THOUGHT LEADER '19

LAPORAN TAHUNAN | ANNUAL REPORT 2019

AKADEMI SAINS MALAYSIA

LAPORAN TAHUNAN

2019

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THOUGHT LEADER '19

Laporan ini merupakan sumber maklumat utama mengenai Akademi Sains Malaysia (ASM). Laporan ini memberikan gambaran umum yang ringkas mengenai pencapaian kami serta prestasi kewangan dan bukan kewangan bagi tahun 2019. Penglibatan kami dengan pihak pemegang taruh dalaman dan luaran turut dibentangkan. Selain itu, inisiatif, rakan strategik, dan strategi serta matlamat masa depan kami turut dikemukakan untuk menunjukkan kredibiliti kami sebagai sebuah badan pemikir. Objektif kami adalah untuk memperkukuh kepercayaan para pemegang taruh melalui pelbagai input dan idea strategik yang kami usulkan.

KONSEP

Mentol telah lama dikenali sebagai simbol idea. Bentuk mentol yang diisi dengan kata kunci seperti "cemerlang", "inovasi", dan "pemikiran kreatif" menunjukkan idea-idea yang merupakan manifestasi nilai-nilai positif yang mengisi bentuk mentol tersebut.

Warna kuning dipilih kerana ia memberi gambaran nilai optimisme, kesedaran dan kreativiti, sesuai dengan matlamat ASM untuk membawa STI Malaysia ke tahap yang lebih tinggi.

Pemilihan jenis huruf yang tidak formal mencerminkan tenaga ASM yang dinamik.

KANDUNGAN

MENGENAI ASM

SIAPA KAMI

ASM berusaha menjadi Peneraju Pemikir yang diiktiraf bagi isu berkaitan sains, teknologi dan inovasi.

ASM komited dalam memupuk kecemerlangan dalam bidang sains, kejuruteraan dan teknologi untuk kebaikan masyarakat sejagat.

AKTIVITI KAMI

ASM menyokong sains yang bermanfaat dengan menggalakkan aktiviti yang mempromosikan penglibatan, pemahaman dan literasi dalam sains, teknologi dan inovasi.

Sains di luar jangkauannya merupakan suatu pengalaman yang memacu kita ke arah yang lebih menarik, dipenuhi dengan penglibatan dengan pelbagai lapisan masyarakat. Pada akhirnya, komitmen ASM adalah untuk meningkatkan keupayaan saintifik negara ini.

KAJIAN STRATEGIK STI PERDANA & PENASIHAT DASAR
Laporan Penasihat & Kertas Posisi | Pembangunan Pelan Tindakan & Pelan Pembangunan | Pemikiran & Pandangan Masa Depan | Dasar Kebangsaan / Sektoral | Penilaian & Rumusan | Kewajaran Keputusan & Amalan Terbaik Dalam STI | Tindak balas terhadap isu nasional & antarabangsa

INISIATIF & RAKAN STRATEGIK
Kajian Diterajui Pakar | Komunikasi, Pembudayaan & Penglibatan dalam Sains | Pembinaan Kapaisiti STI | Anugerah, Geran dan Pengiktirafan | Hubungan Strategik STI

JARINGAN ANTARABANGSA
Ahli SCA, AASSA, IAP, APEC, ASEAN, TWAS | Program Saintis Muda – CERN & Lindau | Membida geran antarabangsa – ASEAN & APEC

KOMUNIKASI SAINS
Penerbitan | Jurnal Sains ASM | Komunikasi Korporat | Perhubungan Awam | Penglibatan Media | Pengurusan & Visualisasi Data

PROJEK RINTIS
Malaysian Collaborative Network for Innovation (i-Connect) | Malaysia Open Science Platform (MOSP)

Misi

- Menjadi Peneraju Pemikir
- Menjadi Badan Penasihat Apex dalam hal berkaitan Sains, Teknologi dan Inovasi (STI)
- Menjadi penggalak yang efektif terhadap kesedaran dan pemahaman awam tentang STI
- Menjadikan STI sebagai asas bagi pembangunan ekonomi dan kesejahteraan rakyat

Fungsi

- Menasihati Kerajaan berkenaan hal STI yang berkepentingan kepada negara dan antarabangsa
- Memupuk budaya kecemerlangan Sains, Kejuruteraan dan Teknologi (SET) di Malaysia
- Membantu meningkatkan keupayaan 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 SET
- Memastikan input STI yang berwibawa dan tepat pada masanya
- Menggalakkan penggunaan dan aplikasi sains untuk kesejahteraan rakyat
- Memudahcara pelaksanaan strategi ekonomi berasaskan inovasi

Pemegang Taruh

Dalaman
Felo | Associates | Members of Young Scientists Network (YSN-ASM) | Top Research Scientists Malaysia (TRSM)

Luaran
Kerajaan Malaysia | Agensi | Industri | Institusi Penyelidikan | Institusi Pendidikan Tinggi | Badan Profesional STI | Organisasi STI Antarabangsa | Masyarakat

Piagam Pelanggan

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

BUDAYAKAN SAINS. RAIKAN TEKNOLOGI. CETUSKAN INOVASI

Profesor Dato' Dr Asma Ismail FASc

KREDIT FOTO :
THE PRESTIGE MALAYSIA MAGAZINE

TITIPAN PRESIDEN

MENJELANG SAMBUTAN JUBLI PERAK

2019 – Tahun yang amat bermakna! Saya berasa teruja untuk meneruskan penggal kedua sebagai Presiden ASM – yang amat dikenali sebagai sebuah badan pemikir dalam bidang sains dan teknologi, berperanan dalam memperkasakan teknologi memuncul dan masa depan yang lestari.

Sejak penubuhan Akademi, setiap tahun ASM berdepan dengan pelbagai cabaran yang silih berganti, namun kami secara konsisten berusaha keras untuk mencapai matlamat kami. Tahun 2019 juga begitu. Program anjuran yang semakin banyak, pelbagai organisasi mula menghubungi kami untuk kajian perundingan, peranan kami di peringkat global menjadi semakin penting, dan rangkaian pakar kami makin berkembang.

Aktiviti-aktiviti ASM sememangnya melangkaui pelbagai bidang sains. Tahun ini, ASM terus memberikan khidmat nasihat yang boleh dipercayai dan relevan kepada Kerajaan. Kami juga telah menghadiri dalam 430 mesyuarat dan bengkel untuk memahami dunia dan trendnya yang sentiasa berubah demi masa hadapan yang lestari. Dalam usaha untuk mengenal pasti cara dan langkah bagi memenuhi keperluan negara, kami bekerja keras untuk mengukuhkan ekosistem inovasi negara yang bertujuan untuk mecipta kekayaan dan kesejahteraan masyarakat.

Selain menjalankan amanah sebagai penasihat Kerajaan dalam hal-hal yang berkaitan dengan sains dan teknologi, Akademi juga telah menganjurkan program-program berasaskan STEM untuk menggalakkan minat dalam kalangan belia. Kami juga turut memastikan bahawa para pendidik lebih bersedia untuk mengajar mata pelajaran STEM. Mengapa kami memberi penekanan terhadap STEM? Kerana masa depan menuntutnya. Dalam perlumbaan global untuk inovasi, ekonomi yang pesat, dan kelestarian, STEM bukan hanya sekadar beberapa mata pelajaran yang diajar dalam kelas. Ianya menjadi semakin penting kerana dunia hari ini bergantung kepada teknologi dan inovasi.

Pada tahun 2019, kami telah melantik 27 saintis, jurutera dan pakar teknologi terkemuka di Malaysia sebagai Felo baru dan memilih sembilan pakar untuk menerima anugerah *Top Research Scientists Malaysia (TRSM)*. Tahniah diucapkan kepada semua, khususnya kepada Academician Profesor Emeritus Dato' Dr Khalid Yusoff FASc, atas pelantikan sebagai Felo Kanan ASM. Felo-felo ini secara aktif menyumbang kepada hal-hal polisi dan penyelidikan Akademi, program jangkauan awam, geran dan dana, aktiviti antarabangsa serta aktiviti yang berkaitan dengan STEM.

Pada masa yang sama, kami terus bekerjasama dengan rakan strategik antarabangsa kami untuk meningkatkan aliran idea dan bakat dalam kalangan penyelidik. Seiring kemajuan sains dan teknologi, kolaborasi antarabangsa menjadi semakin penting. Penglibatan aktif ASM serta impak yang signifikan telah membolehkan kami untuk meletakkan diri kami sejajar dengan institusi saintifik yang lain.

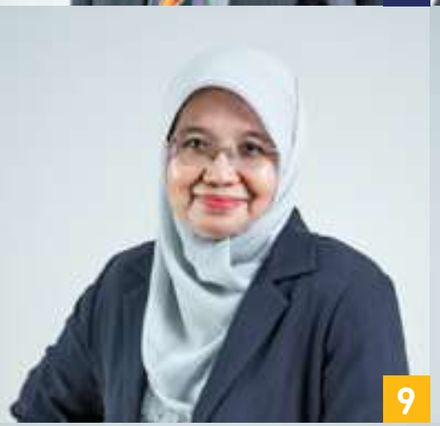
BERMULA DENGAN MEMBINA PERHUBUNGAN

Kolaborasi merupakan satu pendekatan yang terbaik. Sebuah perhubungan yang dibina dan cara bekerjasama yang berbeza akan membantu kita untuk berkembang ke tahap yang baru. Saya percaya bahawa sekarang merupakan waktu yang sesuai untuk bekerjasama. Seperti kata pepatah,

> "jika anda ingin pergi cepat, pergilah sendiri; tetapi jika anda mahu pergi jauh, pergi bersama-sama."

Akhirnya, saya ingin mengucapkan terima kasih kepada semua pihak yang menyokong ASM melalui pelbagai kolaborasi dan sesi libat urus, serta sumbangan yang diterima, dan input yang diberikan. Kami tidak akan mampu untuk mencapai semua ini tanpa penyokong yang ingin melihat sains dan teknologi sebagai satu komponen penting dalam membentuk masa depan Malaysia.

- Tonton Ucapan Presiden semasa Mesyuarat Agung Tahunan ke-25
- Baca teks penuh



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Presiden (2019-2022)
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2) YM ACADEMICIAN TENGKU DATUK DR MOHD AZZMAN SHARIFFADEEN FASc
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Teknologi Maklumat dan Sains Komputer

3) DATUK PROFESOR DR AWG BULGIBA AWG MAHMUD FASc
Setiausaha Agong (2019-2021)
Sains Perubatan dan Kesihatan

4) DATUK DR ABDUL RAZAK MOHD ALI FASc
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Pembangunan Sains & Teknologi dan Industri

AHLI BIASA (2018-2020)

5) IR DR AHMAD FAIZAL MOHD ZAIN FASc
Sains Kejuruteraan (2018-2020)

6) PROFESOR DR AHMAD ISMAIL FASc
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7) ACADEMICIAN TAN SRI DATO' IR TS AHMAD ZAIDEE LAIDIN FASc
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ANGKA DI SEBALIK 2019

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INPUT STRATEGIK UNTUK EKOSISTEM STI YANG KUKUH

Kami bergerak ke arah merealisasikan aspirasi sejajar dengan tujuan ASM untuk menangani keperluan negara dan masyarakat berpaksikan sains, teknologi dan inovasi (STI) ke arah mencapai impak sosio-ekonomi yang bermakna. Kami komited dalam memberikan input strategik kepada penggubal dasar, komuniti saintifik, pemimpin industri dan masyarakat untuk membina asas yang kukuh bagi mencorak masa depan yang cerah dan memastikan masyarakat yang progresif.

Analisis yang teliti, penilaian bukti secara objektif, dan responsif terhadap perubahan adalah sebahagian daripada budaya kerja kami. Analisis data dan sintesis dapatan kajian merangkumi pelbagai topik seperti Ekosistem dan Tadbir Urus STI, Teknologi Memuncul dan Pemikiran Masa Hadapan, Sains Kelestarian, dan aspek Sosio-ekonomi yang lain untuk menghasilkan input bernas dan syor yang releven.

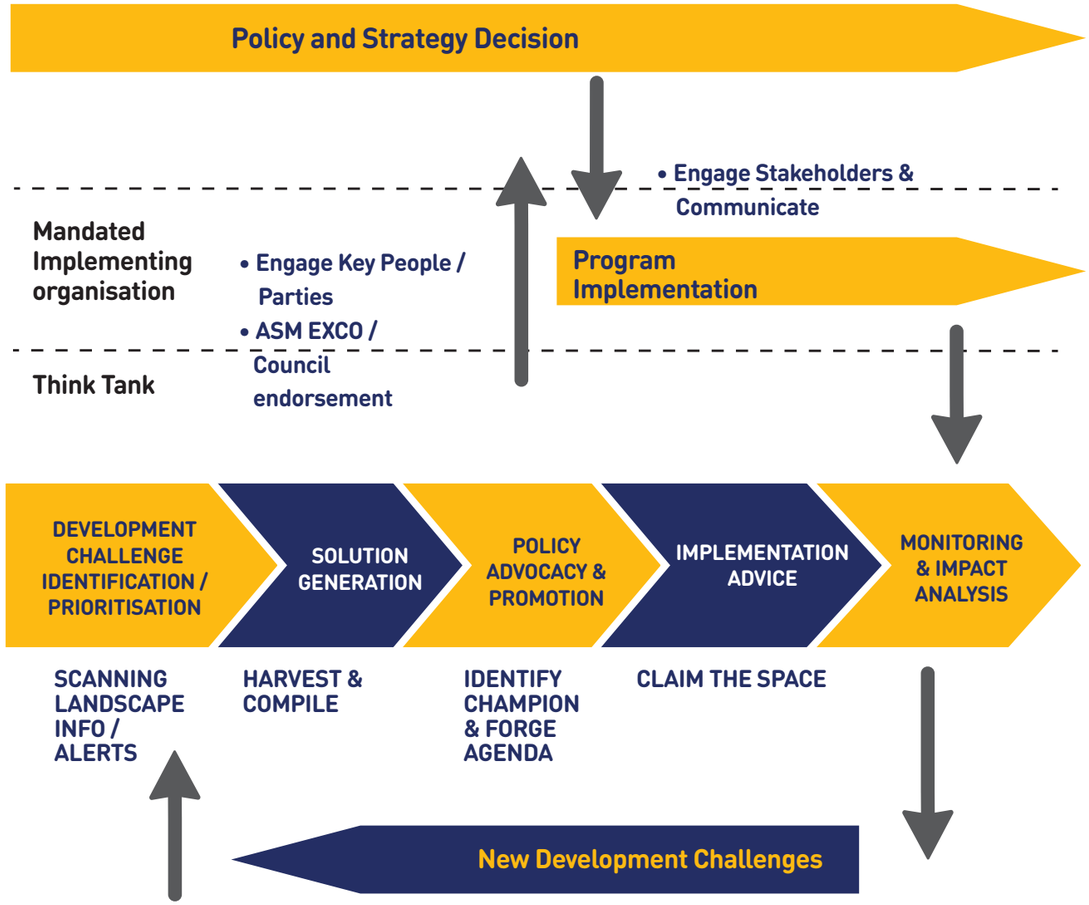
Fokus utama kami adalah memastikan kebolehpercayaan input, ketepatan masa dan kesesuaian dalam pemberian input-input strategik mengenai isu-isu berkaitan STI di peringkat nasional dan antarabangsa. Input kami adalah berdasarkan maklum balas dari pelbagai sektor, pemikiran futuristik dan pendekatan yang melangkau batas disiplin konvensional. Penterjemahan dan komunikasi input secara tepat dan efektif kepada penggubal dasar dan undang-undang, pemimpin industri, dan masyarakat dititikberatkan.

Di ASM, kami bekerja secara pasukan. Setiap individu, dari pakar bidang khusus kepada penganalisis, memainkan peranan penting dan saling bergantung antara satu sama lain. Kami memanfaatkan kepakaran lebih 700 pakar terulung negara dalam menangani isu-isu memuncul. Ilmu pengetahuan yang kami pelajari di arena antarabanga diadaptasi dan digunapakai bagi memenuhi keperluan negara. Kolaborasi, penglibatan menyeluruh pemegang taruh dan kepelbagaian pemikiran menjadi tunjang pendekatan kerja kami.

74 **PENERBITAN BERKAITAN ISU STI SETAKAT INI**

RANTAIAN NILAI UNTUK IMPAK

Policy and Strategy Development- Activity Value Chain & Process Flow



Sumber: YM Academician Datuk Dr Tengku Mohd Azzman Shariffadeen FASc, 2015

NADIR BUMI: PELUANG EKONOMI BARU?

Malaysia seharusnya mengambil bahagian dalam rantaian industri nadir bumi ini kerana ianya mempunyai ciri untuk membina ekosistem yang teguh. Memandangkan industri teknologi tinggi negara terus berkembang maju, bekalan bahan mentah nadir bumi yang mencukupi adalah penting. Oleh itu, pembangunan industri nadir bumi akan memberi kelebihan kepada Malaysia.

Penciptaan dan penubuhan industri bernilai tinggi sebegini di Malaysia akan mendorong pengembangan bakat yang berterusan (dari perlombongan hingga pemprosesan hingga pembuatan) serta menyumbang kepada Keluaran Dalam Negara Kasar (KDNK) nasional.

Lynas Advanced Material Plant (LAMP) telah beroperasi sejak 2012. Ia pernah menjadi isu perdebatan alam sekitar yang hangat di Malaysia dan terus menimbulkan pelbagai reaksi dalam kalangan rakyat. Kabinet Malaysia telah memutuskan untuk melanjutkan lessen operasi LAMP, dengan beberapa syarat yang perlu dipatuhi.

LAMP, yang merupakan satu-satunya pengeluar nadir bumi selain negara China, menghasilkan lanthanides, nama bagi gabungan 17 elemen yang penting dalam pembuatan industri berkualiti tinggi untuk bateri, komputer, televisyen, magnet dan telefon pintar.

» • Baca laporan kajian

PERUBATAN KEPERSISAN

ASM's Precision Medicine Initiative for Malaysia telah dimulakan pada bulan September 2017. Badan Bertindak ini dipengerusikan oleh Profesor Datuk Dr A Rahman A Jamal FASc dan mempunyai sembilan ahli. Tujuan inisiatif ini adalah untuk mengemukakan syor ke arah meningkatkan kesedaran tentang kepentingan perubatan kepersisan (*Precision Medicine*) dan mengarusperdanakannya untuk melengkapi amalan klinikal semasa.

Perubatan kepersisan merupakan pendekatan memuncul yang mula mendapat perhatian kerana keperluan pencegahan dan rawatan penyakit yang tepat dan bersesuaian dengan setiap individu. lanya merupakan satu pendekatan untuk pencegahan, diagnosis dan rawatan penyakit yang memaksimumkan keberkesanan dengan mengambil kira kebolehubahan individu dari segi reka bentuk genetik, persekitaran dan gaya hidup. Perubatan kepersisan boleh menyediakan nilai tambah dalam penjagaan kesihatan, meningkatkan keberkesanan dan mengurangkan kos rawatan.

Kepelbagaian etnik di Malaysia adalah 'lubuk emas' kerana kepelbagaian data genomik seperti ini dicari-cari oleh syarikat farmaseutikal di seluruh dunia. Kepelbagaian maklumat genetik ini mempunyai potensi besar untuk analisis dan ramalan bagi jenis rawatan yang tepat dan sesuai bagi seseorang individu.

Badan Bertindak ini telah memetakan lanskap inisiatif persendirian atau berkumpulan di Malaysia dan berpendapat bahawa inisiatif di peringkat Nasional harus dilaksanakan untuk usaha yang lebih bersepadu. Ini adalah untuk melindungi data genetik dan menguruskan akses ke 'lubuk emas' ini dengan lebih teratur bagi memanfaatkan penyelidikan dan pembangunan (P&P) yang berimpak serta kerjasama antarabangsa. Kerangka perundangan dan peraturan yang kukuh disokong oleh Akta yang relevan seperti Akta Perlindungan Data Peribadi yang khusus untuk data genetik manusia adalah diperlukan.

ASM Task Force on Precision Medicine: Public Engagement Workshop telah diadakan pada bulan November 2019 untuk mengumpul input dan maklumbalas daripada pihak berkepentingan mengenai faedah memperkenalkan perubatan kepersisan bagi melengkapi perkhidmatan perubatan konvensional. Badan Bertindak ini akan menyediakan satu Kertas Posisi yang akan dibentangkan kepada Kementerian Kesihatan Malaysia selepas mendapat kelulusan daripada pihak *STI Policy and Advisory Committee* (STIPAC) dengan tujuan meletakkan perubatan kepersisan sebagai salah satu bidang utama dalam tempoh lima tahun akan datang melalui Rancangan Malaysia Kedua Belas (RMKe12).

STRATEGI UNTUK MEMPERBAIKI PENGURUSAN PERMINTAAN AIR DI SARAWAK

Ketika *ASM Task Force on Water Demand Management* menganjurkan bengkel di Sarawak untuk *Study on Water Demand Management for Malaysia* pada tahun 2014, Kerajaan Negeri Sarawak telah memohon satu laporan khas bagi Sarawak supaya dapat meningkatkan kesiapsagaan negeri Sarawak dalam aspek ini. Oleh kerana aliran yang tidak terkawal dan kualiti air yang makin menurun, peralihan daripada pendekatan pengurusan berasaskan bekalan semasa, kepada pengurusan yang lebih lestari adalah penting.

Menurut laporan kajian ini, penambahbaikan struktur tadbir urus air di Sarawak merupakan salah satu kunci untuk pengurusan air yang lebih lestari. Cadangan utama laporan tersebut adalah:

- Menerapkan definisi pengurusan permintaan air yang lebih menyeluruh
- Merangka Pelan Pengurusan Permintaan Air Bersepadu
- Mengukuhkan penglibatan masyarakat melalui platform pihak pemegang taruh rasmi yang dihubungkan dengan Majlis Sumber Air Sarawak
- Menubuhkan *Agriculture Water Services Organisation*
- Merangka model Neksus Air-Tenaga-Makanan untuk pengurusan air yang juga akan mempertimbangkan air untuk ekosistem / alam sekitar

Penemuan dari draf laporan akhir telah dibentangkan ke Majlis Sumber Air Sarawak yang dipengerusikan oleh Setiausaha Kerajaan Negeri Sarawak. Pembentangan tersebut diterima dengan baik.

LAPORAN INI MENGEMUKAKAN

27 strategi merangkumi **17** aspek:

- Tadbir Urus
- Dasar
- Undang-undang
- Institusi
- Operasi, Penyelenggaraan & Tahap Perkhidmatan
- Data & Maklumat
- STI
- Penjanaan Kekayaan
- Pengurusan Partisipatif
- Pengurangan, Penggunaan & Kitar Semula
- Air-Tanah
- Kapasiti Pembangunan
- Perancangan Pembangunan
- Pembiayaan
- Penyelidikan dan Pembangunan
- Kerjasama Antarabangsa
- Neksus Air-Makanan-Tenaga

INDUSTRI HALAL YANG PESAT

Halal bukan sekadar satu hukum Islam yang hanya menyentuh hal makanan dan minuman. Bahkan, industri halal global merupakan satu ekosistem yang menyeluruh, dari farmaseutikal, barangan kosmetik, fesyen dan industri lain.

Malaysia kini merupakan salah satu pemain utama dalam pasaran halal global, dengan eskport halal negara dijangka mencecah USD12 bilion menjelang 2020 (*The Malaysia Reserve*, 2019). Untuk merangsang lagi perkembangan industri halal negara dan menjadi hab halal global, STI perlu dimanfaatkan. Kemajuan STI telah memacu perkembangan bahan halal dalam produk makanan diproses, farmaseutikal, kosmetik, penjagaan diri, dan sebagainya. Ini boleh dilihat dari piawaian yang diamalkan oleh pengeluar produk dan perkhidmatan halal yang memerlukan pekerja berlatarbelakangkan bidang sains halal.

ASM Task Force on the Science of Halal Initiative dipengerusikan oleh Academician Tan Sri Dato' Ir Ts Ahmad Zaidee Laidin FASc. Badan Bertindak ini telah merangka satu Kertas Posisi yang menekankan keperluan penubuhan ekosistem menyeluruh yang disokong oleh dasar nasional dan strategi bagi mengatasi cabaran dan merebut peluang dalam industri halal global berpaksikan STI untuk transformasi industri ini. Antara cadangan yang diusulkan adalah:

- Memperkasakan Majlis Halal Malaysia yang akan memantau perkembangan agenda halal negara, termasuklah kajian dan penyelidikan bagi Sains Halal. Majlis Halal Malaysia perlu disokong oleh penggubal dasar, saintis, dan wakil industri bagi mengenal pasti bidang keutamaan dan tertumpu untuk kajian berkaitan halal.
- Badan pemikir sains halal perlu menubuhkan dan mengurus dana khas untuk menampung kajian bidang sains halal, terutamanya dalam penyelidikan pra-pengkomersilan (*experimental development*). Badan pemikir sains halal juga diusulkan untuk bekerjasama dengan Majlis Halal Malaysia untuk mendapatkan dana dari badan-badan tempatan dan antarabangsa (contoh: *Organisation of Islamic Cooperation (OIC)* dan *Islamic Development Bank (IDB)*).
- Konsortium penyelidikan sains halal harus disokong untuk menggalakkan saintis tempatan untuk bekerjasama dan memantau bakat, sumber dan kemudahan untuk kajian dan inisisatif Sains Halal. Pangkalan data saintis halal, kepakaran dan penerbitan kertas penyelidikan mereka harus dikembangkan untuk membina rangkaian dan mencipta peluang kolaborasi, meningkatkan keterlihatan kepada komuniti saintifik serta pihak berkepentingan yang berkaitan, dan bertindak sebagai titik rujukan bagi semua penyelidik sains halal.
- Platform kolaboratif dalam industri halal, seperti di bawah *Malaysian Collaborative Network Platform for Disruptive Innovation (i-Connect)*, perlu menyokong Perusahaan Kecil dan Sederhana (PKS) Halal tempatan dalam usaha pendigitalan operasi dan menggalakkan P&P kolaboratif dengan pihak universiti tempatan.

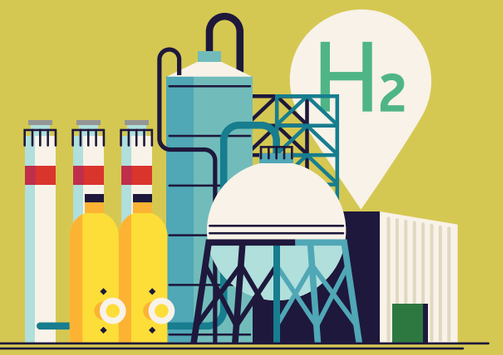
MENYELAK LEMBARAN BARU; *SIG*

ASM telah memulakan langkah membentuk *Special Interest Group (SIG)* untuk meneroka bidang penting dan memuncul merentasi disiplin bagi Malaysia dari segi merealisasikan pertumbuhan ekonomi, kemajuan masyarakat, peningkatan daya saing, fokus masa depan dan kelestarian. SIG diterajui oleh pakar dan proaktif dalam merapatkan jurang antara penjana dan pengguna ilmu pengetahuan untuk tindakan kolaboratif dan transformatif agar Malaysia sentiasa di hadapan.

EKONOMI HIDROGEN

Pertumbuhan hijau semakin mendapat perhatian dalam usaha membentuk masyarakat yang lebih lestari. Seperti negara-negara lain di seluruh dunia, Malaysia komited untuk menuju masa depan tenaga bercirikarbon rendah. Hal ini mendorong ASM untuk menubuhkan *Special Interest Group on Hydrogen Economy*, yang dikendalikan oleh Profesor Dato' Ir Dr Wan Ramli Wan Daud FASc. SIG ini telah menghasilkan kertas posisi yang holistik dan disokong bukti yang menggariskan peluang dan cabaran bagi Malaysia untuk menceburkan diri dalam Ekonomi Hidrogen.

Rangkaian bekalan Hidrogen Ekonomi yang lengkap, dari pengeluaran, penyimpanan dan pengangkutan hidrogen hingga penggunaan, telah dibincangkan. Teknologi hidrogen yang paling sesuai untuk Malaysia, seperti *electrolyser* dan sel bahan api, telah diketengahkan. Pelan tindakan dicadangkan untuk Rancangan Malaysia ke-12 dan seterusnya bagi membina ekosistem yang kondusif untuk Ekonomi Hidrogen di Malaysia. Empat aspek utama ekosistem, iaitu tadbir urus, penerimaan masyarakat dan pasaran, kesediaan bakat dan pengetahuan teknikal serta keperluan kewangan telah dibincangkan.



PEMBELAJARAN MESIN

Dipengerusikan oleh YM Academician Tengku Datuk Dr Mohd Azzman Shariffadeen FASc, *ASM Special Interest Group on Machine Learning (SIGML)* ditugaskan untuk menyediakan Kertas Posisi mengenai peranan penting Kecerdasan Buatan / Pembelajaran Mesin dalam pembangunan Malaysia. Kertas ini juga mengemukakan cadangan berdasarkan keperluan ekonomi dan jurang data negara untuk perancangan dan penggunaan ML /AI.

Kertas kerja ini mensyorkan yang berikut untuk membina ekosistem data dengan tujuan membangunkan AI untuk penyelesaian tempatan:

1. Merangka pelan hala tuju strategik yang berfokus kepada STI negara untuk mengubah cara Malaysia melihat maklumat, data dan nilai yang boleh dijana melalui AI untuk faedah ekonomi dan sosial.
2. Mencadangkan penubuhan Jawatankuasa AI Nasional untuk menyelaraskan semua projek AI bertaraf kebangsaan di bawah naungan Majlis Sains Negara
3. Memperkenalkan peranan Data Czar dan Rangka Kerja Tadbir Urus Data Kebangsaan untuk memastikan ekosistem data yang boleh meningkatkan akses kepada data awam dan swasta yang tidak sensitif bagi tujuan penciptaan nilai.
4. Membina *"AI Makerspace"* yang akan memanfaatkan platform kolaborasi sedia ada untuk mengembangkan AI untuk solusi tempatan dalam empat bidang fokus yang dikenal pasti: (i) Bandar Pintar, (ii) Pembuatan Digital, (iii) Pertanian Kepersisan & (iv) Penjagaan Kesihatan yang Terhubung
5. Melengkapkan bakat Malaysia dengan kecekapan dan kemahiran untuk menggunakan teknologi dan aplikasi AI.

KERJASAMA STRATEGIK UNTUK KAJIAN UTAMA NEGARA

KAJIAN DASAR DAN PELAN INDUK SAINS, TEKNOLOGI DAN INOVASI

ASM telah diberikan mandat untuk mengkaji semula Dasar Sains, Teknologi dan Inovasi 2013-2020 dan merangka Dasar Sains, Teknologi, Inovasi 2021-2030 yang baru oleh Kementerian Sains Teknologi & Inovasi (MOSTI) (sebelum ini dikenali sebagai Kementerian Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim, MESTECC). Hal ini bertepatan dengan aspirasi kerajaan yang ingin memastikan Malaysia menjadi negara maju dengan mengarusperdanakan STI. ASM juga telah diamanahkan untuk membangunkan Pelan Induk Sains, Teknologi, Inovasi Malaysia (STIMP) 2020-2030. Langkah ini amat penting bagi menyelaras dan melaksanakan semua dasar berkaitan STI ke arah memanfaatkan peluang STI untuk impak sosio-ekonomi.

Menyedari bahawa STI adalah antara pemacu utama untuk memastikan Malaysia berkembang maju, menjadi negara yang progresif, harmoni, makmur dan lestari, kami telah melangkah lebih jauh untuk memurnikan dan mengintegrasikan penemuan dan cadangan NPSTI (2021-2030) dan STIMP (2020-2030). Dengan ini, satu dokumen Dasar dan Pelan Induk STI (2021-2030) yang bersepadu terhasil ke arah memastikan penyelarasan, kolaborasi, dan penggemblengan sumber yang cekap.

7 Teras Strategik

22 Strategi

40 Langkah Polisi

89 Inisiatif

97 Petunjuk

10 Mesej Utama Polisi

MENGATASI PENCEMARAN MERENTASI SEMPADAN

Pencemaran merentasi sempadan – pencemaran yang berasal dari satu negara yang merentasi sempadan dan menyebabkan kerosakan kepada alam sekitar dan lain – telah memberi kesan buruk terhadap kesihatan dan ekonomi negara-negara ASEAN sejak beberapa dekad yang lalu. Episod jerebu yang berterusan terutamanya menunjukkan usaha diplomatik tidak membuahkan hasil. Keadaan ini menggesa Kerajaan Malaysia untuk mempertimbangkan undang-undang bagi membendung pencemaran merentasi sempadan ini. Penguatkuasaan akta di luar jangkauan bidang adalah sesuatu yang mencabar dan tidak dapat dielakkan.

Sebagai rakan strategik MESTECC, ASM menubuhkan satu badan bertindak yang diketuai oleh Professor Dato' Ir Dr A. Bakar Jaafar FASc untuk mengkaji keperluan akta Local and Transboundary Pollution. Pada 20 Disember 2019, badan bertindak ini telah membentangkan hasil dapatan kepada YB Menteri MESTECC, menyampaikan justifikasi kepada keperluan akta pemcemaran merentasi sempadan, serta mencadangkan mekanisme yang penting bagi membolehkan penguatkuasaan undang-undang berjalan secara efektif.

PENILAIAN AKTA KUALITI ALAM SEKELILING 1974

ASM telah ditugaskan oleh Kementerian Alam Sekitar dan Air (sebelumnya Kementerian Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim) untuk membuat penilaian semua terhadap Akta Kualiti Alam Sekeliling 1974 (EQA1974). Tugasan ini bermula pada November 2019.

ASM dilihat sebagai rakan strategik yang sesuai kerana mempunyai rangkaian pakar yang releven serta Felo ASM yang diiktiraf di peringkat kebangsaan. ASM bertanggungjawab untuk mengenal pasti jurang dalam akta tersebut dan memberikan cadangan penambahbaikan ke arah memperkasa undang-undang sedia ada. Jawatankuasa Pemandu ini telah dipimpin oleh Academician Professor Emeritus Tan Sri Dr Zakri Abdul Hamid FASc dan komited dalam menangani isu-isu berkaitan kelemahan dalam penguatkuasaan undang-undang, kelemahan dalam isu ketelusan dan akses kepada maklumat, serta tadbir urus yang lemah.

Peruntukan undang-undang berkenaan perubahan iklim, *circular economy* dan penyertaan masyarakat juga dicadangkan bagi mengubah pengurusan alam sekitar daripada pendekatan reaktif kini kepada pendekatan pencegahan. ASM yakin bahawa input daripada pakar akan membolehkan undang-undang alam sekitar yang menyeluruh dan releven untuk masa kini. Kementerian dan agensi berkaitan sedang meneliti dan melaksanakan proses-proses berkaitan ke arah merealisasikan penguatkuasaan undang-undang tersebut. Ini akan melonjakkan kedudukan Malaysia dalam perundangan alam sekitar di peringkat antarabangsa.

TINJAUAN SEPARUH PENGGAL PELAN PEMBANGUNAN PENDIDIKAN MALAYSIA 2015-2025 (PENDIDIKAN TINGGI)

Untuk menilai keberkesanan Pelan Pembangunan Pendidikan Malaysia 2015 – 2025 (Pendidikan Tinggi) dan pelaksanaan programnya, Kementerian Pendidikan telah memberi mandat kepada ASM untuk menganalisis dan menilai pencapaian semasa dan impak strategi dan inisiatif di bawah MEB (HE). Kajian ini merangkumi penilaian terhadap 10 lonjakan yang relevan untuk membentuk landskap pendidikan Malaysia mengikut keperluan semasa dan masa hadapan. MEB (HE) menekankan keperluan melahirkan graduan berciri keusahawanan, bukan hanya mencari kerja. Oleh itu, perkembangan bakat yang menyeluruh, terutamanya dari segi penerapan pemikiran keusahawanan, kemahiran *'start-ups'*, perlu diperkukuhkan. Penilaian pelan pembangunan ini juga menunjukkan bahawa sistem pendidikan perlu diselaraskan di semua peringkat untuk membolehkan peningkatan dan perkembangan ilmu pengetahuan yang berterusan dalam mempersiapkan graduan untuk masa depan.

ANALISIS ASM :

Berdasarkan *IMD World Talent Ranking 2018*, Malaysia menduduki tempat ke-**22 daripada 63 negara**. Namun, Malaysia berada di tempat ke-99 dari 137 dalam "*Start-up Skills*", sub-komponen *Global Entrepreneurship Index* 2018

KAJIAN IMPAK PELAKSANAAN UNIVERSITI PENYELIDIKAN MALAYSIA

Malaysia telah mengamanahkan lima universiti terbaik iaitu Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM), Universiti Sains Malaysia (USM), Universiti Putra Malaysia (UPM) dan Universiti Teknologi Malaysia (UTM) untuk menerajui aktiviti Penyelidikan & Pembangunan (P&P) negara. Kelima-lima universiti ini dikenali sebagai Universiti Penyelidikan Malaysia (MRUs) dan merupakan pemangkin penting untuk meletakkan Malaysia sebagai pusat kecemerlangan pendidikan dan penyelidikan serantau dan global dan menjadi percubaan *(testbed)* bagi industri terkemuka dunia untuk menjalankan aktiviti P&P yang inovatif. ASM sebagai rakan strategik telah diamanahkan oleh Kementerian Pendidikan Malaysia (KPM) untuk menjalankan penilaian impak daripada pelaksanaan kesemua universiti penyelidikan ini.

