akademi bertanggungjawab terhadap penyediaan dan persembahan penyata kewangan yang saksama selaras dengan piawaian pelaporan kewangan yang diluluskan di Malaysia dan Akta Akademi Sains Malaysia 1994 (Akta 524). Majlis Akademi 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 Akademi Sains Malaysia pada 31 Disember 2014 dan prestasi kewangan serta aliran tunainya bagi tahun berakhir pada tarikh tersebut selaras dengan piawaian pelaporan kewangan yang diluluskan di Malaysia.

(NOOR RITA BINTI KASSIM)
b.p. KETUA AUDIT NEGARA
MALAYSIA

PUTRAJAYA
2 APRIL 2015

Academy of Sciences Malaysia

PENYATA PRESIDEN DAN BENDAHARI KEHORMAT
AKADEMI SAINS MALAYSIA

Kami, **TAN SRI DR. AHMAD TAJUDDIN BIN ALI F.A.Sc** dan **PROFESSOR EMERITUS DATO' DR. MOHAMMED MAHYUDDIN MOHD DAHAN F.A.Sc,** yang merupakan Presiden dan Bendahari Kehormat AKADEMI SAINS MALAYSIA dan juga Ahli-Ahli Majlis, dengan ini menyatakan bahawa, pada pendapat Majlis Akademi, Penyata Kewangan yang dikemukakan berserta dengan nota-nota didalamnya adalah disediakan untuk merujuk pandangan yang benar dan saksama berkenaan :-

(a) Lembaran Imbangan pada 31 Disember 2014 dan Akaun Pendapatan dan Perbelanjaan untuk tahun berakhir itu dan

(b) Penyata Aliran Tunai untuk tahun berakhir pada 31 Disember 2014

(c) Penyata Perubahan Dana

(d) Nota – Nota Akaun

Bagi pihak Majlis

Tan Sri Dr. Ahmad Tajuddin Bin Ali
F.A.Sc

Presiden
Akademi Sains Malaysia

Bagi pihak Majlis

Professor Emeritus Dato' Dr.
Mohammed Mahyuddin Mohd
Dahan F.A.Sc
Bendahari Kehormat
Akademi Sains Malaysia

KUALA LUMPUR, MALAYSIA

Tarikh : 16 MAR 2015

Tingkat 20, Sayap Barat
Menara MATRADE
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50480 Kuala Lumpur

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www.akademisains.gov.my

SAINS DAN INOVASI PENGACU TRANSFORMASI

AKADEMI SAINS MALAYSIA

LEMBARAN IMBANGAN PADA 31 DISEMBER 2014

	Nota	2014 RM	2013 RM
HARTANAH DAN PERALATAN	3	1,127,139	1,021,683
ASET SEMASA			
Lain-lain Penghutang	4	696,413	937,828
Simpanan Tetap	5	105,222,027	136,813,013
Wang Tunai Dan Baki Di Bank	6	3,450,329	6,375,999
		109,368,769	144,126,840
LIABILITI SEMASA			
Lain-lain Pemiutang	7	4,644,435	943,170
		4,644,435	943,170
ASET SEMASA BERSIH		104,724,334	143,183,670
		105,851,473	144,205,353
DIBIAYAI OLEH:			
Kumpulan Wang:			
Kumpulan Wang Pengurusan	8	9,562,211	11,172,298
Kumpulan Wang Amanah	9	50,000	50,000
Kumpulan Wang Pembangunan	10	-	118,203
Kumpulan Wang Projek	11	1,561,686	4,509,904
Kumpulan Wang Rezab Modal	12	58,710	59,740
Liabiliti Bukan Semasa:			
Pendapatan Belum Iktiraf	13	94,618,866	128,295,208
		105,851,473	144,205,353

Nota di muka surat 7 hingga 15 merupakan sebahagian asas Penyata Kewangan ini.

AKADEMI SAINS MALAYSIA

PENYATA PENDAPATAN
BAGI TAHUN BERAKHIR 31 DISEMBER 2014

	Nota	2014 RM	2013 RM
PENDAPATAN			
Sumbangan (Geran Program)	14	35,855,512	43,081,980
Sumbangan (Geran Operasi)		8,597,900	8,815,400
Geran Pembangunan dilunaskan	10	118,203	118,203
Pelunasan Pajakan	12	1,030	1,030
Pendapatan faedah	15	368,876	1,981,197
Hutang Lapuk Pulih		150	-
Kutipan majlis makan malam		50,000	35,506
Pelbagai penerimaan	16	1,870,873	833,942
		46,862,544	54,867,258
PERBELANJAAN			
Emolumen		1,055,986	917,795
Perkhidmatan & bekalan		4,857,615	4,971,384
Pemberian dan kenaan bayaran tetap		3,338,005	3,811,391
Perbelanjaan-perbelanjaan lain		1,830,704	102,889
Susutnilai hartanah dan peralatan	3	467,830	404,882
Hutang lapuk		-	249,360
Peruntukan hutang ragu		73,955	77,600
Majlis makan malam		163,342	223,845
Perbelanjaan program sains	14	36,685,194	43,979,135
		48,472,631	54,738,281
(Kurangan) / Lebihan pendapatan		(1,610,087)	128,977

Nota di muka surat 7 hingga 15 merupakan sebahagian asas Penyata Kewangan ini.

AKADEMI SAINS MALAYSIA

PENYATA ALIRAN TUNAI
BAGI TAHUN BERAKHIR 31 DISEMBER 2014

	2014 RM	2013 RM
ALIRAN TUNAI DARI AKTIVITI OPERASI		
(Kurangan) / Lebihan Pendapatan Atas Perbelanjaan	(1,610,087)	128,977
Pelarasan:		
Susutnilai	467,830	404,881
Peruntukan hutang ragu	73,955	77,600
Faedah dari Deposit Jangka Pendek, Simpanan Tetap & Pelaburan	(368,876)	(1,981,197)
Hartanah dan Peralatan Dihapuskira	578	-
(Kurangan) pendapatan dari operasi sebelum perubahan modal kerja	(1,436,600)	(1,369,739)
Kurangan Penghutang	167,460	688,786
Lebihan / (Kurangan) Pemiutang	3,701,265	(487,299)
Tunai bersih digunakan untuk Aktiviti Operasi	**2,432,125**	**(1,168,252)**
ALIRAN TUNAI DARI AKTIVITI PELABURAN		
Pembelian Hartanah dan Peralatan	(573,864)	(359,407)
Faedah Diterima	368,876	1,981,197
Tunai bersih (ke) / dari Aktiviti Pelaburan	**(204,988)**	**1,621,790**
ALIRAN TUNAI DARI AKTIVITI PEMBIAYAAN		
Kumpulan Wang Projek	(2,948,218)	1,212,973
Kumpulan Wang Pembangunan	(118,203)	(118,203)
Kumpulan Wang Rezab Modal	(1,030)	(1,030)
Pendapatan Belum Iktiraf	(33,676,342)	99,303,122
Tunai bersih (ke) / dari Aktiviti Pembiayaan	**(36,743,793)**	**100,396,862**
(KURANGAN) / PENAMBAHAN BAKI TUNAI DAN KESETARAAN TUNAI	**(34,516,656)**	**100,850,400**
TUNAI DAN KESETARAAN TUNAI PADA AWAL TAHUN KEWANGAN	**143,189,012**	**42,338,612**
TUNAI DAN KESETARAAN TUNAI PADA AKHIR TAHUN KEWANGAN	**108,672,356**	**143,189,012**
TUNAI DAN KESETARAAN TUNAI		
Simpanan Tetap	105,222,027	136,813,013
Wang Tunai dan Baki di Bank	3,450,329	6,375,999
	108,672,356	**143,189,012**

Nota di muka surat 7 hingga 15 merupakan sebahagian asas Penyata Kewangan ini.

AKADEMI SAINS MALAYSIA

PENYATA PERUBAHAN EKUITI
BAGI TAHUN BERAKHIR 31 DISEMBER 2014

	Kumpulan Wang Pengurusan RM	Kumpulan Wang Amanah RM	Kumpulan Wang Pembangunan RM	Kumpulan Wang Projek RM	Kumpulan Wang Rezab Modal RM	Jumlah RM
Baki pada 01 Januari 2013	11,043,321	50,000	236,406	3,296,931	60,770	14,687,428
Terimaan dalam tahun 2013	-	-	-	3,260,857	-	3,260,857
Geran Pembangunan dilunaskan	-	-	(118,203)	-	-	(118,203)
Pelunasan pajakan					(1,030)	(1,030)
Lebihan pendapatan atas perbelanjaan	128,977	-	-	-	-	128,977
Perbelanjaan bagi tahun 2013	-	-	-	(2,271,402)	-	(2,271,402)
Pelarasan	-	-	-	223,518	-	223,518
Baki pada 31 Disember 2013 seperti yang dilaporkan	11,172,298	50,000	118,203	4,509,904	59,740	15,910,145
Terimaan dalam tahun 2014	-	-	-	-	-	-
Geran Pembangunan dilunaskan	-	-	(118,203)	-	-	(118,203)
Pelunasan pajakan	-	-	-	-	(1,030)	(1,030)
Kurangan pendapatan atas perbelanjaan	(1,610,087)	-	-	-	-	(1,610,087)
Perbelanjaan bagi tahun 2014	-	-	-	(2,948,218)	-	(2,948,218)
Pelarasan	-	-	-	-	-	-
Baki pada 31 Disember 2014	9,562,211	50,000	-	1,561,686	58,710	11,232,607

Nota di muka surat 7 hingga 15 merupakan sebahagian asas Penyata Kewangan ini.

AKADEMI SAINS MALAYSIA

NOTA KEPADA PENYATA KEWANGAN BAGI TAHUN BERAKHIR 31 DISEMBER 2014

1 a) AKTIVITI UTAMA

Objektif utama Akademi Sains Malaysia (ASM) adalah untuk mencapai, menggalak dan meningkatkan kecemerlangan dalam bidang sains, kejuruteraan dan teknologi khusus untuk kemajuan dan pembangunan negara serta untuk kebaikan manusia sejagat.

b) PEMBENTANGAN PENYATA KEWANGAN

Penyata kewangan Akademi bagi tahun kewangan berakhir 31 Disember 2014 diluluskan oleh Majlis Akademi pada 16 Mac 2015.

2 DASAR-DASAR PERAKAUNAN

a) Asas Perakaunan

Penyata kewangan telah disediakan mengikut kelaziman kos sejarah dan mengikut piawaian perakaunan yang di luluskan oleh Lembaga Piawaian Perakaunan Malaysia (MASB).

b) Hartanah Dan Peralatan

Hartanah dan peralatan dinyatakan pada kos setelah ditolak susut nilai terkumpul.

Susut nilai bagi hartanah dan peralatan dikira berasaskan kaedah garis lurus di atas kos di sepanjang tempoh hayat kegunaan aset tersebut pada kadar yang berikut:-

Tanah (milik pajakan)	Mengikut tempoh pajakan
Pengubahsuaian Pejabat	10%
Kenderaan	20%
Peralatan dan kelengkapan pejabat	20%
Komputer	20%

Tanah milik pajakan bernilai RM 61,800.00 diperolehi pada 21 Jun 2012 dengan tempoh pajakan selama 60 tahun dan bayaran sebanyak RM 1,030.00 setahun dan perlu dibayar sebelum 7hb Januari setiap tahun.

Hartanah Dan Peralatan didefinasikan sebagai barang-barang tak luak yang bernilai RM1,000.00 atau lebih setiap unit.