Kajian ini melaporkan bahawa kesemua universiti penyelidikan ini telah menunjukkan prestasi yang cemerlang apabila dibandingkan dengan universiti lain yang turut mempunyai kriteria yang sama. Kesemua MRU memiliki asas-asas pembangunan *(building blocks)* yang perlu untuk pengukuhan kedudukan mereka di arena global. Sokongan yang berterusan daripada ekosistem luaran terutamanya dari aspek dana, perundangan dan peraturan serta insentif akan membolehkan MRU terus maju dan mempunyai ekosistem penyelidikan yang mantap. Ini seterusnya akan meningkatkan daya saing serta membolehkan penemuan P&P diterjemahkan untuk memacu sektor utama ekonomi dan menyumbang kepada pembangunan negara. Hasil kajian ini telah membantu dalam menyediakan rangka kerja nasional untuk memastikan perancangan dan pelaksanaan nasional yang bersepadu dalam membangunkan sektor sosio-ekonomi yang berpandukan Sains dan Teknologi.

ANALISIS ASM :

Sejak 2013, Malaysia mempunyai **120,000 Penerbitan Penyelidikan** dan **39%** penyelidikan berimpak tinggii tetapi berada di kedudukan **71 dari 129 negara** dalam *Knowledge Creation*, sub-komponen bagi *Global Innovation Index* pada tahun 2019

DASAR KEUSAHAWAN NEGARA

ASM merupakan rakan strategik kepada Kementerian Pembangunan Usahawan dan Koperasi (MEDAC) (dahulunya dikenali sebagai Kementerian Pembangunan Usahawan) yang telah membangunkan Dasar Keusahawanan Negara (DKN) 2030. Melalui dasar ini, MEDAC berharap untuk merangka hala tuju ke arah mewujudkan ekosistem keusahawanan yang holistik, kondusif dan inklusif untuk menyokong agenda sosio-ekonomi negara. Rancangan jangka panjang ini menggariskan lima objektif, lima sasaran, 19 strategi dan 62 inisiatif yang akan dilaksanakan untuk mengembangkan ekosistem keusahawanan di semua bidang industri yang merangkumi setiap peringkat usahawan dan masyarakat.

Menurut statistik Banci Ekonomi 2016, peratusan terbesar perniagaan di Malaysia adalah terdiri daripada PKS yang menyumbang 98.5% (907,065) daripada jumlah perniagaan. Daripada ini, 76.5% (693.670) terdiri daripada perusahaan mikro, 21.2% (192.783) sebagai perusahaan kecil dan selebihnya 2.3% (20.612) merupakan perusahaan sederhana. DKN ini bertujuan untuk meletakkan Malaysia sebagai negara keusahawan menjelang 2030 dengan menyediakan pelbagai peruntukan termasuklah penerapan elemen STI untuk produk dan perkhidmatan dengan nilai tambah bagi meningkatkan daya saing dan peluang perniagaan. DKN menekankan kolaborasi yang efektif, penyelarasan merentasi pelbagai entiti di tahap nasional, komitmen serta sokongan daripada semua pemegang taruh sebagai pemacu untuk Malaysia menjadi ekonomi yang maju, mempunyai pertumbuhan ekonomi yang saksama serta inklusif.

ANALISIS ASM :

Malaysia berada di tempat ke **58 daripada 137 negara** dalam *Global Entrepreneurship Index 2018* tetapi mencatat skor terendah untuk ***Technology Absorption (9%), Product Innovation (12%),*** **dan** ***High Growth (13%).***

BADAN BERTINDAK INSIDEN SUNGAI KIM KIM & PASIR GUDANG

Tragedi Sungai Kim Kim dan Pasir Gudang telah mencetuskan kesedaran di seluruh negara mengenai pengurusan kimia yang lemah dan pertumbuhan industri yang tidak terkawal yang telah menyebabkan bahaya kepada masyarakat. Negara telah menyaksikan kes pencemaran kimia pertama yang menyebabkan penutupan semua sekolah di Pasir Gudang.

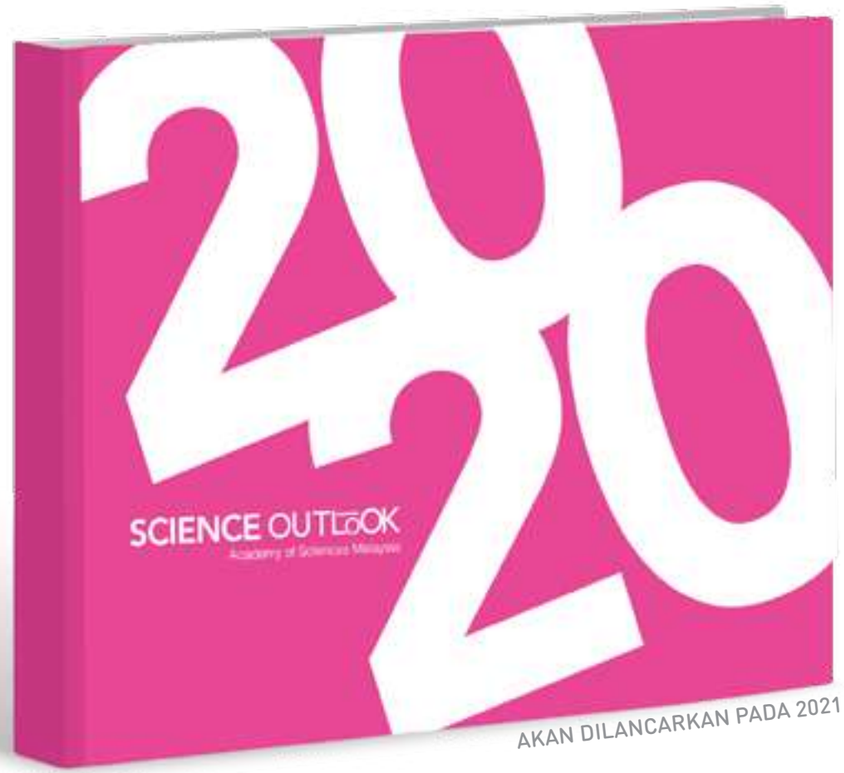
Untuk mengemukakan cadangan holistik kepada kerajaan, ASM telah menubuhkan *Task Force on Sg Kim Kim and Pasir Gudang Incidents*, yang diketuai oleh Profesor Dato' Ir Dr Wan Ramli Wan Daud FASc. Dalam masa enam minggu, Badan Bertindak ini telah bersidang empat kali, mengadakan lawatan ke Pasir Gudang, dan membentangkan laporan akhir kepada YB Menteri MESTECC dan YAB Menteri Besar Johor.

Cadangan:

1. Zon penampan keselamatan yang disemak semula selari dengan penemuan oleh *Loading Analysis and Carrying Capacity Study in Pasir Gudang* yang dibentang oleh sekumpulan ahli akademik dan agensi kerajaan kepada kerajaan negeri Johor dan MESTECC ketika itu.
2. Penggunaan *Gas Chromatograph / Mass Spectrometer (GCMS)* dengan pengesan pengionan api (FID) dan pengesan pengionan foto (PID) untuk ditempatkan di Pasir Gudang. Pihak Kementerian telah membeli 25 alat pengesan gas automatik (GCMS PID) untuk ditempatkan di Pasir Gudang sebagai sistem amaran masa nyata.
3. Penubuhan Jabatan Alam Sekitar yang baru di Pasir Gudang untuk penguatkuasaan dan pemantauan yang lebih baik.

30 TAHUN PEMBANGUNAN STI: MENGUKUR IMPAK EKONOMI, SOSIAL DAN ALAM SEKITAR

Science Outlook 2020 merupakan Edisi Khas yang akan meneliti status lanskap STI terdahulu dan semasa di Malaysia untuk 30 tahun yang lalu, sejak bermulanya Wawasan 2020. Ianya bertujuan untuk menilai kemajuan dan perkembangan STI di Malaysia dalam tiga teras utama iaitu ekonomi, sosial, dan alam sekitar.



AKAN DILANCARKAN PADA 2021

BUDAYA KECEMERLANGAN SAINS

Ramai telah mula menyedari keperluan untuk menguasai kemahiran STEM. Situasi ini mewujudkan lebih banyak peluang untuk Akademi untuk membuktikan bahawa STEM amat penting (dan juga menyeronokkan)

ASM sentiasa memberi penekanan terhadap subjek STEM. Kami arif betapa pentingnya mendidik generasi muda dalam bidang ini. Negara kita sentiasa memerlukan bakat yang terlatih. Melalui program yang berkaitan dengan STEM, kami berhasrat untuk melengkapkan generasi akan datang dengan kemahiran untuk memimpin masa depan yang kita semua inginkan suatu hari nanti.

ASM bertujuan untuk memberi inspirasi kepada golongan muda untuk meneruskan kerjaya dalam bidang STEM. Dalam usaha menangani cabaran kekurangan graduan STEM yang berkelayakan, ASM telah melaksanakan pertandingan sains peringkat kebangsaan yang dikenali sebagai *National Science Challenge* (NSC). Melalui NSC, peserta didedahkan kepada modul yang kompleks yang memerlukan pemikiran kreatif. Kami berhasrat untuk menggalakkan lebih dari seratus ribu peserta untuk mengikuti program ini pada tahun 2020.

Usaha kami tidak terhad kepada golongan muda sahaja. Sama ada dengan memperkasakan pendidik STEM, memperkenalkan pelbagai inisiatif, atau bekerjasama dengan organisasi pendidikan terkemuka, ASM tetap komited dalam mempersiapkan generasi hari ini untuk terus menceburi bidang STEM.

MEMUPUK BAKAT LOKAL DALAM BIDANG PERHUTANAN DAN KEPELBAGAIAN BIOLOGI

Kepelbagaian biologi yang luar biasa di hutan Borneo menawarkan peluang P&P untuk memulihara, melindungi dan mengurus warisan yang tidak ternilai. 'Makmal semula jadi' ini membolehkan Malaysia untuk melatih, memupuk dan mengembangkan bakat tempatan dalam kalangan saintis muda serta memanfaatkan pakar tempatan dalam bidang perhutanan dan kepelbagaian biologi ke arah mengukuhkan kemampuan dan kebolehan negara dalam bidang ini.

Sejak tahun 2006, ASM telah bekerjasama dengan *Sabah Foundation (SF)* dalam menghubung dan membawa para saintis dari institusi Malaysia untuk melakukan ekspedisi dan penyelidikan di hutan-hutan di Sabah. Sejak 2016, ASM diberi kepercayaan oleh SF untuk mengembangkan dan melaksanakan program penyelidikan saintifik untuk *Imbak Canyon Rainforest Research and Training Programme* (ICRRTP).

Lawatan ke Kawasan Pemuliharaan Imbak Canyon (ICCA) telah diadakan pada 17 - 20 Februari 2019 oleh *ASM Task Force on ICRRTP.* Melalui lawatan ini, peluang untuk penyelidikan di ICCA dan kemudahan yang terdapat di Pusat Pengajian Imbak Canyon telah dikenal pasti untuk ICRRTP. Antara bidang penyelidikan berpotensi untuk ICRRTP adalah seperti berikut:

1. Penilaian status biodiversiti berdasarkan genomik dan maklumat
2. Perhubungan koridor dan perubahan lanskap
3. Kesihatan, biodiversiti dan perubahan ekosistem
4. Pengurusan kawasan legeh dan Hidrogeomorfologi
5. Perubahan iklim

MALAYSIA CODE OF RESPONSIBLE OF CONDUCT IN RESEARCH (MCRCR)

The Code of Responsible Conduct in Research (MCRCR) merupakan satu inisiatif untuk melengkapi dan menambah nilai usaha-usaha menggabungkan penyelidikan dan sains di Malaysia selama ini. MCRCR membuktikan bahawa penyelidik dan entiti penyelidikan Malaysia komited terhadap integriti dan tanggungjawab dalam menuntut ilmu.

MCRCR telah disahkan oleh Majlis Sains Negara pada tahun 2017. Ianya dirumus melalui rundingan dengan pelbagai pihak berkaitan seperti universiti, institusi penyelidikan, kementerian, penyedia dana penyelidikan, agensi kerajaan, badan bukan kerajaan (NGO), penyelidik dan pihak berkuasa undang-undang. Pelbagai perbincangan, bengkel dan sesi latihan yang melibatkan kementerian, entiti penyelidikan, pengurusan penyelidikan, dan penyelidik individu telah diadakan. Salah satu pencapaian utama MCRCR adalah Kursus dan Penilaian MCRCR pada tahun 2018. Kursus ini dilaksanakan pada bulan Januari dan Ogos 2019 bersama penyelidik dari Universiti Teknologi Mara (UiTM). Dari 80 peserta, 75 orang lulus dalam penilaian.

Ahli Jawatankuasa, ASM (2019)

- Objektif: untuk memudahcara, menyelaras dan memantau pelaksanaan MCRCR

Pengerusi:
Profesor Emeritus Akademik Dato' Dr Khalid Yusoff FASc

- Ahli:
  - MESTECC
  - KPM
  - Kementerian Kesihatan Malaysia (KKM)
  - ASM
  - Akademi Perubatan Malaysia
  - UPM
  - UM
  - UKM
  - Universiti UCSI

KONSORTIUM SAINS KEBANGSAAN

NATIONAL CENTRE FOR PARTICLE PHYSICS (NCPP)

Sebagai pusat yang mumudahcara kolaborasi saintifik dalam fizik zarah, NCPP berperanan sebagai titik fokus untuk pengembangan pengetahuan baru dalam teori tenaga tinggi dan fizik zarah serta kerjasama dengan pusat penyelidikan dan eksperimen antarabangsa.

Pusat ini telah mengetuai penerokaan nasional dalam penyelidikan fizik zarah eksperimen melalui usaha dan penglibatan dalam penyelidikan fizik teori serta fizik zarah dan fizik tenaga tinggi dengan pusat kecemerlangan antarabangsa (COE).

NCPP secara aktif bekerjasama dan menghantar penyelidik ke empat COE terbaik:
- *Central Muon Solenoid (CMS) European Organization for Nuclear Research (CERN), Geneva, Switzerland*
- *Deutsches Elektronen-Synchrotron (DESY), Hamburg, German*
- *High Energy Accelerator Research Organization (KEK), Tsukuba, Japan*
- *Osaka University, Osaka, Japan*

Pada tahun 2019, NCPP menganjurkan dua program saintifik dan peningkatan kapasiti untuk pelajar sarjana dan penyelidik:

- ***National School of Particle Physics* (25 – 27 Februari 2019)**
  Platform untuk pelajar tempatan mengambil bahagian dalam pembelajaran secara langsung dan komprehensif mengenai fizik zarah, yang dijalankan oleh pakar dari pelbagai pusat penyelidikan fizik zarah terunggul di dunia. Tiga peserta dari program ini dipilih sebagai peserta Malaysia untuk Program Pelajar Musim Panas CERN (CSSP) 2019 di Geneva.

- **Konferens Zarah & Daya 2019 (31 Oktober 2019)**
  Persidangan ini dianjurkan bersama dengan UKM dan Agensi Nuklear Sains bersempena dengan *International Nuclear Science, Technology and Engineering Conference* (iNUSTEC2019). Profesor Albert De Roeck, pakar terkemuka dari CERN, menyampaikan syarahan pleno pada persidangan tersebut.

MALAYSIA INSTITUTE FOR INNOVATIVE NANOTECHNOLOGY (NanoMITe)

Sebagai sebuah konsortium penyelidikan global yang terdiri daripada sekitar 100 saintis nano peringkat tinggi dari institusi dan pusat akademik bertaraf dunia, *Malaysia Institute for Innovative Technology* (NanoMITe) menyediakan sumber yang terbaik untuk menjalankan penyelidikan berimpak tinggi dalam pelbagai bidang nanoteknologi. Usaha bersama komuniti saintifik di seluruh dunia dalam konsortium ini membantu melatih generasi muda untuk menterjemah penyelesaian teknologi ke dalam platform keusahawanan. NanoMITe telah melaksanakan 19 projek dibawah lima bidang keutamaan:

Tenaga

Kesejahteraan, Perubatan dan Kesihatan

Makanan dan Pertanian

Elektronik, Peranti dan Sistem

Alam Sekitar

Pada tahun 2019, NanoMITe menganjurkan *NanoMITe Annual Symposium & Nanotechnology Malaysia Annual Symposium 2019* (NANOSYM 2019) dari 21-22 Ogos 2019. NANOSYM 2019 berfungsi sebagai platform perhimpunan utama untuk ahli nanoteknologi dan pakar akademik terkemuka dalam bidang nanoteknologi. Penyelidik NanoMITE membentangkan kemajuan projek mereka dalam konsortium ini.

MEMBANGUN DAN MEMANFAATKAN BAKAT STI

Memperluas jangkauannya ke wilayah selatan, ASM melalui Southern Chapter telah menganjurkan *ASM Merdeka Meeting* dengan kerjasama *Merdeka Award Secretariat*.

Bertemakan *"Science for a Greater Nation: Wisdom of the Past, Quest of the Future"*, seramai 61 saintis muda dan pakar terkenal menghadiri Mesyuarat kali kedua ini. Ianya merangkumi kedua-dua komponen akademik dan pengkomersialan, dan melengkapkan para saintis muda dengan pengetahuan dan kemahiran yang diperlukan untuk pembangunan STI pada masa hadapan. Pertemuan ini terdiri daripada empat aktiviti yang dirangka khas; Kuliah Ucapan Utama, Kuliah Merdeka, Dialog Meja Bulat Merdeka, dan Kelas Pakar bersama *Merdeka Award Laureates* dan pakar jemputan dari sektor industri.

7 pakar terkenal yang hadir di *2nd ASM Merdeka Meeting:*

1. **Profesor Dr Abdul Latif Ahmad FASc**
   Penerima Anugerah Merdeka 2014
   (Pencapaian Akademik Luar Biasa)

2. **Profesor Datuk Dr Ahmad Fauzi Ismail FASc**
   Penerima Anugerah Merdeka 2014
   (Pencapaian Akademik Luar Biasa)

3. **Academician Emeritus Profesor Tan Sri Dato' Sri Dr Zakri Abdul Hamid FASc**
   Penerima Anugerah Merdeka 2015 (Alam Sekitar)

4. **Dato' Dr Gan Ee Kiang**
   Penerima Anugerah Merdeka 2018
   (Kesihatan, Sains & Teknologi)

5. **Profesor Dr Mohd Hair Bejo FASc**
   Penerima Anugerah Merdeka 2018
   (Kesihatan, Sains & Teknologi)

6. **Dato' Norhalim Yunus**
   CEO, Malaysian Technology Development Corporation

7. **Dr Mohd Faizal Sedaralit**
   Ketua (Delivery Hydrocarbon Recovery Technology), Group Research & Technology, PETRONAS Holding Bhd

• Lawati galeri foto • Baca liputan media

GALAKAN MINAT STEM

Kerjasama industri dan kerajaan dalam memperkasakan STEM telah mencapai satu tahap yang baru melalui *CCM STEM Up Challenge* edisi kedua. Selaras dengan objektif untuk mengembangkan bakat STEM di negara ini, CCM dan ASM telah memulakan format baru pertandingan ini yang dikendalikan oleh YSN-ASM.

Berlangsung di Sungai Petani, Kedah, pertandingan ini diadakan sempena Minggu Amanah Saham Negara 2019. Para pelajar dari 48 sekolah menengah di Sungai Petani telah menyertai kuiz peringkat awal. 20 sekolah teratas kemudiannya dijemput untuk bertanding di pusingan separuh akhir yang merangkumi *Amazing Science Challenge* (Biologi, Fizik dan Kimia) dan #MyLabRules.

Kuiz Peringkat Awal
17-21 Mac 2019

Pusingan Akhir
24 April 2019

Projek Terbaik #MyLabRules

Sekolah Menengah Kebangsaan Ibrahim

Juara Keseluruhan

Maktab Rendah Sains MARA Merbok

• Lawati galeri foto • Baca liputan ASM

LAWATAN KE *SILICON VALLEY* - PUPUK BAKAT STEM DALAM DIRI

Pemenang *National Science Challenge* 2018 berkongsi pengalaman dan pengetahuan yang mereka perolehi semasa lawatan belajar mereka ke *Silicon Valley*. Program ini juga bertujuan untuk mengembangkan minat mereka dan seterusnya meneruskan kerjaya dalam bidang STEM.

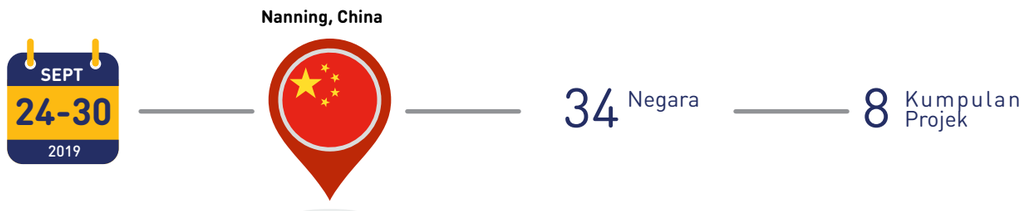
Academician Tan Sri Dr Salleh Mohd Nor FASc telah diberi peluang untuk berinteraksi dengan para pelajar pada sesi "*Being a Scientist is Awesome*". Semasa program ini, para pelajar dicabar untuk menerapkan konsep STEM secara kreatif dengan membina sebuah kereta menggunakan barang-barang kitar semula dalam "***30 Minutes STEM Challenge - Make It Move!***".

• Lawati galeri foto

INSPIRASI INOVASI NEGARA-NEGARA LALUAN SUTERA

Buat kali ketiga, ASM dan *China Association for Science and Technology (CAST)* telah menyertai *Belt and Road Teenager Maker Camp and Teacher Workshop*. Pasukan Malaysia diwakili oleh tiga pemenang 2018 *Young Makers* dari MRSM Transkrian, diiringi oleh dua penyelia.

Para peserta telah bekerjasama dengan rakan antarabangsa mereka untuk menyelesaikan salah satu daripada lapan projek yang berbeza. Mereka dinilai dari segi kerja berpasukan, persembahan dan pencipta terbaik. Ketiga-tiga wakil Malaysia membawa pulang pingat emas dalam setiap penilaian. Rombongan yang hadir juga menyampaikan kerjasama industri-akademik-komuniti semasa *Science Education Forum*.



• Baca liputan media

ANUGERAH & GERAN

ANUGERAH PENYELIDIKAN KANSER MAKNA

Penyelidikan kanser sangat penting dalam mengenal pasti penyebab kanser dan mengembangkan strategi pencegahan, diagnosis dan rawatan kanser. Kini, teknologi dalam rawatan kanser telah menjadi lebih maju dan penemuan para penyelidik muda Malaysia adalah penting dalam memacu teknologi terkini. Untuk mendorong para penyelidik muda Malaysia mencari penawar kanser, MAKNA sentiasa menyediakan dana untuk penyelidikan.

Jaringan pakar ASM telah menyumbang kepakaran mereka kepada MAKNA dalam memilih penyelidik muda Malaysia yang layak mendapatkan geran penyelidikan.

Setiap tahun, MAKNA memperuntukkan RM90,000,00 untuk diberikan kepada tiga penyelidik.

2001-2019

57 Jumlah Projek

Jumlah Geran yang Dianugerahkan : RM1,641,410

DR RANJEET BHAGWAN SINGH *MEDICAL RESEARCH GRANT*

Para penyelidik telah memanfaatkan sains untuk menghasilkan penyelesaian dalam memastikan kehidupan yang lebih lama, sihat dan mencari penawar kepada sesuatu penyakit. Menyedari kekuatan sains dan pentingnya menyokong para penyelidik, Dr Ranjeet Bhagwan Singh telah menderma sebahagian dari kekayaannya untuk membantu penyelidik melengkapkan kajian mereka.

- **Penerima Geran 2018**
  Dr Hairul Aini Hamzah, IIUM
  Infectivity assessment of occult hepatitis C virus in primary peripheral blood mononuclear cells towards understanding of occult hepatitis C infection transmission

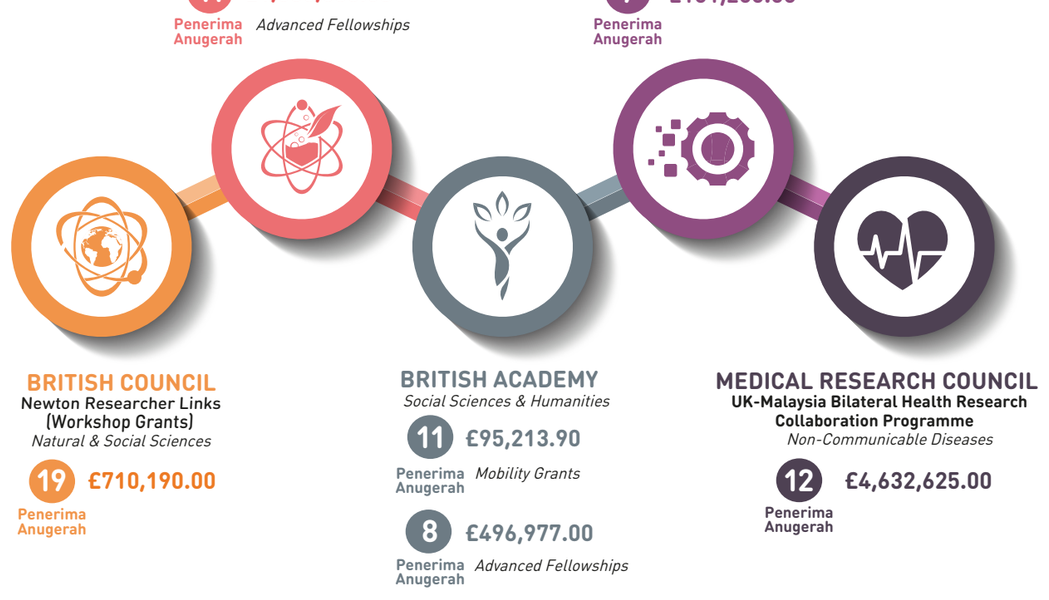
NEWTON-UNGKU OMAR FUND (NUOF)

Dana ini bertujuan untuk mengembangkan rangkaian penyelidikan dalam kalangan penyelidik pelbagai disiplin melalui integrasi pengetahuan STI yang menangani masalah sosio-ekonomi di Malaysia dan UK. Kerajaan Malaysia telah bekerjasama dalam melaksanakan NUOF sejak tahun 2015. Kegiatan NUOF meliputi:

a) Meningkatkan keupayaan komuniti sains dan inovasi Malaysia melalui *fellowship*, skim mobiliti dan pusat kerjasama.
b) Menjalinkan kerjasama penyelidikan mengenai topik-topik pembangunan.
c) Menubuhkan rakan inovasi dan mencabar dana untuk mengembangkan penyelesaian inovatif mengenai topik pembangunan.

Sepanjang empat tahun berkolaborasi, ASM sebagai salah badan pelaksana tempatan telah mengadakan beberapa program NUOF dengan kerjasama lima rakan pelaksana terkemuka di UK.

BILANGAN GERAN DAN JUMLAH DANA YANG DIANUGERAHKAN PADA 2019



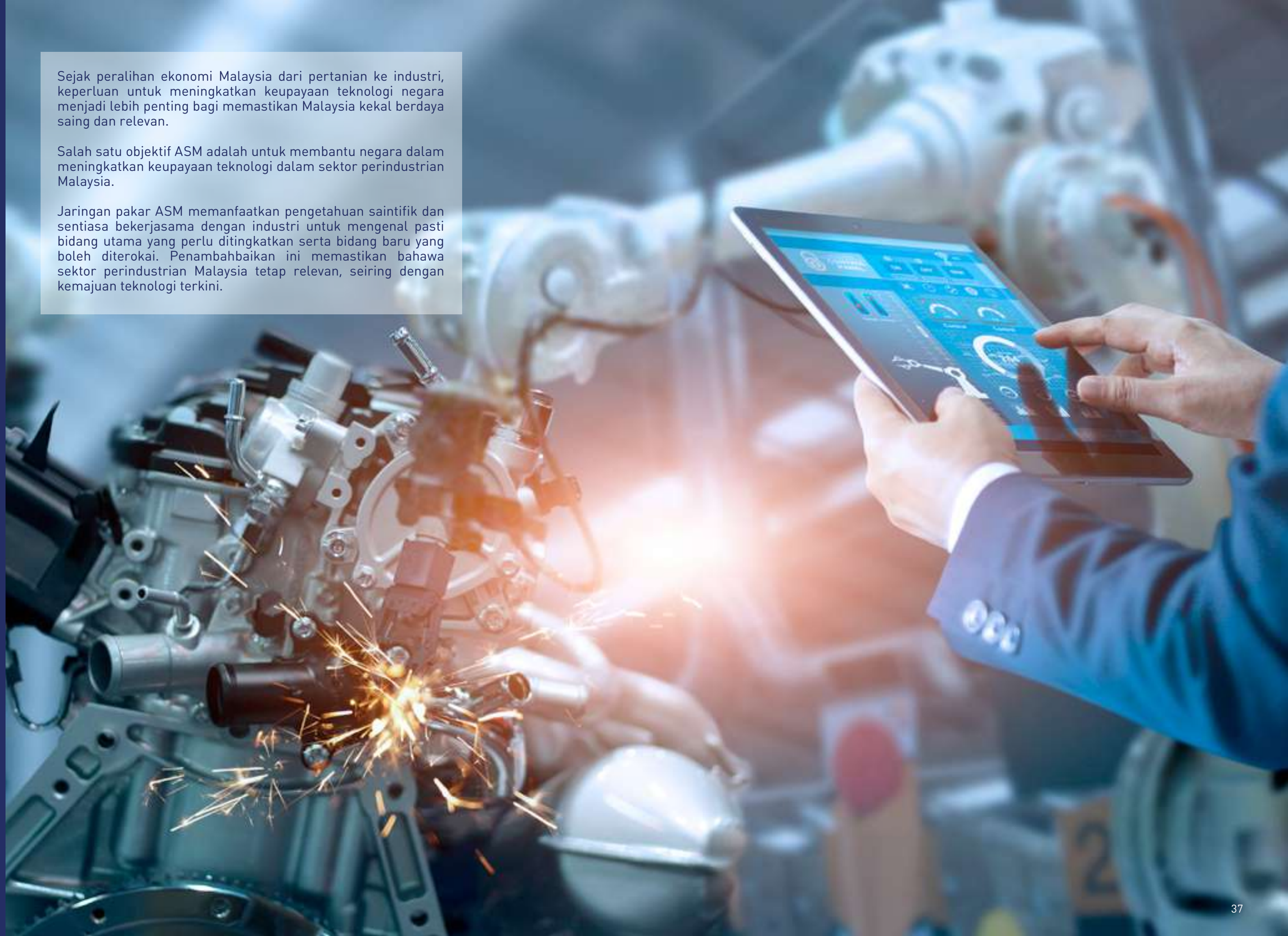
RAKAN PELAKSANA . PROGRAM . PENERIMA

MENAIK TARAF KEUPAYAAN TEKNOLOGI INDUSTRI

Sejak peralihan ekonomi Malaysia dari pertanian ke industri, keperluan untuk meningkatkan keupayaan teknologi negara menjadi lebih penting bagi memastikan Malaysia kekal berdaya saing dan relevan.

Salah satu objektif ASM adalah untuk membantu negara dalam meningkatkan keupayaan teknologi dalam sektor perindustrian Malaysia.

Jaringan pakar ASM memanfaatkan pengetahuan saintifik dan sentiasa bekerjasama dengan industri untuk mengenal pasti bidang utama yang perlu ditingkatkan serta bidang baru yang boleh diterokai. Penambahbaikan ini memastikan bahawa sektor perindustrian Malaysia tetap relevan, seiring dengan kemajuan teknologi terkini.



I-CONNECT: KOLABORASI DALAM INOVASI

MESTECC dan ASM telah memulakan inisiatif *Malaysian Collaborative Network Platform for Disruptive Innovation*, yang dikenali sebagai i-Connect. i-Connect adalah rangkaian inovasi kolaboratif yang dipacu oleh industri yang melibatkan empat pihak berkepentingan. Ia bertujuan untuk mewujudkan ekosistem inovasi yang kondusif di Malaysia ke arah peningkatan inovasi disruptif melalui rangkaian kolaboratif untuk membolehkan industri Malaysia memanfaatkan peluang ekonomi baru bagi memasuki dunia pasaran memuncul.

Interaksi dinamik yang dipacu industri dan didorong oleh pengguna dalam i-Connect akan mewujudkan kelompok pengetahuan dan hab bakat. Sebagai permulaan, i-Connect akan dilaksanakan dalam empat bidang industri strategik berdasarkan kekuatan dan permintaan pasaran Malaysia:

4 Pihak Berkepentingan

- **Industri**
- **Penyelidik**
- **Kerajaan**
- **Masyarakat**

Sebagai inisiatif rintis, *i-Connect* akan dilaksanakan dalam empat bidang strategik berdasarkan permintaan pasaran dan keperluan Malaysia:

- **Pembuatan: Industri 4.0**
- **Kesihatan & Kesejahteraan**
- ***Fintech* dalam Perbankan dan Kewangan Islam**
- **Rantaian Bekalan Halal**

iConnect
Malaysian Collaborative Network for Innovation

Open Science
Malaysia Open Science Platform (MOSP)

KEKAYAAN DATA PENYELIDIKAN MALAYSIA

MOSP bertujuan untuk menjadikan data penyelidikan Malaysia sebagai aset nasional yang berharga dan dikongsi melalui satu platform yang boleh dipercayai. MOSP juga membolehkan ketercapaian dan perkongsian data penyelidikan yang selari dengan keutamaan negara dan amalan terbaik antarabangsa. MOSP akan diterajui oleh *MOSP Alliance* yang akan merumuskan Pengurusan Dasar dan Garis Panduan Nasional untuk memberi kesedaran serta mengembangkan kapasiti dan infrastruktur untuk MOSP.

Di fasa pertama, ia akan menghubungkan data penyelidikan, penyelidik dan penerbitan antara lima Universiti Penyelidikan dan 15 Institut Penyelidikan dan Agensi di bawah MESTECC.

MOSP dijangka akan dihubungkan dengan platform *Open Science* global yang lain untuk memperkasa ekosistem inovasi negara. Oleh itu, semua pemain dialu-alukan untuk menyumbang kepada MOSP bagi membina *Malaysia Open Science Community* ke arah merealisasikan visi *Open Science* untuk Malaysia.

MOSP akan mengguna pakai prinsip FAIR yang akan menjadikan data penyelidikan Malaysia aset yang berharga

- ***Findable***
- ***Accessible***
- ***Interoperable***
- ***Reusable***

- Lawati foto galeri
- Baca liputan media
- Baca liputan ASM

GIST INVESTORS MOBILISATION TRAINING PROGRAMME DI MALAYSIA

ASM, dengan kerjasama *Global Innovation through Science and Technology (GIST)* dan SIZZLESCIENCE, bersama-sama menganjurkan *GIST Investors Mobilization Training Program* di Malaysia dengan beberapa pemain pengkomersialan. Latihan ini bertujuan untuk memupuk dan memperkasakan bakal pelabur tempatan dalam bidang sains ke arah meningkatkan pengkomersialan teknologi berasaskan STI tempatan. Latihan ini telah berjaya mendedahkan dan mendidik *Malaysian Angels* mengenai potensi dan kelebihan melabur dalam syarikat pemula yang berpangkalan di Malaysia dan peringkat global.

Pelancaran inisiatif *Angels in Science* dan *UM Angels* oleh YB Puan Isnaraissah Munirah Majilis, Timbalan Menteri MESTECC juga diadakan semasa latihan.

APR
2-3
2019

Kuala Lumpur

56 Peserta

3 Pelabur/Pelatih terkemuka dari *Silicon Valley, US*:

1. Gwen Edwards
2. Faz Bashi
3. Melissa Bradley

SME CLINIC ON INDUSTRY 4.0: ANGEL INVESTORS INITIATIVE FOR HEALTHCARE SECTOR

ASM, dengan kerjasama Universiti SEGi dan SIZZLESCIENCE, telah menganjurkan *SME Clinic on Industry 4.0* yang bertajuk "*Angel Investors Initiative for Healthcare Sector*". Program ini bertujuan untuk memperkasakan pelabur dan rangkaian mereka dengan amalan terbaik untuk melabur pada peringkat awal bagi syarikat pemula berasaskan sains dan teknologi. Program ini juga melatih para penyelidik muda, saintis dan pengamal penjagaan kesihatan mengenai teknik mempromosikan produk atau idea mereka kepada bakal pelabur.

Dua usahawan hebat, Dr Khairul Idzwan Baharin dan Encik Ahmad Syafik Jaafar berkongsi pengalaman dan kejayaan mereka dalam program tersebut.

30 Peserta dari industri, akademia, dan komuniti penyelidik

4 syarikat pemula telah membentangkan hasil ciptaan STI masing-masing kepada pelabur

SEPT
15
2019

- Lawati galeri foto • Baca liputan media
- Baca liputan ASM

PEMAHAMAN & KESEDARAN AWAM TERHADAP SAINS

Sains adalah satu bidang yang dihormati; namun masyarakat sering terasa asing dengan bidang tersebut. Masyarakat perlu memahami bahawa sains bukan hanya penting bagi para saintis atau penyelidik, atau akademi sains sahaja. Tidak kira sama ada seseorang itu menganggap sains menarik atau sebaliknya - tahap pemahaman asas sangat penting bagi masyarakat moden, terutamanya kerana sains dan teknologi telah mengambil alih dunia hari ini.

Di ASM, kami melihat bagaimana sains dapat mempengaruhi pelbagai bidang, dari matematik hingga perubatan. Kami meneroka sains dalam dunia semula jadi dan sosial. Namun, walaupun dengan ruang lingkup yang luas sebegini, sains sering dianggap terlalu kompleks dan sukar bagi sesiapa sahaja, kecuali untuk pakar-pakar. Sebenarnya, sains terlalu berharga untuk diserahkan kepada para saintis profesional sahaja. Untuk kebaikan masyarakat dan untuk masa depan yang kita mahukan, masyarakat perlu memahami sains. Dengan kata lain, sains memerlukan komuniti yang lebih meluas.

Dalam usaha meningkatkan pemahaman dan kesedaran masyarakat dalam bidang sains, ASM menganjurkan pelbagai program berasaskan sains setiap tahun.

SAINS UNTUK KESEJAHTERAAN

Minggu Sains Negara 2019 telah dianjurkan dengan tema 'Sains untuk Kesejahteraan' dalam dua fasa. ASM telah dilantik oleh MESTECC sebagai Agensi Utama MSN 2019 untuk Negeri Johor dengan kerjasama Kerajaan Negeri Johor. Sehubungan itu, untuk menjadikan program ini sebagai satu program yang memberi impak kepada masyarakat, ASM juga bekerjasama dengan pelbagai agensi negeri, jabatan kerajaan, institut pengajian tinggi, NGO, badan profesional STI dan organisasi swasta.

MSN 2019 Peringkat Negeri Johor dianjurkan dari 15 Julai - 15 Ogos 2019 dengan sokongan Bahagian Sains Teknologi dan ICT (BICT) dan Bahagian Perancang Ekonomi Negeri (BPEN) Johor. Program utama MSN 2019 Johor dianjurkan pada 3 - 4 Ogos 2019 di Dewan Orang Ramai Parit Raja dan Sekolah Menengah Kebangsaan Tun Ismail, Batu Pahat, Johor, yang telah dirasmikan oleh YB Tuan Aminolhuda Hassan, Pengerusi Pendidikan, Sumber Manusia, Sains dan Teknologi Johor.

Sekolah-sekolah di seluruh Malaysia telah mengambil bahagian dalam acara berprestij ini yang diketuai oleh Pusat STEM Negara, KPM. 10 daerah di Johor, iaitu Batu Pahat, Johor Bharu, Kluang, Kota Tinggi, Kulai, Mersing, Muar, Pontian, Segamat dan Tangkak tidak melepaskan peluang untuk menyertai MSN 2019 dengan menganjurkan program mereka sendiri seperti Gotong Royong dan program *Car Free Day Program*.

ASM telah diumumkan sebagai *The Best Leading Agency* yang menganjurkan MSN 2019 oleh MESTECC.

- **Fasa 1 (1 - 7 April 2019) :**

Wilayah Persekutuan, Terengganu, Sabah, Sarawak

- **Fasa 2 (15 Julai – 15 Ogos 2019) :**

Perlis, Kedah, Penang, Perak, Selangor

Kelantan, Pahang, Negeri Sembilan, Melaka, Johor

- **6,000** pengunjung membanjiri Sains Karnival
- **101,227** penglibatan dari 15 Julai - 15 Ogos 2019
- **Rakan Strategik Utama:**
  - Unversiti Tun Hussein Onn Malaysia (UTHM)
  - National STEM Centre
  - Politeknik Tun Syed Nasir (PTSN)
  - Ministry of Youth and Sports
  - Politeknik Mersing Johor (PMJ)
  - Politeknik Ibrahim Sultan (PIS)
- **Penaja:**
  - Loreal Malaysia Sdn Bhd
  - Jeffrey Cheah Foundation
  - Percetakan Salam Sdn Bhd
- **Antara aktiviti yang dijalankan:**
  - Karnival Sains
  - *Meet the Scientists*
  - *Pocket Talk*
  - *Crime Scene Investigation Contest*
  - *Weather Forecast Reporter Contest*
  - *Science Show*
  - *Drone-flying competition*
  - *Science quiz with Kahoot!*
  - *Fit Malaysia @ Community*
  - *Mentor Mentee STEM Johor*

Karnival Sains yang dianjurkan sempena MSN 2019 di Johor

Syarahan Sulung

FAScinate™ Talk

Open Minds, Spark Ideas

FAScinate™ menampilkan format yang diperbaharui, dari syarahan formal ke pembentangan yang lebih santai, dalam usaha mendekatkan masyarakat dengan sains. Dengan slogan "Open Mind, Spark Ideas", FAScinate™ bertujuan untuk memberi inspirasi kepada masyarakat untuk membuka minda mereka kepada bidang sains dan teknologi.

Sesi FAScinate™ sulung ini menampilkan enam Felo ASM yang berkongsi kepakaran mereka untuk membuka minda penonton dari pelbagai lapisan masyarakat. Topik-topik yang meransang pemikiran dalam sains perubatan dan kejuruteraan dalam kemajuan terkini bidang STI serta fakta-fakta telah memikat penonton.

Jumlah Tontonan 2,507

• Tonton video-video • Baca liputan media • Baca liputan ASM

Water and Wastewater Services: What's Next?

Ir Ts Mohamed Haniffa Abdul Hamid FASc

Istilah "air kumbahan" sebenarnya berasal dari cara kita menggunakan air dengan membazir. Oleh itu, untuk kelestarian dan kecukupan jangka panjang, sumber air perlu diuruskan dengan baik.

Strategic Mineral Development with Industry 4.0

Profesor Dato' Ir Dr Eric Goh Kok Hoe FASc

Dunia moden tidak dapat berfungsi tanpa aktiviti perlombongan. Dari simen jalan ke muka surat yang sedang anda baca ini, cara hidup kita sangat bergantung pada produk dari aktiviti perlombongan. Sektor perlombongan dan penggalian adalah sektor utama industri dan negara maju.

Virtual Surgery: The Reality

Profesor Dato' Dr Zainal Ariff Abdul Rahman FASc

Teknologi penuh dengan kejutan: contohnya Realiti Maya (VR). VR pertama kali diperkenalkan dalam permainan video. Seiring berkembangnya teknologi, VR telah digunapakai dalam industri lain, seperti penjagaan kesihatan. Semakin banyak hospital dan institusi perubatan menggunakan VR untuk memberikan latihan yang lebih baik kepada bakal doktor dan pakar bedah. Dalam prosedur pembedahan, penggunaan VR dikenali sebagai pembedahan maya.

Climate Change and CO_2 Emission

Profesor Dr Dominic Foo Chwan Yee FASc

Sebagai rakyat, apa yang boleh kita lakukan untuk mencapai target pengurangan CO_2 yang signifikan? Ramai yang merasakan bahawa isu perubahan iklim terlalu luas untuk diubah oleh tindakan seseorag individu. Sama ada besar atau kecil, tindakan anda akan mempengaruhi planet ini dalam beberapa dekad akan datang – sama ada menjadi lebih baik atau lebih buruk.

Tuberculosis: Past, Present and Future

Profesor Dr Ngeow Yun Fong FASc

Tuberkulosis (TB) adalah penyakit kuno yang terus menimbulkan ketakutan pada manusia. Bakteria penyebab TB dianggarkan telah wujud selama kira-kira tiga juta tahun, tetapi hanya ditemui pada tahun 1882. Setelah penemuan ini, ubat-ubatan anti-TB dan vaksin untuk mengawal penyakit telah dicipta. Malangnya, TB tetap menjadi penyebab utama masalah kesihatan dan kematian walaupun di zaman moden ini.

Dengue: The Many Unanswered Questions

Profesor Dr Shamala Devi KC Sekaran FASc

Dalam beberapa dekad kebelakangan ini, denggi telah menjadi penyakit berjangkit yang tidak terkawal, terutama di kawasan tropika dan sub-tropik dunia. Jangkitan denggi meningkat secara konsisten kerana tidak ada vaksin berlesen atau antivirus yang dipersetujui untuk memerangi jangkitan denggi.

INISIATIF artscience™

Penghargaan seni terhadap akulturasi sains

Inisiatif *ArtScience™* ASM bertujuan untuk memupuk kreativiti pada pertemuan Seni dan Sains. Inisiatif ini merangkumi dua program; ASM *ArtScience™ Prize* dan program ASM *ArtScience™ Engagement*.

Anugerah akan diberikan setiap dua tahun untuk projek terbaik yang merangkumi falsafah ArtScience™. Dua program di bawah ASM *ArtScience™* Engagement adalah *2* dan ASM *ArtScience™ Dialogue* yang melibatkan para profesional, seniman dan saintis untuk mempromosikan pertemuan antara seni dan sains.

ASM berharap inisiatif *ArtScience™* akan menjadi program yang mempromosikan kecemerlangan seni-sains secara berterusan. Pihak yang berminat dialu-alukan untuk menyumbang ke inisiatif ini.

- Dilancarkan pada 4 Disember 2019 oleh YB Puan Isnarissah Munirah Majilis
- Disokong oleh Balai Seni Negara, Universiti Malaya & Galeri PETRONAS
- Sumbangan boleh dibuat melalui ASM *Giving to Science*

• Lawati galeri foto • Tonton video • Baca liputan ASM
www.akademisains.gov.my/artscience

EKONOMI HIDROGEN: APAKAH LANGKAH SETERUSNYA BUAT MALAYSIA?

Rantau ASEAN berusaha menerapkan konsep ekonomi hidrogen secara pantas. Di Malaysia, Kerajaan Negeri Sarawak sudah menjadi peneraju utama dengan memperkenalkan bas yang dijanakan oleh hidrogen pada tahun 2018. Salah satu sumber tenaga yang berpotensi di Malaysia adalah *Ocean Thermal Energy Conversion* (OTEC), yang memiliki kelebihan dari segi daya saing dan kos penjanaan berbanding alternatif lain. Usaha yang lebih bersepadu diperlukan untuk mempromosikan pembangunan ekonomi hidrogen di Malaysia, terutamanya oleh penggubal dasar. Seterusnya, ASM telah menubuhkan satu Badan Bertindak Ekonomi Hidrogen untuk merangka kertas posisi mengenai Ekonomi Hidrogen.

• Lawati galeri foto • Tonton video • Baca liputan media • Baca liputan ASM

IDEAXCHANGE KE-31 - WASTE TO WEALTH:
EXPLORING NEW HORIZONS

Pengurusan sisa buangan adalah masalah utama yang dihadapi di seluruh dunia. Sisa buangan global dijangka mencapai 27 bilion tan pada tahun 2050. Oleh itu, inisiatif *waste-to-wealth* diperkenalkan untuk menukarkan sisa buangan menjadi sesuatu yang mempunyai nilai ekonomi. Forum ini membincangkan bagaimana Malaysia dapat menjana kekayaan daripada sisa buangan tanpa memberi kesan kepada alam sekitar. Kerjasama antara kementerian sedang dijalankan untuk melaksanakan projek *waste-to-energy*.

JULAI
29
2019

IDEAXCHANGE KE-32 - HAZE PROBLEM:
A BLAME GAME OR AN ENDGAME

Dalam usaha untuk mengatasi episod jerebu tahunan dari perspektif yang berbeza, IdeaXchange ke-32 mengumpulkan pihak-pihak berkepentingan untuk membincangkan penyelesaian holistik dalam forum ini. Pelbagai idea bernas telah dibentangkan, dari menyelesaikan isu pembakaran terbuka hingga penggunaan biojisim sebagai tenaga yang boleh diperbaharui.

Jerebu adalah isu merentasi sempadan. Forum ini menyeru kepada penyelesaian tempatan dan serantau serta meminimumkan kesan jerebu terhadap kesihatan, ekonomi dan kesejahteraan masyarakat. Oleh itu, lebih banyak kajian berdasarkan data mesti dilakukan untuk mendapatkan lebih banyak pemahaman mengenai kesan pencemaran udara.

OKT
15
2019

• Tonton video • Baca liputan ASM

MENANGANI ANCAMAN BIOSEKURITI DARI TEKNOLOGI MEMUNCUL

The Malaysian Science and Technology Research Institute for Defence (STRIDE) bersama-sama dengan *Malaysian Biosafety and Biosecurity Association* (MBBA), ASM dan *Health Security Partners* telah menganjurkan *Symposium on Promoting Institutional Oversight Mechanisms to Address Biosecurity Threats from Emerging Technologies*. Simposium yang ditaja oleh *Biosecurity Engagement Program (BEP)* AS ini memberi fokus pada bioteknologi memuncul, bio-risiko penyelidikan yang berkaitan dengan penggunaan teknologi ini, dan pengawasan untuk memastikan keselamatan dan biosekuriti.

Simposium yang berlangsung selama tiga hari itu dianjurkan dari 10 - 12 September 2019, dan dirasmikan oleh Dr Karminder Singh Dhillon, Timbalan Ketua Setiausaha (Pengurusan), Kementerian Pertahanan Malaysia. Simposium ini menampilkan ahli panel dari Amerika Syarikat, UK, Singapura, Filipina, Indonesia dan Malaysia. Lebih daripada 50 penyelidik Malaysia dari Institut Pengajian Tinggi dan Institut Penyelidikan telah menghadiri acara ini.

Objektif symposium adalah untuk:
- Meningkatkan kesedaran mengenai teknologi memuncul seperti biologi sintetik dan sistem penyuntingan gen, faedahnya terhadap bioekonomi dan bio-risiko penyelidikan yang boleh ditimbulkan oleh teknologi ini
- Meningkatkan kewaspadaan dalam komuniti saintifik untuk mengelak penyalahgunaan dan kemalangan
- Berkongsi amalan terbaik untuk pengawasan institusi bagi mengenal pasti dan mengurangkan bio-risiko penyelidikan yang timbul dari penggunaan teknologi baru
- Merangka cadangan untuk penubuhan dan penggunaan mekanisme pengawasan institusi untuk penyelidikan bio-risiko dalam konteks Malaysia
- Menerbitkan laporan simposium untuk meningkatkan kesedaran dalam kalangan komuniti penyelidikan dan dasar di Malaysia dan di seluruh rantau

RINGKAS MENARIK HEBAH

Secara asasnya, komunikasi sains adalah satu bentuk usaha untuk menjadikan sains satu subjek yang boleh diakses oleh semua individu. Ia menukarkan satu fakta ilmiah yang sukar difahami kepada sesuatu yang seronok untuk dipelajari. Pelbagai media digunakan untuk memenuhi pelbagai kaedah pembelajaran kepada segmen masyarakat yang berlainan, agar pemahaman menyeluruh boleh dicapai. Dengan bantuan media sosial, kami juga memastikan bahawa ilmu pengetahuan ini menjangkau capaian seramai mungkin.

Emelkan kepada:
science_comm@akademisains.gov.my

MEDIA SOSIAL
(2018-2019)

17,366
dari 13,578 (2018)

4,653
dari 3,198 (2018)

3,013
dari 2,310 (2018)

34,696
dari 27,814 (2018)

PENERBITAN & JURNAL:

Laporan Tahunan 2018

***Expert Network* Edisi 2018**

ASM Science Journal **24** artikel

6 ISU KHAS

VOL. 12

- IQRAC2018
- Malaysia in Space
- ICST2018
- ICSE2018
- ICoAIMS2019
- SKSM26

PEMBACA DALAM TALIAN:

e-Penerbitan
94
setakat ini

Pembaca
51,244

Capaian
189,073

ASM FOCUS:
e-Newsletter

Isu
12

Artikel
47

Pembaca
7,176

TEKNIK PENERBITAN ARTIKEL DALAM JURNAL BERIMPAK TINGGI

Penerbitan adalah satu bahagian penting proses penyelidikan. Namun, sesuatu penyelidikan perlu diterbitkan dalam jurnal yang sesuai untuk menjangkau audiens yang tepat. Ia juga perlu disampaikan dengan jelas untuk memberi impak yang signifikan. Dengan persaingan yang semakin sengit dalam komuniti akademik, penyelidik perlu mengembangkan kemahiran yang tepat untuk menerbitkan hasil penyelidikan mereka. Dengan itu, para penyelidik boleh meningkatkan peluang penerimaan penerbitan dan reputasi mereka di peringkat antarabangsa.

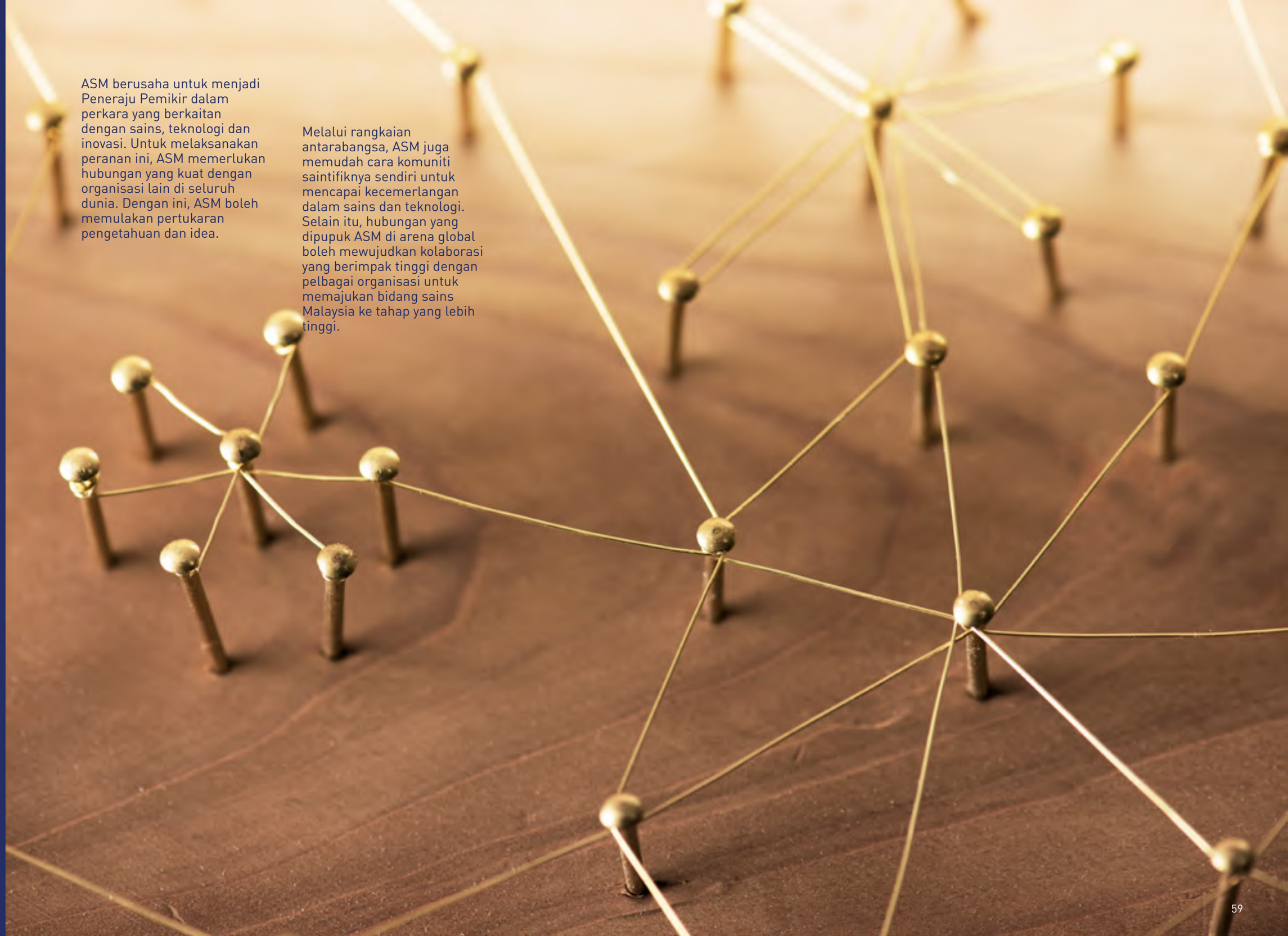
Pada tahun 2019, *British High Commission KL* dan ASM telah menganjurkan bengkel *Effective Publishing Strategies*. Bengkel ini bertujuan untuk melatih penyelidik Malaysia tentang cara menerbitkan artikel dalam jurnal berimpak tinggi dan memaksimumkan impaknya dalam bidang masing-masing. Langkah ini merupakan salah satu cara bagi menangani cabaran untuk menerbitkan artikel dalam jurnal berimpak tinggi.

Bengkel sehari itu diadakan pada 23 Januari 2019, dan dijalankan dalam bentuk syarahan dan latihan oleh *Nature Research*, penerbit akademik yang berpusat di UK, menggunakan jurnal *Nature Research* sebagai bahan latihan. Kira-kira 250 peserta telah mendapat manfaat daripada penceramah Dr Jeffrey Robens.

MENGUKUHKAN KOLABORASI DAN RANGKAIAN ANTARABANGSA

ASM berusaha untuk menjadi Peneraju Pemikir dalam perkara yang berkaitan dengan sains, teknologi dan inovasi. Untuk melaksanakan peranan ini, ASM memerlukan hubungan yang kuat dengan organisasi lain di seluruh dunia. Dengan ini, ASM boleh memulakan pertukaran pengetahuan dan idea.

Melalui rangkaian antarabangsa, ASM juga memudah cara komuniti saintifiknya sendiri untuk mencapai kecemerlangan dalam sains dan teknologi. Selain itu, hubungan yang dipupuk ASM di arena global boleh mewujudkan kolaborasi yang berimpak tinggi dengan pelbagai organisasi untuk memajukan bidang sains Malaysia ke tahap yang lebih tinggi.



ASEAN FORESIGHT ALLIANCE (AFA) WORKSHOP

Melalui MESTECC, ASM telah memulakan *ASEAN Foresight Alliance (AFA)* pada tahun 2018. Inisiatif ini memberi peluang kepada pihak berkepentingan untuk menerapkan paradigma imaginatif namun realistik untuk perancangan strategik melalui pemikiran berpandangan jauh *(foresight)*. Ia melibatkan proses mengenal pasti peluang dan ancaman yang mungkin timbul pada versi jangka sederhana dan jangka panjang masa hadapan. Sebagai cara berfikir, pemikiran berpandangan jauh juga mendorong ketangkasan, inovasi, penilaian strategik, dan pembentukan masa depan yang proaktif. Perancangan tradisional berusaha untuk mencegah kegagalan; namun, pemikiran berpandangan jauh mengutamakan ketahanan, iaitu pengesanan awal dan pemulihan yang cepat.

ASEAN Foresight Alliance (AFA) Workshop telah diadakan pada 11 - 13 Disember 2019. Wakil dari semua ASEAN *Member States (AMS)*, kecuali dari Singapura dan Vietnam telah menghadiri bengkel ini.

Objektif:

1) untuk membantu para peserta ASEAN dalam meningkatkan keberkesanan perancangan jarak jauh melalui penggunaan alat metodologi yang sesuai

2) membantu para peserta untuk meningkatkan keupayaan bagi mengubah organisasi dan pentadbiran secara keseluruhan berorientasikan masa depan

3) untuk mengembangkan perbincangan nasional yang lebih luas dalam jangka masa panjang, terutamanya selepas Wawasan ASEAN 2025

Mesyuarat Lembaga Penasihat AFA

Mesyuarat Lembaga Penasihat Pertama untuk AFA diadakan pada 13 Disember 2019 di Kuala Lumpur. Objektif mesyuarat ini adalah untuk memilih Pengerusi dan Timbalan Pengerusi bagi Lembaga Penasihat AFA serta menetapkan Terma Rujukan untuk Lembaga Penasihat AFA. Mesyuarat ini dihadiri oleh semua wakil AMS, kecuali dari Singapura dan Vietnam.

International Science Council

Regional Office for
Asia and the Pacific

International Science Council (ISC) adalah satu-satunya organisasi bukan kerajaan antarabangsa yang menyatukan sains semula jadi dan sosial dan merupakan organisasi sains global terbesar seumpamanya. Dengan berbagai program, jaringan dan jawatankuasa penyelidikan antarabangsa yang dianjurkan bersama, kegiatan ISC merangkumi berbagai isu termasuk kesihatan dan kesejahteraan bandar, pengurangan risiko bencana, serta nasihat sains kepada pemerintah. Selaras dengan Pelan Tindakan Sains (2019-2021), ISC ROAP memulakan inisiatif baru dan meningkatkan penglibatannya dengan anggota ISC dan organisasi serantau.

Salah satu inovasi yang dilaksanakan adalah program *ROAP Small Grants* (RSG), yang memberikan dana nominal secara kompetitif, untuk kegiatan serantau dalam bidang keutamaan ROAP. ROAP terus memberi penekanan untuk menggerakkan komuniti saintifik dari Negara Kurang Membangun (LDC). Pada tahun 2019, 17 saintis awal kerjaya dari LDC ditaja untuk menghadiri pelbagai bengkel di rantau ini.

Open Science

- o Penganjuran bersama mesyuarat yang merangkumi *Open Science* untuk Asia Pasifik dengan CODATA
- o Menyertai sesi libat urus bersama pihak berkepentingan UNESCO mengenai inisiatif *Open Science*

Responsible Conduct of Research (RCR)

- o Menganjurkan bengkel RCR bersama ASEAN *Young Scientist Network* dan *Global Young Academy*

DRR dan Perubahan Iklim

- o Bekerjasama dengan IRDR ICoE-Taipei, UNDRR APSTAAG dan IPCC dan SEADPRI UKM
- o Melawat Nepal dan Fiji untuk merangka kolaborasi mengenai DRR dan perubahan iklim

Nasihat sains untuk menggubal polisi

- o Menganjurkan dua bengkel pembinaan kapasiti bersama INGSA Asia

ISTIC

INTERNATIONAL SCIENCE, TECHNOLOGY AND INNOVATION CENTRE FOR SOUTH-SOUTH COOPERATION UNDER THE AUSPICES OF UNESCO

Matlamat ISTIC adalah untuk memberikan latihan peningkatan kapasiti dalam pengurusan STI untuk negara-negara membangun di Selatan, baik untuk jangka pendek mahupun jangka panjang. Ini termasuk fellowship, bengkel dan kursus yang menggabungkan latihan khusus dan berorientasikan projek.

Pada tahun 2019, acara penting bagi ISTIC adalah 4th ISTIC *Biennial International Conference on Women in Science, Technology and Innovation* (STI). Persidangan ini bertujuan untuk mempamerkan inovasi STI yang berjaya dalam menyelesaikan dan / atau meminimumkan masalah yang dihadapi oleh wanita, dengan bertukar dan berkongsi pengalaman seterusnya menyumbang kepada pencapaian Matlamat Pembangunan Lestari No. 5.

4th ISTIC Biennial International Conference on Women in Science, Technology and Innovation (STI)

- 22-23 Julai 2019
- Kuala Lumpur, Malaysia

Kesaksamaan gender dan memperkasa wanita

JARINGAN PAKAR

Berpengalaman luas, bijaksana, berdedikasi - jaringan pakar kami terdiri daripada ahli yang bersedia memimpin dan bekerjasama demi satu hasil yang berimpak. Kini, Akademi mempunyai lebih daripada 700 pakar dan jumlahnya terus bertambah dari tahun ke tahun.

Jaringan pakar ASM sentiasa sedia untuk menyumbangkan kepakaran mereka bagi memastikan kajian dan program ASM mendorong kemajuan STI Malaysia ke peringkat yang lebih tinggi.

MERAIKAN MINDA TERULUNG MALAYSIA

Majlis penganugerahan Felo ASM dan pengumuman penerima Anugerah TRSM telah diadakan pada 4 Disember 2019. Dua puluh tujuh felo baru telah diberikan penganugerahan, menjadikan jumlah keseluruhan Felo ASM seramai 376 orang dari lapan kumpulan disiplin. Felo akan membawa gelaran "FASc" yang menandakan Felo Akademi Sains di akhir nama mereka, dan ianya merupakan pengiktirafan seumur hidup untuk pencapaian cemerlang mereka.

Acara berprestij itu juga menyaksikan pengumuman sembilan penerima TRSM 2019, yang disampaikan oleh tetamu kehormat, YB Puan Isnaraissah Munirah Majilis, Timbalan Menteri MESTECC. Kini, seramai 166 penerima TRSM telah diiktiraf atas aktiviti penyelidikan mereka dalam pelbagai bidang.

Selain itu, Akademi telah melantik Profesor Emeritus Dato' Dr Khalid Yusoff FASc sebagai Felo Kanan 2019 atas sumbangan beliau dalam bidang kardiologi, melalui latihan, pengajaran dan penyelidikan serta memperkasakan penyelidikan berintegriti di Malaysia. Anugerah Felo Kanan diiktiraf kepada individu yang telah memberikan sumbangan yang luar biasa dan memberikan kepimpinan baik di peringkat Akademi, nasional dan antarabangsa. Felo Kanan akan membawa gelaran "Academician" pada awal nama mereka untuk menghargai reputasi mereka yang sangat cemerlang.

FELO 2019

1 Felo Kanan

27 Felo Baru

TRSM 2019

9 Penerima

166 Jumlah Penerima

2019 Felo Kanan,
Academician Emeritus Profesor
Dato' Dr Khalid Yusoff FASc

ATAS: Felo dan Felo Kanan 2019 bersama YB Puan Isnaraissah Munirah Majilis, Timbalan Menteri MESTECC, Ahli EXCO dan KPE
BAWAH: Penerima TRSM 2019 bersama YB Puan Isnaraissah Munirah Majilis, Timbalan Menteri MESTECC, Ahli EXCO dan KPE

MENJANA IMPAK!

Sejak ditubuhkan pada tahun 2012, Young Scientists Network-Academy of Sciences Malaysia (YSN-ASM) mengekalkan visinya untuk menjadi sebuah platform untuk komuniti saintifik muda bagi memajukan sains di Malaysia dan menjadi penyumbang yang signifikan kepada STI global.

Dengan jumlah lapan kumpulan gerak kerja, YSN-ASM telah menjalankan, menganjur bersama dan mengambil bahagian dalam lebih dari 50 program, aktiviti, forum, bengkel, pengembangan modul dan mesyuarat antarabangsa pada tahun 2019.

Sorotan Aktiviti:

1) DIALOG AWAM BERSAMA YB PUAN YEO BEE YIN
Sesi dialog awam mengenai *Effective STI Governance for a Progressive Malaysia* yang bertujuan untuk mengenengahkan isu-isu berkaitan keadaan STI di Malaysia dan cara menangani bidang-bidang kritikal.

2) *2019 CCM STEM-UP CHALLENGE*
YSN-ASM membantu dalam penyediaan soalan kuiz dan cabaran berdasarkan permainan di bawah tema "Kelestarian" dan "Tenaga".

3) *RESPONSIBLE CONDUCT OF RESEARCG (RCR)*
YSN-ASM telah menganjurkan dan menyertai beberapa program *RCR* seperti *World Conference on Research Integrity in Hong Kong*, ASEAN *RCR Project*, *Forum for Ethical Review Committees in the Asian and Western Pacific Region*, dan *ASEAN RCR Workshop*.

4) *ASEAN EMERGING RESEARCHES CONFERENCE (ERC) 2019*
ASEAN ERC 2019 merupakan program terbesar ASEAN YSN, dengan kerjasama *Thai Young Scientists (TYSA)*, YSN-ASM, Wolfson College, University of Cambridge, UK, dan Cambridge University Malaysia Society, UK.

YSN-ASM 2019

78 Ahli
12 Ahli Baru
113 Ahli Gabungan
22 Ahli Gabungan Baru

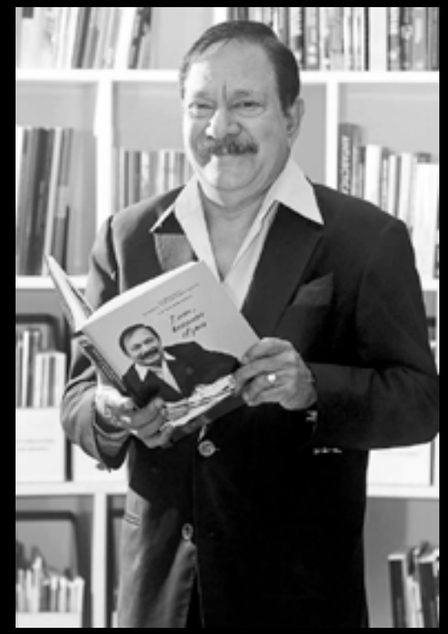
Kolokium YSN-ASM 2019

Kolokium tahun ini telah disertai oleh 104 ahli dan ahli gabungan YSN-ASM serta lima wakil dari rakan strategik ASEAN. Bertemakan "*Fuel the Impact!*", Kolokium YSN-ASM 2019 dilaksanakan dalam pendekatan yang jauh lebih berbeza daripada tahun-tahun sebelumnya. Selain menghubungkan wakil dari ASEAN dengan ahli YSN-ASM, beberapa aktiviti telah dirangka untuk memastikan sesi perbincangan dan perkongsian lebih berkesan serta menjadi satu medium perhubungan. Selain itu, pada tahun ini, YSN-ASM telah memperkenalkan Anugerah *Rising Star* YSN-ASM 2019 buat julung kalinya, dan semua pemenang diumumkan semasa upacara penutup.

Ahli YSN membuat perancangan strategik untuk sesi libat urus akan datang di Kolokium YSN-ASM 2019

DALAM KENANGAN

Academician Emeritus Profesor Dato' Dr C.P. Ramachandran FASc



(6 Jun 1936 - 12 Jan 2019)

Academician Emeritus Profesor Dato' Dr C.P. Ramachandran FASc adalah pakar filariasis dunia. Beliau menerima ijazah dalam Sains Biologi dari University of Madras, India. Di sinilah beliau mengembangkan minat untuk melawan penyakit tropika yang sering diabaikan. Beliau kemudian mengambil keputusan untuk melanjutkan latihan pascasiswazah di *London School of Hygiene and Tropical Medicine* (LSHTM) dan di *Liverpool School of Tropical Medicine* (LSTM) di mana beliau memperolehi Ijazah Kedoktoran.

Dato' Dr C.P. Ramachandran memulakan kerjaya di LSTM sebagai penunjuk cara dalam Parasitologi dari 1952 hingga Jun 1962. Beliau kembali ke Malaysia pada tahun yang sama, dan mula bekerja dalam sebagai felo penyelidikan dalam filariasis di Institut Penyelidikan Perubatan (IMR) di Kuala Lumpur sehingga 1963. Beliau kemudiannya dilantik sebagai Ketua Bidang Filatiasis di IMR, dari 1967 hingga 1970.

Pada tahun 1979, berbekalkan pengetahuan mendalam tentang filariasis, beliau mula menyertai Pertubuhan Kesihatan Sedunia (WHO). Beliau dilantik sebagai Ketua Filariasis Control and TDR di WHO. Beliau bertanggungjawab dalam penubuhan *Centres of Excellence of Tropical Diseases* di banyak negara membangun di Amerika Selatan, Afrika, Asia Tenggara dan Rantau Pasifik Barat. Pencapaian terbesar beliau adalah mengumpulkan Strategi Global untuk Penghapusan Filariasis Limfatik melalui resolusi *World Health Assembly* pada tahun 1997 (GPELF). Hasilnya, mereka berjaya mengurangkan kadar jangkitan dari 120 juta kepada kurang dari 40 juta hari ini, dan mencegah berjuta-juta kanak-kanak dari dijangkiti. Beliau bersara dari WHO pada tahun 1996 dan mengambil keputusan untuk menyertai UPM sebagai Profesor Parasitologi.

Dato' Dr C.P. Ramachandran telah memberi sumbangan besar dalam bidang Perubatan Parasitologi, dalam dan luar negara. Beliau telah menerbitkan pelbagai kertas saintifik, dan tiga parasit telah dinamakan sempena nama beliau. Beliau telah menerima banyak penghargaan, antaranya adalah *Mary Kingsley Medal, United Kingdom for Tropical Medicine*. Beliau adalah Felo ASM sejak tahun 2003 dan dilantik sebagai Felo Kanan pada tahun 2011. Beliau telah mengambil bahagian dalam banyak kajian dan program ASM dan dilantik sebagai *Alternate Chair* bagi kumpulan disiplin Sains Perubatan dan Kesihatan (2011-2015) dan juga Ahli Majlis ASM.

> "Kegagalan adalah perkara biasa, tetapi jangan pernah menganggap bahawa masyarakat telah berhutang sesuatu dengan anda; sebaliknya, anda berhutang kepada masyarakat."