Susut nilai penuh dikenakan dalam tahun pembelian bagi hartanah dan peralatan. Baki bersih setiap hartanah dan peralatan hendaklah tidak kurang daripada RM1.00.

c) Penjejasan Nilai Hartanah Dan Peralatan

Nilai buku bersih hartanah dan peralatan ASM telah dianalisis pada tarikh imbangan disediakan untuk menentukan sama ada terdapat tanda-tanda berlakunya penjejasan nilai hartanah dan peralatan. Sekiranya wujud tanda-tanda kerosakan nilai hartanah dan peralatan yang boleh diperoleh semula didapati kurang daripada nilai buku bersih, maka nilai buku bersih hartanah dan peralatan tersebut akan diturunkan nilainya kepada nilai jumlah hartanah dan peralatan yang boleh diperoleh semula.

Amaun tersebut (yang dikenali sebagai penjejasan nilai hartanah dan peralatan) akan dicatatkan sebagai perbelanjaan dan direkodkan di dalam penyata pendapatan dan perbelanjaan tahun berkenaan.

d) **Pengiktirafan Pendapatan Dan Pendapatan Tertunda**

i) **Pendapatan Faedah Dan Pendapatan Dari Pelaburan**

Pendapatan faedah dari simpanan dan deposit konvensional serta pendapatan dari pelaburan diiktiraf mengikut asas akruan.

ii) **Pengiktirafan Geran/Sumbangan**

Peruntukan atau Geran daripada badan-badan kerajaan dan bukan kerajaan diiktiraf berasaskan asas akruan.

Peruntukan yang diterima bagi program/projek yang merangkumi tempoh kurang daripada setahun diiktiraf sebagai hasil dalam tahun berkenaan. Bagi penerimaan untuk mengendalikan program/projek yang melebihi satu tahun, terimaan akan dimasukkan ke dalam Kumpulan Wang Projek berkenaan dan lebihan penerimaan atas perbelanjaan akan diiktiraf sebagai pendapatan bagi tahun penutupan program/projek apabila habis tempoh atau hayat program/projek tersebut. Sebaliknya jika terdapat lebihan perbelanjaan atas penerimaan ianya akan diiktiraf sebagai perbelanjaan ASM.

Pendapatan belum diiktiraf adalah lebihan pendapatan/peruntukan yang diterima dari perbelanjaan yang dibuat pada tahun semasa di bawa kehadapan bagi menanggung perbelanjaan bagi tahun berikutnya (program/projek yang meliputi tempoh masa melebihi satu tempoh perakaunan).

Geran yang diterima dari Kerajaan Malaysia untuk belanja mengurus diambil kira dalam Penyata Pendapatan Kumpulan Wang Pengurusan.

Bagi geran pemberian kerajaan untuk projek pembangunan ianya diiktiraf sebagai geran modal tertunda dan akan dilunaskan mengikut belanja susut nilai projek yang telah disiapkan.

e) **Instrumen Kewangan**

Instrumen kewangan dinyatakan dalam lembaran imbangan termasuk simpanan tetap, baki tunai dan bank, belum terima dan belum bayar. Kaedah pengiktirafan instrumen kewangan yang diterima pakai telah didedahkan dalam polisi perakaunan penyata kewangan secara berasingan.

i) **Penghutang**

Penghutang dinyatakan pada nilai yang dijangka boleh direalisasi. Hutang lapuk dilupuskan apabila ia dikenal pasti. Anggaran dibuat bagi hutang ragu berasaskan kajian semula semua jumlah tunggakan pada tarikh lembaran imbangan.

ii) **Pemiutang**

Pemiutang dinyatakan pada kos iaitu nilai saksama bayaran dan perkhidmatan yang telah diterima.

f) **Pelaburan**

Pelaburan telah ditunjukkan mengikut kos selepas peruntukan rosot nilai pelaburan diambil kira.

g) **Peruntukan Hutang Ragu**

Hutang ragu diperuntukkan bagi hutang yang tidak terbayar melebihi tempoh tiga tahun.

h) **Tunai Dan Kesetaraan Tunai**

Tunai dan kesetaraan tunai merangkumi tunai di tangan, baki di bank dan simpanan tetap.

3 HARTANAH DAN PERALATAN

	Pengubah-suaian Pejabat	Kenderaan	Peralatan Dan Kelengkapan Pejabat	Komputer	Tanah Pajakan	2014	2013
	RM	RM	RM	RM	RM	RM	RM
KOS							
Pada 1 Januari 2014	3,638,914	428,492	912,904	401,387	61,800	5,443,497	5,084,090
Tambahan	251,080	158,690	121,660	42,434	-	573,864	359,407
Pelupusan/Pengkelasan	-	(110,034)	(4,230)	(77,967)	-	(192,231)	-
Pada 31 Disember 2014	3,889,994	477,148	1,030,334	365,854	61,800	5,825,130	5,443,497
SUSUTNILAI TERKUMPUL							
Pada 1 Januari 2014	3,227,589	417,276	498,678	276,211	2,060	4,421,814	4,016,933
Tambahan	258,659	35,203	129,479	43,459	1,030	467,830	404,881
Pelupusan/Pengkelasan	-	(110,033)	(3,666)	(77,954)	-	(191,653)	-
Pada 31 Disember 2014	3,486,248	342,446	624,491	241,716	3,090	4,697,991	4,421,814
NILAI BUKU							
Pada 31 Disember 2014	403,746	134,702	405,843	124,138	58,710	1,127,139	-
Pada 31 Disember 2013	411,325	11,216	414,226	125,176	59,740	-	1,021,683
Susutnilai pada tahun berakhir 31 Disember 2013	256,568	31,000	82,353	33,930	1,030	-	404,881

4 LAIN-LAIN PENGHUTANG

	2014 RM	2013 RM
Pendahuluan	235,360	-
Penghutang	603,458	1,015,428
Tolak: Peruntukan Hutang Ragu	(142,405)	(77,600)
	696,413	937,828

5 SIMPANAN TETAP

Deposit simpanan dalam institusi kewangan berlesen terdiri daripada:-

	2014 RM	2013 RM
Simpanan Tetap	7,375,052	8,832,671
Simpanan Tetap – Antartika	-	188,220
Simpanan Tetap – *Nobel Laureate*	-	220,110
Simpanan Tetap – *BGM*	2,186,505	2,040,687
Simpanan Tetap – *Science Education*	291,415	563,208
Simpanan Tetap – *Mega Science*	-	1,017,327
Simpanan Tetap – *ICSU*	1,826,510	254,235
Simpanan Tetap – *ISTIC*	2,629,579	790,482
	14,309,061	13,906,940
Simpanan Tetap – R,D&C Fund	90,912,966	122,906,073
	105,222,027	136,813,013

6 WANG TUNAI DAN BAKI DI BANK

	2014 RM	2013 RM
BIMB – Operasi ASM	202,741	4,732,802
BIMB – *Nobel Laureate/SAGA*	15,295	13,474
BIMB – NSTRC	266,092	56,871
BIMB – ICSU	326,776	157,115
BIMB – ISTIC	171,830	183,260
MBB – Antartika	184,281	175,674
Tunai Dalam Tangan	3,000	3,000
	1,170,015	5,322,196
BIMB – R,D&C Fund	2,280,314	1,053,803
	3,450,329	6,375,999

7 LAIN-LAIN PEMIUTANG

	2014 RM	2013 RM
Pemiutang Am	966,724	895,466
Cek belum ditunaikan	40,916	40,916
Peruntukan Perkhidmatan Audit & Akaun	7,467	6,788
	1,015,107	943,170
Faedah R,D & C	3,629,328	-
	4,644,435	943,170

Faedah R,D & C adalah faedah yang dijana dari peruntukan R,D & C yang disimpan di dalam simpanan tetap yang mana ianya perlu dibayar kepada kerajaan.

8 KUMPULAN WANG PENGURUSAN

Kumpulan Wang Pengurusan adalah seperti berikut:-

	2014 RM	2013 RM
Baki pada 1 Januari	11,172,298	11,043,321
(Kurangan) / Lebihan pendapatan atas perbelanjaan	(1,610,087)	128,977
Baki pada 31 Disember	9,562,211	11,172,298

Kumpulan Wang Pengurusan ini terdiri daripada peruntukan mengurus bagi Akademi Sains Malaysia (ASM), ICSU ROAP dan ISTIC. Termasuk dalam Kumpulan Wang Pengurusan ini juga adalah peruntukan untuk tabung-tabung yang diwujudkan dan diluluskan oleh pihak Majlis Akademi bagi memastikan pengurusan dan program-program yang dirancang dibawah Fungsi Akademi sepertimana yang termaktub dalam Akta Akademi Sains Malaysia (Akta 524) dapat berjalan dengan lancar. Tabung-tabung yang diwujudkan adalah:-

Tabung	RM
Tabung Program Pembangunan Sains	1,500,000
Tabung Program Sains untuk Pembangunan	1,500,000
Tabung Penerbitan ASM	1,000,000
Tabung Bangunan ASM	800,000
Tabung "HCD"	700,000
Tabung Felo dan Kakitangan Akademi Sains Malaysia	500,000
Jumlah	6,000,000

9 KUMPULAN WANG AMANAH

Kumpulan Wang Amanah adalah seperti berikut:-

	2014 RM	2013 RM
Baki pada 1 Januari	50,000	50,000
Penerimaan tahun semasa	-	-
Perbelanjaan tahun semasa	-	-
Baki pada 31 Disember	50,000	50,000

Kumpulan Wang ini diwujudkan bagi sumbangan yang diterima dari Felo bagi menjalankan aktiviti ASM.

10 KUMPULAN WANG PEMBANGUNAN

Kumpulan Wang Pembangunan adalah seperti berikut:-

	2014 RM	2013 RM
Baki pada 1 Januari	118,203	236,406
Penerimaan tahun semasa	-	-
	118,203	236,406
Tolak :		
Geran Pembangunan dilunaskan :		
Susutnilai	118,203	118,203
Baki pada 31 Disember	-	118,203

Kumpulan Wang Pembangunan ini mewakili kos pengubahsuaian bangunan. Peruntukan ini diperoleh daripada Kementerian Sains, Teknologi dan Inovasi (MOSTI). Geran Pembangunan dilunaskan setiap tahun pada kadar susutnilai 10% dari kos aset yang terlibat iaitu RM118,203.

11 KUMPULAN WANG PROJEK

Kumpulan Wang Projek adalah seperti berikut:-

	2014 RM	2013 RM
Baki pada 1 Januari	4,509,904	3,296,931
Penerimaan tahun semasa	-	3,260,857
Perbelanjaan tahun semasa	(2,948,218)	(2,271,402)
Pelarasan	-	223,518
Baki pada 31 Disember	1,561,686	4,509,904

Projek yang termasuk dalam Kumpulan Wang Projek adalah Projek-projek Rancangan Malaysia Ke Sepuluh (RMK-10), Ke Sembilan (RMK-9) dan Projek Rancangan Malaysia Ke Lapan (RMK-8) –SAGA

KUMPULAN WANG PROJEK (Sambungan)

	2014 RM	2013 RM
Program Penyelidikan Antartika Kebangsaan dan Program Antarabangsa	81,206	83,690
Ekspedisi Saintifik	137,811	137,811
Program *Nobel Laureate* Kebangsaan dan *Scientific Advancement Grant Allocation (SAGA)*	131,824	324,345
Laporan Kajian Strategik dan Pandangan Pakar Dalam Isu-Isu STI dan Program Penilaian Pemeringkatan Penyelidikan	35,140	35,140
Penerbitan Saintifik	27,149	166,543
Program Pendidikan Sains & Kuiz Sains Nasional	911,010	1,012,936
Program Latihan Pengurusan S&T	209,330	209,330
Mega *Science Framework II*	28,216	2,540,109
Baki pada 31 Disember	1,561,686	4,509,904

12 KUMPULAN WANG REZAB MODAL

Kumpulan Wang Rezab Modal adalah seperti berikut:-

	2014 RM	2013 RM
Baki pada 1 Januari	59,740	60,770
Pajakan Tanah	-	-
	59,740	60,770
Tolak :		
Pelunasan Pajakan	1,030	1,030
Baki pada 31 Disember	58,710	59,740

Kumpulan Wang Rezab Modal ini mewakili kos tanah milik pajakan yang diperolehi pada 21 Jun 2012 dengan tempoh pajakan selama 60 tahun. Pelunasan pajakan dibuat setiap tahun pada kadar RM1,030.00.

13 PENDAPATAN BELUM IKTIRAF

Program dalam pelaksanaan adalah seperti berikut:-

	2014 RM	2013 RM
Pameran Islam	1,455,000	1,455,000
Brain Gain	3,204,251	3,260,114
Program Angkasawan	421	421
Inno Fund	-	527
Science Fund	-	2,899
Angkasa (HCD)	135,338	135,338
Ranjeet Bhagwan Singh	20,491	21,261
Pelan Tindakan MOSTI	74,890	74,890
Rare Earth	238,152	502,397
Asean Journal	91,193	70,393
Science Act	37,727	37,727
World Innovation Forum (WIF)	70,000	70,000
Program Tahun Sains	5,823	254,063
Program i-INNOVA	9,310	9,310
	5,342,596	5,894,340
R,D&C Fund	89,276,270	122,400,868
	94,618,866	128,295,208

Pendapatan belum diiktiraf adalah peruntukan bagi *'special program'* yang dipertanggungjawabkan kepada ASM oleh MOSTI yang meliputi tempoh masa melebihi satu tempoh perakaunan.

14 SUMBANGAN DAN PERBELANJAAN PROGRAM SAINS

Pendapatan	2014 RM	2013 RM
Program Kecemerlangan Sains	42,000	79,060
Program Antarabangsa	404,800	200,000
Jalinan Sains	334,500	331,000
Program MOSTI	583,743	1,522,791
Program-program Lain	1,272,434	1,024,519
	2,637,477	3,157,370
R,D&C Fund	33,218,035	39,924,610
	35,855,512	43,081,980

Perbelanjaan	2014 RM	2013 RM
Program Kecemerlangan Sains	142,000	189,387
Program Antarabangsa	811,205	539,307
Dasar Sains	64,909	309,603
Jalinan Sains	746,141	742,597
Perancangan Strategik	9,973	26,431
Penerbitan	141,582	52,841
Program MOSTI	583,743	1,522,766
Program-program Lain	967,606	671,593
	3,467,159	4,054,525
R,D&C Fund	33,218,035	39,924,610
	36,685,194	43,979,135

15 PENDAPATAN FAEDAH

	2014 RM	2013 RM
Faedah Deposit Jangka Pendek	10,305	36,633
Faedah Simpanan Tetap	358,571	1,944,564
	368,876	1,981,197

16 PELBAGAI PENERIMAAN

	2014 RM	2013 RM
Pelbagai Penerimaan – Jualan CD, buku dan lain-lain	133,326	375,540
Yuran Latihan & Seminar	507,922	350,402
Caj Pengurusan Program	1,229,625	108,000
	1,870,873	833,942

17 PERBELANJAAN – PERBELANJAAN LAIN

Termasuk dalam perbelanjaan-perbelanjaan lain adalah pembayaran faedah simpanan tetap peruntukan R,D & C yang dijana pada tahun 2012 kepada kerajaan.

18 PERCUKAIAN

ASM dikecualikan daripada cukai pendapatan di bawah Seksyen 44 (6) Akta Cukai Pendapatan 1967, selaras dengan surat pengecualian cukai bertarikh 2 Mac 1996 yang bernombor rujukan JHDN. 01/35/42/51/179-6.4357 yang diperolehi daripada Ketua Pengarah Hasil Dalam Negeri.

19 INSTRUMEN KEWANGAN

a. Objektif Dan Polisi Pengurusan Risiko Kewangan

Polisi pengurusan risiko kewangan ASM adalah untuk memastikan sumber-sumber kewangan yang mencukupi bagi pembangunan operasi ASM sementara menguruskan risiko-risiko kewangannya, termasuk risiko kredit, risiko kadar faedah, risiko pinjaman tidak berbayar, risiko kecairan dan aliran tunai.

b. Risiko Kredit

Risiko kredit ASM adalah daripada akaun-akaun belum terima. Akaun-akaun ini dipantau dari semasa ke semasa melalui prosedur dalaman yang sedia ada dan tindakan akan diambil terhadap hutang-hutang tertunggak.

c. Risiko Kadar Faedah

ASM menyelenggarakan satu had tunai dan simpanan tetap untuk memenuhi keperluan modal kerja. Risiko ini wujud akibat kadar turun naik kadar faedah di pasaran.

d. Risiko Kecairan Dan Aliran Tunai

ASM menguruskan dengan teliti urusan keluar masuk tunai dan juga urusan pengutipan semula hutang-hutang pelanggan yang mencapai tempoh matang bagi menjaga kecairan dan aliran tunainya.

20 MANFAAT KAKITANGAN ASM

a. Manfaat jangka pendek

Upah, gaji, elaun dan sumbangan keselamatan sosial diiktiraf sebagai perbelanjaan pada tahun di mana perkhidmatan yang diberikan oleh kakitangan ASM. Pampasan ketidakhadiran terkumpul jangka pendek seperti cuti tahunan berbayar diiktiraf bila perkhidmatan yang diberi oleh kakitangan ASM akan menambahkan hak pampasan ketidakhadiran akan datang dan pampasan ketidakhadiran tidak terkumpul jangka pendek seperti cuti sakit diiktiraf bila ketidakhadiran berlaku.

b. Pelan caruman wajib

ASM mencarum kepada Kumpulan Wang Simpanan Pekerja dan Kumpulan Wang Pencen Kerajaan bagi kakitangannya mengikut skim yang dipilih mereka. Caruman tersebut diiktiraf sebagai perbelanjaan dalam penyata pendapatan apabila ia berlaku.

21 MAKLUMAT KAKITANGAN

Jumlah kakitangan ASM pada 31 Disember 2014 adalah seramai 63 orang (31.12.2013: 60 orang).

22 ANGKA PERBANDINGAN

Angka-angka perbandingan bagi tahun lepas telah disusun semula di mana perlu supaya selaras dengan angka yang dibentangkan tahun ini.

2014 - 2015

AHLI MAJLIS ASM / COUNCIL MEMBERS

Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc
President
2010 - 2016
Mathematics, Physics and Earth Sciences

Professor Dato' Dr Asma Ismail FASc
Vice President
2014 - 2016
Medical and Health Sciences

Dato' Dr Samsudin Tugiman FASc
Secretary General
2013 - 2015
Science & Technology Development and Industry

Emeritus Professor Dato' Dr Mohamed Mahyuddin Mohd Dahan FASc
Honorary Treasurer
2013 - 2015
Biological, Agricultural and Environmental Sciences

AHLI MAJLIS BIASA / ORDINARY COUNCIL MEMBERS

Professor Ir Dr Ahmad Faizal Mohd Zain FASc
2013 – 2015
Engineering and Computer Sciences

Professor Datin Paduka Dr Aini Ideris FASc
2013 – 2015
Biological, Agricultural and Environmental Sciences

Academician Emeritus Professor Dato' Dr C.P. Ramachandran FASc
2013 – 2015
Medical and Health Sciences

Professor Dato' Dr Khalid Yusoff FASc
2013 – 2015
Medical and Health Sciences

Professor Dato' Dr Roslan Abd Shukor FASc
2013 – 2015
Mathematics, Physics and Earth Sciences

Academician Tan Sri Dr Salleh Mohd Nor FASc
2013 – 2015
Biological, Agricultural and Environmental Sciences

Professor Datuk Dr Sukiman Sarmani FASc
2013 – 2015
Chemical Sciences

Professor Dato' Ir Dr Abu Bakar Jaafar FASc
2014 – 2016
Engineering and Computer Sciences

Academician Tan Sri Datuk Ir (Dr) Hj Ahmad Zaidee Laidin FASc
2014 – 2016
Engineering and Computer Sciences

Academician Professor Dato' Ir Dr Chuah Hean Teik FASc
2014 – 2016
Mathematics, Physics and Earth Sciences

Professor Datuk Dr Halimaton Hamdan FASc
2014 – 2016
Chemical Sciences

Professor Datin Paduka Dr Khatijah Mohd Yusoff FASc
2014 – 2016
Biological, Agricultural and Environmental Sciences

JAWATANKUASA KERJA DAN BADAN BERTINDAK
WORKING COMMITTEES AND TASK FORCES

Kumpulan Disiplin ASM
ASM Discipline Groups

Sains Perubatan dan Kesihatan
Medical and Health Sciences
Professor Dato' Dr Khalid Yusoff FASc

Kejuruteraan dan Sains Komputer
Engineering and Computer Sciences
Professor Ir Dr Ahmad Faizal Mohd Zain FASc

Sains Biologi, Pertanian dan Alam Sekitar
Biological, Agricultural and Environmental Sciences
Dato' Dr Hashim Abdul Wahab FASc

Matematik, Fizik dan Sains Bumi
Mathematics, Physics and Earth Sciences
Emeritus Professor Dato' Dr Muhammad Yahaya FASc

Sains Kimia
Chemical Sciences
Professor Datuk Dr Halimaton Hamdan FASc

Pembangunan Sains & Teknologi dan Industri
Science & Technology Development and Industry
Datuk Dr Mohd Basri Wahid FASc

Jawatankuasa Kerja Pengurusan dan Perkhidmatan ASM
ASM Management and Services of Working Committees

Jawatankuasa Kewangan dan Pelaburan
Finance and Investment Committee
Emeritus Professor Dato' Dr Mohamed Mahyuddin Mohd Dahan FASc
(Bendahari Kehormat / Honorary Treasurer)

Jawatankuasa Audit
Audit Committee
Academician Emeritus Professor Dato' Dr C.P. Ramachandran FASc

Jawatankuasa Keahlian
Membership Committee
Professor Dato' Dr Asma Ismail FASc

Lembaga Editorial Jurnal Sains ASM
ASM Science Journal Editorial Board
Professor Datin Paduka Dr Khatijah Mohd Yusoff FASc

Jawatankuasa Penerbitan
Publication Committee
Dato' Dr Samsudin Tugiman FASc

Jawatankuasa Bangunan ASM
ASM Building Committee
Emeritus Professor Dato' Dr Mohamed Mahyuddin Mohd Dahan FASc
(Bendahari Kehormat / Honorary Treasurer)

Jawatankuasa ASM- Young Scientists Network (YSN)
Young Scientists Network (YSN)-ASM Committee
Professor Dr Mohd Basyaruddin Abdul Rahman

Kajian ASM
ASM Studies

Jawatankuasa Penasihat Dasar Sains, Teknologi dan Inovasi
Science, Technology and Innovation Policy Advisory Committee
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc

Jawatankuasa Air
Committee on Water
Academician Datuk Fateh Chand FASc

Badan Bertindak Pengurusan Bekalan Air dan Pengurusan Sisa Air
Task Force on Water Supply and Wastewater Management
Professor Dato' Seri Ir Dr Zaini Ujang FASc
Professor Dr Zulkifli Yusop FASc
(Pengerusi Bersama/Co-Chair)

Badan Bertindak Penyelidikan dan Pembangunan (Air)
Task Force on R&D (Water)
Professor Dr Ahmad Fauzi Ismail FASc

Badan Bertindak Pengurusan Permintaan Air
Task Force on Water Demand Management
Tan Sri Dato' Ir Syed Muhammad Shahabudin FASc

Badan Bertindak Pengurusan Lembangan Sungai Bersepadu
Task Force on Integrated River Basin Management (IRBM)
Dato' Ir Hj Ahmad Husaini Sulaiman
YBhg Dato' Ir Hj Hanapi Mohamad Noor
(Pengerusi Bersama/Co-Chair)