Academician Tan Sri Dr Ahmad Mustaffa Babjee FASc

(31 Julai 1937 - 30 April 2019)

Academician Tan Sri Dr Ahmad Mustaffa Babjee FASc percaya akan pembelajaran sepanjang hayat. Pada umur 69, beliau telah menerima ijazah ketujuh, Ijazah Sarjana dalam Biologi Alam Sekitar dari USM. Beliau turut memiliki Ijazah Kedoktoran dalam Virologi dari University of Queensland, Australia, dan tiga ijazah kehormat dari *University of Queensland*, UPM and Universiti Malaysia Terengganu. Tan Sri Mustaffa telah banyak memberi sumbangan dalam bidang sains. Beliau merupakan saintis pertama yang berjaya mengasingkan dan mencirikan *Australian Poultry Reovirus* pertama, *Turkey Herpesvirus* dan *Adenovirus* di negara ini. Penemuan ini diterbitkan dalam journal berindeks tinggi dan telah dipetik dalam *American Textbooks on Avian and Poultry Diseases.*

Ketika berkhidmat sebagai Ketua Pengarah Perkhidmatan Veterinar, beliau menubuhkan Institut Penyelidikan Bioteknologi Haiwan di Jerantut, Pahang pada tahun 1988 untuk melakukan penyelidikan mengenai pemindahan embrio, pemisahan dan pengklonan. Institut ini adalah institutusi penyelidikan Bioteknologi pertama di Malaysia.

Di peringkat nasional, Tan Sri Mustaffa telah terlibat secara aktif dengan Kementerian Kerajaan Tempatan dan Alam Sekitar, Kementerian Pendidikan, Malaysian Agricultural Research and Development Institute (MARDI) dan Kementerian Sains. Kemahiran kepimpinan beliau turut dikenali di peringkat yang lebih tinggi. Pada tahun 1994, beliau telah dilantik sebagai Presiden untuk *World Organization for Animal Health*, dan Pengerusi untuk beberapa *ASEAN Committees for Animal Production, Livestock and Food Handling.*

Tan Sri Mustaffa merupakan salah seorang Felo Asas ASM. Beliau pernah mempengerusikan beberapa Jawatankuasa ASM seperti *ASM Committee on Biodiversity* 2010, *ASM Committee on Biodiversity and Environment* 2011, dan Pengerusi *Mega Science Framework Study* 2011. Sebagai Pengerusi Jawatankuasa Biodiversiti, beliau telah menerbitkan direktori pakar biodiversiti di Malaysia. Beliau juga turut terlibat dalam *Mahathir Science Award*, Penerbitan ASM dan jawatankuasa antarabangsa.

Sebagai penulis, penerbit, pengarah dan jurugambar yang berbakat, beliau telah menerbitkan pelbagai buku Biodiversiti, lebih dari 75 artikel journal atau prosiding, lebih dari 120 artikel dengan ilustrasi fotografi mengenai alam semula jadi dan alam sekitar, dan beberapa dokumentari yang ditayangkan di beberapa sekolah.

> “Sepanjang hayat saya, saya sentiasa ingin tahu tentang alam semula jadi. Saya boleh memerhati alam semula jadi selama berjam-jam”

Dato’ Dr Hashim Abdul Wahab FASc

(23 Februari 1938 - 1 Julai 2019)

Dato’ Dr Hashim Abdul Wahab FASc mempunyai pengalaman luas dalam bidang pertanian. Beliau memperoleh diploma Pertanian dari *College of Agriculture* (sekarang UPM), Ijazah Sarjana Muda dan Ijazah Sarjana dari *Iowa State University*, dan PhD dalam Sains Pertanian dari *North Carolina State University* pada tahun 1971.

Beliau berkhidmat di Jabatan Pertanian dan MARDI selama lebih dari 20 tahun sehingga beliau dilantik sebagai Timbalan Ketua Pengarah pada tahun 1981. Dengan pengalaman yang luas dalam bidang pertanian, beliau kemudiannya dilantik sebagai Ketua Pengarah pertama, Lembaga Koko Malaysia selama tujuh tahun.

Dato’ Dr Hashim adalah seorang yang peramah dan aktif dengan aktiviti luar. Beliau sering berkongsi pengalamannya melalui penulisan atau ceramah motivasi. Beliau telah menerbitkan enam buku dan lebih daripada 80 artikel mengenai pertanian, pengurusan pertanian, eko-pelancongan, ICT, pelancongan, kesejahteraan dan kebahagiaan. Beliau juga terlibat secara aktif dalam organisasi sukarela dan profesional. Beliau pernah berkhidmat sebagai Presiden *Agricultural Institute of Malaysia*, Presiden Persatuan Alumni UPM, Presiden *Rotary Club of Kajang*, Naib Presiden & Pengerusi Pendidikan Alam Sekitar, Persatuan Pencinta Alam Malaysia pada tahun 2002-2010.

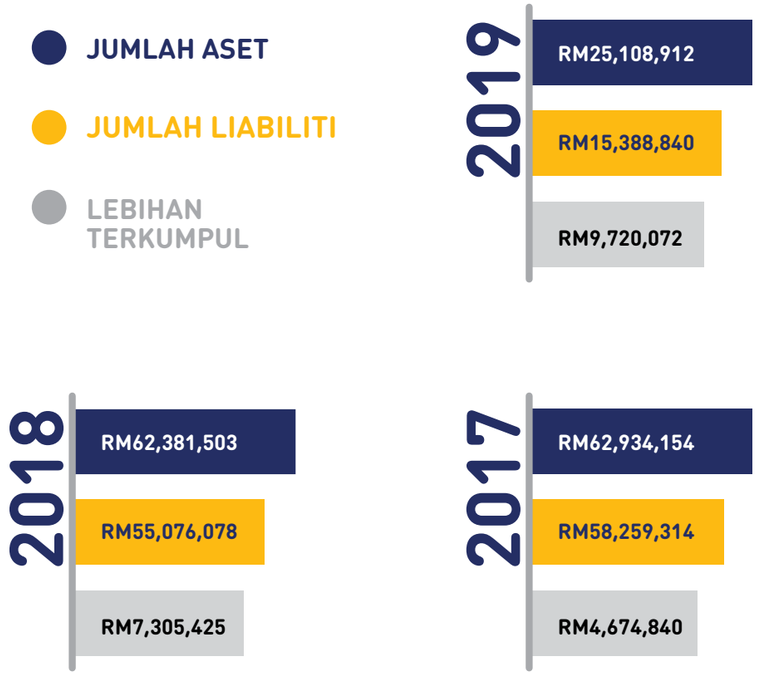
Dato’ Dr Hashim telah memberi pelbagai sumbangan dalam perkhidmatan awam dan aktiviti kemasyarakatan, terutama mengenai isu-isu alam sekitar dan pembangunan lestari. Atas sumbangannya yang cemerlang, beliau menerima beberapa anugerah seperti Johan Setia Mahkota 1988, Darjah Setia DiRaja Kedah 1999, Anugerah Langkawi 2005, Anugerah Alumni UPM, dan *Selected Torch Bearer for the Beijing Olympic 2008.*

Dato’ Dr Hashim telah melibatkan diri secara aktif dalam aktiviti ASM di mana beliau berkhidmat sebagai Pengerusi Kumpulan Disiplin Sains Biologi, Pertanian dan Alam Sekitar (2013-2015), Ahli Majlis (2012-2014), dan Jawatankuasa Keahlian.

> “Berkebun merupakan hobi yang dikaitkan dengan cinta - cinta kepada hidupan seperti herba, sayuran dan lanskap pohon hiasan”

PENYATA KEWANGAN

Bagi badan pemikir seperti kami, ketelusan merupakan sesuatu yang penting bagi membuat penilaian yang tepat. Penyata kewangan ASM memberikan maklumat mengenai hasil dan prestasi kewangan serta aliran tunai kami.



Penyata Prestasi Kewangan

- Prestasi Kewangan ASM bagi tahun berakhir 31 Disember 2019 menunjukkan lebihan sebelum cukai sejumlah RM2,688,803 berbanding tahun 2018 iaitu RM2,630,585. Pendapatan bagi tahun 2019 adalah berjumlah RM18,551,134. Geran operasi yang diterima oleh ASM berjumlah RM10,675,654 mewakili 58% dari peruntukan yang diterima bagi tahun 2019. Selain itu, 32% adalah merupakan pelunasan daripada geran tertunda, pendapatan tertunda dan dana sumbangan berjumlah RM5,920,781, manakala 10% adalah dari pendapatan lain yang berjumlah RM1,954,699.

- ASM mencatatkan perbelanjaan sebanyak 86% pada tahun 2019 dengan jumlah RM15,862,331 berbanding tahun 2018 dengan perbelanjaan 90% iaitu RM24,330,292. Perbelanjaan utama ASM adalah bagi perbelanjaan Program Sains dengan jumlah RM6,072,266 (38%) manakala perbelanjaan Perkhidmatan dan Bekalan adalah sebanyak 37% dengan jumlah RM5,860,156. Ia juga merangkumi emolumen bagi 66 kakitangan kontrak.

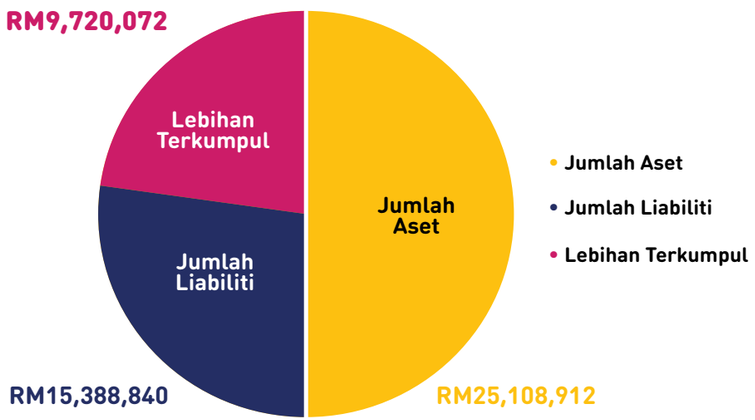
Ringkasan Perincian Kedudukan Kewangan

- Kedudukan Kewangan ASM pada tahun 2019 adalah lebih kukuh dengan lebihan terkumpul berjumlah RM9,720,072 [2018: RM7,305,425]. Perubahan ketara ini adalah disebabkan oleh pengisytiharan bangunan ASM sebagai aset tetap yang bernilai RM3,399,000.

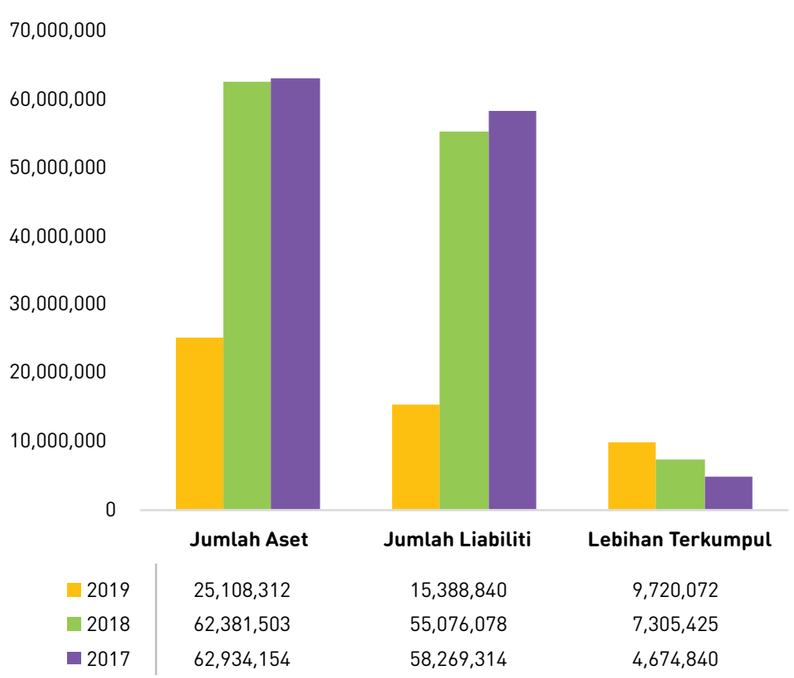
- Aset ASM adalah berjumlah RM25,108,912. Sumbangan terbesar Aset ASM adalah dari simpanan tetap berjumlah RM20,795,161. Geran kerajaan dan Geran Antarabangsa yang diterima untuk operasi dan aktiviti dilaburkan ke dalam simpanan tetap yang diluluskan oleh MOF.

- Sebahagian besar jumlah liabiliti ASM adalah dari geran tertunda yang diterima oleh ASM daripada Kerajaan Malaysia dan peruntukan yang diterima untuk Pejabat Antarabangsa yang dihoskan oleh ASM iaitu ISC ROAP dan ISTIC. Penurunan sebanyak 75% berbanding tahun 2018 (2019: RM12,226,504, 2018: RM48,868,740) adalah disebabkan pemulangan baki dana R, D & C sejumlah RM 32,040,944.43 kepada Kerajaan Malaysia.

KEDUDUKAN KEWANGAN ASM 2019



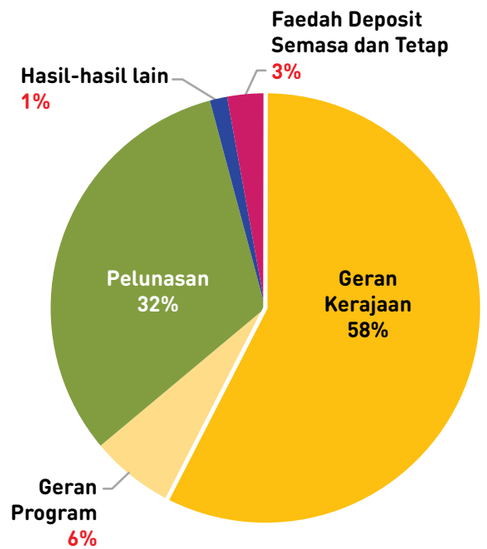
PERBANDINGAN KEDUDUKAN KEWANGAN ASM SELAMA 3 TAHUN



	Jumlah Aset	Jumlah Liabiliti	Lebihan Terkumpul
2019	25,108,312	15,388,840	9,720,072
2018	62,381,503	55,076,078	7,305,425
2017	62,934,154	58,269,314	4,674,840

PRESTASI KEWANGAN ASM

SUMBER PENDAPATAN ASM



JUMLAH PENDAPATAN
RM18,551,134

58% - Geran Operasi ASM berjumlah RM10,675,654.

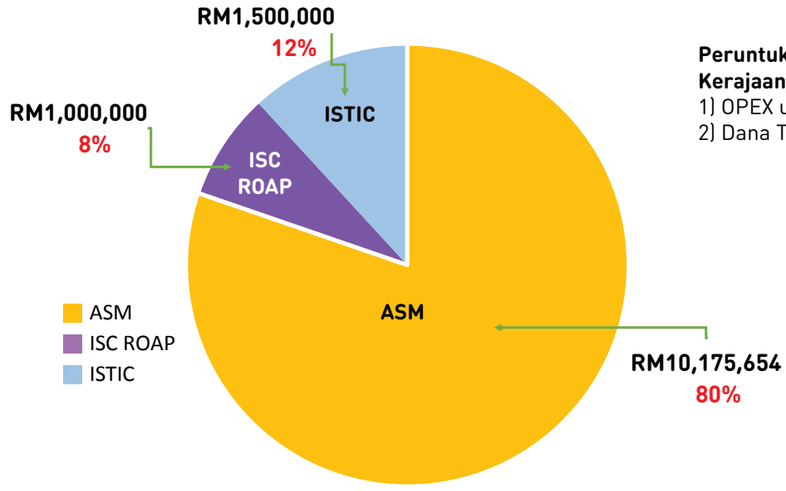
32% - Pelunasan geran tertunda, pendapatan tertunda dan dana sumbangan berjumlah RM5,920,781.

6% - Geran program yang diterima berjumlah RM1,182,849.

3% - Keuntungan pelaburan dana ASM berjumlah RM530,345 dari faedah deposit semasa dan tetap.

1% - Pendapatan lain berjumlah RM241,505 dari sewa, lebihan dari projek, bayaran balik GST dan lain-lain.

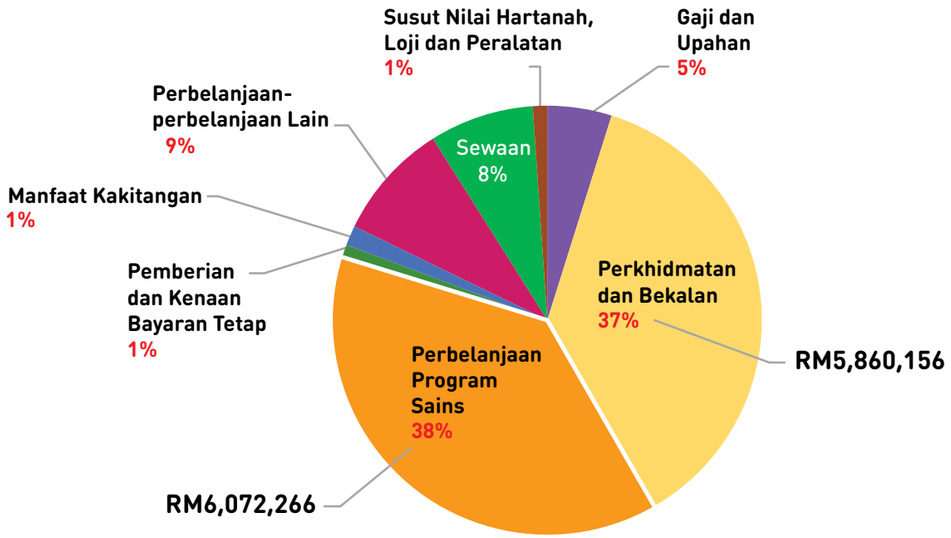
PEMBAHAGIAN GERAN OPERASI ASM



JUMLAH
RM12,675,654

Peruntukan Diterima dari Kerajaan:
1) OPEX untuk 2019: RM8,000,000
2) Dana Tambahan: RM4,675,654

PRESTASI KEWANGAN ASM



JUMLAH PERBELANJAAN
RM15,862,331

38% - **Perbelanjaan Program Sains** berjumlah **RM6,072,266** adalah aktiviti yang diadakan oleh ASM untuk memenuhi 14 fungsi ASM seperti yang dinyatakan dalam Akta Akademi Sains Malaysia 1994.

37% - **Perbelanjaan Perkhidmatan dan Bekalan** berjumlah **RM5,860,156** terdiri daripada perbelanjaan operasi ASM yang merupakan perbelanjaan pentadbiran, gaji dan upah untuk kakitangan kontrak, komunikasi sains, keahlian termasuk urusan antarabangsa.

9% - **Perbelanjaan Lain** berjumlah **RM1,362,201** terdiri daripada yuran, insurans, faedah terakru dan hutang lapuk.

8% - Perbelanjaan **Sewaan** berjumlah **RM1,251,995.**

5% - **Gaji dan Upahan** untuk kakitangan tetap berjumlah **RM771,506.**

1% - **Manfaat Pekerja** terdiri daripada gantian cuti rehat pekerja dan ganjaran pekerja kontrak berjumlah **RM237,644.**

1% - **Susut Nilai bagi Hartanah, Loji dan Peralatan** berjumlah **RM172,332.**

1% - **Pemberian dan Bayaran Tetap** terdiri daripada sumbangan kepada Kelab Sukan dan Kebajikan Kakitangan ASM (ASM KSKK), pencen dan langganan tahunan antarabangsa berjumlah **RM134,231.**

SIJIL KETUA AUDIT NEGARA
MENGENAI PENYATA KEWANGAN
AKADEMI SAINS MALAYSIA
BAGI TAHUN BERAKHIR 31 DISEMBER 2019

Sijil Mengenai Pengauditan Penyata Kewangan

Pendapat

Saya telah mengaudit Penyata Kewangan Akademi Sains Malaysia yang merangkumi Penyata Kedudukan Kewangan pada 31 Disember 2019 dan Penyata Prestasi Kewangan, Penyata Perubahan Aset Bersih, Penyata Aliran Tunai serta Penyata Perbandingan Bajet dan Sebenar bagi tahun berakhir pada tarikh tersebut dan nota kepada penyata kewangan termasuklah ringkasan polisi perakaunan yang signifikan seperti yang dinyatakan pada muka surat 3 hingga 37.

Pada pendapat saya, penyata kewangan ini memberikan gambaran yang benar dan saksama mengenai kedudukan kewangan Akademi Sains Malaysia pada 31 Disember 2019 dan prestasi kewangan serta aliran tunai bagi tahun berakhir pada tarikh tersebut selaras dengan Piawaian Perakaunan Sektor Awam Malaysia (MPSAS) dan Akta Akademi Sains Malaysia 1994 (Akta 524) serta Peraturan-peraturan Akademi Sains Malaysia 1995.

Asas Kepada Pendapat

Pengauditan telah dilaksanakan berdasarkan Akta Audit 1957 dan *International Standards of Supreme Audit Institutions*. Tanggungjawab saya dihuraikan selanjutnya di perenggan Tanggungjawab Juruaudit Terhadap Pengauditan Penyata Kewangan dalam sijil ini. Saya percaya bahawa bukti audit yang diperoleh adalah mencukupi dan bersesuaian untuk dijadikan asas kepada pendapat saya.

Kebebasan dan Tanggungjawab Etika Lain

Saya adalah bebas daripada Akademi Sains Malaysia dan telah memenuhi tanggungjawab etika lain berdasarkan *International Standards of Supreme Audit Institutions*.

Maklumat Lain Selain Daripada Penyata Kewangan dan Sijil Juruaudit Mengenainya

Majlis Akademi Sains Malaysia bertanggungjawab terhadap maklumat lain dalam Laporan Tahunan. Pendapat saya terhadap Penyata Kewangan Akademi Sains Malaysia tidak meliputi maklumat lain selain daripada Penyata Kewangan dan Sijil Juruaudit mengenainya dan saya tidak menyatakan sebarang bentuk kesimpulan jaminan mengenainya.

Tanggungjawab Majlis Terhadap Penyata Kewangan

Majlis bertanggungjawab terhadap penyediaan Penyata Kewangan Akademi Sains Malaysia yang memberi gambaran benar dan saksama selaras dengan Piawaian Perakaunan Sektor Awam Malaysia (MPSAS) dan Akta Akademi Sains Malaysia 1994 (Akta 524) serta Peraturan-peraturan Akademi Sains Malaysia 1995. Majlis juga bertanggungjawab terhadap penetapan kawalan dalaman yang perlu bagi membolehkan penyediaan Penyata Kewangan Akademi Sains Malaysia yang bebas daripada salah nyata yang ketara, sama ada disebabkan fraud atau kesilapan.

Semasa penyediaan Penyata Kewangan Akademi Sains Malaysia, Majlis bertanggungjawab untuk menilai keupayaan Akademi Sains Malaysia untuk beroperasi sebagai satu usaha berterusan, mendedahkannya jika berkaitan serta menggunakannya sebagai asas perakaunan.

Tanggungjawab Juruaudit Terhadap Pengauditan Penyata Kewangan

Objektif saya adalah untuk memperoleh keyakinan yang munasabah sama ada Penyata Kewangan Akademi Sains Malaysia secara keseluruhannya adalah bebas daripada salah nyata yang ketara, sama ada disebabkan fraud atau kesilapan, dan mengeluarkan Sijil Juruaudit yang merangkumi pendapat saya. Jaminan yang munasabah adalah satu tahap jaminan yang tinggi, tetapi bukan satu jaminan bahawa audit yang dijalankan mengikut *International Standards of Supreme Audit Institutions* akan sentiasa mengesan salah nyata yang ketara apabila ia wujud. Salah nyata boleh wujud daripada fraud atau kesilapan dan dianggap ketara sama ada secara individu atau agregat sekiranya boleh dijangkakan dengan munasabah untuk mempengaruhi keputusan ekonomi yang dibuat oleh pengguna berdasarkan penyata kewangan ini.

Sebagai sebahagian daripada pengauditan mengikut *International Standards of Supreme Audit Institutions*, saya menggunakan pertimbangan profesional dan mengekalkan keraguan profesional sepanjang pengauditan. Saya juga:

a. Mengenal pasti dan menilai risiko salah nyata ketara dalam Penyata Kewangan Akademi Sains Malaysia, sama ada disebabkan fraud atau kesilapan, merangka dan melaksanakan prosedur audit yang responsif terhadap risiko berkenaan serta mendapatkan bukti audit yang mencukupi dan bersesuaian untuk memberikan asas kepada pendapat saya. Risiko untuk tidak mengesan salah nyata ketara akibat daripada fraud adalah lebih tinggi daripada kesilapan kerana fraud mungkin melibatkan pakatan, pemalsuan, ketinggalan yang disengajakan, representasi yang salah, atau mengatasi kawalan dalaman.

b. Memahami kawalan dalaman yang relevan untuk merangka prosedur audit yang bersesuaian tetapi bukan untuk menyatakan pendapat mengenai keberkesanan kawalan dalaman Akademi Sains Malaysia.

c. Menilai kesesuaian dasar perakaunan yang diguna pakai kemunasabahan anggaran perakaunan dan pendedahan yang berkaitan oleh Majlis.

d. Membuat kesimpulan terhadap kesesuaian penggunaan asas perakaunan untuk usaha berterusan oleh Majlis dan berdasarkan bukti audit yang diperoleh, sama ada wujudnya ketidakpastian ketara yang berkaitan dengan peristiwa atau keadaan yang mungkin menimbulkan keraguan yang signifikan terhadap keupayaan Akademi Sains Malaysia sebagai satu usaha berterusan. Jika saya membuat kesimpulan bahawa ketidakpastian ketara wujud, saya perlu melaporkan dalam Sijil Juruaudit terhadap pendedahan yang berkaitan dalam Penyata Kewangan Akademi Sains Malaysia atau, jika pendedahan tersebut tidak mencukupi, pendapat saya akan diubah. Kesimpulan saya dibuat berdasarkan bukti audit yang diperoleh sehingga tarikh Sijil Juruaudit.

e. Menilai sama ada keseluruhan persembahan termasuk pendedahan Penyata Kewangan Akademi Sains Malaysia memberi gambaran yang saksama.

Saya telah berkomunikasi dengan Majlis, antaranya mengenai skop dan tempoh pengauditan yang dirancang serta penemuan audit yang signifikan, termasuk kelemahan kawalan dalaman yang dikenal pasti semasa pengauditan.

Hal-hal Lain

Peraturan 12 (6) Peraturan-peraturan Akademi Sains Malaysia 1995 menetapkan Majlis hendaklah melantik jawatankuasa kerja dan kumpulan kerja, sebagaimana dan apabila difikirkan perlu, untuk memudahkan pengendalian Akademi dengan efisyen dan berkesan. Majlis hendaklah menyediakan prosedur bagi penjalanan jawatankuasa kerja dan kumpulan kerja. Pengauditan penyata kewangan yang dilaksanakan menunjukkan Tatacara Kewangan dan Perakaunan Akademi Sains Malaysia yang berkuat kuasa mulai 31 Julai 2004 tidak dikemaskini berdasarkan prosedur kerja yang diguna pakai pada masa kini. Majlis hendaklah meluluskan *Standard Operating Procedure* (SOP) yang diguna pakai di Akademi Sains Malaysia. Akademi Sains Malaysia hendaklah memastikan Tatacara Kewangan dan Perakaunan serta *Standard Operating Procedure* (SOP) yang diguna pakai oleh ASM dikemas kini dan diluluskan secara rasmi supaya ianya sah sebagai panduan terhadap prosedur kerja yang dijalankan.

Sijil ini dibuat untuk Majlis berdasarkan Akta Akademi Sains Malaysia 1994 (Akta 524) serta Peraturan-peraturan Akademi Sains Malaysia 1995 dan bukan untuk tujuan lain. Saya tidak bertanggungjawab terhadap pihak lain bagi kandungan sijil ini.

(MOHD NASRI BIN MOHD NASIR)
b.p. KETUA AUDIT NEGARA

PUTRAJAYA
15 SEPTEMBER 2020

4/4

Academy of Sciences Malaysia

PENYATA PRESIDEN DAN BENDAHARI KEHORMAT AKADEMI SAINS MALAYSIA
STATEMENT BY PRESIDENT AND HONORARY TREASURER OF THE ACADEMY OF SCIENCES MALAYSIA

Kami, **PROFESSOR DATUK DR ASMA BINTI ISMAIL FASc** dan **DATUK DR. ABDUL RAZAK BIN MOHD ALI FASc,** yang merupakan Presiden dan Bendahari Kehormat AKADEMI SAINS MALAYSIA (ASM) dan juga Ahli Majlis, dengan ini menyatakan bahawa, pada pendapat Majlis ASM, Penyata Kedudukan Kewangan, Penyata Prestasi Kewangan, Penyata Perubahan Aset Bersih, Penyata Aliran Tunai dan Penyata Perbandingan Bajet dan Sebenar yang berikut ini berserta dengan nota-nota kepada Penyata Kewangan didalamnya adalah disediakan untuk menunjukkan pandangan yang benar dan saksama kedudukan ASM pada 31 Disember 2019 dan hasil kendaliannya serta perubahan kedudukan kewangannya bagi tahun berakhir pada tarikh tersebut.

*We, **PROFESSOR DATUK DR. ASMA BINTI ISMAIL FASc** and **DATUK DR. ABDUL RAZAK BIN MOHD ALI FASc**, being the President and Honorary Treasurer of the ACADEMY OF SCIENCES MALAYSIA (ASM) as well as Council Members, do hereby declare that, in the opinion of ASM Council, the Statement of Financial Position, Statement of Financial Performance, Statement of Changes in Net Assets, Statement of Cash Flows and Statement of Comparison Budget and Actual together with the notes contained therein are drawn up in order to give a true and fair view of the financial position of ASM as at 31 December 2019 and the resulting revenues and changes in the financial position of the period ending on that date.*

Bagi pihak Majlis
On behalf of the Council

PROFESSOR DATUK DR. ASMA BINTI ISMAIL FASc
Presiden / *President*

Akademi Sains Malaysia / *Academy of Sciences Malaysia*

Bagi pihak Majlis
On behalf of the Council

DATUK DR. ABDUL RAZAK BIN MOHD ALI FASc
Bendahari Kehormat / *Honorary Treasurer*
Akademi Sains Malaysia / *Academy of Sciences Malaysia*

KUALA LUMPUR, MALAYSIA

Tarikh / *Date:* 15 SEP 2020

Menara MATRADE
Tingkat 20, Sayap Barat
Jalan Sultan Haji Ahmad Shah
Off Jalan Tuanku Abdul Halim
50480 Kuala Lumpur

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Academy of Sciences Malaysia

PENGAKUAN OLEH KETUA PEGAWAI EKSEKUTIF KE ATAS PENGURUSAN KEWANGAN AKADEMI SAINS MALAYSIA
DECLARATION BY CHIEF EXECUTIVE OFFICER ON THE FINANCIAL MANAGEMENT OF THE ACADEMY OF SCIENCES MALAYSIA

Saya, **HAZAMI BINTI HABIB**, No. K/P 660619-08-5516 pegawai utama yang bertanggungjawab ke atas pengurusan kewangan dan rekod-rekod perakaunan AKADEMI SAINS MALAYSIA (ASM), dengan ikhlasnya mengakui bahawa Penyata Kedudukan Kewangan, Penyata Prestasi Kewangan, Penyata Perubahan Aset Bersih, Penyata Aliran Tunai dan Penyata Perbandingan Bajet dan Sebenar dalam kedudukan kewangan yang berikut ini berserta dengan nota-nota kepada penyata kewangan didalamnya mengikut sebaik-baik pengetahuan dan kepercayaan saya, adalah betul dan saya membuat ikrar ini dengan sebenarnya mempercayai bahawa adalah benar dan atas kehendak-kehendak Akta Akuan Berkanun, 1960.

*I, **HAZAMI BINTI HABIB**, NRIC No:660619-08-5516 being the officer primarily responsible for the financial management of the ACADEMY OF SCIENCES MALAYSIA (ASM), do solemnly and sincerely declare that the Statement of Financial Position, Statement of Financial Performance, Statement of Changes in Net Assets, Statement of Cash Flows and Statement of Comparison Budget and Actual together with the notes therein, are the best of my knowledge and belief, correct, and I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Statutory Declarations Act 1960.*

Sebenarnya dan sesungguhnya diakui oleh penama di atas di Kuala Lumpur, Malaysia
Subscribed and solemnly declared by the abovenamed at Kuala Lumpur, Malaysia

HAZAMI BINTI HABIB

Tarikh / *Date* :
15 SEP 2020

Di hadapan saya / *Before me* :

PESURUHJAYA SUMPAH
W 465
KAPT (B) JASNI BIN YUSOFF
MALAYSIA

Lot 1.08, Tingkat 1,
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PENYATA KEDUDUKAN KEWANGAN
PADA 31 DISEMBER 2019

	Nota	2019 RM	2018 RM *(Dinyatakan Semula)*	01.01.2018 RM *(Dinyatakan Semula)*
ASET				
Aset Semasa				
Wang Tunai dan Baki di Bank	3	596,349	1,154,784	748,589
Simpanan Tetap	4	20,795,161	51,677,584	56,670,263
Deposit Jangka Pendek	5	-	618,810	109,515
Akaun Belum Terima Bagi Urus Niaga Pertukaran	6	7,379	3,628,782	788,406
Akaun Belum Terima Lain	7	136,821	1,697,515	965,259
Jumlah Aset Semasa		21,535,710	58,777,475	59,282,032
Aset Bukan Semasa				
Hartanah, Loji dan Peralatan	8	3,551,676	3,604,028	3,652,122
Kerja Dalam Kemajuan	9	21,526	-	-
Jumlah Aset Bukan Semasa		3,573,202	3,604,028	3,652,122
JUMLAH ASET		25,108,912	62,381,503	62,934,154
LIABILITI				
Liabiliti Semasa				
Akaun Belum Bayar Bagi Urus Niaga Pertukaran	10	942,497	4,916,004	7,851,454
Peruntukan Manfaat Pekerja	11	229,395	178,837	153,246
Sumbangan	12	337,385	245,202	171,856
Pendapatan Tertunda	13	1,438,383	867,295	608,953
Peruntukan Cukai	25	214,676	-	-
Jumlah Liabiliti Semasa		3,162,336	6,207,338	8,785,509
Liabiliti Bukan Semasa				
Peruntukan Manfaat Pekerja	11	23,586	21,818	18,061
Geran Tertunda	14	10,613,173	47,182,050	47,967,506
Geran Tertunda - Pejabat Antarabangsa	15	1,589,745	1,664,872	1,488,238
Jumlah Liabiliti Bukan Semasa		12,226,504	48,868,740	49,473,805
JUMLAH LIABILITI		15,388,840	55,076,078	58,259,314
ASET BERSIH		**9,720,072**	**7,305,425**	**4,674,840**
ASET BERSIH				
Lebihan Terkumpul		9,720,072	7,305,425	4,674,840
JUMLAH ASET BERSIH		**9,720,072**	**7,305,425**	**4,674,840**

PENYATA PRESTASI KEWANGAN
BAGI TAHUN KEWANGAN BERAKHIR 31 DISEMBER 2019

	Nota	2019 RM	2018 RM
			(Dinyatakan Semula)
HASIL			
Urus Niaga Bukan Pertukaran	16	17,892,773	25,355,785
Urus Niaga Pertukaran	17	658,361	1,605,092
JUMLAH HASIL		18,551,134	26,960,877
PERBELANJAAN			
Gaji dan Upahan	18	771,506	641,583
Perkhidmatan dan Bekalan	19	5,860,156	5,647,536
Perbelanjaan Program Sains	20	6,072,266	16,246,953
Pemberian dan Kenaan Bayaran Tetap	21	134,231	102,324
Manfaat Kakitangan	22	237,644	182,594
Perbelanjaan-perbelanjaan Lain	23	1,362,201	86,652
Sewaan	24	1,251,995	1,196,021
Susut Nilai Hartanah, Loji dan Peralatan	8	172,332	226,629
JUMLAH PERBELANJAAN		15,862,331	24,330,292
LEBIHAN SEBELUM CUKAI		2,688,803	2,630,585
Cukai	25	274,156	-
LEBIHAN SELEPAS CUKAI		**2,414,647**	**2,630,585**

PENYATA PERUBAHAN DALAM ASET BERSIH
BAGI TAHUN KEWANGAN BERAKHIR 31 DISEMBER 2019

	Nota	Lebihan Terkumpul RM	Jumlah RM
Baki pada 01 Januari 2018		1,652,074	1,652,074
- (Seperti yang Dinyatakan Terdahulu)			
Pelarasan Tahun Lalu	31	3,022,766	3,022,766
Baki pada 01 Januari 2018		4,674,840	4,674,840
- (Seperti yang Dinyatakan Semula)			
Lebihan Pendapatan atas Perbelanjaan		2,630,585	2,630,585
- (Seperti yang Dinyatakan Semula)			
Baki pada 31 Disember 2018		7,305,425	7,305,425
- (Seperti yang Dinyatakan Semula)			
Lebihan Pendapatan atas Perbelanjaan		2,414,647	2,414,647
Baki pada 31 Disember 2019		**9,720,072**	**9,720,072**

PENYATA ALIRAN TUNAI
BAGI TAHUN KEWANGAN BERAKHIR 31 DISEMBER 2019

	2019 RM	2018 RM *(Dinyatakan Semula)*
ALIRAN TUNAI DARIPADA AKTIVITI OPERASI		
Lebihan Sebelum Cukai	2,688,803	2,630,585
Pelarasan:		
Cukai dibayar	(15,279)	-
Cukai dibayar bagi Tahun Lepas	(44,201)	-
Susut Nilai Hartanah, Loji dan Peralatan	172,332	226,629
Faedah dari Pelaburan Jangka Pendek dan Simpanan Tetap	(530,345)	(1,058,326)
Faedah Terakru	133,204	846,945
Pelarasan Pembalikan Faedah Simpanan Tetap	846,945	-
Pelarasan dari Hartanah, Loji dan Peralatan Dihapuskira	5,014	2,391
Keuntungan daripada Pelupusan Hartanah, Loji dan Peralatan	(1,771)	(2,396)
Hutang lapuk	500,000	-
Pelunasan Pendapatan Tertunda	(10,091)	-
Pelarasan Manfaat Kakitangan	52,326	29,348
Pelunasan Geran Tertunda	(1,479,550)	(81,395)
Kurangan dari Operasi Sebelum Perubahan Modal Kerja	2,317,387	2,593,781
Pengurangan / (Peningkatan) daripada Akaun Belum Terima bagi Urus Niaga Pertukaran	4,682,097	(3,572,632)
Pengurangan daripada Akaun Belum Bayar bagi Urus Niaga Pertukaran	(3,973,507)	(2,935,450)
Tunai Bersih digunakan untuk Aktiviti Operasi	3,025,977	(3,914,301)
ALIRAN TUNAI DARIPADA AKTIVITI PELABURAN		
Terimaan daripada Pelupusan Hartanah, Loji dan Peralatan	1,771	2,419
Pembelian Hartanah, Loji dan Peralatan	(124,994)	(180,949)
Kerja dalam Kemajuan	(21,526)	-
Faedah Diterima	(449,804)	211,381
Tunai Bersih dijana daripada Aktiviti Pelaburan	(594,553)	32,851
ALIRAN TUNAI DARIPADA AKTIVITI PEMBIAYAAN		
Terimaan Sumbangan	98,233	73,346
Bayaran Sumbangan	(6,050)	-
Terimaan Pendapatan Tertunda	1,931,363	1,688,729
Bayaran Pendapatan Tertunda	(1,350,184)	(1,430,387)
Terimaan Geran Tertunda	7,498,227	9,029,816
Bayaran Geran Tertunda	(42,587,554)	(9,733,877)
Terimaan Geran Tertunda - Antarabangsa	2,505,000	2,334,548
Bayaran Geran Tertunda - Antarabangsa	(2,580,127)	(2,157,914)
Tunai Bersih dijana daripada Aktiviti Pembiayaan	(34,491,092)	(195,739)
PENGURANGAN BAKI TUNAI DAN KESETARAAN TUNAI	(32,059,668)	(4,077,189)
TUNAI DAN KESETARAAN TUNAI PADA AWAL TAHUN KEWANGAN	53,451,178	57,528,367
TUNAI DAN KESETARAAN TUNAI PADA AKHIR TAHUN KEWANGAN	**21,391,510**	**53,451,178**
DIWAKILI OLEH:		
Simpanan Tetap	20,795,161	51,677,584
Wang Tunai dan Baki di Bank	596,349	1,154,784
Deposit Jangka Pendek	-	618,810
	21,391,510	**53,451,178**

PENYATA PERBANDINGAN BAJET DAN SEBENAR
BAGI TAHUN KEWANGAN BERAKHIR 31 DISEMBER 2019

	Jumlah Bajet		Jumlah	Varian	
	Asal 2019 RM	Akhir 2019 RM	Sebenar 2019 RM	Bajet 2019 RM	Nota
PENERIMAAN					(a)
Urus Niaga Bukan Pertukaran					
Pemberian Kerajaan	10,646,932	9,498,407	10,675,654	1,177,247	
Sumbangan Luar	542,700		-	-	
Urus Niaga Pertukaran					
Pelbagai Penerimaan	-	-	81,148	81,148	
	11,189,632	**9,498,407**	**10,756,802**	**1,258,395**	
PEMBAYARAN					(b)
Gaji dan Upahan	973,156	683,759	771,506	87,747	
Perkhidmatan dan Bekalan	9,498,638	8,147,721	7,736,479	(411,242)	
Aset Tetap	33,850	33,850	124,994	91,144	
Pemberian dan Kenaan Bayaran Tetap	337,150	568,329	134,231	(434,098)	
Perbelanjaan-perbelanjaan Lain	346,838	64,748	59,457	(5,291)	
	11,189,632	**9,498,407**	**8,826,667**	**(671,740)**	
PENERIMAAN BERSIH	**-**	**-**	**1,930,135**	**1,930,135**	

*Merujuk kepada varian di antara Jumlah Bajet Akhir dan Jumlah Sebenar.

Nota (a):
Perbezaan varian pemberian geran operasi daripada Kerajaan bagi tahun 2019 yang signifikan adalah disebabkan oleh peruntukan operasi yang diterima oleh ASM tidak mencukupi. ASM menerima peruntukan tambahan setelah permohonan ASM diluluskan oleh MESTECC dan Kementerian Kewangan Malaysia (MOF) pada 6 September 2019. Peruntukan tambahan ini telah dimasukkan ke dalam bajet asal oleh ASM setelah menerima kelulusan untuk menutup bajet akhir.

Nota (b):
Perbezaan varian perbelanjaan yang signifikan adalah disebabkan oleh ASM menerima geran tambahan pada suku tahun keempat dan menyebabkan terdapat beberapa program yang dirancangkan pada tahun 2019 ditunda pada tahun 2020.

NOTA-NOTA KEPADA PENYATA KEWANGAN
BAGI TAHUN KEWANGAN BERAKHIR 31 DISEMBER 2019

1. MAKLUMAT AM
a) Penubuhan dan Objektif Utama
Akademi Sains Malaysia (ASM) telah ditubuhkan di bawah Akta 524. Objektif utama 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) Mata Wang Fungsian untuk Penyata Kewangan
Penyata Kewangan ini dibentangkan dalam Ringgit Malaysia ("RM") yang merupakan mata wang fungsian dan persembahan ASM. Semua maklumat kewangan yang dibentangkan adalah dalam RM.

c) Tarikh Penyata Kewangan Diluluskan
Penyata Kewangan Akademi bagi tahun kewangan berakhir 31 Disember 2019 telah dibentangkan dan diluluskan oleh Majlis ASM pada **15 September 2020**.

2) DASAR PERAKAUNAN
a) Asas Penyediaan Penyata Kewangan
Penyata Kewangan ASM telah disediakan mengikut kelaziman kos sejarah dan mematuhi Piawaian Perakaunan Sektor Awam Malaysia (MPSAS).

Penyata Kewangan ASM ini adalah merupakan penyata kewangan tahun keempat yang disediakan mengunakan MPSAS. ASM telah menggunapakai MPSAS pada 1 Januari 2015 (lebih awal dari tarikh kuatkuasa pada tahun 2020 kepada penyata kewangan). Pemakaian MPSAS memerlukan semua piawaian di dalam MPSAS digunapakai dalam penyediaan Penyata Kewangan bagi Tahun Kewangan Berakhir 31 Disember 2016, Penyata Perbandingan bagi Tahun sebelumnya Berakhir 31 Disember 2015 dan baki awal Penyata Kedudukan Kewangan pada tarikh peralihan kepada MPSAS. Sebelum ini Penyata Kewangan ASM telah disediakan mengunakan Piawaian Pelaporan Entiti Persendirian (PERS).

Penyediaan penyata kewangan memerlukan pertimbangan, anggaran dan andaian yang memberi kesan kepada penggunaan dasar dan amaun bagi aset, liabiliti, hasil dan belanja yang dilaporkan.

Anggaran dan andaian yang digunakan akan disemak secara berterusan. Semakan semula kepada anggaran perakaunan akan diiktiraf dalam tempoh anggaran tersebut disemak, jika semakan semula hanya memberi kesan kepada tempoh tersebut, atau dalam tempoh semakan dan tempoh masa hadapan sekiranya semakan semula memberi kesan kepada tempoh semasa dan masa yang akan datang.

Sekiranya pertimbangan, anggaran dan andaian ini memberi kesan signifikan kepada amaun yang diiktiraf dalam penyata kewangan, ia telah didedahkan dalam Nota 2(p) Pertimbangan Perakaunan Kritikal dan Sumber Utama Ketidakpastian Anggaran kepada penyata kewangan.

b) Pengiktirafan Hasil
<u>Hasil daripada Urus Niaga Bukan Pertukaran</u>
Urus Niaga bukan pertukaran akan diiktiraf sebagai aset apabila terdapat manfaat ekonomi masa depan atau potensi perkhidmatan dijangka mengalir ke dalam entiti, ianya berpunca daripada peristiwa lampau serta nilai saksama aset dapat diukur dengan munasabah. Urus niaga bukan pertukaran yang diiktiraf sebagai aset hendaklah diiktiraf sebagai hasil, kecuali setakat liabiliti yang juga diiktiraf berkenaan dengan aliran masuk yang sama sebagai tertunda di dalam penyata kedudukan kewangan. Apabila obligasi terhadap sesuatu liabiliti itu telah dipenuhi, entiti hendaklah mengurangkan amaun bawaan liabiliti yang diiktiraf itu dan mengiktiraf amaun hasil yang sama dengan pengurangan itu.

Hasil daripada Urus Niaga Bukan Pertukaran adalah seperti berikut:

i. Geran Kerajaan
Geran Kerajaan yang tidak dikenakan syarat-syarat prestasi masa depan yang tertentu seperti geran keseimbangan diambil kira sebagai hasil di dalam penyata prestasi kewangan. Geran Kerajaan yang dikenakan syarat-syarat prestasi masa depan tertentu seperti geran pembangunan diiktiraf sebagai geran tertunda dan dilunaskan sebagai hasil bersamaan dengan amaun bawaan liabiliti yang telah memenuhi syarat. Geran dilunaskan berasaskan kaedah garis lurus mengikut anggaran hayat kegunaannya

ii. Sumbangan
Sumbangan yang tidak dikenakan syarat-syarat prestasi masa depan yang tertentu diambil kira sebagai hasil di dalam penyata prestasi kewangan. Sumbangan yang dikenakan syarat-syarat prestasi masa depan tertentu diiktiraf sebagai liabiliti dan dilunaskan sebagai hasil bersamaan dengan amaun bawaan liabiliti yang telah memenuhi syarat. Sumbangan dilunaskan berasaskan kaedah garis lurus mengikut anggaran hayat kegunaannya.

<u>Hasil daripada Urus Niaga Pertukaran</u>
Hasil daripada urus niaga pertukaran diiktiraf apabila terdapat kemungkinan bahawa manfaat ekonomi masa hadapan atau potensi perkhidmatan akan mengalir kepada entiti dan manfaat ini boleh diukur dengan pasti.

Hasil daripada Urus Niaga Pertukaran adalah seperti berikut:

i. Pendapatan Faedah dan Pendapatan daripada Pelaburan
Hasil keuntungan daripada simpanan tetap diiktiraf atas dasar perkadaran masa yang mengambil kira kadar pulangan hasil efektif atas aset tersebut. Kadar pulangan hasil efektif ke atas aset ialah kadar keuntungan yang diperlukan untuk mendiskaunkan jangkaan aliran penerimaan tunai masa hadapan sepanjang hayat aset tersebut untuk disamakan dengan amaun bawaan awal aset tersebut.

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

2) DASAR PERAKAUNAN **(SAMBUNGAN)**
ii. Sewaan
Hasil sewaan diiktiraf apabila hasil itu diperoleh mengikut syarat perjanjian penyewaan.

iii. Lain-lain Hasil
Lain-lain hasil diiktiraf apabila sesuatu perkhidmatan itu telah diberikan.

c) Hartanah, Loji dan Peralatan
Hartanah, loji dan peralatan dinyatakan pada kos tolak susut nilai terkumpul dan rosot nilai terkumpul. Kos termasuk semua kos langsung yang terlibat untuk membawa aset tersebut ke lokasi dan keadaan yang membolehkannya beroperasi dalam cara yang dikehendaki oleh pihak pengurusan. Kos penggantian bagi mana-mana aset yang memerlukan penggantian secara berkala akan dipermodalkan manakala nilai dibawa bagi bahagian yang diganti tersebut akan dinyahiktirafkan. Kos-kos perkhidmatan harian akan diiktiraf sebagai perbelanjaan dalam penyata prestasi kewangan.

Hartanah, loji dan peralatan diiktirafkan pada nilai kos yang melebihi RM1,000 dan ke atas atau yang memerlukan penyelenggaraan secara berkala akan dipermodalkan sebagai hartanah, loji dan peralatan.

Jika sesuatu aset diperoleh melalui urus niaga bukan pertukaran, kos hendaklah diukur berdasarkan nilai saksama pada tarikh perolehan. Aset-aset ini kemudiannya akan dikreditkan di dalam penyata prestasi kewangan, melainkan jika terdapat syarat-syarat mengenai penggunaan aset tersebut, di mana ia perlu diiktiraf di dalam liabiliti semasa. Nilai dibawa item hartanah, loji dan peralatan hendaklah dinyahiktirafkan semasa pelupusan atau apabila tiada manfaat ekonomi masa hadapan atau potensi perkhidmatan yang dijangka daripada penggunaan atau pelupusannya.

Keuntungan atau kerugian atas nyahiktiraf hartanah, loji dan peralatan adalah ditentukan dengan membandingkan nilai pelupusan bersih dengan nilai dibawa aset di mana perbezaannya akan diambil kira sebagai keuntungan atau kerugian di dalam penyata prestasi kewangan.

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:-

Bangunan	1.67%
Pengubahsuaian Pejabat	10%
Kenderaan	20%
Peralatan dan Kelengkapan Pejabat	20%
Komputer	20%

Susut nilai penuh dikenakan dalam tahun pembelian bagi hartanah, loji dan peralatan. Baki bersih setiap hartanah dan peralatan hendaklah tidak kurang daripada RM1. Jika terdapat tanda perubahan yang ketara dalam faktor-faktor yang memberi kesan kepada nilai sisa, jangkaan hayat atau corak berguna aset sejak tarikh laporan tahunan lepas, nilai sisa, kaedah susut nilai dan hayat berguna aset yang boleh disusut nilai akan disemak semula dan dilaraskan secara prospektif.

Kerja dalam kemajuan terdiri daripada kerja-kerja yang melibatkan hartanah dan peralatan yang belum disempurnakan sehingga akhir tahun kewangan semasa. Kerja dalam kemajuan dinyatakan pada nilai kos dan tidak disusutnilaikan sehingga aset berkenaan sedia untuk digunakan.

d) Rosot Nilai Aset Bukan Kewangan
i. Aset Penjanaan Tunai
Pada setiap tarikh penyata kedudukan kewangan, ASM mengkaji semula nilai dibawa bagi aset-asetnya untuk menentukan sama ada terdapat sebarang petunjuk kemerosotan nilai. Jika sebarang petunjuk wujud, rosot nilai dikira dengan membandingkan nilai dibawa aset dengan amaun boleh pulih. Amaun boleh pulih adalah nilai tertinggi di antara nilai saksama ditolak kos untuk dijual dan nilai dalam penggunaan.

Dalam menentukan nilai dalam penggunaan, aliran tunai masa hadapan akan didiskaun kepada nilai semasanya menggunakan kadar diskaun sebelum cukai yang menggambarkan nilai pasaran semasa nilai masa wang dan risiko khusus kepada aset tersebut. Di dalam menentukan nilai saksama ditolak kos untuk dijual pula, urus niaga pasaran terkini akan diambil kira, jika ada. Jika tiada urus niaga pasaran terkini berlaku, model penilaian yang sesuai hendaklah digunakan.

Kerugian kemerosotan diiktiraf sebagai perbelanjaan dalam lebihan atau kurangan serta merta apabila nilai dibawa aset melebihi amaun boleh pulihnya, melainkan aset tersebut dibawa pada jumlah penilaian semula. Sebarang kerugian kemerosotan aset yang dinilai semula akan dikurangkan setakat lebihan penilaian semula yang masih belum digunakan bagi aset yang sama.

ii. Aset Penjanaan Bukan Tunai
ASM akan menilai pada setiap tarikh pelaporan sama ada terdapat petunjuk bahawa aset penjanaan bukan tunai mungkin terjejas. Jika sebarang petunjuk wujud, maka ASM akan membuat anggaran ke atas jumlah perkhidmatan boleh pulih aset. Jumlah perkhidmatan boleh pulih aset adalah nilai tertinggi di antara nilai saksama ditolak kos untuk dijual dan nilai dalam penggunaan.

Kerugian kemerosotan diiktiraf sebagai perbelanjaan dalam lebihan atau kurangan serta merta apabila nilai dibawa aset melebihi jumlah perkhidmatan boleh pulihnya.

Dalam menentukan nilai dalam penggunaan, ASM telah mengguna pakai pendekatan kos penggantian yang disusut nilai. Di bawah pendekatan ini, nilai semasa baki potensi perkhidmatan aset ditentukan sebagai kos penggantian aset yang telah disusut nilai. Kos penggantian yang disusut nilai akan diukur dengan mengambil kira kos penggantian aset ditolak susut nilai terkumpul yang dikira atas kos itu bagi mencerminkan potensi perkhidmatan aset yang telah digunakan atau sudah luput.

2) DASAR PERAKAUNAN **(SAMBUNGAN)**
Dalam menentukan nilai saksama ditolak kos untuk dijual pula, harga aset dalam perjanjian yang mengikat akan dilaraskan bagi menentukan harga pelupusan aset tersebut. Jika tiada perjanjian yang mengikat, tetapi aset tersebut diniagakan di pasaran secara aktif, maka nilai saksama ditolak kos untuk dijual adalah ditentukan dengan merujuk kepada nilai pasaran terkini ditolak kos pelupusan. Jika tiada perjanjian jual mengikat atau pasaran aktif bagi aset, ASM menentukan nilai saksama ditolak kos untuk menjual berdasarkan maklumat yang ada yang terbaik.

Bagi setiap aset, penilaian dibuat pada setiap tarikh laporan sama ada terdapat sebarang petunjuk yang sebelum ini kerugian rosot nilai yang diiktiraf mungkin tidak lagi wujud atau telah berkurangan. Jika petunjuk sedemikian wujud, ASM menganggarkan jumlah perkhidmatan boleh pulih aset. Kerugian kemerosotan nilai yang diiktiraf sebelumnya dibalikkan hanya jika terdapat perubahan dalam andaian yang digunakan untuk menentukan jumlah perkhidmatan boleh pulih aset sejak kerugian kemerosotan nilai terakhir diiktiraf. Pembalikan adalah terhad setakat nilai dibawa aset tidak melebihi jumlah perkhidmatan boleh pulih atau tidak melebihi nilai dibawa yang mungkin setelah susut nilai terkumpul seperti tiada kerugian kemerosotan nilai diiktiraf bagi aset tersebut dalam tahun sebelumnya. Pembalikan tersebut diiktiraf dalam lebihan atau kurangan.

e) Aset Kewangan
Aset kewangan diiktiraf dalam penyata kedudukan kewangan apabila ASM menjadi pihak kepada peruntukan kontrak instrumen.

Pada pengiktirafan awal, aset kewangan adalah diukur pada nilai saksama, termasuk kos urus niaga untuk aset kewangan yang tidak diukur pada nilai saksama menerusi lebihan atau kurangan, yang terlibat secara langsung di dalam mengisu aset kewangan.

Selepas pengiktirafan awal, aset kewangan akan dikelaskan kepada salah satu daripada empat kategori aset kewangan iaitu aset kewangan diukur pada nilai saksama menerusi lebihan atau kurangan, pinjaman dan belum terima, pelaburan dipegang hingga matang dan aset kewangan sedia untuk dijual.

Pembelian atau penjualan aset kewangan yang memerlukan penyerahan aset dalam tempoh masa yang ditetapkan oleh peraturan atau konvensyen di dalam pasaran akan diiktiraf pada tarikh transaksi itu dibuat, iaitu tarikh di mana ASM membuat komitmen untuk membeli atau menjual aset tersebut.

ASM hanya mempunyai kategori aset kewangan seperti berikut:

i. Pinjaman dan Belum Terima
Pinjaman dan belum terima adalah aset kewangan bukan derivatif dengan bayaran tetap atau boleh ditentukan yang tidak disebut harga dalam pasaran aktif. Selepas pengukuran awal, aset kewangan tersebut kemudiannya diukur pada kos dilunaskan menggunakan kaedah faedah berkesan dan ditolak rosot nilai. Kos dilunaskan dikira dengan mengambil kira apa-apa diskaun atau premium atas pembelian aset tersebut serta yuran atau kos yang merupakan sebahagian daripada kadar faedah berkesan. Kerugian yang timbul daripada kemerosotan nilai diiktiraf dalam lebihan atau kurangan.

ii. Pelaburan Dipegang Hingga Matang
Aset kewangan bukan derivatif dengan tempoh matang pembayaran tetap atau boleh ditentukan dan tetap diklasifikasikan sebagai dipegang untuk matang apabila ASM mempunyai niat positif dan keupayaan untuk memegang sehingga matang. Selepas pengukuran awal, dipegang hingga matang pelaburan diukur pada kos yang dilunaskan menggunakan kaedah faedah berkesan dan ditolak rosot nilai. Kos pelunasan dikira dengan mengambil kira apa-apa diskaun atau premium atas pengambilalihan dan yuran atau kos yang merupakan sebahagian daripada kadar faedah efektif. Kerugian yang timbul daripada kemerosotan nilai diiktiraf dalam penyata prestasi kewangan.

iii. Rosot Nilai Aset Kewangan
Pada akhir setiap tempoh pelaporan, ASM akan menilai sama ada terdapat sebarang bukti objektif bahawa aset kewangan perlu untuk dirosot nilai. Bukti objektif termasuk:

(i) kesukaran kewangan yang ketara oleh peminjam;
(ii) pembayaran tertunggak;
(iii) kemungkinan bahawa peminjam akan muflis;
(iv) data yang menunjukkan bahawa terdapat penurunan di dalam anggaran aliran tunai masa hadapan.

Bagi kategori aset kewangan yang diukur pada kos dilunaskan, jika tiada bukti objektif wujud bagi individu yang ketara, maka semua aset dalam ASM yang mempunyai ciri-ciri risiko yang serupa tidak kira sama ada ia ketara atau tidak, akan dinilai secara kolektif untuk menentukan sama ada ia perlu dibuat rosot nilai.

Kerugian rosot nilai, berhubung dengan aset kewangan yang diukur pada kos dilunaskan, diukur sebagai perbezaan di antara nilai dibawa aset berkenaan dan nilai semasa anggaran aliran tunai yang didiskaunkan pada kadar faedah berkesan yang asal. Nilai dibawa aset tersebut akan dikurangkan melalui penggunaan akaun elaun. Sebarang kerugian rosot nilai diiktiraf dalam lebihan atau kurangan dengan serta-merta. Jika, dalam tempoh kemudiannya, sebarang amaun kerugian rosot nilai menurun, kerugian rosot nilai yang diiktiraf sebelumnya akan dibalikkan secara langsung dalam akaun elaun. Pembalikkan ini diiktiraf dalam lebihan atau kurangan dengan serta-merta.

iv. Penyahiktirafan Aset Kewangan
Aset kewangan dinyahiktiraf apabila hak kontrak untuk aliran tunai daripada aset kewangan tersebut tamat tempoh atau diselesai serta ASM telah memindahkan risiko dan ganjaran pemilikan aset kewangan yang ketara kepada pihak lain.

Pada penyahiktirafan aset kewangan secara keseluruhannya, perbezaan di antara nilai dibawa dan jumlah pertimbangan diterima diiktiraf dalam lebihan atau kurangan dalam tempoh penyahiktirafan.

2) DASAR PERAKAUNAN **(SAMBUNGAN)**
f) Tunai dan Kesetaraan Tunai
Penyata aliran tunai telah disediakan menggunakan kaedah tidak langsung. Tunai dan kesetaraan tunai terdiri daripada tunai di tangan dan di bank serta pelaburan berkecairan tinggi dengan bank berlesen dan institusi kewangan yang mempunyai tempoh matang dua belas bulan atau kurang yang sedia ditukar kepada amaun tunai yang diketahui dan tertakluk kepada risiko perubahan nilai yang tidak ketara

g) Manfaat Kakitangan
i. Manfaat Kakitangan Jangka Pendek
ASM sebagai sebuah badan berkanun persekutuan menggunakan peraturan-peraturan perkhidmatan Jabatan Perkhidmatan Awam (JPA) yang diterimapakai oleh ASM dan dasar ASM sebagai panduan. Manfaat pekerja jangka pendek ini merangkumi gaji pokok, elaun-elaun tetap, elaun-elaun berubah, pelbagai cuti termasuk cuti tahunan dan kemudahan perubatan serta insuran.

Faedah kakitangan jangka pendek termasuk gaji, upah, elaun, sumbangan berkanun dan caruman keselamatan sosial dikira sebagai perbelanjaan dalam tahun di mana perkhidmatan berkaitan diberikan oleh pekerja. Cuti bergaji seperti cuti tahunan yang tidak dapat digunakan oleh pekerja boleh di bawa ke tahun hadapan perkhidmatan pekerja tersebut. Bagaimanapun, bagi cuti yang tidak layak di bawa ke tahun hadapan seperti cuti sakit, cuti tersebut hanya akan dikira apabila ketidakhadiran berlaku.

ii. Manfaat Selepas Perkhidmatan
<u>i. Kumpulan Wang Simpanan Pekerja (KWSP)</u>
ASM membuat caruman KWSP mengikut kadar dan syarat yang ditetapkan oleh KWSP. Kadar caruman yang digunapakai oleh ASM adalah 12% dan 13% bagi kakitangan di bawah 60 tahun, manakala bagi kakitangan berumur 60 tahun ke atas, kadar caruman yang digunapakai adalah 4% dan 6%. Kadar caruman ini juga terpakai bagi kakitangan tetap yang memilih caruman KWSP.

<u>Kumpulan Wang Persaraan (KWAP)</u>
ASM juga membuat caruman kepada KWAP bagi kakitangan tetap yang memilih caruman pencen. Kadar caruman yang digunapakai adalah mengikut seperti yang ditetapkan oleh KWAP iaitu 17.5%.

iii. Manfaat Cuti Rehat dan Ganjaran Kakitangan
<u>Kakitangan Tetap</u>
Bagi kakitangan tetap ASM sama ada memilih skim berpencen mahupun KWSP akan mendapat Gantian Cuti Rehat (GCR) apabila tiba umur persaraan mereka. GCR ini adalah berdasarkan Pekeliling Perkhidmatan yang dikeluarkan oleh Jabatan Perkhidmatan Awam (JPA) yang diguna pakai oleh ASM.

Gantian Cuti Rehat adalah dikira berdasarkan formula berikut:

1/30 X gaji + imbuhan tetap akhir yang diterima X bilangan hari cuti rehat yang dikumpul

(tertakluk kepada had maksimum 150 hari)

Imbuhan yang diambil kira adalah:
- Imbuhan Tetap Perumahan (ITP)
- Imbuhan Tetap Khidmat Awam (ITKA)/Keraian

<u>Kakitangan Kontrak</u>
ASM memberi ganjaran bagi setiap kontrak perkhidmatan *Contract of Service (CoS)* tertakluk kepada syarat kontrak. Kakitangan CoS ASM turut dibayar bagi cuti rehat yang tidak dapat dihabiskan dalam tempoh kontrak maksimum 6 hari. Bayaran ganjaran dan GCR bagi kakitangan kontrak adalah mengikut terma dan syarat yang termaktub dalam pekeliling perkhidmatan awam.

h) Mengkontra Instrumen Kewangan
Aset kewangan dan liabiliti kewangan hanya dikontra jika, dan hanya jika, terdapat hak undang-undang mengofsetkannya dan terdapat tujuan menyelesaikannya pada nilai bersih atau untuk merealisasikan aset dan menyelesaikan liabiliti secara serentak.

i) Cukai Barangan dan Perkhidmatan (GST) dan Cukai Jualan dan Perkhidmatan (SST)
Pelaksanaan Cukai Barang dan Perkhidmatan (GST) berkuatkuasa pada 1 April 2015. ASM telah mendaftar dengan Jabatan Kastam di Raja Malaysia pada 29 Disember 2014 dengan nombor rujukan 001836703744. GST kemudiannya telah dimansuhkan oleh Kerajaan berkuatkuasa 30 Jun 2018. Cukai Jualan dan Perkhidmatan (SST) kemudiannya telah diperkenalkan berkuatkuasa 1 September 2018.

j) Maklumat Bajet
Bajet tahunan disediakan berdasarkan asas tunai. Memandangkan penyata kewangan disediakan menggunakan asas akruan, maka satu Penyata Perbandingan Bajet dan Sebenar disediakan secara berasingan. Penyata ini telah disediakan menggunakan asas penyediaan bajet tahunan dan hanya merujuk kepada bajet mengurus sahaja.

Bajet yang dibentangkan adalah bagi rujukan pihak ASM sahaja. Bajet ini telah diluluskan oleh Majlis ASM.

k) Peruntukan dan Liabiliti
Peruntukan diiktiraf apabila ASM mempunyai obligasi semasa (perundangan atau konstruktif) hasil dari peristiwa lalu, terdapat kemungkinan bahawa aliran keluar sumber yang mengandungi manfaat ekonomi perlu dilakukan untuk menyelesaikan obligasi dan jumlah obligasi boleh dianggarkan dengan pasti. Apabila ASM menjangkakan beberapa atau semua peruntukan akan dibayar balik, perbelanjaan berkaitan peruntukan dibentangkan dalam lebihan atau kurangan daripada sebarang pembayaran balik.

l) Pihak Berkaitan
ASM menganggap pihak berkaitan sebagai orang atau entiti dengan keupayaan untuk mengenakan kawalan secara individu atau bersama, atau untuk melaksanakan pengaruh penting ke atas ASM, atau sebaliknya. Kakitangan penting pihak pengurusan dianggap sebagai pihak berkaitan dan terdiri daripada Pengerusi dan ahli-ahli Majlis ASM.

2) DASAR PERAKAUNAN (SAMBUNGAN)

m) Liabiliti Luar Jangka dan Aset Luar Jangka

Liabiliti luar jangka adalah obligasi semasa yang tidak diiktiraf kerana tiada kebarangkalian aliran keluar sumber akan diperlukan untuk menyelesaikan obligasi atau dalam kes yang sangat jarang berlaku di mana liabiliti tidak dapat diiktiraf kerana ia tidak boleh diukur secara pasti. Liabiliti luar jangka tidak diiktiraf tetapi didedahkan dalam penyata kewangan. Obligasi yang muncul dari peristiwa yang lepas, yang kewujudannya hanya dapat disahkan melalui berlakunya atau tidak berlakunya satu atau lebih peristiwa akan datang yang belum pasti, tidak di bawah kawalan ASM keseluruhan juga didedahkan sebagai liabiliti luar jangka melainkan kebarangkalian aliran keluar sumber ekonomi adalah kecil.

Aset luar jangka adalah aset yang berkemungkinan wujud dari peristiwa lalu yang kewujudannya akan hanya disahkan apabila berlaku atau tidak berlakunya satu atau lebih peristiwa yang tidak pasti pada masa hadapan yang bukan dalam kawalan penuh ASM. ASM tidak mengiktiraf aset luar jangka dalam penyata kewangan tetapi mendedahkan kewujudannya di mana aliran masuk manfaat ekonomi adalah berkemungkinan, tetapi tidak pasti.

n) Liabiliti Kewangan

Liabiliti kewangan diiktiraf dalam penyata kedudukan kewangan apabila ASM menjadi pihak kepada peruntukan kontrak instrumen.

Pada pengiktirafan awal, liabiliti kewangan adalah diukur pada nilai saksama, termasuk kos urus niaga untuk liabiliti kewangan yang tidak diukur pada nilai saksama menerusi lebihan atau kurangan, yang terlibat secara langsung di dalam mengisu liabiliti kewangan.

Selepas pengiktirafan awal, liabiliti kewangan dikelaskan kepada salah satu daripada dua kategori liabiliti kewangan iaitu liabiliti kewangan diukur pada nilai saksama menerusi lebihan atau kurangan, pinjaman dan belum bayar.

ASM mempunyai kategori liabiliti kewangan seperti berikut :

Pinjaman dan Belum Bayar

Selepas pengiktirafan awal, pinjaman dan belum bayar adalah diukur pada kos dilunaskan menggunakan kaedah faedah berkesan. Keuntungan atau kerugian diiktiraf di dalam lebihan atau kurangan apabila liabiliti kewangan dinyahiktiraf atau dirosot nilai.

Kaedah faedah berkesan adalah kaedah untuk mengira kos dilunaskan liabiliti kewangan dan untuk memperuntukan perbelanjaan faedah ke atas tempoh yang berkaitan. Kadar faedah berkesan adalah kadar diskaun anggaran pembayaran tunai masa depan yang tepat menerusi jangka hayat liabiliti kewangan atau, apabila sesuai, tempoh yang lebih singkat, dengan nilai dibawa liabiliti kewangan tersebut.

Liabiliti kewangan dinyahiktiraf apabila obligasi yang dinyatakan dalam kontrak telah dilepaskan, dibatalkan atau tamat hayat.

Sebarang perbezaan di antara nilai dibawa liabiliti kewangan yang dinyahiktiraf dan pertimbangan dibayar adalah diiktiraf di dalam lebihan atau kurangan dalam tempoh penyahiktirafan.

o) Pajakan

Pajakan hartanah, loji dan peralatan adalah dikelaskan sebagai pajakan kewangan apabila sebahagian besar risiko dan ganjaran dengan pemilikan harta, tetapi bukan pemilikan yang sah disisi undang-undang, dipindahkan kepada ASM.

ASM pada awalnya mengiktiraf hak penggunaan dan obligasinya di bawah pajakan kewangan sebagai aset dan liabiliti dalam penyata kedudukan kewangan pada amaun yang sama dengan nilai saksama aset yang dipajak atau, jika yang lebih rendah, nilai semasa bayaran pajakan minimum, ditentukan pada permulaan pajakan. Sebarang kos langsung awal ditambah kepada amaun yang diiktiraf sebagai aset.

Bayaran pajakan minimum adalah dibahagikan antara caj kewangan dan pengurangan tanggungan tertunggak dengan menggunakan kaedah faedah efektif. Caj kewangan adalah diperuntukkan pada setiap tempoh sepanjang tempoh pajakan untuk menghasilkan kadar faedah tempoh yang tetap ke atas baki liabiliti.

Dasar susut nilai bagi aset pajakan adalah konsisten dengan aset yang boleh disusut nilai yang dimiliki. Jika tiada kepastian yang munasabah bahawa ASM akan mendapat pemilikan menjelang akhir tempoh pajakan, aset pajakan disusut nilai sepenuhnya dalam jangka pajakan dan hayat bergunanya, yang mana lebih singkat. Pada setiap tarikh pelaporan, ASM menilai sama ada harta pajakan di bawah pajakan kewangan perlu dirosot nilai.

Pajakan operasi adalah diiktiraf sebagai perbelanjaan dalam untung atau rugi pada garis lurus sepanjang tempoh pajakan. Manfaat agregat insentif yang disediakan oleh pemberi pajak adalah diiktiraf sebagai pengurangan daripada perbelanjaan sewa sepanjang tempoh pajakan menggunakan kaedah garis lurus.

p) Pertimbangan Perakaunan Kritikal dan Sumber Utama Ketidakpastian Anggaran

i. Pertimbangan Perakaunan Kritikal

Tiada sebarang pertimbangan perakaunan kritikal yang mempunyai kesan ketara ke atas jumlah yang diiktiraf di dalam penyata kewangan.

ii. Sumber Utama Ketidakpastian Anggaran

Anggaran utama berkenaan masa hadapan, dan lain-lain sumber utama ketidakpastian anggaran pada tarikh pelaporan, yang mempunyai risiko ketara yang akan menyebabkan pelarasan penting terhadap nilai dibawa aset dan liabiliti di dalam tahun kewangan seterusnya adalah seperti berikut:

Pengukuran Peruntukan

Laporan Pengukuran Belanjawan (LPB) sentiasa menggunakan anggaran terbaik sebagai asas untuk mengukur sesuatu peruntukan itu. Anggaran itu dibuat berdasarkan kepada pengalaman lalu, lain-lain petunjuk atau andaian, perkembangan terkini dan peristiwa masa hadapan yang munasabah dalam menentukan sesuatu peruntukan.

Kerugian Rosot Nilai bagi Akaun Belum Terima

ASM menilai pada setiap tarikh pelaporan sama ada terdapat sebarang bukti objektif bahawa aset kewangan terjejas. Untuk menentukan sama ada terdapat bukti objektif rosot nilai, ASM menganggap faktor seperti ketidakmampuan bayar siberhutang dan keingkaran atau kelewatan pembayaran yang ketara. Jika terdapat bukti objektif kemerosotan nilai, jumlah dan masa aliran tunai masa depan dianggarkan berdasarkan sejarah pengalaman kerugian untuk aset yang mempunyai ciri-ciri risiko kredit yang serupa.