Badan Bertindak Air dan Pertanian
Task Force on Water and Agriculture
Datuk Ir Mohd Adnan Mohd Nor FASc

Badan Bertindak Polisi dan Undang-undang Air
Task Force on Water-Related Policies and Legislation
Professor Dr Joy Jacqueline Pereira FASc

Jawatankuasa Science Outlook
Science Outlook Committee
Professor Datuk Dr Halimaton Hamdan FASc

Jawatankuasa Nadir Bumi
Rare Earth Committee
Academician Tan Sri Datuk Ir (Dr)
Hj Ahmad Zaidee Laidin FASc

Badan Bertindak Carbon Free Energy
Task Force on Carbon Free Energy
Professor Dato' Dr Kamaruzzaman Sopian FASc

Badan Bertindak Penggunaan Tenaga & Kecekapan Tenaga dalam Pengangkutan
Task Force on Energy Use & Energy Efficiency in Transportation
Academician Tan Sri Datuk Ir (Dr)
Hj Ahmad Zaidee Laidin FASc
Professor Dr Nasrudin Abd Rahim FASc
(Pengerusi Bersama/ Co-chair)

Badan Bertindak Sel Bahan Api
Task Force on Fuel Cell
Professor Dato' Ir Dr Wan Ramli Wan Daud FASc

Kumpulan Kerja Bidang Keberhasilan Utama Ekonomi (NKEA) untuk Air
Working Group on National Key Economic Areas (NKEA) for Water
Dr Low Kwai Sim FASc

Jawatankuasa Bersama ASM-MIGHT S2A
ASM-MIGHT Joint Committee on S2A
Dato' Dr Samsudin Tugiman FASc

Badan Bertindak Berkenaan El Nino – Kesan Sosial kepada Malaysia
Task Force on El Nino – Social Impacts on Malaysia
Professor Dr Low Pak Sum FASc

Jawatankuasa Program ASM
ASM Programme Committees

Mega Science 3.0
Datuk Dr Mazlan Othman FASc

Jawatankuasa Pemandu Mahathir Science Award
Mahathir Science Award Steering Committee
Dato' Dr Samsudin Tugiman FASc

Jawatankuasa Penilaian TechnoFund
TechnoFund Evaluation Committee
Professor Ir Dr Ahmad Faizal Mohd Zain FASc

Panel Penilaian Community Innovation Fund (CIF)
Community Innovation Fund (CIF) Evaluation Panel
Professor Dato' Dr Roslan Abd Shukor FASc

Panel Penilaian ScienceFund
ScienceFund Evaluation Panel
Professor Datin Paduka Dr Aini Ideris FASc

Pasukan Pemantauan Projek ScienceFund and InnoFund
ScienceFund and InnoFund Project Monitoring Team
Professor Datuk Dr Sukiman Sarmani FASc

Jawatankuasa Saringan ASM bagi Peruntukan Khas untuk Agensi di bawah MOSTI (Green Lane) dan Program Flagship DSTIN
ASM Screening Committee for the Special Allocation for Agencies under MOSTI (Green Lane) and DSTIN Flagship Program
Professor Dato' Dr Asma Ismail FASc
Emeritus Professor Dato' Dr Mohamed Mahyuddin Mohd Dahan FASc
(Alternate Chair)

Panel Penyaringan Anugerah Penyelidikan Kanser MAKNA
MAKNA Cancer Research Award Vetting Panel
Professor Datin Paduka Dr Khatijah Mohd Yusoff FASc

Panel Pemilihan Program Lindau
Lindau Program Selection Panel
Professor Dato' Dr Asma Ismail FASc

Panel Pemilihan Top Research Scientist Malaysia (TRSM)
Top Research Scientist Malaysia (TRSM) Selection Panel
Academician Emeritus Professor Tan Sri Dr Omar Abdul Rahman FASc

Panel Pemilihan Summer Programme European Organization for Nuclear Research (CERN)
European Organization for Nuclear Research (CERN) Summer Programme Selection Panel
Professor Dr Awg Bulgiba Awg Mahmud FASc

Panel Pemilihan Keahlian YSN
YSN Membership Selection Panel
Professor Dato' Dr Asma Ismail FASc

Panel Pemilihan IAMP
IAMP Selection Panel
Professor Dato' Dr Khalid Yusoff FASc

Panel Pemilihan IIASA
IIASA Selection Panel
Professor Dato' Ir Dr Abu Bakar Jaafar FASc

Jawatankuasa Pemandu Program Tabung Penyelidikan Perubatan Dr Ranjeet Bhagwan Singh
Dr Ranjeet Bhagwan Singh Medical Research Trust Fund Programme Steering Committee
Academician Distinguised Professor Datuk Dr Looi Lai Meng FASc

Jawatankuasa Kajian Semula TRSM
TRSM Review Committee
Academician Tan Sri Datuk Dr Yusof Basiron FASc

Jawatankuasa Penganjur Perjumpaan Tahunan TRSM
Organising Committee of TRSM Annual Gathering
Professor Dr Abdul Rahman Mohamed FASc

Lembaga Editorial Jurnal Sains dan Teknologi untuk Pembangunan ASEAN
ASEAN Journal on Science & Technology for Development Editorial Board
Emeritus Professor Dato' Dr Md Ikram Mohd Said FASc

Jawatankuasa Penganjuran Global R&D CEO Forum
Global R&D CEO Forum Organizing Committee
Professor Dato' Dr Asma Ismail FASc

Jawatankuasa Pemandu Persidangan Antarabangsa Science for Peace
International Conference on Science for Peace Steering Committee
Academician Tan Sri Dr Ahmad Mustaffa Babjee FASc
Dato' Dr Hashim Abdul Wahab FASc
(Pengerusi Bersama/ Co-chair)

Jawatankuasa Pembangunan Modal Insan
Human Capital Development Committee
Professor Dato' Dr Mohamed Shariff Mohamed Din FASc

Jawatankuasa Penganjuran Malaysian Technical Cooperation Programme (MTCP)
Malaysian Technical Cooperation Programme (MTCP) Organising Committee
Emeritus Professor Dr Jalani Sukaimi FASc

Jawatankuasa Rangkaian Sains & Teknologi dan Industri
Science & Technology and Industry Linkages Committee
Academician Datuk Ir Hong Lee Pee FASc

Jawatankuasa Kecil Penyebaran Maklumat S&T
S&T Information Dissemination sub-committee
Academician Dr Ho Chee Cheong FASc

Jawatankuasa Kecil Model Hubungan S&T - Industri
S&T- Industry Linkage Model sub-committee
Professor Dr Lee Sze Wei

Jawatankuasa Kecil Kerjasama S&T dan Industri
S&T and Industry Alliance sub-committee
Ir Choo Kok Beng FASc
Dato' Ir (Dr) Andy Seo Kian Haw FASc
(Pengerusi Bersama/ Co-chair)

Jawatankuasa Pendidikan Sains ASM
ASM Science Education Committee
Academician Datuk Dr Abdul Aziz S.A. Kadir FASc

Badan Bertindak Kerjasama Penyelidikan bersama European Organization for Nuclear Research (CERN)
Task Force on Research Collaboration with the European Organization for Nuclear Research (CERN)
Professor Dr Wan Ahmad Tajuddin Wan Abdullah FASc

Jawatankuasa Pemandu National Science Challenge
National Science Challenge Steering Committee
Professor Dr Yang Farina Abdul Aziz FASc

Wakil ASM dalam Mesyuarat dan Jawatankuasa Nasional
ASM Representatives in National Meetings and Committees

Global Science and Innovation Advisory Council (GSIAC)
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc

National Megatrends Committee
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc

National Innovation Council (NIC)
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc

National Science and Research Council (NSRC)
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc

WAKIL ASM DALAM MESYUARAT DAN JAWATANKUASA ANTARABANGSA
ASM REPRESENTATIVES IN INTERNATIONAL MEETINGS AND COMMITTEES

Association of Academies and Societies in Asia (AASSA)- Merging of FASAS & AASA
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc

Inter Academy Medical Panel (IAMP)
Academician Distinguised Professor Datuk Dr Looi Lai Meng FASc

Inter Academy Panel (IAP)
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc

International Council for Science (ICSU)
Professor Datuk Dr Sukiman Sarmani FASc

International Institute for Applied Systems Analysis (IIASA)
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc

ISTIC Board
Professor Dato' Dr Asma Ismail FASc

Network of Academies of Sciences in the Islamic Countries (NASIC)
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc

Science Council of Asia (SCA)
Emeritus Professor Dr Mohd Nordin Hj Hasan FASc

Academy of Sciences in Developing World (TWAS)
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc

IAP-Science Education Programme (IAP-SEP)
Academician Dato' Ir Lee Yee Cheong FASc

MESYUARAT ANTARABANGSA
INTERNATIONAL MEETINGS

1 **Association of Southeast Asian Nations (ASEAN) Talent Mobility Workshop**
26 – 28 March 2014
Phuket, Thailand

2 **Advisory Body on ASEAN Plan of Action on Science and Technology Meeting (ABAPAST)**
22 April 2014
Singapore

3 **African-European-Mediterranean Academies of Science Education (AEMASE) International Conference On Science Education**
19 – 20 May 2014
Rome, Italy

4 **International Institute for Applied Systems Analysis (IIASA) Young Scientists Summer Programme (YSSP)**
1 June – 31 August 2014
Vienne, Austria

5 **Korean Academy of Science and Technology – Academy of Sciences Malaysia – InterAcademy Panel (KAST-ASM-IAP) International Workshop on "Science Literacy: Science Communication and Science Outreach"**
12 – 13 June 2014
Seoul, Korea

6 **The European Organization for Nuclear Research/ Conseil Européen pour la Recherche Nucléaire (CERN) Summer Student Programme (CSSP)**
23 June – 15 August 2014
Geneva, Switzerland

7 **64th Lindau Nobel Laureate Meeting 2014**
29 June – 4 July 2014
Lindau, Germany

8 **Smart Villages Initiatives - First Workshop on Energy for Off Grid Villages in Africa**
2 - 5 June 2014
Arusha, Tanzania

9 **Innovation for Cool Earth Forum (ICEF) 1st Annual Meeting**
7 – 8 October 2014
Tokyo, Japan

10 **KAST-ASM-INSA-IAP International Symposium on "SHER Communication in Asia with a Special Focus on Science Festivals"**
14 – 17 October 2014
New Delhi, India

11 **2014 8th National Research Foundation of Korea (NRF) Capacity Building Workshop**
15 – 17 October 2014
Seoul, Korea

12 **IAMP Executive Committee (EC) Meeting**
17 – 21 October 2014
Berlin, Germany

13 **The World Academy of Sciences (TWAS) 25th General Meeting**
26 – 29 October 2014
Muscat, Oman

14 **IAP Science Education Programme (SEP) Global Council Meeting and Biennial Conference 2014 on "Challenges and Opportunities of IBSE / STEM Education"**
28 – 31 October 2014
Beijing, China

15 **InterAcademy Partnership (IAP) Board Meeting**
6 – 7 November 2014
Paris, France

16 **2nd China-ASEAN Technology Manager Training Session**
11 – 30 July 2014
Nanning, China

17 **International Institute for Applied Systems Analysis (IIASA) 85th Council Meeting**
9 – 12 November 2014
Laxenburg, Austria

18 **International Institute for Applied Systems Analysis (IIASA) National Member Organisation (NMO) Secretaries Meeting**
12 November 2014
Laxenburg, Austria

19 **Science@Malaysia – Conference for National Scientific Engagement**
22 November 2014
Oxford, UK

20 **InterAcademy Panel (IAP) Conference: "Science for Poverty Eradication and Sustainable Development: a Call for Action"**
3 – 5 December 2014
Manaus, Brazil

21 **InterAcademy Panel (IAP) Conference: "Science for Poverty Eradication and Sustainable Development: a Call for Action"**
3 – 5 December 2014
Manaus, Brazil

22 **Malaysian Delegation Visit to Hassan II Academy of Sciences and Technology of Morocco**
- Renewable Energy Workshop
- Education Workshop
7 – 16 December 2014
Morocco

23 **ASEAN Talent Mobility Workshop**
13 – 14 November 2014
Bangkok, Thailand

24 **3rd APEC PPSTI Meeting**
9 – 12 April 2014
Changzhou, China

25 **4th APEC PPSTI Meeting**
17 – 19 September 2014
Beijing, China

MEMORANDUM PERSEFAHAMAN
MEMORANDUM OF UNDERSTANDING

Memorandum Persefahaman / Perjanjian bertujuan untuk meningkatkan dan mengeratkan kerjasama dua hala di antara Malaysia dengan negara-negara lain melalui akademi-akademi sains yang lain serta organisasi sains, teknologi dan inovasi (STI) antarabangsa. MoU / perjanjian yang telah ditandatangani oleh ASM memberi peluang kepada penyelidik Malaysia untuk bekerjasama dengan rakan-rakan asing, untuk berkongsi pengetahuan, untuk membina kepakaran dan juga untuk mengukuhkan keupayaan sains dan teknologi untuk membolehkan negara bersaing seiring dengan pembangunan kemajuan sains dan teknologi global.

The Memorandum of Understandings (MoU) /Agreements aim at promoting and strengthening bilateral cooperation between Malaysia and other countries through sister academies or science, technology and innovation (STI) international organizations. These MoUs/agreements signed by ASM provide opportunities for Malaysian researchers to collaborate with foreign colleagues, to share knowledge, to build expertise as well as to strengthen scientific and technological capabilities in order for the nation to remain competent in the context of global science and technology advancement.

Following are the Memorandum of Understanding signed by ASM:

Australia
Australian Academy of Sciences
Cooperation Agreement between the Australian Academy of Sciences, Australian Academy of Technological Science and Engineering and ASM
Australian Antarctic Division
MOU on Academic and Research Corporation

Belarus
Australian Antarctic Division

France
Academies Des Sciences of Institute De France
Letter of Intention on Scientific and Technological Cooperation Between Academies Des Sciences of Institute De France

German
Berlin-Branderburg Academy of Science

Kyrgyz Republic
National Academy of Sciences of the Kyrgyz Republic

Morocco
The Hassan II Academy of Science and Technology
Cooperation Agreement

Philippines
National Academy of Science and Technology Philippines

Switzerland
European Organization for Nuclear Research (CERN)
Expression of Interest in the participation of Scientist and Students from Universities and Research Institute in Malaysia in the CMS Experiment at the CERN LHC Accelerator

United Kingdom
Royal Society UK
Royal Society of Edinburgh
MOU on Academic and Research Corporation

Vietnam
Vietnam Academy of Science & Technology (VAST)
Cooperation Agreement between Vietnam Academy of Science & Technology Vietnam and The Academy of Sciences Malaysia

PROGRAM ASM
ASM PROGRAMMES

01 January

Sketches of Science Exhibition
12 December 2013 – 31 January 2014
PETRONAS Art Gallery, KLCC

Mega Science Frame Work Study 2.0: Transportation Sector Workshop
22 January 2014
ASM

Mega Science Frame Work Study 2.0: Housing Sector Workshop
23 January 2014
ASM

14th IdeaXchange
24 January 2014
ASM

Café Scientifique on 'Keeping Sport Clean and Fair' by Academician Tan Sri Dr M. Jegathesan FASc
25 January 2014
PETRONAS Art Gallery, KLCC

Café Scientifique on 'Understanding Cancer' by Academician Distinguished Professor Datuk Dr Looi Lai Meng FASc
27 January 2014
PETRONAS Art Gallery, KLCC

In House Training: Excel Advance 1 and 2
28 – 29 January 2014
ASM

Café Scientifique on 'What's the Big Deal about Biodiversity?' by Academician Tan Sri Dr Ahmad Mustaffa Babjee FASc
29 January 2014
PETROSAINS, KLCC

02 February

Mega Science Frame Work Study 2.0: Electrical & Electronics Sector Workshop
5 February 2014
ASM

Mega Science Frame Work Study 2.0: Environment Sector Workshop
6 February 2014
ASM

Mega Science Frame Work Study 2.0: Infrastructure Sector Workshop
7 February 2014
ASM

In House Training: Practical Session – Writing In English With ASM Chief Editor
7 February 2014
ASM

Mega Science Frame Work Study 2.0: Transportation Stakeholders Workshop
10 February 2014
ASM

Strategic Consultation on 'Developing Roadmap for Particle Physics in Malaysia'
11 February 2014
ASM

Discipline Selection Task Force Meeting
15 February 2014
ASM

Bengkel Penilaian Projek Science Fund Bil. 1/2014 di bawah S&T Core, MOSTI
17 – 19 February 2014
ASM

Talk on 'The Scientific Rationale for the Immunological Enhancement and Long-Term Remissions in HIV Patients Exposed to High-Level Whole Body Hyperthermia' by Professor Emeritus Dr Milton Brian Yatvin, Oregon Health Sciences University
19 February 2014
UKM, Bangi

Bengkel Penilaian Projek Science Fund Bilangan 1/2014 di bawah S&T Core, MOSTI
21 February 2014
ASM

ASM Membership Meeting
21 February 2014
ASM

100th ASM Finance Meeting
21 February 2014
ASM

Mega Science Frame Work Study 3.0: Scoping Workshop
22 February 2014
ASM

43rd ASM EXCO Meeting
28 February 2014
ASM

03 March

Visit by Hassan II Academy of Sciences and Technology of Morocco's Delegate
3 – 10 March 2014
ASM

Renewable Energy Workshop with Hassan II Academy of Sciences and Technology of Morocco
4 – 5 March 2014
ASM

Education Workshop with Hassan II Academy of Sciences and Technology of Morocco
4 – 5 March 2014
ASM

NSC 2014 Question Committee Workshop
6 March 2014
ASM

15th IdeaXchange
7 March 2014
ASM

Closing Ceremony of the Hassan II Academy of Sciences and Technology of Morocco Delegation's Visit
10 March 2014
ASM

Senior Fellows Meeting
10 March 2014
ASM

ASM Activities Brainstorming Session
11 – 13 March 2014
Petaling Jaya

Water Supply and Wastewater Management: 3rd Strategic Consultative Workshop
14 March 2014
ASM

Mega Science Frame Work Study 3.0: Scoping Workshop
17 March 2014
ASM

Global R&D CEO Forum 2014: Dialogue
17 March 2014
ASM

Talk on 'The New Clean Energy Era and How It Impact You' by Dr Patrick Meyer
18 March 2014
ASM

Water Research & Development: 2nd Strategic Consultative Workshop
20 March 2014
ASM

Water Research & Development: 2nd Strategic Consultative Workshop
6 March 2014
ASM

108th ASM Council Meeting
21 March 2014
ASM

Public Lecture on 'Understanding Cancer' by Academician Distinguished Professor Datuk Looi Lai Meng FASc
26 March 2014
UTP, Perak

I'm A Scientists, Get Me Out of Here, Malaysia: Moderator Training Session
28 March 2014
ASM

101st ASM Finance Meeting
28 March 2014
ASM

04 April

1st Workshop by National Science Research Council (NSRC) on Priority Areas for Research, Development & Commercialisation (R,D,&C)
1 April 2014
ASM

Reunion Meeting for International Workshop on Educational Institute on Responsible Science
1-2 April 2014
Kuala Lumpur

A National Key Priority on Water: 1st Strategic Consultative Workshop
3 April 2014
ASM

Media Briefing on 'Water Futures and Solutions'
4 April 2014
ASM

Membership Workshop
4 April 2014
ASM

Study Visit by NISTPASS Vietnam Delegate
7 April 2014
ASM

I'm A Scientist, Get Me Out of Here, Malaysia: Zuhrah & Bumi Zone
7-18 April 2014
Online ASM

Malay College Kuala Kangsar (MCKK) Science Carnival
8 April 2014
Kuala Kangsar, Perak

2014 National Science Challenge Preliminary Level
8-14 April 2014
Online, Malaysia

109th ASM Council Meeting
11 April 2014
ASM

Training Workshop on 'Technical Writing for Research and Publications'
15-17 April 2014
Kuala Lumpur

2014 National Science Challenge State Level (Zone A)
23 April 2014
Penang, Perlis, Kedah & Perak

5th General Assembly on 'Matching Talent with Economic Transformation Programme (ETP)'
26 April 2014
ASM

19th Annual General Meeting
26 April 2014
ASM

2014 National Science Challenge State Level (Zone B)
29 April 2014
Kelantan, Terengganu & Pahang

05 May

2014 National Science Challenge State Level (Zone C)
6 May 2014
Putrajaya, Kuala Lumpur & Selangor

Water Demand Management: 6th Strategic Consultative Workshop
6 May 2014
Kota Kinabalu, Sabah

Water Demand Management: 5th Strategic Consultative Workshop
7 May 2014
Kuching, Sarawak

2014 National Science Challenge State Level (Zone D)
8 May 2014
Negeri Sembilan, Malacca & Johor

102nd Finance Meeting
9 May 2014
ASM

16th IdeaXchange
14 May 2014
ASM

Media Announcement on 'Outstanding Malaysian Young Scientists to Join Nobel Laureates and International Scholars'
15 May 2014
ASM

2014 National Science Challenge State Level (Zone E)
15 May 2014
Labuan, Sabah & Sarawak

44th Exco Meeting
16 May 2014
ASM

Media Briefing on '14th Science Council for Asia Annual Conference 2014'
22 May 2014
Kuala Lumpur

Training Workshop on 'How to Write A Winning Research Proposal'
20-22 May 2014
ASM

2nd Workshop by National Science Research Council (NSRC) on 'Priority Areas for Research, Development & Commercialisation (R,D&C)
26 May 2014
ASM

ScienceBuzz Poster Contest
28 May 2014 - 28 August 2014
ASM

06 June

Workshop on Change Acceleration (CAP)
2-3 June 2014
SIRIM Berhad, Shah Alam

New ASM Fellows Induction Session
6 June 2014
ASM

Official Launch of *I Am ... Because of You;* A biography by Academician Professor Emeritus Dato' Dr C.P. Ramachandran FASc
8 June 2014
Kuala Lumpur

Lecture on 'An Old Enemy, A New Battle Plan: Combating the Scourge of Malaria in the Genomic Era' by 2013 Mahathir Science Award recipient, Professor Alan F. Cowman
10 June 2014
Sunway University, Subang Jaya

Mock Cheque Presentation Ceremony for the 2014 National Science Challenge and International Mathematical Olympiad by Exxonmobil Subsidiaries in Malaysia Incorporated
11 June 2014
Pusat PERMATA Pintar, UKM

2013 Mahathir Science Award Ceremony
11 June 2014
Kuala Lumpur

Official Launch of *From Science to Science Policy - One Man's Passionate Journey;* A Biography cum Memoir of Academician Professor Emeritus Tan Sri Dr Omar Abdul Rahman
11 June 2014
Online ASM

Art Auction - Nature Inspired Art
11 June 2014
Kuala Lumpur

Dialogue on 'Trials and Tribulations in Vaccine Development for Malaria' with Professor Alan F. Cowman, the 2013 Mahathir Science Award recipient
12 June 2014
ASM