Perubahan Anggaran Jangka Hayat bagi Hartanah, Loji dan Peralatan

Semua hartanah, loji dan peralatan disusut nilaikan mengikut kaedah garis lurus sepanjang jangka hayat aset tersebut. Pengurusan menganggarkan jangka hayat hartanah, loji dan peralatan dalam tempoh masa lima (5) sehingga 60 tahun. Perubahan dalam anggaran corak penggunaan aset dan pembangunan teknologi boleh memberi kesan kepada jangka hayat dan nilai sisa aset tersebut. Ini akan menyebabkan susut nilai aset pada masa hadapan akan disemak semula.

3) WANG TUNAI DAN BAKI DI BANK

	2019 RM	2018 RM (Dinyatakan Semula)
ASM		
Tunai di Tangan	3,953	3,041
Tunai di Bank	592,396	936,129
Research, Development & Commercialisation Fund (R,D&C)		
Baki di Bank	-	215,614
	596,349	1,154,784

4) SIMPANAN TETAP

	2019 RM	2018 RM (Dinyatakan Semula)
ASM		
Simpanan Tetap	20,795,161	8,019,270
Research, Development & Commercialisation Fund (R,D&C)		
Simpanan Tetap	-	43,658,314
	20,795,161	51,677,584

Simpanan tetap dibuat untuk pelbagai tempoh antara 12 bulan atau kurang bergantung kepada keperluan tunai segera ASM dan memperoleh faedah pada Kadar Deposit Jangka Pendek. Purata Wajaran Kadar Faedah Berkesan pada 31 Disember 2019 adalah pada kadar 3.48% setahun (2018: 2.68% setahun).

5) DEPOSIT JANGKA PENDEK

	2019 RM	2018 RM (Dinyatakan Semula)
Opus Shariah Cash Extra Fund:		
Jumlah Unit	-	600,378
NIlai Pasaran	-	618,810

Deposit jangka pendek mempunyai tempoh matang 12 bulan dan memperoleh faedah pada Kadar Deposit Jangka Pendek. Purata Wajaran Kadar Faedah Berkesan pada 31 Disember 2018 adalah pada kadar 1.03% setahun.

6) AKAUN BELUM TERIMA BAGI URUS NIAGA PERTUKARAN

	2019 RM	2018 RM (Dinyatakan Semula)
Akaun Belum Terima	7,379	3,693,687
Tolak:Peruntukan Hutang Ragu	-	(64,905)
	7,379	3,628,782

Akaun Belum Terima tidak dikenakan faedah dan secara umumnya tempoh yang terlibat dari satu (1) hari ke 30 hari. Akaun Belum Terima diiktiraf pada Nilai Saksama semasa pengiktirafan awal. Amaun dijangka boleh pulih dalam masa 12 bulan, akan diiktiraf pada amaun invois asal. Jika tidak, ia akan diiktiraf pada Nilai Kini amaun invois asal.

Analisis pengumuran akaun belum terima adalah seperti berikut:

	2019 RM	2018 RM (Dinyatakan Semula)
Tidak melebihi tempoh dan tidak terjejas	6,250	174
1 hingga 3 bulan	729	864,850
3 hingga 12 bulan	-	2,821,863
Lebih dari 12 bulan	400	6,800
	7,379	3,693,687
Terjejas	-	(64,905)
	7,379	3,628,782

Pergerakan di dalam peruntukan hutang ragu adalah seperti berikut:

	2019 RM	2018 RM
Baki pada 31 Disember	-	64,905

7) AKAUN BELUM TERIMA LAIN

	2019 RM	2018 RM (Dinyatakan Semula)
Pendahuluan Kakitangan	3,617	8,703
Mahathir Science Award Foundation (MSAF)	-	500,000
Faedah Terakru	133,204	846,945
Pendapatan Terakru	-	500
Cukai Barangan dan Perkhidmatan Belum Terima	-	341,367
	136,821	1,697,515

8) HARTANAH, LOJI DAN PERALATAN

	Pada 01 Januari 2019 RM (Dinyatakan Semula)	Tambahan RM	Pelupusan/ Pengkelasan RM	Pada 31 Disember 2019 RM
PADA NILAI KOS				
Bangunan	3,399,000	-	-	3,399,000
Kenderaan	477,148	-	-	477,148
Peralatan Pejabat	881,831	17,752	-	899,583
Komputer	334,000	107,242	(55,228)	386,014
Ubahsuai Pejabat	3,851,640	-	-	3,851,640
	8,943,619	124,994	(55,228)	9,013,385

	Pada 01 Januari 2019 RM (Dinyatakan Semula)	Tambahan RM	Pelupusan/ Pengkelasan RM	Pada 31 Disember 2019 RM
SUSUT NILAI TERKUMPUL				
Bangunan	135,960	67,980	-	203,940
Kenderaan	471,854	5,288	-	477,142
Peralatan Pejabat	833,554	25,220	-	858,774
Komputer	246,298	43,130	(50,214)	239,214
Ubahsuai Pejabat	3,651,925	30,714	-	3,682,639
	5,339,591	172,332	(50,214)	5,461,709

	Pada 31 Disember 2019 RM
AMAUN BAWAAN BERSIH	
Bangunan	3,195,060
Kenderaan	6
Peralatan Pejabat	40,809
Komputer	146,800
Ubahsuai Pejabat	169,001
	3,551,676

8) HARTANAH, LOJI DAN PERALATAN (SAMBUNGAN)

	Pada 01 Januari 2018 RM (Dinyatakan Terdahulu)	Tambahan RM	Pelupusan/ Pengkelasan RM	Pada 31 Disember 2018 RM (Dinyatakan Semula)
PADA NILAI KOS				
Bangunan	3,399,000	-	-	3,399,000
Kenderaan	477,148	-	-	477,148
Peralatan Pejabat	888,460	24,319	(30,948)	881,831
Komputer	484,933	37,904	(188,837)	334,000
Ubahsuai Pejabat	3,732,914	118,726	-	3,851,640
	8,982,455	180,949	(219,785)	8,943,619

	Pada 1 January 2018 RM (Dinyatakan Terdahulu)	Tambahan RM	Pelupusan/ Pengkelasan RM	Pada 31 December 2018 RM (Dinyatakan Semula)
SUSUT NILAI TERKUMPUL				
Bangunan	67,980	67,980	-	135,960
Kenderaan	440,116	31,738	-	471,854
Peralatan Pejabat	795,750	68,747	(30,943)	833,554
Komputer	395,676	37,050	(186,428)	246,298
Ubahsuai Pejabat	3,630,811	21,114	-	3,651,925
	5,330,333	226,629	(217,371)	5,339,591

	Pada 31 Disember 2018 RM (Dinyatakan Semula)
AMAUN BAWAAN BERSIH	
Bangunan	3,263,040
Kenderaan	5,294
Peralatan Pejabat	48,277
Komputer	87,702
Ubahsuai Pejabat	199,715
	3,604,028

9) KERJA DALAM KEMAJUAN

	2019 RM	2018 RM
Geran Tambahan - *One-off*	500,000	-
Perbelanjaan	(21,526)	-
Baki pada 31 Disember	478,474	-

ASM menerima peruntukan geran tambahan one-off daripada MESTECC bagi pembaikan bumbung ASM di Jalan Tun Ismail. Peruntukan geran ini diterima pada suku keempat 2019 dan dijangka selesai pada tahun 2020.

10) AKAUN BELUM BAYAR BAGI URUS NIAGA PERTUKARAN

	2019 RM	2018 RM (Dinyatakan Semula)
Pemiutang Institusi	905,128	1,022,505
Pemiutang Lain-lain	18,750	242,475
Peruntukan Yuran Audit	18,619	8,563
Faedah Dana *Research, Development and Commercialisation (R,D&C)*	-	3,642,461
	942,497	4,916,004

ASM telah dilantik sebagai Agensi Pemantau Projek (PMA) bagi projek *Research, Development and Commercialization (R,D&C)* sejak 29 Disember 2011. Sebagai PMA, ASM bertanggungjawab membuat bayaran peruntukan penyelidikan dan pembangunan (R&D) mengikut pencapaian projek berdasarkan kelulusan Kementerian. Projek R,D&C ini telah selesai pada tahun 2018 dan baki peruntukan telah dipulangkan kepada Kerajaan pada 4 Julai 2019.

ASM meletakkan dana ini dalam simpanan tetap dan faedah yang dijana telah diasingkan dan milik Kerajaan.

11) PERUNTUKAN MANFAAT PEKERJA

	2019 RM	2018 RM (Dinyatakan Semula)
Pada 01 Januari - (Seperti yang Dinyatakan Terdahulu)	200,655	378,385
Pelarasan Tahun Lalu	-	(207,078)
Baki pada 01 Januari - (Seperti yang Dinyatakan Semula)	200,655	171,307
Tambah: Peruntukan Tahun Semasa	237,644	297,767
Tolak: Pembayaran Tahun Semasa	(185,318)	(121,219)
Tolak: Pelarasan	-	(147,200)
Pada 31 Disember	252,981	200,655

	2019 RM	2018 RM (Dinyatakan Semula)
Liabiliti Semasa	229,395	178,837
Liabiliti Bukan Semasa	23,586	21,818
	252,981	200,655

12) SUMBANGAN

	2019 RM	2018 RM (Dinyatakan Semula)
Baki pada 01 Januari	245,202	171,856
Tambahan	98,233	73,346
Perbelanjaan	(6,050)	-
Baki pada 31 Disember	337,385	245,202

Pecahan sumbangan adalah seperti berikut:

	2019 RM	2018 RM (Dinyatakan Semula)
Dana Utama	140,930	118,110
Program Pembangunan Bakat	35,193	32,591
Program Kesedaran Sains	5,300	5,300
ArtScience	90,151	69,200
Program Pembangunan Ilmu Sains	5,011	5,001
Program Pembangunan Kelestarian	15,000	15,000
S&T Based Start-ups	800	-
Penerbitan	32,000	-
Program Saintis Muda	13,000	-
	337,385	245,202

ASM menerima derma daripada ahli ASM dan bukan ahli untuk pelaksanaan pelbagai program. Sumbangan yang diberi adalah secara sukarela berdasarkan kekerapan sama ada secara bulanan, tahunan atau *one-off*. Sumbangan adalah berdasarkan objektif yang khusus di mana ASM bertanggungjawab melaksanakan program tersebut apabila mencapai nilai yang mencukupi.

13) PENDAPATAN TERTUNDA

	2019 RM	2018 RM (Dinyatakan Semula)
Baki pada 01 Januari	867,295	608,953
Tambahan	1,931,363	1,688,729
Pelunasan ke Penyata Prestasi Kewangan Perbelanjaan	(1,350,184)	(1,430,387)
Perlunasan Hasil	(10,091)	-
Baki pada 31 Disember	1,438,383	867,295

Pecahan pendapatan tertunda adalah seperti berikut:

	2019 RM	2018 RM (Dinyatakan Semula)
ASM		
ASEAN *Young Scientists Network*	48,697	-
2019 *CCM STEM Up Challenge*	-	-
ISC ROAP	1,389,686	867,295
	1,438,383	867,295

Pendapatan tertunda adalah peruntukan yang diterima daripada pihak bukan Kerajaan Malaysia, dan ianya merangkumi geran antarabangsa atau geran daripada sesuatu firma korporat atau organisasi. ASM adalah terikat dengan terma rujukan dan tempoh pelaksanaan program seperti yang dihuraikan dalam perjanjian atau surat lantikan.

14) GERAN TERTUNDA

	2019 RM	2018 RM (Dinyatakan Semula)
Baki pada 01 Januari - (Seperti yang Dinyatakan Terdahulu)	47,182,050	48,499,882
Pelarasan Tahun Lalu	-	(532,376)
Baki pada 01 Januari - (Seperti yang Dinyatakan Semula)	47,182,050	47,967,506
Tambahan	7,498,227	9,029,816
Pelarasan (Lebihan Baki Program)	(1,479,550)	(81,395)
Pemulangan Peruntukan	(40,603,135)	(750,000)
Pelunasan ke Penyata Prestasi Kewangan Perbelanjaan	(1,984,419)	(8,983,877)
Baki pada 31 Disember	10,613,173	47,182,050

Geran tertunda adalah peruntukan yang diterima daripada Kerajaan Malaysia bagi suatu objektif yang khusus. ASM adalah terikat dengan terma rujukan dan tempoh pelaksanaan program seperti yang dihuraikan dalam perjanjian atau surat lantikan.

Geran tertunda dianalisis seperti berikut:

	2019 RM	2018 RM (Dinyatakan Semula)
Liabiliti Bukan Semasa	10,613,173	47,182,050
	10,613,173	47,182,050

14) GERAN TERTUNDA (SAMBUNGAN)

Pecahan peruntukan geran tertunda adalah seperti berikut:

	2019 RM	2018 RM (Dinyatakan Semula)
ASM		
Study on Rare Earth	-	207,707
MOSTI *Social Innovation* – Duta Sains	-	203,542
Project Monitoring Team	-	260,174
Newton Ungku Omar Fund (NUOF)	3,484,360	4,279,486
National Policy on Science, Technology and Innovation (NPSTI)	-	504,972
Science Technology and Innovation Master Plan (STIMP)	-	435,528
Program Penyelidikan Antartika Kebangsaan dan Program Antarabangsa	-	1,016
Ekspedisi Saintifik	-	96,898
Program *Nobel Laureate Kebangsaan* dan *Scientific Advancement Grant Allocation* (SAGA)	-	561
Kajian Impak Pelaksanaan Universiti Penyelidikan	23,350	553,336
Kajian Separuh Penggal Pelan Pembangunan Pendidikan 2015 – 2025 (Pendidikan Tinggi)	19,620	597,886
Dasar Keusahawanan Negara	3,541	-
Task Force Sg Kim Kim	94,369	-
ASEAN *Foresight Alliance*	8,983	-
Malaysian Collaborative Network Platform for Disruptive Innovation (i-CONNECT)	3,988,807	-
Malaysia Open Science Platform (MOSP)	991,475	-
Review & Update Study on Environmental Quality Act	1,998,668	-
Research, Development & Commercialization Fund	-	40,040,944
	10,613,173	47,182,050

15) GERAN TERTUNDA - PEJABAT ANTARABANGSA

	2019 RM	2018 RM (Dinyatakan Semula)
Baki pada 01 Januari	1,664,872	1,488,238
- (Seperti yang Dinyatakan Terdahulu)		
Hasil	2,505,000	2,334,548
Pelunasan ke Penyata Prestasi Kewangan		
Perbelanjaan	(2,580,127)	(2,157,914)
Baki pada 31 Disember	1,589,745	1,664,872

Geran tertunda dianalisis seperti berikut:

	2019 RM	2018 RM (Dinyatakan Semula)
Liabiliti Bukan Semasa	1,589,745	1,664,872
	1,589,745	1,664,872

15) GERAN TERTUNDA - PEJABAT ANTARABANGSA (SAMBUNGAN)

International Science Council Regional Office for Asia and the Pacific (ISC ROAP)

	2019 RM	2018 RM (Dinyatakan Semula)
Baki pada 01 Januari	864,019	812,865
- (Seperti yang Dinyatakan Terdahulu)		
Hasil	1,000,000	871,083
Pelunasan ke Penyata Prestasi Kewangan		
Perbelanjaan	(867,785)	(819,929)
Baki pada 31 Disember	996,234	864,019

International Science Council (ISC) memainkan peranan di peringkat global sebagai pemangkin dan mengadakan persidangan kepakaran saintifik, memberi nasihat dan input mengenai isu-isu yang menjadi keutamaan sains dan masyarakat. ISC telah dilancarkan pada 2018 berikutan penggabungan International Council for Science (ICSU) yang telah ditubuhkan pada 1931, dan International Social Science Council (ISSC) yang telah ditubuhkan pada 1952.

ISC ROAP (sebelum ini dikenali sebagai ICSU ROAP) dihos oleh Kerajaan Malaysia bermula 19 September 2006 berikutan perjanjian lima (5) tahun antara Kerajaan Malaysia dan ISC (sebelum ini dikenali sebagai ICSU). Peruntukan operasi ditanggung oleh Kerajaan Malaysia manakala peruntukan program ditanggung oleh ISC. Perjanjian kali ketiga akan tamat pada 18 September 2021.

International Science, Technology & Innovation Centre (ISTIC)

	2019 RM	2018 RM (Dinyatakan Semula)
Baki pada 01 Januari	800,853	675,373
- (Seperti yang Dinyatakan Terdahulu)		
Hasil	1,505,000	1,463,465
Pelunasan ke Penyata Prestasi Kewangan		
Perbelanjaan	(1,712,342)	(1,337,985)
Baki pada 31 Disember	593,511	800,853

ISTIC merupakan pusat UNESCO kategori II yang dihos oleh Kerajaan Malaysia sejak 26 Mac 2009 (dilancarkan pada 22 Mei 2008). ISTIC ditubuhkan untuk membangunkan dan melaksanakan program kerjasama dengan negara-negara selatan dalam bidang sains dan teknologi dengan tujuan untuk memudah cara integrasi pendekatan pembangunan di dalam sains dan teknologi dan dasar inovasi di peringkat nasional; meningkatkan keupayaan dalam sains dan teknologi dengan memberikan nasihat dasar dan pertukaran pengalaman dan amalan terbaik; dan mewujudkan rangkaian pusat-pusat kecemerlangan penyelesaian masalah di negara-negara membangun serta menyokong pertukaran pelajar, penyelidik, saintis dan teknologis di kalangan negara-negara membangun.

ISTIC dihos oleh Kerajaan Malaysia untuk tempoh lima (5) tahun berdasarkan perjanjian antara Kerajaan Malaysia dan UNESCO dan perjanjian ketiga akan tamat pada 7 September 2021. Kos operasi dan program adalah ditanggung oleh Kerajaan Malaysia.

16) URUS NIAGA BUKAN PERTUKARAN

	2019 RM	2018 RM (Dinyatakan Semula)
Geran Mengurus	5,879,871	5,558,292
Geran Tambahan	4,795,783	3,759,000
	10,675,654	9,317,292
Geran Program	1,182,849	2,871,045
Pelunasan Hasil Geran Tertunda	1,984,420	8,983,876
Pelunasan Hasil Geran Tertunda – Pejabat Antarabangsa	2,580,127	2,157,914
Pelunasan Pendapatan Tertunda	1,350,184	1,430,387
Pelunasan Sumbangan	6,050	-
Lain-lain Hasil:		
Caj Sewaan Pejabat	82,000	55,000
Bayaran Balik Program Antarabangsa	-	172,871
Kutipan Majlis Makan Malam	400	10,500
Lebihan Baki Projek	31,089	356,900
	17,892,773	25,355,785

17) URUS NIAGA PERTUKARAN

	2019 RM	2018 RM (Dinyatakan Semula)
Pemulangan Deposit	-	168,590
Caj Pengurusan Program	-	330,000
Faedah Akaun Semasa	18,037	6,890
Faedah Simpanan Tetap	512,308	1,051,436
Hutang Lapuk Pulih Semula	2,300	-
Bayaran Balik GST	33,900	-
Lain-lain Hasil	91,816	48,176
	658,361	1,605,092

18) GAJI DAN UPAHAN

	2019 RM	2018 RM (Dinyatakan Semula)
Kakitangan Tetap:	549,976	418,256
Gaji dan Upahan	168,527	155,311
Elaun-elaun Tetap	40,160	30,223
Sumbangan Berkanun Untuk Kakitangan	3,149	10,844
Elaun Lebih Masa Kakitangan	9,694	26,949
Faedah Kewangan Yang Lain	771,506	641,583

Kakitangan tetap ASM adalah merupakan kakitangan perkhidmatan awam yang mengisi waran perjawatan JPA. Pembayaran gaji, upah dan bayaran kenaan tetap adalah mengikut Pekeliling Perkhidmatan Bil 1/2016.

19) PERKHIDMATAN DAN BEKALAN

	2019 RM	2018 RM (Dinyatakan Semula)
Perbelanjaan Pengurusan Pentadbiran	1,288,425	1,240,999
Emolumen Kakitangan Kontrak	3,856,849	3,823,493
Komunikasi Sains	208,936	116,938
Hal Ehwal Keahlian	505,946	466,106
	5,860,156	5,647,536

Perkhidmatan dan Bekalan merupakan perbelanjaan operasi ASM yang merangkumi Perbelanjaan Pengurusan Pentadbiran yang melibatkan perbelanjaan pengurusan fasiliti, teknologi maklumat, kewangan dan akaun, The HUB dan perbelanjaan bagi jawatankuasa dan badan bertindak ASM. Selain itu, gaji dan upahan bagi kakitangan kontrak ASM adalah dilantik mengikut Pekeliling Perkhidmatan Bil 2/2008. Pembayaran gaji, upah dan bayaran kenaan tetap adalah mengikut Pekeliling Perkhidmatan Bil 1/2016.

20) PERBELANJAAN PROGRAM SAINS

	2019 RM	2018 RM (Dinyatakan Semula)
Perbelanjaan Geran Tertunda		
Project Monitoring Team R,D&C	-	48,048
Newton Ungku Omar Fund (NUOF)	929,355	6,981,254
National Policy on Science, Technology and Innovation (NPSTI)	161,122	348,956
Science Technology and Innovation Master Plan (STIMP)	238,434	367,248
Research, Development & Commercialization Fund (R,D&C)	-	748,340
Dasar Sains Teknologi dan Inovasi Negara (*DSTIN Flagship*)	-	448,529
Program MCCE - MOSTI	-	2,000
Bibliometrik	-	28,000
ASEAN *Journal*	-	5,000
Kajian Impak Pelaksanaan Universiti Penyelidikan	283,318	2,127
Kajian Separuh Penggal Pelan Pembangunan Pendidikan 2015 – 2025 (Pendidikan Tinggi)	159,493	4,374
Dasar Keusahawanan Negara	55,775	
Minggu Sains Negara 2019	75,576	-
Task Force Sg Kim Kim	19,280	-
ASEAN *Foresight Alliance*	41,017	-
Malaysian Collaborative Network (i-Connect)	11,193	-
Malaysia Open Science Platform (MOSP)	8,525	-
Review & Update Study on Environmental Quality Act	1,332	-
	1,984,420	8,983,876
Perbelanjaan Geran Tertunda - Pejabat Antarabangsa		
International Science Council Regional Office for Asia and the Pacific (ISC ROAP)	867,785	819,929
International Science, Technology & Innovation Centre (ISTIC)	1,712,342	1,337,985
	2,580,127	2,157,914
Perbelanjaan Pendapatan Tertunda		
ISC ROAP	1,293,160	1,430,387
2019 CCM *STEM Up Challenge*	23,267	-
ASEAN *Young Scientists Network*	33,757	-
	1,350,184	1,430,387
Aktiviti Jaringan Kerjasama dan Kecemerlangan Sains	157,535	3,674,776
	6,072,266	16,246,953

Program Sains adalah aktiviti-aktiviti yang dilaksanakan oleh ASM bagi memenuhi 14 fungsi ASM seperti yang dinyatakan dalam Akta Akademi Sains Malaysia 1994.

21) PEMBERIAN DAN KENAAN BAYARAN TETAP

	2019 RM	2018 RM (Dinyatakan Semula)
Kelab Sukan dan Kebajikan	25,000	25,000
Pencen	67,696	47,274
Sumbangan/Langganan Antarabangsa	41,535	30,050
	134,231	102,324

22) MANFAAT KAKITANGAN

	2019 RM	2018 RM (Dinyatakan Semula)
Gantian Cuti Rehat Kakitangan Tetap	1,768	16,213
Gantian Cuti Rehat Kakitangan Kontrak	25,727	3,758
Ganjaran Kakitangan Kontrak	210,149	162,623
	237,644	182,594

23) PERBELANJAAN - PERBELANJAAN LAIN

	2019 RM	2018 RM (Dinyatakan Semula)
Yuran, Insurans, Cukai, Duti Setem	15,256	86,652
Pembalikan Faedah Terakru	846,945	-
Hutang Lapuk	500,000	-
	1,362,201	86,652

24) SEWAAN

	2019 RM	2018 RM (Dinyatakan Semula)
Sewaan Bangunan	1,143,667	1,088,431
Sewaan Ruang Simpanan	18,340	18,240
Sewaan Tempat Letak Kenderaan	23,400	20,577
Sewaan Alat Kelengkapan Elektrik	4,248	-
Sewaan Alat Kelengkapan Pejabat	62,340	68,773
	1,251,995	1,196,021

25) CUKAI

	2019 RM	2018 RM
Cukai Korporat:		
Terkurang Peruntukan Tahun Semasa	214,676	-
Pembayaran Cukai	15,279	-
Peruntukan Tahun Semasa	229,955	-
Pembayaran Cukai Tahun Lalu	44,201	-
Cukai	274,156	-

26) SUMBER MANUSIA

ASM mempunyai pegawai dan kakitangan tetap, kontrak dan peminjaman. Operasi ASM diuruskan oleh pegawai dan kakitangan ASM. Jumlah kakitangan ASM pada 31 Disember 2019 adalah seramai 75 orang (2018: 73) seperti berikut:

	2019 RM	2018 RM
Kakitangan Tetap:		
Kumpulan Pengurusan Tertinggi	1	1
Kumpulan Pengurusan dan Profesional	2	2
Kumpulan Pelaksana	6	6
Kakitangan Kontrak:		
Kumpulan Pengurusan dan Profesional	46	45
Kumpulan Pelaksana	20	19
Jumlah Keseluruhan Kakitangan:		
Kumpulan Pengurusan Tertinggi	1	1
Kumpulan Pengurusan dan Profesional	48	47
Kumpulan Pelaksana	26	25
	75	73

27) PIHAK PENGURUSAN TERTINGGI

Kepimpinan ASM diterajui oleh Majlis ASM yang dipengerusikan oleh Presiden. Majlis ASM menentukan hala tuju ASM dan menetapkan dasar ASM. Semua keputusan Majlis ASM dilaksanakan oleh Pengurusan ASM yang diketuai oleh Ketua Pegawai Eksekutif (KPE). KPE merupakan Pegawai Pengawal ASM dan mempunyai kuasa dan tanggungjawab untuk merancang, mengarah, melaksana dan mengawal aktiviti-aktiviti ASM. KPE melaporkan prestasi dan status semua aktiviti kepada Majlis ASM.

	2019 RM	2018 RM
Ahli Majlis:		
Jumlah Elaun Ahli Majlis	37,500	31,250
Ahli Jawatankuasa Kewangan:		
Jumlah Elaun	11,200	6,400
Ahli Jawatankuasa Exco:		
Jumlah Elaun	2,500	2,500
Kakitangan Pengurusan Utama:		
Manfaat Jangka Pendek	243,764	234,385
	294,964	274,535

Ahli Majlis adalah seramai 16 orang terdiri daripada Presiden dan Ahli Majlis Biasa. Manakala ahli Jawatankuasa Kewangan ASM adalah terdiri daripada Bendahari Kehormat dan 8 ahli biasa.

28) PENGURUSAN RISIKO KEWANGAN

i. Objektif dan Polisi Risiko Pengurusan Kewangan
Dasar pengurusan risiko kewangan ASM bertujuan untuk memastikan bahawa terdapatnya sumber kewangan yang mencukupi untuk pembangunan perniagaan, menguruskan risiko kredit, tukaran asing dan kecairan. ASM beroperasi di bawah garis panduan yang telah ditetapkan dengan jelas yang diluluskan oleh ASM dan dasar ASM adalah untuk tidak melibatkan ASM dalam urusniaga spekulatif.

ii. Risiko Kredit
Risiko kredit atau risiko pihak ketiga gagal membayar, dikawal dengan penerapan tatacara kelulusan kredit, had dan pengawasan yang ketat. Risiko kredit diminimumkan dan diawasi secara ketat dengan menghadkan kerjasama ASM dengan rakan perniagaan yang mempunyai kepercayaan kredit yang tinggi. Penghutang diawasi secara berterusan melalui tatacara pelaporan pengurusan ASM.

Bagi wang tunai dan baki di bank, simpanan tetap dan deposit jangka pendek, ASM mengurangkan risiko kredit dengan berurusan secara eksklusif dengan institut kewangan yang mempunyai penarafan kredit yang tinggi.

iii. Risiko Kadar Faedah
Risiko kadar faedah adalah risiko bahawa nilai wajar atau aliran tunai masa hadapan bagi instrumen kewangan ASM akan berubah-ubah kerana perubahan dalam pasaran kadar faedah.

iv. Risiko Kecairan
Risiko kecairan dan aliran tunai adalah risiko bahawa ASM akan menghadapi kesukaran dalam memenuhi kewajipan kewangan oleh kerana kekurangan dana. Pendedahan ASM kepada risiko kecairan wujud daripada perbezaan dalam kematangan aset kewangan dan liabiliti kewangan. Jadual di bawah menunjukkan profil kematangan liabiliti ASM pada tarikh laporan berdasarkan obligasi pembayaran semula tanpa diskaun kontrak.

ASM mengurus risiko kecairan dan aliran tunai dengan memastikan tunai yang mencukupi dan menyediakan dana yang cukup bagi memenuhi komitmen daripada perbelanjaan operasi dan liabiliti kewangan.

	Kurang Tempoh Setahun RM	Lebih Tempoh Setahun RM	Jumlah
Pada 31 Disember 2019			
Akaun Belum Bayar Bagi Urus Niaga Pertukaran	-	-	-
Pada 31 Disember 2018			
Akaun Belum Bayar Bagi Urus Niaga Pertukaran	4,916,004	-	4,916,004

v. Nilai Saksama
Nilai dibawa tunai dan kesetaraan tunai, belum terima dan belum bayar adalah menyamai nilai saksamanya kerana tempoh matangnya yang pendek.

29) ASET LUAR JANGKA

	2019 RM	2018 RM
Tidak Bercagar		
Jaminan yang diberikan:		
Urus Niaga palsu yang dilakukan oleh bekas pekerja	1,688,475	1,688,475
	1,688,475	1,688,475

Pada tahun 2018, pihak Akademi Sains Malaysia (ASM) telah mengambil tindakan undang-undang terhadap seorang pekerja di atas kesalahan pecah amanah dan penipuan transaksi yang dilakukan oleh beliau dan telah disabitkan di bawah Bahagian Sivil di Mahkamah Tinggi Malaya di Kuala Lumpur.

Beliau diarahkan untuk membayar ganti rugi sebanyak RM1,688,475 kepada ASM di atas kesalahan yang dilakukan. Memandangkan kemungkinan ketidakmampuan beliau untuk membayar ganti rugi tersebut, ASM telah dinasihati oleh Mahkamah Tinggi Malaya di Kuala Lumpur untuk memfailkan status bankrap (kebankrapan) terhadap beliau. Justeru itu, permintaan untuk mengeluarkan notis kebankrapan telah dipohon oleh ASM pada 30 Ogos 2018. Sebarang pembayaran yang dilakukan oleh beliau selepas disahkan bankrap akan terus dibuat ke Jabatan Insolvensi.

Tiada peruntukan dinyatakan di dalam penyata kewangan ASM. Bagaimanapun, kos undang - undang berkaitan telah diakrukan ke dalam penyata kedudukan kewangan.

30) NOTA BAGI PENYATA PERBANDINGAN BAJET DAN SEBENAR

Bajet ASM telah diluluskan dan dibentangkan atas asas tunai bagi tempoh kewangan 1 Januari 2019 sehingga 31 Disember 2019. Bajet asal telah diluluskan oleh Kementerian Tenaga, Sains, Teknologi, Alam Sekitar dan Perubahan Iklim (yang dikenali sebagai MESTECC) melalui surat MESTECC.400-4/1/5(22) bertarikh 23 Januari 2019. Peruntukan tambahan pula telah dibuat kepada bajet yang telah diluluskan oleh Kementerian Kewangan Malaysia (MOF) melalui surat MOF.NBO.600-9/1/176 JLD.2(21) bertarikh 6 September 2019. Peruntukan tambahan ini telah dimasukkan ke dalam bajet asal oleh ASM setelah menerima kelulusan untuk menutup bajet akhir. Pada tahun 2019, ASM mencatat tambahan peruntukan berjumlah RM4,675,653.76 yang mendapat kelulusan daripada MOF dan MESTECC.

31) PELARASAN TAHUN LALU DAN ANGKA BANDINGAN

Pelarasan tahun lalu diiktiraf disebabkan oleh pemakaian dan pematuhan beberapa piawaian MPSAS. Sepanjang tahun kewangan juga, ASM telah mengkelaskan semula angka perbandingan untuk mematuhi pembentangan tahun kewangan semasa. Justeru, kesan dalam penyata kewangan adalah seperti berikut:

	Dinyatakan Terdahulu RM	Pelarasan RM	Klasifikasi RM	Dinyatakan Semula RM
31 Disember 2018				
Penyata Kedudukan Kewangan				
ASET				
Aset Semasa				
Tunai dan Kesetaraan Tunai	53,451,178	-	(53,451,178)	-
Wang Tunai dan Baki di Bank	-	-	1,154,784	1,154,784
Simpanan Tetap	-	-	51,677,584	51,677,584
Deposit Jangka Pendek	-	-	618,810	618,810
Akaun Belum Terima	3,693,687	-	(64,905)	3,628,782
Aset Semasa Lain/ Akaun Belum Terima Lain	785,665	846,945	64,905	1,697,515
Aset Bukan Semasa				
Hartanah, Loji dan Peralatan	395,570	3,208,458	-	3,604,028
LIABILITI				
Liabiliti Semasa				
Pemiutang/ Akaun Belum Bayar	4,836,324	79,680	-	4,916,004
Manfaat Kakitangan	240,689	(61,852)	-	178,837
Sumbangan	-	-	245,202	245,202
Pendapatan Tertunda	-	867,295	-	867,295
Liabiliti Bukan Semasa				
Manfaat kakitangan	137,696	(115,878)		21,818
Geran Tertunda	48,499,882	(1,317,832)		47,182,050
Geran Tertunda - Pejabat Antarabangsa	-	1,664,872	-	1,664,872
ASET BERSIH/ EKUITI				
Kumpulan Wang Pengurusan	4,428,897	-	(4,428,897)	-
Kumpulan Wang Amanah	245,202	-	(245,202)	-
Kumpulan Wang Projek	1,906,813	-	(1,906,813)	-
Kumpulan Wang Rezab Modal	54,590	-	(54,590)	-
Lebihan Terkumpul	-	915,125	6,390,300	7,305,425
	118,676,193	6,086,813	-	124,763,006

31) PELARASAN TAHUN LALU DAN ANGKA BANDINGAN (SAMBUNGAN)

	Dinyatakan Terdahulu RM	Pelarasan RM	Klasifikasi RM	Dinyatakan Semula RM
31 Disember 2018				
Penyata Prestasi Kewangan				
HASIL				
Urusniaga Bukan Pertukaran	25,111,969	(906,099)	1,149,915	25,355,785
Urusniaga Pertukaran	211,381	846,945	546,766	1,605,092
Lain-lain Hasil	1,328,055	(1,030)	(1,327,025)	-
PERBELANJAAN				
Perkhidmatan dan Bekalan	6,545,803	-	(898,266)	5,647,536
Pemberian dan Kenaan Bayaran Tetap	3,660,573	-	(3,558,249)	102,324
Manfaat Kakitangan	329,794	(147,200)	-	182,594
Perbelanjaan - perbelanjaan Lain	282,643	-	(195,991)	86,652
Perbelanjaan Program Sains	12,450,496	3,796,457	-	16,246,953
Sewaan	-	-	1,196,021	1,196,021
Susut Nilai Hartanah, Loji dan Peralatan	198,410	28,219	-	226,629
	50,119,123	3,617,292	(3,086,829)	50,649,586

AKADEMI SAINS MALAYSIA

2019 ANNUAL REPORT

SCAN TO READ THE
DIGITAL VERSION
OF THIS REPORT.

THOUGHT LEADER ’19

This report is the primary source of information about ASM. It provides a simple yet comprehensive overview of our achievements as well as financial and non-financial milestones for the year 2019. This annual report highlights our engagements with internal and external stakeholders. Our initiatives, partnerships and strategies as well as our future goals are presented to demonstrate our credibility as a think tank. We aim to strengthen the trust of our stakeholders through various strategic input and ideas.

CONCEPT

The lightbulb has long been a symbol of ideas. The lightbulb shape populated with keywords such as “brilliant”, ”innovation”, and ”creative thinking” signifies ideas that are the manifestation of said positive values and many more within.

The colour yellow was selected for its optimism, enlightenment and creativity, aligning well with ASM’s goal of bringing Malaysia’s STI landscape to greater heights.

The selection of an informal and playful typeface reflects the dynamic and youthful energy that ASM possesses.

Written and designed by the Academy of Sciences Malaysia

CONTENT

WHO WE ARE

ASM strives to be the nation's Thought Leader for matters related to Science, Technology and Innovation (STI).

ASM is committed to pursuing excellence in the fields of Science, Engineering and Technology (SET) for the benefit of all.

WHAT WE DO

ASM supports good science by endorsing activities of highest fulfilment to promote engagement, understanding and literacy in science, technology and innovation.

Taking science outside its box is often a delightful journey that leads us to interesting new directions filled with various types of engagements with people. At the end of the day, it is ASM's commitment to enhance the scientific capacity of the country.