14th Science Council of Asia Annual Conference 2014
18-19 June 2014
Kuala Lumpur

Science Outlook Workshop
20 June 2014
PICC, Putrajaya

Talk on 'Climate Impacts and Adaptation' by Mr Simon Sharpe, Head of Global Strategic Impacts Team, Climate Change and Energy Department, Foreign and Commonwealth Office, UK
24 June 2014
ASM

A National Key Priority on 'Water: 2nd Strategic Concultative Workshop'
26 June 2014
ASM

Science to Action Workshop
27-28 June 2014
Port Dickson, Negeri Sembilan

07 July

ASM Orientation Programme 2/2014
1-2 July 2014
ASM

NST-ASM Insight on 'Malaysian's Water Future: Assessment of Challenges and Opportunities'
4 July 2014
NSTP Theatrette Hall, Bangsar

Workshop on 'Preparation Procedure for Finance and Accounts, Administration and ICT, Human Resources and Management'
7-10 July 2014
ASM

Bengkel Tatacara Pentadbiran dan Pengurusan Sumber Manusia
9 – 10 July 2014
ASM

1st Meeting on Smart Village Workshop
14 July 2014
ASM

2nd Meeting on Smart Village Workshop
16 July 2014
UNIMAS, Sarawak

103rd ASM Finance Meeting
18 July 2014
ASM

08 August

ASM Eid Ul-Fitr Gathering
5 August 2014
ASM

2014 National Science Challenge Semi Final
10 – 16 August 2014
UPM, Serdang

Art Sales@Festival Pelancongan Seni Kontemporari 1Malaysia (1MCAT)
11 August – 18 September 2014
Kuala Lumpur

2014 NSC Mentor Teachers Visit to ASM
13 August 2014
ASM

Announcement of 2014 National Science Challenge Finalists
16 August 2014
UPM, Serdang

ASM Fellow's Lecture on 'Malaysian Palms: Prince of the Plant Kingdom'by Dr Saw Leng Guan FASc
18 August 2014
FRIM, Kepong

45th EXCO Meeting
22 August 2014
ASM

Training Workshop on 'How to Write a Winning Research Proposal?'
27 – 29 August 2014
UMP, Pahang

09 September

17th IdeaXchange
5 September 2014
ASM

111th ASM Council Meeting
5 September 2014
ASM

Water Demand Management: 10th Science, Technology and Innovation (STI) Management Training Course for Researchers in OIC Countries
14 – 23 September 2014
Kuala Lumpur

10 October

2014 National Science Challenge Final
9 October 2014
Putrajaya

ASM Convergence Zone on 'Mega Trends Driving Innovation in a Hyper Connected World' by Professor Mohan Sawhney
14 October 2014
MATRADE, Kuala Lumpur

ASM Fellow's Lecture on 'Sustainable Rice Cultivation: Steps Towards Sustainable Practices' by Professor Dr Shamshuddin Jusop FASc
17 October 2014
UPM, Serdang

Seminar on 'Bio-risks and Bio-threats: Bridging Science and Security'
27 – 28 October 2014
Penang

3rd Meeting on Smart Village Workshop
30 October 2014
Kuching, Sarawak

11 November

National Forum: Mega Science Agenda, Malaysia 2050
6 November 2014
MATRADE Hall

Senior Fellow's Meeting
6 November 2014
ASM

46th ASM EXCO Meeting
7 November 2014
ASM

International Workshop on 'Mathematical Modelling for Applications 2014:
Track A - Bioinformatics Models and Methods for Genomic Medicine and Drug Design'
Track B - Oil Palm Ecosystem'
11 – 13 November 2014
Kuala Lumpur

Strategic Planning for 2015 Activities
17 November 2014
Petaling Jaya

I'm A Scientist, Get Me Out of Here, Malaysia: Marikh and Musytari Zone
10 – 21 November 2014
Online ASM

Visit by Professor Daniel Roan, President La Main Ala Pate Foundation and Member of French Academy of Sciences
21 November 2014
ASM

International Workshop on 'Mathematical Modelling for Applications 2014:
Track C - Big Data and the Power of Statistics for Decision Makers: Patterns, Predictions and Prescriptive Analytics'
Track D - Smart Grid Power System'
11 – 13 November 2014
Kuala Lumpur

105th ASM Finance Meeting
28 November 2014
ASM

2014 Mahathir Science Award – Voting by ASM Fellows
28 November 2014
ASM

6th General Assembly on 'Malaysia Beyond 2020'
29 November 2014
ASM

12 December

Workshop on 'Energy Usage and Energy Efficiency In Transportation
4 December 2014
Sepang, Selangor

Sending Off Ceremony of 2014 National Science Challenge Winners to Stockholm'
4 December 2014
Port Dickson, Negeri Sembilan

112th ASM Council Meeting
5 December 2014
Port Dickson, Negeri Sembilan

Top Research Scientists Malaysia (TRSM) Annual Gathering and Roundtable on 'Are You Delivering Value for Money?'
8 December 2014
Kuala Lumpur

Launching of 'Blueprint for the Establishment of Rare-Earth Based Industries in Malaysia'
8 December 2014
Kuala Lumpur

2014 Conferment of Fellowship and Announcement of the 2014 Top Research Scientists Malaysia
8 December 2014
Kuala Lumpur

Talk on 'Role, Program and Achievements of KISTEP' by Professor Youngah Park, President of Korea Institute of Science and Technology Evaluation and Planning (KISTEP)
9 December 2014
ASM

PENERBITAN
PUBLICATIONS

ASM 2014, A Study on the Current Status and Needs Assessment of Water Resources Research in Malaysia Position Paper 2/2014 – Volume II, ASM, Kuala Lumpur

ASM 2014, Asean Journal on Science & Technology for Development, vol. 31, no.1.

ASM 2014, Asean Journal on Science & Technology for Development, vol. 31, no.2.

ASM 2014, ASM Annual Report 2013, ASM, Kuala Lumpur

ASM 2014, ASM Science Journal, vol.8, no. 1.

ASM 2014, ASM Science Journal, vol.8, no. 2.

ASM 2014, Blueprint for The Establishment of Rare Earth-Based Industries in Malaysia, ASM, Kuala Lumpur

ASM 2014, Blueprint The Establishment of Rare Earth-Based Industries in Malaysia – Summary for Policy Makers, ASM, Kuala Lumpur

ASM 2014, Captivating Lindau - Dedicated to Chemistry, ASM, Kuala Lumpur

ASM 2014, Rising To The Challenge, ASM, Kuala Lumpur

ASM 2014, Setting A National Agenda for Integrated Water Research Advisory Report 2/2014 – Volume I, ASM, Kuala Lumpur

ASM 2014, Strategic Plan for Addressing the Impacts of Climate Change on Water-Related Issues in Malaysia Advisory Report 1/2014, ASM, Kuala Lumpur

ASM 2014, Sustainability of Malaysian Palm oil Report (MPOC), ASM, Kuala Lumpur

ASM June 2014, STI@3d, ASM, Kuala Lumpur, http://www.akademisains.gov.my/sti3d/#samples/june-2014

ASM September 2014, ST@3d, ASM, Kuala Lumpur, http://www.akademisains.gov.my/sti3d/#samples/september-2014

ASM December 2014, STI@3d, ASM, Kuala Lumpur, http://www.akademisains.gov.my/sti3d/#samples/december-2014

COSTAM 2014, Journal of Science & Technology in the Tropics vol.10, no.1.

COSTAM 2014, Journal of Science & Technology in the Tropics vol.10, no.2.

Fadzil, Ahmad 2014, Medical Imaging - Bringing Pixels to the Life Sciences, ASM, Kuala Lumpur

Ibrahim, Ahmad 2014, From Science to Science Policy: Biography-cum-Memoir of Academician Tan Sri Datuk Dr Omar Abdul Rahman FASc, ASM, Kuala Lumpur

Jusop, Shamshuddin 2014, Acid Sulfate Soils - Occurance, Properties, Utilisation for Rice Production, ASM, Kuala Lumpur

Kuan, Chee Yan & Fee, Chung Gait 2014, Efficient Weed Management to Enhance Rubber Production, ASM, Kuala Lumpur

Narayanan, Bernice 2014, "I am…Because of You": Biography of Academician Emeritus Professor Dato' Dr C.P. Ramachandran FASc, ASM, Kuala Lumpur

FELO KEHORMAT
HONORARY FELLOWS

1995
Tun Dr Mahathir Mohamad
Mantan Perdana Menteri Malaysia
Former Prime Minister of Malaysia

2005
Tun Abdullah Ahmad Badawi
Mantan Perdana Menteri Malaysia
Former Prime Minister of Malaysia

2006
Nobel Laureate Prof Ahmed H. Zewail
Pemenang Hadiah Nobel 1999 (Kimia)
Nobel Laureate 1999 (Chemistry)

2009
Tun Ahmad Sarji Abdul Hamid
Mantan Ketua Setiausaha Negara
Former Chief Secretary to the Government

2010
Nobel Laureate Professor Lee Yuan Tseh
Pemenang Hadiah Nobel 1986 (Kimia)
Nobel Laureate 1986 (Chemistry)

2011
Tan Sri Dato' Seri Law Hieng Ding
Mantan Menteri, Kementerian Sains, Teknologi dan Alam Sekitar Malaysia
Former Minister of the Ministry of Science, Technology and Environment Malaysia