FLAGSHIP STI STRATEGIC STUDIES & POLICY ADVISORY
Advisory Reports & Position Papers | Roadmap & Blueprint Development | Futures Thinking & Foresighting | National / Sectoral Policy | Review & Formulation | STI Due Diligence & Decision Intelligence | Rapid Response on Matters of National & International Importance

INITIATIVES & PARTNERSHIPS
Expert-driven Studies | Science Communication, Enculturation & Engagements | STI Capacity Building | Awards, Grants and Recognitions | STI Strategic Linkages

INTERNATIONAL NETWORK
National Member in SCA, AASSA, IAP, APEC, ASEAN, TWAS | Young Scientist Programmes – CERN & Lindau | Bidding International Grants – ASEAN & APEC

SCIENCE COMMUNICATION
Publications | ASM Science Journal | Corporate Communication | Public Relations | Media Engagements | Curation & Visualisation of Data

PILOT PROJECTS
i-Connect - Malaysian Collaborative Network for Innovation | Malaysia Open Science Platform (MOSP)

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 SET in Malaysia
- Assisting in upgrading technological capabilities of Malaysian industrial sectors
- Promoting public awareness in understanding of science
- Enhancing international networking and collaborations
- Producing scientific publications

Strategies

- Harnessing scientific minds to charter STI direction for the country
- Fostering culture of excellence in SET
- Ensuring independent, authoritative and timely STI input
- Promoting the utilisation and application of science for societal well-being
- Facilitating the implementation of innovation-led economy strategy

Stakeholders

Internal
Fellows | Associates | Members of Young Scientists Network (YSN-ASM) | Top Research Scientists Malaysia (TRSM)

External
Government of Malaysia | Agencies | Industry | Research Institutions | Higher Learning Institutions | STI Professional Bodies | International STI Organisations | Communities at Large

Client Charter

- Provide independent, evidence-based, reliable and timely advice
- Committed to initiating quality programmes towards developing a strong STI foundation for the nation
- Represent Malaysia and its scientific community at the international arena
- Disseminate scientific knowledge

DEAR READERS

Professor Dato' Dr Asma Ismail FASc

PHOTO CREDIT :
THE PRESTIGE
MALAYSIA MAGAZINE

PRESIDENT'S FOREWORD

ON THE EVE OF OUR SILVER JUBILEE

What a year it has been! I am very excited to continue my second term as the President of the Academy of Sciences Malaysia (ASM) – known for its leading role in science and technology sector, championing emerging technologies and sustainable future.

Throughout the Academy's history, while every year brings new challenges, we consistently work hard to achieve our goals. 2019 followed that precedent. Our programmes are expanding, more organisations are reaching out to us for consultative studies, our global presence is becoming more significant, and our expert network is expanding.

The work of ASM extends far beyond the cutting-edge areas of science. This year, we continued to provide our reliable and timely advice to the Government. We have participated in close to 430 meetings and workshops to understand our changing world and its trends, for a sustainable future. In our efforts to identify new ways to respond to the needs of the nation, ASM strives to enhance the national innovation ecosystem for wealth creation and societal well-being.

Aside from carrying out the mandate as the Government advisor in matters related to science and technology, the Academy has also been championing STEM-based programmes to promote greater interest among the youth. We also ensure that educators are better equipped to teach STEM subjects. Why the emphasis on STEM? Because the future demands it. In the global race for innovation, healthy economy, and sustainability, STEM is no longer just subjects in classroom. They are now more important than ever as we evolve into a more technology and innovation dependent world.

In 2019, we have elected 27 of Malaysia's leading scientists, engineers and technologists as new Fellows and welcomed nine Top Research Scientists Malaysia. Heartfelt congratulations to all, in particular to Academician Emeritus Professor Dato' Dr Khalid Yusoff FASc, for the appointment as ASM Senior Fellow. Our fellows actively contributed to the Academy's studies and policy matters, public outreach programmes, awards and funding, international activities and activities related to STEM.

At the same time, we continue to work closely with our international strategic partners to increase the flow of people and ideas among research environment. As science and technology progress, international collaboration is more important now than ever. Our active involvement and significant impact have enabled us to position ourselves on the same level as other scientific institutions.

IT BEGINS WITH MAKING CONNECTIONS

Collaboration is a powerful tool. It is the connections we form with others, and the different ways we collaborate that will help us grow to a new level. I personally believe there has never been a better time to collaborate. As the saying goes,

> "if you want to go fast, go alone; but if you want to go far, go together."

Finally, I would like to thank all those who have supported ASM through the many collaborations formed and engagements had, as well as the donations received, and input given. We certainly could not have achieved all of these without the supporters who wish to see science and technology as a vital component in shaping Malaysia's future.

- Watch the 2020 Presidential Address during the 25th Annual General Meeting here
- Read the full text

COUNCIL MEMBERS

1) PROFESSOR DATUK DR ASMA ISMAIL FASc
President (2019-2022)
Medical and Health Sciences

2) YM ACADEMICIAN TENGKU DATUK DR MOHD AZZMAN SHARIFFADEEN FASc
Vice-President (2018-2020)
Information Technology and Computer Sciences

3) DATUK PROFESSOR DR AWG BULGIBA AWG MAHMUD FASc
Secretary General (2019-2021)
Medical and Health Sciences

4) DATUK DR ABDUL RAZAK MOHD ALI FASc
Honorary Treasurer (2019-2021)
Science & Technology Development and Industry

ORDINARY COUNCIL MEMBERS (2018-2020)

5) IR DR AHMAD FAIZAL MOHD ZAIN FASc
Engineering Sciences (2018-2020)

6) PROFESSOR DR AHMAD ISMAIL FASc
Biological, Agricultural and Environmental Sciences (2018-2020)

7) ACADEMICIAN TAN SRI DATO' IR TS AHMAD ZAIDEE LAIDIN FASc
Engineering Sciences (2019-2021)

8) PROFESSOR DATIN PADUKA SETIA DATO' DR AINI IDERIS FASc
Biological, Agricultural and Environmental Sciences (2019-2021)

9) PROFESSOR DATO' DR AISHAH BIDIN FASc
Social Sciences and Humanities (2018-2020)

10) IR TS CHOO KOK BENG FASc
Science & Technology Development and Industry (2019-2021)

11) DR HELEN NAIR FASc
Biological, Agricultural and Environmental Sciences (2019-2021)

12) ACADEMICIAN EMERITUS PROFESSOR DATO' DR KHALID YUSOFF FASc
Medical and Health Sciences (2018-2020)

13) PROFESSOR DATIN PADUKA DR KHATIJAH MOHD YUSOFF FASc
Biological, Agricultural and Environmental Sciences (2019-2021)

14) EMERITUS PROFESSOR DR PHANG SIEW MOI FASc
Biological, Agricultural and Environmental Sciences (2019-2021)

15) PROFESSOR DR SHAMALA DEVI K.C. SEKARAN FASc
Medical and Health Sciences (2019-2021)

16) PROFESSOR DATO' DR MOHD ALI HASSAN FASc
Environmental Biotechnology (2019-2021)

2019 BY THE NUMBERS

EXPERT NETWORK

376 FELLOWS OF THE ACADEMY OF SCIENCES MALAYSIA

27 SENIOR FELLOWS

8 DISCIPLINE GROUPS

- Information Technology & Computer Sciences
- Biological, Agricultural & Environmental Sciences
- Engineering Sciences
- Science & Technology Development Industry
- Medical & Health Sciences
- Mathematics, Physics & Earth Sciences
- Chemical Sciences
- Social Sciences & Humanities

10 MSAF LAUREATES

166 TRSM RECIPIENTS

170 YSN-ASM NETWORK

40 ASSOCIATES

STRATEGIC INPUT

4 **STI REPORTS:**
Rare Earth Industry
Precision Medicine
Water Demand Management
Halal Sciences

2 **SPECIAL INTEREST GROUPS:**
Hydrogen Economy
Machine Learning

7 **PARTNER-SHIPS:**
Key National Studies

1 **FLAGSHIP STUDY:**
Science Outlook 2020

INITIATIVES & ACTIVITIES

278 DISCOURSES

37 STAKEHOLDER ENGAGEMENTS

11 KNOWLEDGE SHARING SESSIONS

2 PILOT PROJECTS

1 INITIATIVE

1 FLAGSHIP PROGRAMME

6 PUBLICATIONS

26,109 TOTAL READERSHIP

24 ARTICLES IN THE **ASM SCIENCE JOURNAL**
+6 Special Issues

MEDIA COVERAGE & OUTREACH

157 ONLINE & PRINT NEWS

53,395 SOCIAL MEDIA COMMUNITY

12 ISSUES OF (NEWSLETTER) ASM FOCUS

STRATEGIC INPUT FOR ROBUST STI ECOSYSTEMS

As we pursue our aspirations, we are ever-mindful of our purpose to address the needs of the nation by harnessing science, technology and innovation (STI) for socio-economic impact. This is intrinsic to our commitment to provide strategic input to policymakers, the scientific community, industry captains and community leaders to lay the foundation for reimagining our future and contribute to society in meaningful ways.

Being analytically rigorous, unbiased in the assessment of the evidence and responsive to changes is part of our work culture. Spanning a wide range of topics under the banner of STI Ecosystem & Governance, Emerging Technologies & Futures Thinking, Sustainability Science and Socio-economics, we analyse the data and synthesise the findings to give rise to insights and recommendations that are credible and responsible.

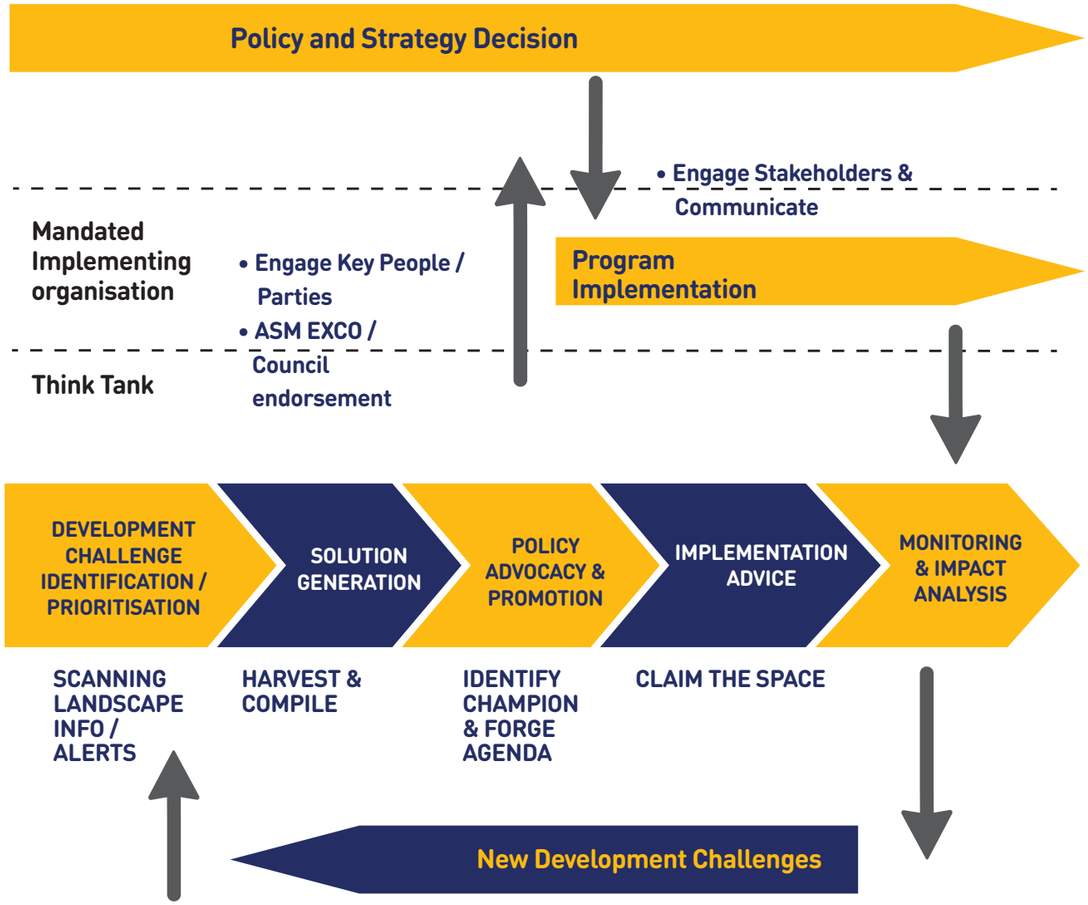
Our priority has always been to provide credible, timely and relevant input on STI related issues of national interest and international importance. Our input is based on multisectoral feedback, futuristic outlook and approaches that transcend conventional discipline boundaries. We package and communicate our input to policymakers, legislators, industry leaders and people at large. Let the quality and quantity speak for themselves.

Here at ASM, we are a team. Every individual, from the subject matter expert to the analyst, plays an important role interdependently. We tap on more than 700 brilliant minds of the nation for their expertise on emerging challenges. We connect what we learn globally to adapt and adopt to our local needs. Collaboration, engagement and diversity of thought lie at the core of how we work.

74 PUBLICATIONS TO DATE ON STI-RELATED ISSUES

OUR VALUE CHAIN FOR IMPACT

Policy and Strategy Development- Activity Value Chain & Process Flow



Source: YM Academician Datuk Dr Tengku Mohd Azzman Shariffadeen FASc, 2015

RARE EARTH ELEMENTS: A NEW ECONOMIC OPPORTUNITY?

Malaysia is in an advantageous position to participate in the global rare earth industry value chain as it has all the building blocks for a robust ecosystem. As the country's high technology industry continues to develop and expand, a secure supply of Rare Earth (RE) raw material is critical. As such, the development of the upstream and downstream of rare earth industries will be an advantage to Malaysia.

The creation and establishment of these multi-billion-dollar industries in Malaysia would augur well for the continuous development of its human capital (from mining to processing to manufacturing) as well as contributing to the national Gross Domestic Product (GDP).

Lynas Advanced Material Plant (LAMP) has been operating since 2012. It was once the hottest environmental debate in Malaysia and continues to raise mixed reactions among Malaysians. The Malaysian Cabinet decided for LAMP's operating licence to be extended provided several stipulated conditions are met.

LAMP, being the only significant producer of rare earth (RE) outside of China, produces lanthanides, the name for a group of 17 elements crucial in the production of high-end industries of batteries, computers, televisions, magnets and smartphones.

» • Read the full report

PRECISION MEDICINE

ASM's Precision Medicine Initiative for Malaysia was initiated in September 2017. This Task Force is chaired by Professor Datuk Dr A Rahman A Jamal FASc and has nine active members. This initiative aims to study the feasibility of mainstreaming precision medicine to complement the current clinical practice.

Precision medicine is an emerging approach but fast gaining popularity for accurate disease treatment and prevention strategies. It is an approach towards disease prevention, diagnosis and treatment that seeks to maximise effectiveness by considering individual variability in genes, environment and lifestyle. Precision medicine is seen to provide high-value healthcare by improving outcomes while decreasing the cost of treatment.

Malaysia's rich ethnic diversity is a gold mine of rich and diverse genomic data which is much sought-after by pharmaceutical companies the world over. Such diverse genetic information holds great potential of predictive analytics for much-targeted treatments which is fundamental for precision medicine.

The Task Force has mapped the landscape of individual initiatives in Malaysia and is of the opinion that a National level initiative must be in place for a much-concerted effort. This is to safeguard the genetic data and better manage the access to this gold mine for more impactful research and development (R&D) as well as international collaborations. As such, a solid legal and regulatory framework is also needed to be in place supported by updated and relevant Acts such as the Personal Data Protection Act specific for human genetic data.

ASM Task Force on Precision Medicine: Public Engagement Workshop was organised in November 2019 to gather the views of the stakeholders representing the quadruple helix of the benefits of introducing precision medicine to complement conventional medical services. The Task Force's findings will be translated into a position paper which upon the approval of STIPAC will be discussed with the Ministry of Health with the aim to position precision medicine as one of the key areas for Malaysia to focus on over the next five years through the 12th Malaysia Plan (RMKe-12).

STRATEGIES TO ENHANCE WATER DEMAND MANAGEMENT IN SARAWAK

When the ASM Task Force on Water Demand Management conducted a workshop in Sarawak for the Study on Water Demand Management for Malaysia back in 2014, the Sarawak State Government requested for an exclusive report from ASM. Due to declining unregulated flow and decreasing water quality, there is an urgent need for the shift from the currently practised supply-driven management approach to a more sustainable demand management approach.

The study noted that Sarawak has a good water governance structure, but further improvements could be made to manage water resources sustainably. The key recommendations of the report are as follows:

- Adopt a more comprehensive definition of water demand management
- Develop an Integrated Water Demand Management Plan
- Strengthen public participation through formal stakeholders platform that is linked to the Sarawak Water Resources Council
- Establish a dedicated Agriculture Water Services Organisation
- Develop a Water-Energy-Food Nexus model for water management that would also take into consideration water for ecosystem/environment

Findings from the draft of the final report were tabled to the Sarawak Water Resources Council chaired by the Sarawak State Secretary, and the presentation was well-received. The potential water savings with WDM is significant and offers tremendous benefits, especially in terms of freshwater availability that is already under threat in certain regions of the country. The savings in water demands provides relief for water availability not only to the people, but economic and environmental needs.

THE BOOMING HALAL INDUSTRY

One might think of 'halal' as just being a set of Islamic rules about food and drink, but the global halal industry is an ecosystem by itself which incorporates everything from medicines, cosmetics, fashion and many other industries.

Malaysia is currently one of the key players in the global halal market with the country's halal exports is projected to hit USD12 billion by 2020 (The Malaysian Reserve, 2019). For Malaysia's halal industry to accelerate this growth and become a global halal hub, STI must be leveraged upon. Advancement STI has driven the proliferation of halal ingredients in products in processed food, pharmaceuticals, cosmetics, personal care and more. This is reflected in the standards practised by companies that produce halal products and services which require employees to have a background in Halal Sciences.

The ASM Task Force on the Science of Halal Initiative is led by Academician Tan Sri Dato' Ir Ts Ahmad Zaidee Laidin FASc. This Task Force has developed a position paper which highlights the need to establish an enabling ecosystem supported by national policies and strategies that address the opportunities and challenges of the global halal industry and how to leverage on STI to support the industry. The key recommendations are:

- To empower the *Majlis Halal Malaysia* to oversee the development of the nation's overall Halal agenda, including research for Halal Sciences. The *Majlis Halal Malaysia* should be supported by a think tank for Halal Sciences comprising policymakers, scientists and industry representatives to identify the niche and priority areas of halal-related research.
- The Halal Sciences think tank should create and manage a dedicated fund to support Halal Sciences research, from basic research to experimental development. It is proposed that the Halal Science think tank work closely with the *Majlis Halal* Malaysia to secure funding sources from both local and international bodies (for example Organisation of Islamic Cooperation- OIC and Islamic Development Bank- IDB) for research projects.
- Halal Sciences research consortiums should be supported to encourage local scientists to work together and coordinate the talents, resources and facilities. A database of Halal Scientists, their expertise and research publications should be developed to facilitate networking and collaborative efforts, improve visibility to both the scientific community as well as the relevant stakeholders and act as a reference point for all Halal Science researchers.
- Platforms such as the Malaysian Collaborative Network for Disruptive Innovation (i-Connect), should be supporting local halal small and medium sized entreprises (SMEs) to digitalise their operations and encourage collaborative R&D with local universities on Halal Sciences.

UNFOLDING A NEW CHAPTER: SIGs

We have embarked on establishing Special Interest Groups (SIGs) to explore emerging, cross-cutting areas of importance to Malaysia in terms of realising economic growth, societal advancement, competitiveness, future focus and sustainability. SIGs are expert-driven and proactive in bridging the gap between the generators and users of knowledge to forge collaborative and transformative action so Malaysia can be ahead of the curve.

HYDROGEN ECONOMY

Green growth is gaining traction in the quest for a more sustainable society. Similar to countries across the globe, Malaysia is committed to a low-carbon energy future. This prompted ASM to establish a Special Interest Group on Hydrogen Economy, helmed by Professor Dato' Ir Dr Wan Ramli Wan Daud FASc. This SIG has developed a holistic, evidence-based position paper outlining the opportunities and challenges for Malaysia to venture into hydrogen economy.

A complete supply chain of hydrogen economy, from hydrogen production, storage and transportation to applications, was discussed. The most feasible hydrogen technologies for Malaysia, such as electrolysers and fuel cells, were highlighted. Action plans were proposed for the 12th Malaysian Plan and beyond to build a conducive ecosystem for Hydrogen Economy in Malaysia. Four key aspects of the ecosystem, i.e. governance, public and market acceptance, technical and human capital readiness as well a finance readiness were addressed.

MACHINE LEARNING

Chaired by YM Academician Tengku Datuk Dr Mohd Azzman Shariffadeen FASc, the ASM Special Interest Group on Machine Learning (SIGML) was tasked to formulate a position paper on the important role that AI will play in Malaysia's development and proposed key recommendations, based on Malaysia's economic strengths and data gaps, that will take the nation on a fast trajectory of adoption and deployment.

The position paper calls for the following overarching recommendations to build an enabling data ecosystem for homegrown AI solutions which are:

1. To call for a strategic National STI-focused AI Roadmap to shift Malaysia to a new way of looking at knowledge through AI for economic and social benefits.
2. To propose the establishment of a National AI Committee to coordinate all national level STI related AI projects under the auspices of the National Science Council.
3. To institute a national Data Czar role and data governance framework to ensure an enabling data ecosystem for enhanced accessibility to non-sensitive public and private data towards value creation.
4. To establish an "AI Makerspace" that would leverage existing collaborative platforms to develop homegrown AI solutions in the four identified focus areas: (i) Smart Cities, (ii) Digital Manufacturing, (iii) Precision Agriculture & (iv) Connected Healthcare
5. To equip Malaysia's talent pool to have competencies and skill sets to deploy AI technology and applications.

STRATEGIC PARTNERSHIP FOR KEY NATIONAL STUDIES

MALAYSIA POLICY AND MASTER PLAN ON STI

This journey started with ASM being mandated to review the National Policy on Science, Technology and Innovation (NPSTI) 2013-2020 and formulate the new NPSTI 2021-2030 by MOSTI (then known as Ministry of Energy, Science, Technology, Environment and Climate Change). This was in line with the Government's aspiration to ensure Malaysia becomes a developed country through the mainstreaming of STI. Alongside this, ASM was also tasked to develop the Malaysia Science, Technology & Innovation Master Plan (STIMP) 2020-2030. This was deemed necessary for national-level coordination and effective implementation of all policies related to STI towards leveraging STI opportunities for socio-economic impact.

Recognising that STI is a vital driver for Malaysia to thrive as a progressive, harmonious, prosperous and sustainable nation, we went a step further to harmonise and integrate the findings and recommendations of the NPSTI (2021-2030) and the STIMP (2020-2030). This culminated in a single, seamless Policy and Mater Plan on STI (2021-2030) to forge national level synchronisation, collaboration and efficient mobilisation of resources.

7 Strategic Thrusts

22 Strategies

40 Policy Measures

89 Initiatives

97 Indicators

10 Grand Policy Takeaways

WHAT CAN WE DO ABOUT TRANSBOUNDARY POLLUTION?

Transboundary pollution is pollution that originates from one country but crosses the border, causing damage to the environment of another country. It has detrimental impact on the health and economy of the ASEAN countries over the past decades. Particularly, the persistent haze episodes imply that the diplomatic effort is reaching stagnancy. This urged the Malaysian Government to consider a legal approach to push for the progress of mitigating the transboundary pollution. Extraterritorial application of an act is inevitable and is nothing short of challenging.

As an appointed strategic partner of MESTECC, ASM formed a task force to study the feasibility of having a Local and Transboundary Pollution Act, chaired by Professor Dato' Ir Dr A. Bakar Jaafar FASc. On 20 December 2019, the task force successfully presented the findings to the Minister of MESTECC, delivering the justification for having a transboundary pollution act, as well as proposing crucial mechanisms that would enable effective law enforcement.

REVIEW OF THE ENVIRONMENTAL QUALITY ACT 1974

The Review of the Environmental Quality Act 1974 (EQA1974) was commissioned by the Ministry of Environment and Water (previously Ministry of Energy, Science, Technology, Environment and Climate Change) and commenced in November 2019.

ASM was seen as a suitable strategic partner due to the vast knowledge and experience of internationally recognised ASM Fellows and other members of ASM's expert network. ASM was tasked to identify gaps and provide recommendations to strengthen the existing law. The Steering Committee helmed by Academician Professor Emeritus Tan Sri Dr Zakri Abdul Hamid FASc is committed to address pertinent issues such as the weak implementation of the law, the lack of transparency and access to information and fragmented environmental governance.

Provisions for climate change, circular economy and public participation are also proposed towards shifting current environmental management from a reactive to the precautionary approach. ASM is confident that the value-added inputs of experts will fortify the environmental law to be not only comprehensive but state of the art. The Ministry and relevant agencies are looking into the necessary processes to seeing the updated law take effect. When we get there, it will catapult Malaysia to the forefront of environmental legislation in the global arena.

MID-TERM REVIEW OF MALAYSIA EDUCATION BLUEPRINT 2015-2025 (HIGHER EDUCATION)

To assess the Malaysia Education Blueprint 2015-2025 (Higher Education)'s effectiveness and the implementation of its programmes, the Ministry of Education (MOE) (following the merging of the Ministry of Education and the Ministry of Higher Education in 2018) mandated ASM to analyse and evaluate the current achievement and significant impacts of the strategies and initiatives under the MEB(HE). The study encompassed a review of the 10 transformational shifts where they were found to be very much relevant to mould Malaysia's education landscape today. Among many things, MEB (HE) envisions producing job creators rather than job seekers. As such, our talent development, especially in terms of entrepreneurial mindset and start-up skills needs to be strengthened. The review also recognises that the education system should be streamlined across all levels to allow continuous improvement and knowledge development in preparing graduates for the future.

ASM ANALYTICS:
Based on IMD World Talent Ranking 2018, Malaysia ranked **22nd out of 63 countries**. However, we ranked **99 out of 137 in "Start-up Skills"**, a sub-component of the Global Entrepreneurship Index 2018.

AN IMPACT STUDY ON THE IMPLEMENTATION OF THE MALAYSIAN RESEARCH UNIVERSITIES

Malaysia had entrusted five of its most established universities namely Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM), Universiti Sains Malaysia (USM), Universiti Putra Malaysia (UPM) and Universiti Teknologi Malaysia (UTM) to spearhead R&D activities for the nation. Called the Malaysian Research Universities (MRUs), these universities are important catalysts for transforming Malaysia into a regional and global centre of educational and research excellence and a testbed for leading global industries to undertake innovative R&D activities. ASM was commissioned by the MOE to carry out an impact assessment of the implementation of these MRUs.

The study reports that MRUs have performed well when compared to other universities of similar nature and age. Our MRUs have the right building blocks in place, which have contributed to the significant improvements in their global positioning over the years. Consistent support from the external environment such as funding, regulations and incentives will allow the MRUs to continuously reinforce and reenergise their research ecosystem to enhance their competitiveness as well as translate their findings to spur key sectors of the economy and contribute to nation-building. The study's findings have provided a launchpad for the creation of the national framework to synergise national planning and implementation in developing Malaysia's key socio-economic sectors driven by science and technology.

ASM ANALYTICS:
Since 2013, Malaysia has **120,000 Research Publications** and **39%** are high impact but ranked **71 out of 129 countries** in 'Knowledge Creation', a sub-component of the Global Innovation Index in 2019

NATIONAL ENTREPRENEURSHIP POLICY

ASM as a strategic partner to the Ministry of Entrepreneur Development and Cooperatives, MEDAC (previously Ministry of Entrepreneur Development) have developed the National Entrepreneurship Policy (NEP) 2030. Through this policy, MEDAC hopes to chart the direction towards creating a holistic, conducive and inclusive entrepreneurship ecosystem to support the socio-economic agenda of the country. The long-term plan outlines five objectives, five targets, 19 strategies and 62 initiatives that will be implemented to develop an entrepreneurial ecosystem across all industry areas and encompass every level of entrepreneurs and communities.

According to the National Economic Census (2016), the largest proportion of business establishments (BEs) in Malaysia are made up of small and medium enterprises (SMEs) which accounts for 98.5% (907,065) of the total BEs. From this, 76.5% (693,670) comprises of micro-enterprises, 21.2% (192,783) as small enterprises and the remaining 2.3% (20,612) are medium enterprises. The NEP aspires to position Malaysia as an entrepreneurial nation by 2030 with various provisions including to instil technological and innovative elements for value-added products and services, ensuring competitiveness while increasing the prospects of growth and business opportunities. The NEP calls upon an effective collaboration, established coordination, commitment and support from all stakeholders as drivers to catalyse Malaysia's growth forward to escape the middle-income trap and become an economic axis in Asia and globally with equitable distribution and inclusivity for all Malaysians.

ASM ANALYTICS: Malaysia ranked **58 out of 137 countries** in the Global Entrepreneurship Index 2018 but recorded lowest scores for **Technology Absorption (9%), Product Innovation (12%), and High Growth (13%).**

TASK FORCE ON SUNGAI KIM KIM & PASIR GUDANG INCIDENTS

The incidents of Sungai Kim Kim and Pasir Gudang triggered a nationwide awareness on the poor state of our chemical governance and uncontrolled industrial growth that had posed danger to the community. Malaysians witnessed our first major case of chemical pollution that led to the closure of all schools in Pasir Gudang.

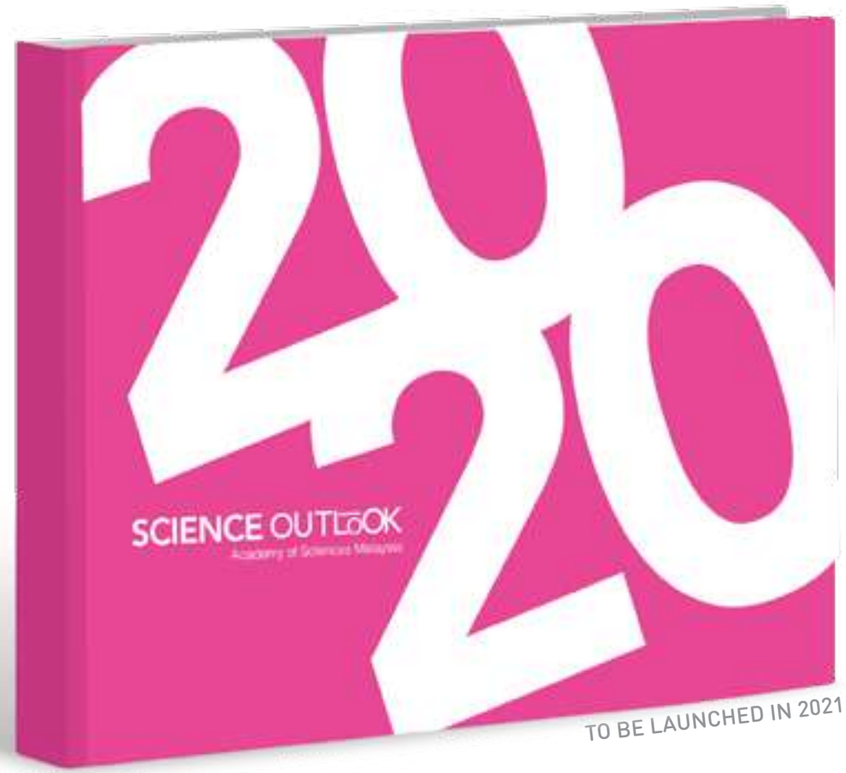
In order to provide a holistic recommendation to the government, ASM established the Task Force on Sg Kim Kim and Pasir Gudang incidents, chaired by Professor Dato' Ir Dr Wan Ramli Wan Daud FASc. Within six weeks, the Task Force convened four times, held a site visit to Pasir Gudang and presented the final report to the YB Minister of MESTECC and YAB Menteri Besar Johor.

Recommendations:

1. A revised safety buffer zone in line with the findings by the Loading Analysis and Carrying Capacity study in Pasir Gudang presented by a group of academicians and government agencies to Johor state government and the then MESTECC.
2. The use of Gas Chromatograph/Mass Spectrometer (GCMS) with flame ionisation detectors (FID) and photoionisation detectors (PID) to be stationed at Pasir Gudang. The Ministry purchased 25 automatic gas detectors (GCMS PID) to be stationed at Pasir Gudang for a real-time alert system.
3. Establishment of a new Department of Environment office in Pasir Gudang for better enforcement and monitoring.

30 YEARS OF STI DEVELOPMENT: MEASURING ECONOMIC, SOCIETAL AND ENVIRONMENTAL IMPACT

Science Outlook 2020 is a Special Edition as this edition would examine the current and past status of the STI landscape in Malaysia over the last 30 years, since the inception of Vision 2020. It aims to evaluate the progress and development of STI in Malaysia through the perspective of economic, societal and environmental impacts.



More people are acknowledging the necessity of mastering STEM skills, thus creating more opportunities for us to show why STEM is important (and can be fun too)!

STEM are subjects at the very heart of ASM. We know first-hand the importance of educating our young people in these areas. Our country needs a constant supply of highly trained, highly capable talent. Through our STEM-related programmes, we aim to equip future generations with the skills to lead the future we desire one day.

Our country is facing a shortage of suitably qualified STEM graduates. ASM aims to inspire young people to pursue careers in STEM and ASM has responded by creating a national science programme called National Science Challenge (NSC), which exposes the youths to the complex and creative thinking. We aim to encourage more than one hundred thousand young people to join the programme by 2020.

Whether through empowering STEM educators, introducing initiatives or partnering with leading education organisations, ASM is committed to inspiring and preparing youth to pursue STEM careers.

DEVELOPING LOCAL TALENTS IN FORESTRY AND BIODIVERSITY AREAS

The exceptional richness of biodiversity in Borneo forests offers tremendous opportunities R&D towards conserving, protecting and managing the priceless heritage. This living lab can provide an avenue for Malaysia to train, nurture and develop local talents among young scientists as well as harnessing local experts in the field of forestry and biodiversity towards strengthening country's capacity and capability in this fields.

In its efforts to develop talents and enhancing local capacity and capability in forestry and biodiversity areas, ASM has been collaborating with Sabah Foundation (SF) since 2006 in bridging and bringing scientists from Malaysian institutions and institutes to perform expedition and research in Sabah forests. Since 2016, ASM is entrusted to develop and implement scientific research programmes for Imbak Canyon named as Imbak Canyon Rainforest Research and Training Programme (ICRRTP).

An exploratory visit to Imbak Canyon Conservation Area (ICCA) was held from 17 – 20 February 2019 by ASM Task Force on ICRRTP. Through this visit, the current opportunity for research in ICCA, as well as facilities that available in the Imbak Canyon Studies Centre, were explored for ICRRTP. Among the identified potential research areas for ICRRTP as follows:

1. Genomics and informatics-based assessment of biodiversity status
2. Corridor connectivity and landscape changes
3. Ecosystem change, biodiversity and health
4. Hydrogeomorphological and watershed management
5. Climate change

MALAYSIA CODE OF RESPONSIBLE CONDUCT IN RESEARCH (MCRCR)

The Malaysian Code of Responsible Conduct in Research (MCRCR) is an initiative to complement and value-add all the efforts of consolidating research and science in Malaysia over the years. The MCRCR is a statement that Malaysian researchers and research entities are committed to integrity and accountability in their pursuit of science.

The MCRCR has been adopted and endorsed by the National Science Council in 2017. Its formulation had been in consultation with various relevant parties such as universities, research institutions, Ministries, research funders, governmental agencies, NGOs, individual researchers and legal authorities. Since its inception, there has been a number of discussions, workshops and training sessions involving ministries, research entities, research management and individual researchers. One of the main achievements of MCRCR is the development of the MCRCR Course and Assessment in 2018. The course was implemented in January and August 2019 with the researchers from UiTM. From 80 participants, 75 passed the assessment.

Committee on Research Integrity (CRI), ASM (2019)

- Objective: to facilitate, coordinate and monitor the implementation of the code

Chair:
Academician Emeritus Professor Dato' Dr Khalid Yusoff FASc

- Members:
  - MESTECC
  - MOE
  - Ministry of Health
  - ASM
  - Academy of Medicine Malaysia
  - UPM
  - UM
  - UKM
  - UCSI University

NATIONAL SCIENCE CONSORTIUM

NATIONAL CENTRE FOR PARTICLE PHYSICS (NCPP)

As a centre that facilitates scientific collaboration in particle physics, NCPP is instrumental as a focal point for the development of new knowledge in theoretical high energy and particle physics as well as collaboration with international experiments and research centres.

The centre has led national exploration in experimental particle physics research through the engagement in impactful theoretical physics research as well as high energy and particle physics efforts with international centres of excellence (COEs).

NCPP is collaborating and actively sending researchers to four prominent international COEs:

- Compact Muon Solenoid (CMS) European Organization for Nuclear Research (CERN), Geneva, Switzerland
- Deutsches Elektronen-Synchrotron (DESY), Hamburg, German
- High Energy Accelerator Research Organization (KEK), Tsukuba, Japan
- Osaka University, Osaka, Japan

In 2019, NCPP organised two scientific and capacity building programmes for undergraduates and researchers:

- **National School of Particle Physics (25 – 27 February 2019)**
  A platform for local undergraduates to participate in comprehensive and hands-on learning on particle physics, conducted by experts from various top research centres for particle physics in the world. Three participants from this programme were selected as Malaysian participants for the 2019 CERN Summer Student Programme (CSSP) in Geneva.