2014
Dato' Sri Mohd Najib Tun Abdul Razak
Perdana Menteri Malaysia
Prime Minister of Malaysia

FELO KANAN
SENIOR FELLOWS

1999
Academician Emeritus Professor
Tan Sri Datuk Dr Haji Omar Abdul Rahman FASc

Academician Dato' Ir Lee Yee Cheong FASc

Academician Emeritus Professor
Tan Sri Datuk Dr Augustine Ong Soon Hock FASc

2001
Academician Tan Sri Dato' Dr Mohd Rashdan Haji Baba FASc

2002
Academician Emeritus Professor Dr Yong Hoi Sen FASc

Academician Tan Sri Dato' Seri Ir (Dr) Shamsuddin Abdul Kadir FASc

2004
Academician Tan Sri Dr Salleh Mohd Nor FASc

2005
Academician Distinguished Professor Datuk Dr Looi Lai Meng FASc

2006
Academician Tan Sri Dr M Jegathesan FASc

2007
Academician Datuk Dr Abdul Aziz SA Kadir FASc

2008
Academician Tan Sri Ir Hj Shahrizaila Abdullah FASc

2009
Academician Tan Sri Dr Ahmad Mustaffa Babjee FASc

2010
Academician Emeritus Professor
Dato' Dr VG Kumar Das Govinda Panicker FASc

Academician Emeritus Professor
Tan Sri Dato' Dr Syed Jalaludin Syed Salim FASc

2011
Academician Tan Sri Datuk Ir (Dr) Hj Ahmad Zaidee Laidin FASc

Academician Emeritus Professor Dato' Dr C.P. Ramachandran FASc

Academician Professor Dato' Ir Dr Chuah Hean Teik FASc

2012
Academician Dr C. Devendra FASc

Academician Datuk Fateh Chand FASc

Academician Dr Ho Chee Cheong FASc

2013
Academician Dr Chia Swee Ping FASc

Academician Tan Sri Datuk Dr Yusof Basiron FASc

2014
Academician Datuk Ir Hong Lee Pee FASc

Academician Professor Dato' Dr Khairul Anuar Abdullah FASc

FELO
FELLOWS

SAINS PERUBATAN DAN KESIHATAN
MEDICAL AND HEALTH SCIENCES

Academician Distinguished Professor Datuk Dr Looi Lai Meng FASc*
Academician Tan Sri Datuk Dr M. Jegathesan FASc*
Academician Emeritus Professor Dato' Dr C.P. Ramachandran FASc
Professor Dr Mak Joon Wah FASc*
Dato' Dr Lim Kee Jin FASc *
Datuk Dr Hussein Awang FASc*
Emeritus Professor Dato' Dr Khalid Abdul Kadir FASc*
Tan Sri Dato' Dr Yahya Awang FASc*
Tan Sri Dato' Dr Abu Bakar Dato' Suleiman FASc
Emeritus Professor Dato' Dr Lam Sai Kit FASc
Tan Sri Dato' Seri Hj Musa Mohamad FASc
Emeritus Professor Dato' Paduka Dr Mustaffa Embong FASc
Emeritus Professor Puan Sri Datin Dr Wan Nafisah Hj. Nik Mohd Adeeb FASc
Kept Professor Dato' Dr Hashim Yaacob FASc
Professor Dr Yap Sook Fan FASc
Emeritus Professor Dr Cheong Soon-Keng FASc
Academician Professor Dato' Dr Khairul Anuar Abdullah FASc
Professor Dato' Dr Asma Ismail FASc
Professor Dato' Dr Anuar Zaini Md Zain FASc
Professor Dr Victor Lim Kok Eow @ Azman Lim FASc
Professor Dato' Dr Khalid Yusoff FASc
Tan Sri Dato' Wira Dr Sharifah Hapsah Syed Hasan Shahabudin FASc
Emeritus Professor Dr Mohd Ismail Mohd Noor FASc
Tan Sri Datuk Dr Mohd Ismail Merican FASc
Professor Dr Cheah Phaik Leng FASc
Professor Dr Mary Jane Cardosa FASc
Emeritus Professor Dr Boo Nem Yun FASc
Professor Dr Subramaniam Krishnan FASc
Professor Dato' Dr Jafri Malin Abdullah FASc
Professor Dato' Dr Goh Khean Lee FASc
Professor Dr Adeeba Kamarulzaman FASc
Professor Dr Rosnah Mohd Zain FASc
Professor Dr Rahmah Nordin FASc
Professor Dato' Dr Ikram Shah Ismail FASc
Emeritus Professor Dato' Dr Lian Chin Boon FASc
Professor Dato' Dr Mohd Amin Jalaludin FASc
Professor Dato' Dr Tan Chong Tin FASc
Professor Dr Norazmi Mohd Nor FASc
Professor Dr Salmaan Hussain Inayat Hussain FASc
Professor Dr Awg Bulgiba Awg Mahmud FASc
Emeritus Professor Dr Khor Geok Lin FASc
Professor Dr Mustafa Ali Mohd FASc
Professor Dr Jamunarani S Vadivelu FASc
Professor Datuk Dr Rohana Yusof FASc
Professor Dr Wan Azman Wan Ahmad FASc
Dr Teo Soo Hwang FASc

Nota: Nama yang bertanda '*' adalah Felo Asas
Note: Names marked '*' are Foundation Fellows

KEJURUTERAAN DAN SAINS KOMPUTER
ENGINEERING AND COMPUTER SCIENCES

Academician Dato' Ir Lee Yee Cheong FASc*
Academician Tan Sri Dato' Seri Ir Shamsuddin Abdul Kadir FASc*
Academician Tan Sri Dato' Ir Haji Shahrizaila Abdullah FASc*
Academician Tan Sri Professor Datuk Ir (Dr) Haji Ahmad Zaidee Laidin FASc
Tan Sri Dato' Ir Abu Zarim Haji Omar FASc*
Dato' Dr Muhammad Ridzuan Haji Salleh FASc*
YM Tengku Datuk Dr Mohd Azzman Shariffadeen Tengku Ibrahim FASc*
Dato' Ir Dr Mohd Zawawi Ismail FASc*
Academician Datuk Ir Hong Lee Pee FASc
Emeritus Professor Dato' Dr Tan Wang Seng FASc
Ar. Hijjas Kasturi FASc
Datuk Dr Mohamed Arif Nun FASc
Dr Mohamed Awang Lah FASc
Dr Mohamad Zahran Dato' Sheikh Abdul Halim FASc
Professor Dr Zaharin Yusoff FASc
Dato' Dr Mohd Ariffin Haji Aton FASc
Ir Dr Ting Wen Hui FASc
Dato' Professor Ir Dr Zainul Abidin Md Shariff FASc
Professor Dato' Ir Dr Abu Bakar Jaafar FASc
Dato' Seri Professor Mashkuri Yaacob FASc
Emeritus Professor Dato' Wira Ir Dr Mohammad Noor Haji Salleh FASc
Professor Dato' Ir Abang Abdullah Abang Ali FASc
Tan Sri Dato' Sri Professor Ir Dr Sahol Hamid Abu Bakar FASc
Professor Dr Mohd Ali Hashim FASc
Ir Dr Ma Ah Ngan FASc
Professor Dato' Dr Goh Sing Yau FASc
Tan Sri Datuk Seri Dr Jamaludin Mohd Jarjis FASc
Tan Sri Professor Ir Dr Mohd Zulkifli Tan Sri Mohd Ghazali FASc
Professor Dr Tan Hong Siang FASc
Datuk Ir Dr Ow Chee Sheng FASc

Dato' Ir Dr Gue See Sew FASc
Dr Salmah Zakaria FASc
Professor Dr Zahari Taha FASc
Professor Dr Tengku Mohd Tengku Sembok FASc
Datuk Dr A. Rahman Abdullah FASc
Tan Sri Dato' Ar. Haji Esa Haji Mohamed FASc
Professor Dato' Seri Ir Dr Zaini Ujang FASc
Professor Dr Shah Nor Basri FASc
Professor Dato' Dr Halimah Badioze Zaman FASc
Professor Dr Nasrudin Abd Rahim FASc
Tan Sri Dato' Ir Syed Muhammad Shahabudin FASc
Tan Sri Dato' Ir Omar Ibrahim FASc
Professor Ir Dr Ahmad Faizal Mohd Zain FASc
Professor Ir Dr Ahmad Fadzil Mohamad Hani FASc
Professor Dr Ahmad Fauzi Ismail FASc
Dato' Sri Professor Ir Dr Judin Abdul Karim FASc
Professor Ir Dr Wan Abu Bakar Wan Abas FASc
Dato' Ir Mohd Yusof Ibrahim FASc
Professor Ir Dr Ruslan Hassan FASc
Professor Dr Zulkifli Yusop FASc
Professor Dato' Ir Dr Wan Ramli Wan Daud FASc
Professor Ir Dr Mohd Jailani Mohd Nor FASc
Professor Dr Hanafi Ismail FASc
Professor Ir Dr Abd Halim Shamsuddin FASc
Professor Dr Abdul Latif Ahmad FASc
Professor Dr Hamdani Saidi FASc
Professor Dato' Dr Kamaruzzaman Sopian FASc
Datuk Ir Mohd Adnan Mohd Nor FASc
Datuk Ir (Dr) Abdul Rahim Hj Hashim FASc
Professor Dr Abdul Rahman Mohamed FASc
Professor Dato' Ir Dr Abdul Wahab Mohammad FASc
Professor Dato' Ir Dr Badhrulhisham Abdul Aziz FASc
Professor Dato' Dr Burhanuddin Yeop Majlis FASc
Ir Lalchand Gulabrai FASc

Nota: Nama yang bertanda '*' adalah Felo Asas
Note: Names marked '*' are Foundation Fellows

SAINS BIOLOGI, PERTANIAN DAN ALAM SEKITAR
BIOLOGICAL, AGRICULTURAL AND ENVIRONMENTAL SCIENCES

Academician Emeritus Professor Dr Yong Hoi Sen FASc*
Academician Tan Sri Dr Salleh Mohd Nor FASc*
Academician Tan Sri Dr Ahmad Mustaffa Babjee FASc*
Academician Emeritus Professor Tan Sri Dato' Dr Syed Jalaluddin Syed Salim FASc*
Academician Dr C. Devendra FASc
Emeritus Professor Datuk Dr Abdul Latif Ibrahim FASc*
Tan Sri Datuk Dr Ahmad Zaharudin Idrus FASc*
Tan Sri Emeritus Professor Dato' Sri Dr Zakri Abdul Hamid FASc*
Emeritus Professor Dr Chin Hoong Fong FASc*
Dr Francis S.P. Ng FASc
Professor Dr Mak Chai @ Mak Lian Fong FASc
Professor Dr Ho Yin Wan FASc
Dr Koh Chong Lek FASc
Emeritus Professor Dr Mohd Nordin Hasan FASc
Dr Rajanaidu Nookiah FASc
Dato' Dr Sheikh Omar Abdul Rahman FASc
Emeritus Professor Dr Muhamad Awang FASc
Emeritus Professor Dato' Dr Mohamed Mahyuddin Mohd Dahan FASc
Dato' Dr Yeang Hoong Yeet FASc
Emeritus Professor Dato' Dr Abdul Latiff Mohamad FASc
Dr Ghazally Ismail FASc
Emeritus Professor Dato' Dr Haji Mohamed Abdul Majid FASc
Professor Dr Helen Nair FASc
Professor Dr Soh Aik Chin FASc
Professor Datin Paduka Dr Khatijah Mohd Yusoff FASc
Dr Lim Boo Liat FASc
Dr Tan Swee Lian FASc
Dr Yap Thoo Chai FASc
Professor Datin Paduka Dr Aini Ideris FASc
Dr Heong Kong Luen FASc
Professor Dr Phang Siew Moi FASc
Dr Ravigadevi Sambanthamurthi FASc
Dr Sim Soon Liang FASc
Professor Dato' Dr Azizan Abu Samah FASc
Dato' Dr Hashim Abd Wahab FASc
Professor Dr Mohd Sanusi Jangi FASc
Professor Dr Low Pak Sum FASc
Dr Chan Ying Kwok FASc
Professor Dato' Dr Mohamed Shariff Mohamed Din FASc
Professor Datin Dr Faridah Hanum Ibrahim FASc
Dato' Dr Makhdzir Mardan FASc
Dr K. Harikrishna Dr K. Kulaveerasingam FASc
Professor Dr Wickneswari Ratnam FASc
Dr Tan Keng Hong FASc

Professor Dr Normah Mohd Noor FASc
Datuk Seri Lim Chong Keat FASc
Professor Dr Fatimah Md Yusoff FASc
Professor Dato' Dr Haji Ibrahim Che Omar FASc
Professor Dato' Dr Mohd Tajuddin Abdullah FASc
Professor Dr Ng Wing Keong FASc
Dr Saw Leng Guan FASc
Dato' Dr Abd Latif Mohmod FASc
Professor Dr Agamutu a/l Pariatamby FASc
Professor Dr Jinap Selamat FASc
Professor Dr Shamsuddin Jusop FASc
Professor Dr Tan Soon Guan FASc

MATEMATIK, FIZIK DAN SAINS BUMI
MATHEMATICS, PHYSICS AND EARTH SCIENCES

Academician Datuk Fateh Chand FASc*
Academician Professor Dato' Ir Dr Chuah Hean Teik FASc
Academician Dr Chia Swee Ping FASc
Dato' Dr Chatar Singh FASc*
Tan Sri Datuk Dr Ahmad Tajuddin Ali FASc*
Emeritus Professor Dato' Dr Mohd Sham Mohd Sani FASc*
Dato' Dr R. Ratnalingam FASc*
Dr Shaharir Mohamad Zain FASc
Professor Dato' Dr Hassan Said FASc
Professor Dato' Dr Ibrahim Komoo FASc
Professor Dr Bahrom Sanugi FASc
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Professor Dr Adeeba Kamarulzaman FASc
Professor Dr Ahmad Zuhairi Abdullah
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Hazami Habib
Chief Operating Officer (COO)

Norazirah Ramli
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Project Director, Mega Science 3.0

P. Loganathan
Research Fellow

Loi Poh Poh
Research Officer

RESEARCH FELLOWS FOR ASM PROJECTS

Dr Ahmad Ibrahim FASc

Dato' Dr Sharifah Maimunah Syed Zin

PROGRAM ISTIC
ISTIC Programmes

The Training Workshop on
Technopreneurship for the Caribbean (report)
5-9 May 2014
Trinidad and Tobago

The Training Workshop on
Training Workshop on Maintenance of Infrastructure (report)
26-29 May 2014
Yangon, Myanmar

ISTIC Certified Training Programme on STI Policy
and Management for Developing Countries (ICPS) (report)
8-15 September 2014
Kuala Lumpur, Malaysia

Training Workshop on Preparing R&D Proposal and
Technopreneurship for CIS Countries (report)
7-13 October 2014
Astana, Kazakhstan

Malaysia UNESCO Day 2014 (report)
18 - 19 October 2014
Kuala Lumpur, Malaysia

Training Workshop on BSE for
Teacher Trainers from Asia-Pacific (report)
17 - 22 November 2014
Yogyakarta, Indonesia

KISTEP-ISTIC STI Training Program for
High Level Policy Makers
8 – 12 December 2014
Malacca, Malaysia

Other Programmes

International African – European – Mediterranean Academies
For Science Education (AEMASE) Conference (report)
19 – 20 May 2014
Rome

KAST-ASM-IAP International Workshop on
'Science Literacy: Science Communication and Science Outreach' (report)
12 - 13 June 2014
Seoul, Korea

SEAMEO Centre Directors Meeting 2014 (report)
25 - 26 June 2014
Bangkok, Thailand

SEAMEO CONGRESS: Southeast Asia in Transition -
Re-thinking Education, Science and Culture for Regional Integration (report)
21 - 23 October 2014
Bangkok, Thailand

IAP SEP BIENNIAL CONFERENCE: Challenges, Opportunities of
IBSE / STEM Conference (report)
28 - 30 October 2014
Bejing, China

PROGRAM ICSU
ICSU Programmes

50th Annual Convention of Indian Geophysical Union
8 January
Hyderabad, India

High-level Meeting on Future Earth
27 January
Sendai, Japan

International Workshop on Future Earth in Asia
4 – 5 February
Kyoto, Japan

Pre-scoping Workshop on SIMSEA
27 – 28 February
Yokohama, Japan

1st Planning Meeting on Capacity Building for Psychological Intervention After Disasters
7 – 8 March
Kuala Lumpur, Malaysia

Future Earth in the Philippines at the 81st General Membership Assembly of NRCP
26 – 27 March
Manila, Philippines

MAIRS 2014 Open Science Conference
7 April
Beijing, China

17th Meeting, ICSU Regional Committee for Asia and the Pacific
24 – 25 April
Kuala Lumpur, Malaysia

Meeting of ROAP Steering Group on Natural Hazards and Risk in the Asia – Pacific Region
28 – 29 April
Kuala Lumpur, Malaysia

Science and Technology in Society Forum Meeting
16 May
Singapore

Short Course on Urbanisation and Health: Systems Approach
2-6 June
Kuala Lumpur, Malaysia

6th International Conference on Applied Energy
30 May – 2 June
Taipei, Taiwan

SIMSEA Core Group Meeting
30 June – 1 July
Manila, Philippines

International Workshop on Open Data for Science and Sustainability in Developing Countries
6 – 8 August
Gigiri, Nairobi

18th Meeting, ICSU Regional Committee for Asia and the Pacific
27– 28 August
Auckland, New Zealand

31st ICSU General Assembly
30Aug –3Sep
Auckland, New Zealand

Future Earth in Asia – Regional Networking
1 October
Taipei

LESTARI Executive Workshop Series III: Co-production of Knowledge for Global Health Challenge
29–30 October
Kuala Lumpur, Malaysia

Systems Thinking Training Workshop for Cross-sector Collaboration on Urban Health
9 – 10 November
Taipei

SIMSEA Research Scoping Workshop
19 – 20 November
Manila, Philippines

Capacity Development Workshop on PIAD
8 –11 December
Myianyang, China

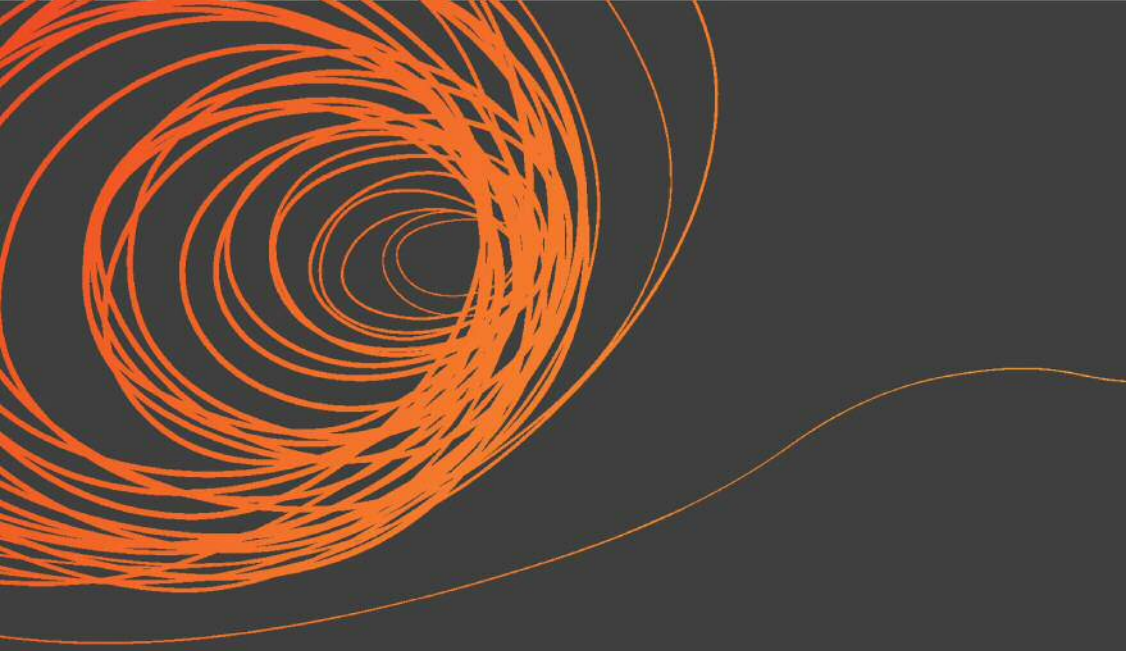
1st Xiamen Expert Workshop on "Health and Wellbeing in the Changing Urban Environment: Systems Analysis Approach"
8 – 10 December

Urban Health and Wellbeing Systems Thinking Workshop
11 – 12 December
Xiamen, China

AKRONIM
ACRONYMS

10th MP	10th Malaysian Plan
ACP	Area Congestion Pricing
ADS-B	Automatic Dependent Surveillance Broadcast System
AGM	Annual General Meeting
AHIIST	Hassan II Academy of Science and Technology
ASEAN	Association of Southeast Asian Nations
ASM	Akademi Sains Malaysia
BE	Business Enterprises
BRT	Bus Rapid Transit
BSN	Bank Simpanan Nasional
CERN	European Organization for Nuclear Research
CMS	Compact Muon Solenoid
CO2	Carbon Dioxide
CSSP	CERN Summer Student Programme
DOSM	Department of Statistics Malaysia
DSTIN	Dasar Sains, Teknologi dan Inovasi Negara
EEV	Energy Efficient Vehicles
EPC	Engineering, Procurement and Construction
EPU	Economic Planning Unit
ESET	Emerging Science, Engineering and Technology
ESM	Ecosystem Services and Management Programme
ETP	Economic Transformation Programme
FH	Familial hypercholesterolaemia
FMM	Federation of Malaysian Manufacturers
GDP	Gross Domestic Product
GE	General Electric
GLC	Government-Linked Companies
GRI	Government Research Institutes
GTAP	Global Trade Analysis Project
HOTS	Higher Order Thinking Skills
IAC	InterAcademy Council
IAMP	InterAcademy Medical Panel
IAP	InterAcademy Partnership
IAP-SEP	IAP Science Education Programme
IBSE	Inquiry-Based Science Education
ICSU	International Council for Asia and the Pacific
IEA	International Association for the Evaluation of Educational Achievement
IHL	Institute of Higher Learning
IIASA	International Institute for Applied System Analysis
i-INOVA	Exposition on Islamic Innovation
IIUM	International IslamicUniversity Malaysia
IMD	Institute for Management Development
INFORMM	Institute for Research in Molecular Medicine
IoT	Internet of Things
IoV	Internet of Vehicle
IPOSC	International Palm Oil Sustainability Conference
ISTIC	International Science, Technology and Innovation Center for South-South Cooperation under the Auspices of UNESCO
IWRM	Integrated Water Resources in Malaysia
JPJ	Jabatan Pengangkutan Jalan
KBAT	Kemahiran Berfikir Aras Tinggi
KPM	Kementerian Pendidikan Malaysia
KSSR	Kurikulum Standard Sekolah Rendah
MAKNA	Majlis Kanser Nasional
MARDI	Malaysia Agricultural Research and Development Institute
MASTIC	Malaysian Science and Technology Information Centre
MCFF	Multicore Flat Fibre
MCKK	Malay College Kuala Kangsar
MIMOS	Malaysian Institute of Microelectronic System
MITI	Ministry of International Trade and Industry
MNC	Multinational Corporations
MOE	Ministry of Education
MOSTI	Ministry of Science, Technology and Innovation
MOU	Memorandum of Understanding
MPOC	Malaysian Palm Oil Council
MSAF	Mahathir Science Award Foundation
MyIPO	Malaysian Intellectual Property Office
NAHRIM	National Hydraulic Research Institute of Malaysia
NCPP	National Centre for Particle Physics
NIWR	National Integrated Water Research
NKEA	National Key Economic Area
NKPA	National Key Priority Area
NMO	National Member Organizations
NPSTI	National Policy on Science, Technology and Innovation
NRE	Ministry of Natural Resources and Environment
NSC	Natioanl Science Challenge
NSTP	National Science and Technology Policy
OECD	Organisation for Economic Co-operation and Development
OIC	Organization of the Islamic Conference
OTEC	Ocean Thermal Energy Conversion
PEMANDU	Performance Management Delivery Unit
PISA	Programme for International Students Assessment
PKS	Perusahaan Kecil dan Sederhana
PMT	Project Monitoring Team
POSDI	Palm Oil Sustainable Development Index
R & D	Research and Development
RBS	Dr Ranjeet Bhagwan Singh
RDC	Research, Development and Commercialisation
RECSAM	Regional Centre for Education in Science and Mathematics
RI	Research Institution
ROI	Return of Investment
RRIM	Rubber Research Institute of Malaysia

S & T	Science and Technology
S2A	Science 2 Action
SBTC	Skill-biased Technical Change
SCA	Science Council of Asia
SET	Science, Engineering and Technology
SHER	Science, Health, Environment and Risk
SME	Small and Medium Enterprises
SPAD	Suruhanjaya Perkhidmatan Awam Darat
STEM	Science, Technology, Engineering and Mathematics
STI	Science, Technology and Innovation
TIMSS	Trends of International Mathematics and Science Study
TLO	Technology Licensing Office
TNB	Tenaga Nasional Berhad
TOD	Transit Oriented Development
TRSM	Top Research Scientists Malaysia
UIAM	Universiti Islam Antarabangsa Malaysia
UK	United Kingdom
UKM	Universiti Kebangsaan Malaysia
UM	University of Malaya
UN	United Nation
UNESCO	United Nations Educational, Scientific and Cultural Organization
USIM	Universiti Sains Islam Malaysia
USM	Universiti Sains Malaysia
WRDC	Water Research and Development Centre
YSN-ASM	Young Scientists Network-Academy of Sciences Malaysia
YSSP	Young Scientists Summer Programme



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