- ***Konferens Zarah & Daya 2019* (31 October 2019)**
  The conference was jointly organised with UKM and *Agensi Nuklear Sains* in conjunction with the International Nuclear Science, Technology and Engineering Conference (iNUSTEC2019). Professor Albert De Roeck, a prominent expert from CERN, delivered a plenary talk at the conference.

MALAYSIA INSTITUTE FOR INNOVATIVE NANOTECHNOLOGY (NanoMITe)

A global research consortium consisting around 100 top-level nano-scientists from the world-class academic institutions and centers, Malaysia Institute for Innovative Nanotechnology (NanoMITe) provides tremendous resources for carrying out high-impact research in different domains of nanotechnology. The concerted efforts of scientific community across the globe in this consortium helps train the young generation to translate technological solutions into entrepreneurial platforms.

NanoMITe has implemented 19 projects under five flagship areas:

Energy

Wellness, Medical and Healthcare

Food and Agriculture

Electronics, Devices and Systems

Environment

In 2019, NanoMITe organised the NanoMITe Annual Symposium & Nanotechnology Malaysia Annual Symposium 2019 (NANOSYM 2019) from 21-22 August 2019. NANOSYM 2019 serves as a premier gathering platform for nanotechnologists with the leading academic experts in the field of nanotechnology. NanoMITE researchers presented the progress of their projects in this consortium.

DEVELOPING AND HARNESSING STI TALENT

Extending its reach in the southern region, ASM via the Southern Chapter organised the ASM Merdeka Meeting in collaboration with the Merdeka Award Secretariat.

The 2nd ASM Merdeka Meeting was organised with the theme "Science for a Greater Nation: Wisdom of the Past, Quest of the Future". A total of 61 young scientists and distinguished experts attended the Meeting. Covering both academics and commercialisation components, the meeting equipped the young scientists with the necessary knowledge and skills for the future STI development. The Meeting consists of four specially developed activities; Keynote Lecture, Merdeka Lecture, Merdeka Roundtable Dialogue, and Masterclasses with the Merdeka Award Laureates and guest experts from the industry.

7 Distinguished Experts involved in the 2nd ASM Merdeka Meeting

1. **Professor Dr Abdul Latif Ahmad FASc**
   2014 Merdeka Award recipient
   (Outstanding Scholastic Achievement)

2. **Professor Datuk Dr Ahmad Fauzi Ismail FASc**
   2014 Merdeka Award recipient
   (Outstanding Scholastic Achievement)

3. **Academician Emeritus Professor Tan Sri Dato' Sri Dr Zakri Abdul Hamid FASc**
   2015 Merdeka Award recipient
   (Environment)

4. **Dato' Dr Gan Ee Kiang**
   2018 Merdeka Award recipient
   (Health, Science and Technology)

5. **Professor Datuk Dr Mohd Hair Bejo FASc**
   2018 Merdeka Award recipient
   (Health, Science and Technology)

6. **Dato' Norhalim Yunus**
   CEO, Malaysian Technology Development Corporation

7. **Dr Mohd Faizal Sedaralit**
   Head, (Delivery Hydrocarbon Recovery Technology), Group Research & Technology, PETRONAS Holding Bhd

• View the photo gallery
• Read the media coverage

BOOST YOUR ROOT "STEM"

Industry and government collaboration in championing STEM reached another level with the second edition of CCM STEM Up Challenge. Consistent with the objective in amplifying STEM talent in the country, CCM and ASM embarked on a new exciting format of this competition spearheaded by YSN-ASM.

Taking place in Sungai Petani, Kedah, the competition was held in conjunction with Minggu Amanah Saham Negara 2019. 48 secondary school students in Sungai Petani competed in a preliminary quiz. The top 20 schools were then invited to compete in the semi-final round which comprises the Amazing Science Challenge (Biology, Physics and Chemistry) and #MyLabRules.

Preliminary quiz
17-21 March 2019

Final round
24 April 2019

Best project in #MyLabRules

Sekolah Menengah Kebangsaan Ibrahim

Overall Champion

Maktab Rendah Sains MARA Merbok

• View the photo gallery
• Read our coverage of the event

SILICON VALLEY VISIT - SEARCHING STEM TALENT IN YOU

The winners of the NSC 2018 shared their experience and knowledge that they gained during their study visit to Silicon Valley. The programme aimed to increase their interest and subsequently pursue a career in STEM.

Academician Tan Sri Dr Salleh Mohd Nor FASc interacted with the students at the "Being a Scientist is Awesome" session. During the programme, the students were challenged to apply STEM concepts creatively by building a car using recycled items during the "**30 Minutes STEM Challenge - Make It Move!**".

• View the photo gallery

INSPIRING INNOVATION AMONG COUNTRIES IN THE SILK ROAD ECONOMIC BELT

ASM and CAST came together for the third time to participate in the Belt and Road Teenager Maker Camp and Teacher Workshop. Malaysia was represented by the three winners of 2018 Young Makers from MRSM Transkrian, accompanied by two supervisors.

The students were paired with their international counterparts to complete one of the eight different projects. They were assessed in terms of teamwork, presentation and best maker. All three Malaysian representatives brought home gold medals in each assessment. The accompanying delegation also presented the industry-academia-community collaboration during the Science Education Forum.

Nanning, China

SEPT
24-30
2019

34 participating countries

8 Team Projects

• Read our coverage of the event

AWARDS & GRANTS

MAKNA CANCER RESEARCH AWARD

Cancer research is essential in identifying the causes of cancer and develop the strategies for cancer prevention, diagnose and treatment. Thus far, the technology to cure cancer has become more advanced and Malaysian young researchers' findings are promising in driving the latest technology forward. To encourage Malaysian young researchers to find a cure for cancer, MAKNA consistently provides a funding opportunity.

The ASM expert network contributes its expertise to MAKNA in selecting deserving Malaysian young researchers with a research grant to support their research.

Every year, MAKNA has allocated RM90,000,00 to be awarded to three researchers.

2001-2019

57 Total Projects

Total Grant Awarded : RM1,641,410

DR RANJEET BHAGWAN SINGH MEDICAL RESEARCH GRANT

Researchers have harnessed science to generate solutions in ensuring a longer, healthier life and provide cure for diseases. Realising the power of science and the importance of supporting the researchers towards success, the late Dr Ranjeet Bhagwan Singh dedicated a portion of his wealth towards providing researchers a grant to supplement their research.

- **2018 Grant Recipient**
  Dr Hairul Aini Hamzah, IIUM
  Infectivity assessment of occult hepatitis C virus in primary peripheral blood mononuclear cells towards understanding of occult hepatitis C infection transmission

NEWTON-UNGKU OMAR FUND (NUOF)

The fund aims to develop a research network among the multi- and inter-disciplinary researchers through the integration of STI knowledge that addressing socio-economic issues in Malaysia and UK. The Malaysian Government has collaborated in implementing NUOF since 2015. Activities of the fund range from:

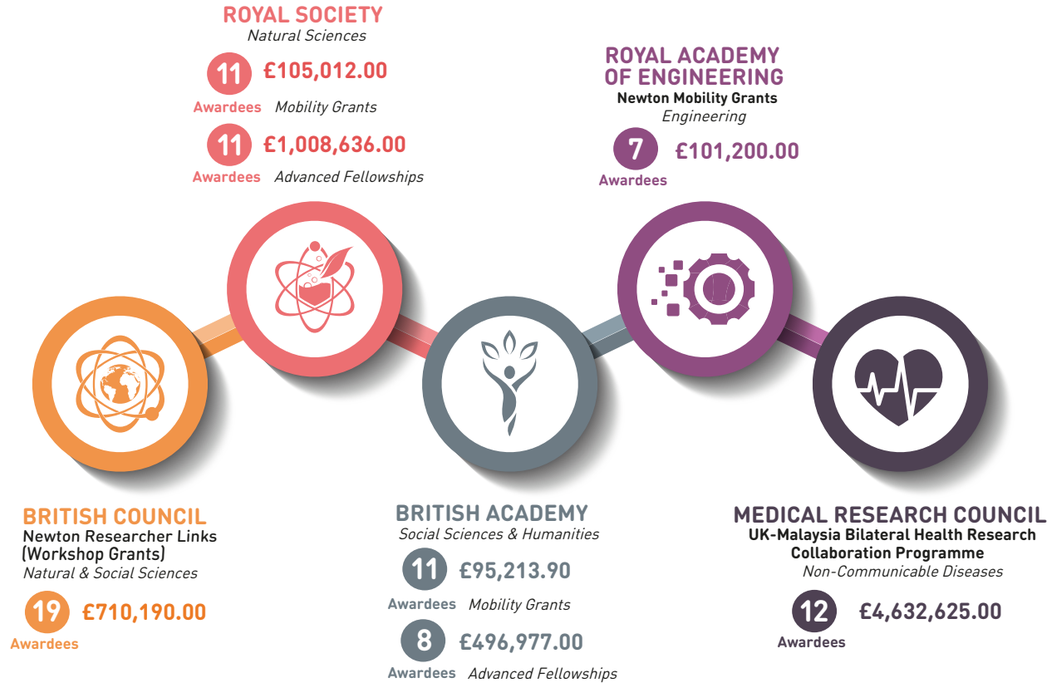
a) Growing capacities of the Malaysian science and innovation community through fellowships, mobility schemes and joint centers.

b) Forging research collaborations on development topics.

c) Establishing innovation partners and challenge funds to develop innovative solutions on development topics.

Throughout the four years of its collaboration, ASM as one of the local delivery partners of NUOF has implemented several NUOF programmes in collaboration with five prominent UK delivery partners.

NUMBER OF GRANTS AND TOTAL AMOUNT AWARDED IN 2019



DELIVERY PARTNERS . PROGRAMMES . RECIPIENTS

UPGRADING TECH CAPABILITIES OF INDUSTRIES

Since Malaysia's shift from being an agricultural economy to an industrial economy, the need to elevate the nation's technological capabilities becomes more crucial in ensuring Malaysia is able to remain competitive and relevant.

One of ASM's objectives is to assist the nation in upgrading the technological capabilities of Malaysia's industrial sector.

ASM's expert network enables it to tap into scientific knowledge and remain close to industries to identify key areas of the industry that needs to be improved as well as new areas to be explored. These upgrading works ensure that the Malaysian industrial sector remains relevant, empowered and updated with the latest technological advances.

COLLABORATION IN INNOVATION: I-CONNECT

MESTECC and ASM embarked on a flagship initiative, Malaysian Collaborative Network Platform for Disruptive Innovation, known as i-Connect. i-Connect is an industry-led collaborative innovation network that involves the quadruple helix. It aims to nurture and establish a conducive innovation ecosystem in Malaysia towards increasing disruptive innovation through collaborative networks in order to enable Malaysian industries to leverage on the new economic opportunities in entering global emerging markets.

The dynamic industry-led and people-driven interactions in i-Connect will give rise to knowledge clusters and a talent hub.

Quadruple Helix

- **Industry**
- **Researcher**
- **Government**
- **Civil Society**

As the pilot initiave, i-Connect will be implemented in four strategic areas based on Malaysia's strength and market demand:

- **Manufacturing: Industry 4.0**
- **Health & Wellness**
- **Fintech in Islamic Banking and Finance**
- **Halal Supply Chain**

iConnect
Malaysian Collaborative Network for Innovation

Open Science
Malaysia Open Science Platform (MOSP)

MALAYSIA'S GREAT WEALTH OF RESEARCH DATA

To ensure an efficient and sustained collaboration between the quadruple helix, MOSP was introduced. MOSP aims to make Malaysia's research data a valuable, shared national asset through the development of a trusted platform. MOSP also enables accessibility and sharing of research data that are aligned to national priorities and international best practices. MOSP will be led by the MOSP Alliance that will formulate the National Policy and Guidelines Management to create awareness as well as develop capacity and infrastructure for MOSP.

The pilot phase of the project will connect research data, researchers and publications between five Research Universities and 15 Research Institutes and Agencies under MESTECC.

MOSP is envisioned to be linked to other global Open Science platforms to further enrich the national innovation ecosystem. As such, all players are welcomed to contribute to MOSP to build a Malaysia Open Science Community towards realising its vision of Open Science for Malaysia.

MOSP will adopt the international principle FAIR that will make Malaysia's research data valuable assets

- **Findable**
- **Accessible**
- **Interoperable**
- **Reusable**

- View the photo gallery
- Read the news coverage
- Read our coverage of the event

GIST INVESTORS MOBILISATION TRAINING PROGRAMME IN MALAYSIA

In collaboration with the Global Innovation through Science and Technology (GIST) and SIZZLESCIENCE, ASM jointly organised GIST Investors Mobilization Training Program in Malaysia together with several commercialisation players. This training aims to nurture and empower the potential local investors in science towards enhancing the commercialising of local STI-based technologies. This training has successfully exposed and educated the Malaysian Angels on the potential and advantages of investing in STI based start-up companies in Malaysia and global level.

A soft launch of Angels in Science and UM Angels initiatives by YB Puan Isnaraissah Munirah Majilis, Deputy Minister of MESTECC was also held during the training.

APR
2-3
2019

Kuala Lumpur

56 Attendees

3 Prominent US investors/trainers involved in the training based in the Silicon Valley, USA

1. Gwen Edwards
2. Faz Bashi
3. Melissa Bradley

SME CLINIC ON INDUSTRY 4.0: ANGEL INVESTORS INITIATIVE FOR HEALTHCARE SECTOR

ASM partnered with SEGi University and SIZZLESCIENCE to organise an SME Clinic on Industry 4.0 titled "Angel Investors Initiative for Healthcare Sector". The Clinic aims to empower investors and their networks with best practices of investing in early-stage science and technology-based startups. The programme also trains young researchers, scientists and healthcare practitioners on techniques to pitch their products or ideas to the potential investors.

Two prominent entrepreneurs, Dr Khairul Idzwan Baharin and Mr Ahmad Syafik Jaafar shared their experiences and success stories during the programme.

30 Participants from industries, academia and research community

4 Start-ups pitched their STI inventions to investors during the training

SEPT
15
2019

- View the photo gallery
- Read our coverage of the event

PUBLIC AWARENESS & IMMERSION IN SCIENCE

Science is well respected by the society, but people often feel disconnected from it. Society must understand that science is not important only to scientists or researchers, or to any academy of sciences alone. It does not matter whether one finds science fascinating or the opposite - a base level of understanding is crucial for modern citizens, especially since we are now in the world where science and technology have taken over.

At ASM, we see how science can influence various fields, from mathematics to medicine. We explore science in both the natural and social world. Even with this broad scope, science is often seen as too complex and difficult for anyone, but the experts. Science is too valuable to be left to the professional scientists alone. For the good of society and for the future that we want, the public needs to understand science. In other words, science needs a broader community.

In an effort to increase public understanding and awareness in science, ASM organises various science-based programmes every year.

SCIENCE FOR WELL-BEING

Minggu Sains Negara 2019 was organised with the theme '*Sains Untuk Kesejahteraan*' in two phases. ASM has been appointed by MESTECC as the Lead Agency of MSN 2019 for Johor with the cooperation of the Johor State Government. In this regard, to make this programme a significant impact for the people, ASM also collaborated with various state agencies, government departments, institutes of higher learning, non-governmental organisations (NGOs), STI professional bodies and private organisations.

The MSN 2019 Johor State Level was organised from 15 July – 15 August 2019 with the support from the *Bahagian Sains Teknologi dan ICT* (BICT) and *Bahagian Perancang Ekonomi Negeri* (BPEN) of Johor. The main programme of MSN 2019 Johor was organised on 3 - 4 August 2019 at the Dewan Orang Ramai Parit Raja and Sekolah Menengah Kebangsaan Tun Ismail, Batu Pahat, Johor, officiated by YB Tuan Aminolhuda Hassan, Chairman Education, Human Resources, Science and Technology of Johor.

Schools all over Malaysia participated in this such prestigious event which were led by the National STEM Centre and the MOE. 10 districts of Johor, which are Batu Pahat, Johor Bharu, Kluang, Kota Tinggi, Kulai, Mersing, Muar, Pontian, Segamat and Tangkak did not miss the chance on joining MSN 2019 by organising their own programmes such as Gotong Royong and Car Free Day.

ASM was announced as the Best Leading Agency for organising MSN 2019 by MESTECC.

- **Phase 1 (1 - 7 April 2019) :**

Federal Territory, Terengganu, Sabah, Sarawak

- **Phase 2 (15 July – 15 August 2019)** :

Perlis, Kedah, Penang, Perak, Selangor

Kelantan, Pahang, Negeri Sembilan, Melaka, Johor

- **6,000** visitors during the 2-day Science Carnival
- **101,227** engagements from 15 July – 15 August 2019

- **Main strategic partners:**
  - Universiti Tun Hussein Onn Malaysia (UTHM)
  - National STEM Centre
  - Politeknik Tun Syed Nasir (PTSN)
  - Ministry of Youth and Sports
  - Politeknik Mersing Johor (PMJ)
  - Politeknik Ibrahim Sultan (PIS)

- **Sponsors:**
  - Loreal Malaysia Sdn Bhd
  - Jeffrey Cheah Foundation
  - Percetakan Salam Sdn Bhd

- **Among the programmes:**
  - Science Carnival
  - Meet the Scientists
  - Pocket Talk
  - Crime Scene Investigation Contest
  - Weather Forecast Reporter Contest
  - Science Show
  - Drone-flying competition
  - Science quiz with Kahoot!
  - Fit Malaysia @ Community
  - Mentor Mentee STEM Johor

Science carnival organised at MSN 2019 in Johor

The Inaugural

FAScinate™ Talk

Open Minds, Spark Ideas

FAScinate™ features a refreshed format, transitioning from a formal lecture-style presentation into a more casual engagement, to bring science closer to the community. Bearing the tagline "Open Minds, Spark Ideas", FAScinate™ aims to inspire the public to open their minds to the width and breadth of science and technology.

The inaugural FAScinate™ featured six ASM Fellows who shared their expertise to open the minds of the audience from all walks of life. The thought-provoking topics in medical and engineering science of the latest advancement in STI and its reality check fascinated the audience.

Total Viewership 2,507

• Watch the video • Read the news coverage • Read our coverage of the event

Water and Wastewater Services: What's Next?

Ir Ts Mohamed Haniffa Abdul Hamid FASc

There is no such thing as wastewater – the term "wastewater" is actually derived from the wasteful ways we use water. Thus, for long-term sustainability and sufficiency, water must be managed well.

Strategic Mineral Development with Industry 4.0

Professor Dato' Ir Dr Eric Goh Kok Hoe FASc

The modern world cannot function without mining. From the cement that you walk on to the page from which you are reading this, our way of life depends heavily on the products of mining practices. The mining and quarrying industry sector is a major sector of industrialised and developed countries

Virtual Surgery: The Reality

Professor Dato' Dr Zainal Ariff Abdul Rahman FASc

Technology is full of surprises: take virtual reality (VR) for example. VR was first introduced in video gaming. As the technology evolves, VR has found itself an unlikely home across other industries, such as healthcare. More and more hospitals and medical schools are embracing VR to provide better training for resident doctors and surgeons. In surgical procedures, the application of VR is known as virtual surgery.

Climate Change and CO_2 Emission

Professor Dr Dominic Foo Chwan Yee FASc

Being a layperson, what can we do to achieve significant CO_2 reduction? Many people feel that the issue of climate change is too vast to be impacted by individual actions. Whether big or small, your actions will influence the planet in the coming decades – for better or for worse.

Tuberculosis: Past, Present and Future

Professor Dr Ngeow Yun Fong FASc

Tuberculosis (TB) is an ancient disease that continues to strike fear in humans. The bacterium that causes TB has been estimated to have existed for about three million years, but it was only discovered in 1882. Following this discovery, anti-TB drugs and a vaccine for the control of the disease have been created. Unfortunately, TB remains a major cause of health problems and death even in the modern times.

Dengue: The Many Unanswered Questions

Professor Dr Shamala Devi KC Sekaran FASc

In recent decades, dengue has become a highly uncontrolled neglected infectious diseases, especially in the tropical and sub-tropical regions of the world. The burden of dengue infection is consistently increasing as there is no licensed vaccine or approved antiviral drugs to combat dengue infection.

artscience™ INITIATIVE

Appreciation of arts towards acculturation of science

ASM ArtScience™ Initiative aims to nurture creativity at the convergence of the Arts and the Sciences. The Initiative comprises two programmes; the ASM ArtScience™ Prize and the ASM ArtScience™ Engagement programme.

The Prize is to be awarded biennially to the best projects that embody the philosophy of ArtScience™. Meanwhile, the two programmes under the ASM ArtScience™ Engagement are The ASM ArtScience™ Coffee Chat and ASM ArtScience™ Dialogue that aims to engage with the professionals, artists and scientists to promote the convergence of art and science.

ASM aims for the ArtScience™ Initiative to be a programme that continuously promote art-science excellence. Interested parties are welcome to contribute towards this cause.

- Launched on 4 December 2019 by YB Puan Isnaraissah Munirah Majilis, Deputy Minister of MESTECC
- Supported by Balai Seni Negara, University of Malaya & Galeri PETRONAS
- Contribution can be made via ASM Giving to Science

• View the photo gallery • Watch the video • Read our coverage of the event

www.akademisains.gov.my/artscience

HYDROGEN ECONOMY: WHAT IS THE WAY FORWARD FOR MALAYSIA?

The ASEAN region is fast adopting the hydrogen economy concept. In Malaysia, the Sarawak State Government is already a front-runner by introducing hydrogen-fuelled buses in 2018. Malaysia as a developing country could learn from its more advanced Asian counterparts like South Korea, China and Japan. One of the potential energy sources in Malaysia is Ocean Thermal Energy Conversion (OTEC), given its competitiveness and lower generation cost compared to other alternatives. More concerted efforts are necessary to promote the development of hydrogen economy in Malaysia, especially by policy makers. Following the General Assembly, ASM established a Task Force on Hydrogen Economy to draft a position paper on Hydrogen Economy.

» • View the photo gallery • Watch the video • Read the news coverage • Read our coverage of the event

31ST IDEAXCHANGE - WASTE TO WEALTH: EXPLORING NEW HORIZONS

Waste management is a major issue faced worldwide. Global municipal solid waste generation is expected to reach 27 billion tonnes in 2050. Hence, waste-to-wealth initiatives were introduced to turn waste into something of economic value. The forum discussed on how Malaysia could make wealth generation from waste a more practical and economical practice with less impact on the environment. An inter-ministry cooperation is currently ongoing to implement a waste-to-energy project.

JULY
29
2019

32ND IDEAXCHANGE - HAZE PROBLEM: A BLAME GAME OR AN ENDGAME

Tackling annual haze episode from different perspective, the 32nd IdeaXchange brought all stakeholders to discuss holistic solutions in this forum. Brilliant ideas were generated, from solving open burning to the use of biomass as a renewable energy.

Haze is a trans-boundary issue and the forum calls for local and regional solutions to the haze episodes and minimised its impact on health, economy and the societal well-being. Therefore, more data-driven research must be done to gain more understanding on the effects of air pollutants.

OCT
15
2019

• Watch the video • Read our coverage of the event

ADDRESSING BIOSECURITY THREATS FROM EMERGING TECHNOLOGIES

The Malaysian Science and Technology Research Institute for Defence (STRIDE), together with the Malaysian Biosafety and Biosecurity Association (MBBA), ASM and Health Security Partners have organised Symposium on Promoting Institutional Oversight Mechanisms to Address Biosecurity Threats from Emerging Technologies. This symposium focused on emerging biotechnologies, research biorisk associated with the use of these technologies and institutional oversight to ensure biosafety and biosecurity sponsored by the Biosecurity Engagement Program (BEP) of USA.

The three-day symposium was organised from 10 – 12 September 2019, and was officiated by Dr Karminder Singh Dhillon, Deputy Secretary General (Management), the Ministry of Defence Malaysia. The symposium featured panelists from the USA, UK, Singapore, Philippine, Indonesia and Malaysia. It was attended by more than 50 Malaysian researchers from Institutes of higher learning and research institutes.

The objectives of the symposium are to:
- Bolster awareness of emerging technologies such as synthetic biology and gene editing systems, their benefits to the bioeconomy and research biorisks posed by these technologies
- Promote increased vigilance by the scientific community to prevent misuse and accidents
- Share best practices for institutional oversight to identify and mitigate research biorisks arising from the use of emerging technologies
- Develop recommendations for the establishment and use of institutional oversight mechanisms for research biorisks in the Malaysian context
- Publish a symposium report to raise awareness across the research and policy communities in Malaysia and across the region

SIMPLIFY
BEAUTIFY
AMPLIFY

Science communication is essentially an attempt to make science accessible to everyone. It makes hard scientific facts easy to understand and a joy to learn. Various media is used to cater to different methods of learning and different segments of society, so that maximum comprehension can be achieved. With the help of the social media, we are also ensuring that this valuable knowledge reaches as much audience as possible.

Drop us an email at:
science_comm@akademisains.gov.my

SOCIAL MEDIA
(2018-2019)

17,366
from 13,578

4,653
from 3,198

3,013
from 2,310

34,696
from 27,814

PUBLICATIONS & JOURNAL:

2018 Annual Report

Expert Network 2018 Edition

ASM Science Journal **24** articles

6 SPECIAL ISSUES | VOL. 12

- IQRAC2018
- Malaysia in Space
- ICST2018
- ICSE2018
- ICoAIMS2019
- SKSM26

ONLINE READERSHIP:

e-Publications	Readership	Impression
94 to date	51,244	189,073

ASM FOCUS: e-Newsletter

Issues	Articles	Readership
12	47	7,176

GETTING PUBLISHED IN HIGH-IMPACT JOURNAL – HOW?

Publishing is an integral part of the research process. However, it is not enough to simply publish research, it needs to be published in the appropriate journals to reach the right audience and be communicated clearly to have impact in the field. Coupled with increasing competition in the academic community, researchers need to develop the right skills to be successful in publishing their work. By doing so, researchers will not only increase their chances of publication acceptance, but also their international reputation in the field.

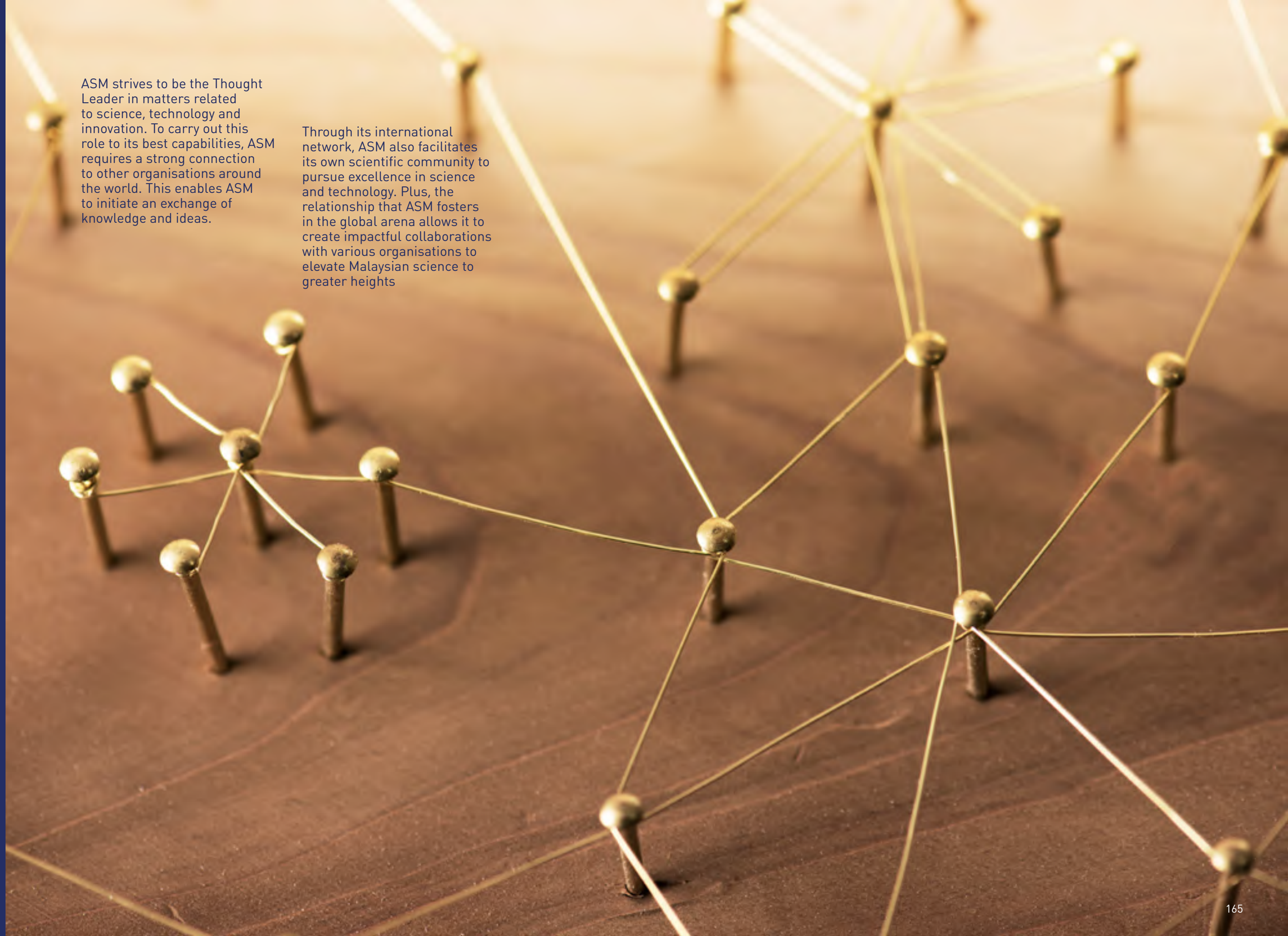
In 2019, British High Commission KL approached ASM to co-organise a workshop on Effective Publishing Strategies. This workshop aimed to train Malaysian academics on how to publish in high impact factor journals and maximise their impact in the field. This directly addresses Malaysia's national challenge of publishing articles in high impact journals.

The one-day workshop was held on 23 January 2019, and was conducted through lecture and exercises by Nature Research, a highly acclaimed UK-based academic publisher, using Nature Research journals as training material. Around 250 participants have benefitted from the speaker, Dr Jeffrey Robens.

ENHANCING INTERNATIONAL NETWORKING AND COLLABORATIONS

ASM strives to be the Thought Leader in matters related to science, technology and innovation. To carry out this role to its best capabilities, ASM requires a strong connection to other organisations around the world. This enables ASM to initiate an exchange of knowledge and ideas.

Through its international network, ASM also facilitates its own scientific community to pursue excellence in science and technology. Plus, the relationship that ASM fosters in the global arena allows it to create impactful collaborations with various organisations to elevate Malaysian science to greater heights



ASEAN FORESIGHT ALLIANCE (AFA) WORKSHOP

ASM, through MESTECC, initiated the ASEAN Foresight Alliance (AFA) in 2018. The initiative presents an opportunity for stakeholders to embrace an imaginative yet realistic paradigm for strategic planning through the use of foresight or futures thinking. It involves the processes of anticipation that identifies opportunities and threats which may arise in mid to long term versions of the future. As a way of thinking, foresight also encourages agility, innovation, strategic evaluation, and the proactive shaping of the future. While traditional planning has sought to prevent failure, foresight prioritises resilience, namely early detection and fast recovery.

The ASEAN Foresight Alliance (AFA) Workshop was held on 11 – 13 December 2019. The participants were representatives from all ASEAN Member States (AMS), except from Singapore and Vietnam.

Objectives:

1) To assist the ASEAN participants to enhance the effectiveness of long range planning through the use of appropriate futures methodological tools

2) To assist the participants to further enhance the capacity to transform their organisations and government as a whole towards future-orientation

3) To develop a broader national conversation on the long-term, particularly post ASEAN Vision 2025

Board of Advisors Meeting for AFA

The 1st Board of Advisors Meeting for ASEAN Foresight Alliance (AFA) was convened on 13 December 2019 in Kuala Lumpur. The objectives of the meeting are to elect the Chair and Vice Chair(s) for ASEAN Foresight Alliance Board of Advisors as well as to set up the Terms of Reference (TOR) for the Board of Advisors for AFA. The meeting was attended by all ASEAN Member States (AMS) representatives, except from Singapore and Vietnam.

International Science Council

Regional Office for Asia and the Pacific

ISC is the only international non-governmental organisation that bringing together the natural and social sciences and the largest global science organisation of its type. With a broad range of co-sponsored international research programmes, networks and committees, ISC activities span a broad range of issues including urban health and wellbeing, disaster risk reduction, as well as science advice to governments. In line with ISC's Science Action Plan (2019-2021), ROAP embarked on new initiatives and ramped up its engagement with members of ISC and regional organisations.

One of the important innovations implemented was the ROAP Small Grants (RSG) programme, which provided nominal funding, awarded on a competitive basis, for regional activities on ROAP's priority areas. ROAP continued to emphasise on mobilising the scientific community from Least Developed Countries (LDCs). In 2019, seventeen early career scientists from LDCs were sponsored to attend various workshops in the region.

Open Science
- Jointly organised a Meeting on the scoping of Open Science for the Asia Pacific with CODATA
- Participated in UNESCO's stakeholder engagement workshop on Open Science initiative

Responsible conduct of research (RCR)
- Organised a workshop on RCR with the ASEAN Young Scientist Network and Global Young Academy

DRR and Climate Change
- Working with IRDR ICoE-Taipei, UNDRR APSTAAG and IPCC and SEADPRI UKM
- Visited Nepal and Fiji to strategise collaboration on DRR and Climate Change

Science advice for policy making
- Organised two capacity building workshops with INGSA Asia

ISTIC

INTERNATIONAL SCIENCE, TECHNOLOGY AND INNOVATION CENTRE FOR SOUTH-SOUTH COOPERATION UNDER THE AUSPICES OF UNESCO

ISTIC aims to provide training for capacity building in STI management for developing countries in the South, both on short- and long-term. This includes fellowship, workshop and courses incorporating specialised and project-oriented training. In 2019, ISTIC organised 10 capacity building programmes that involved 414

In 2019, a significant event for ISTIC was the 4th ISTIC Biennial International Conference on Women in Science, Technology and Innovation (STI). The Conference was aimed at showcasing successful innovations in STI in solving and/or minimising problems faced by women, by exchanging and sharing experiences thus contributing to achieving Sustainable Development Goal No. 5.

4th ISTIC Biennial International Conference on Women in Science, Technology and Innovation (STI)
- 22-23 July 2019
- Kuala Lumpur, Malaysia

EXPERT NETWORK

Experienced, brilliant, dedicated – our expert network comprises members who are ready to lead and collaborate to produce impactful results. The Academy now has more than 700 experts and the number keeps growing year by year.

ASM's expert network is always ready to contribute their valuable knowledge and wisdom to ensure ASM's programmes and studies pushes the envelope of Malaysia's STI advancement to greater heights.

CELEBRATING MALAYSIA'S BRILLIANT MINDS

The Conferment of Fellowship of ASM and the Announcement of the Top Research Scientists Malaysia 2019 was held on 4 December 2019. 27 new Fellows were conferred, bringing the total number to 376 from eight discipline groups. Fellows are allowed to carry the title "FASc" which signifies of Fellows of the Academy of Sciences at the end of their name and it is a lifetime recognition for their remarkable achievements.

The prestigious ceremony had also witnessed the announcement of nine recipients of the 2019 TRSM, presented by our honourable guest, YB Puan Isnaraissah Munirah Majilis, Deputy Minister of MESTECC. Currently, there are total of 166 TRSM recipients who are recognised for their outstanding research activities in various disciplines.

On top of that, the Academy has appointed Academician Emeritus Professor Dato' Dr Khalid Yusoff FASc as the 2019 Senior Fellow for his contribution in the field of cardiology, through practice, teaching and research as well as championing research integrity in Malaysia. Senior Fellows are bestowed to individuals who have made an outstanding contribution and provided leadership both nationally and internationally as well as to the Academy. Senior Fellow will carry the title "Academician" at the beginning of their name to honour their excellent reputation.

2019 FELLOWS — **1** Senior Fellow — **27** New Fellows

2019 TRSM — **9** Recipients — **166** Total Recipients

2019 Senior Fellow,
Academician Emeritus Professor
Dato' Dr Khalid Yusoff FASc

TOP: 2019 Fellows & Senior Fellow with YB Puan Isnaraissah Munirah Majilis, Deputy Minister of MESTECC, ASM Exco Members and CEO.
BOTTOM: 2019 TRSM Recipients with YB Puan Isnaraissah Munirah Majilis, Deputy Minister of MESTECC, ASM Exco Members and CEO.

FUEL THE IMPACT!

Since its establishment in 2012, Young Scientists Network-Academy of Sciences Malaysia (YSN-ASM) maintains its vision to be the platform for the young scientific community to advance science in Malaysia and become a significant contributor to global STI.

With a total of eight working groups, the YSN-ASM has conducted, co-organised and taken part in more than 50 international, regional and national programmes, activities, forums, workshops, module developments and meetings in 2019.

Activity Highlights:

1) DIALOGUE WITH MINISTER MESTECC
A dialogue session on Effective STI Governance for a Progressive Malaysia that aimed to highlight pertinent matters concerning the state of STI in Malaysia and to address critical areas of concern.

2) 2019 CCM STEM-UP CHALLENGE
YSN-ASM helped in designing the quiz questions and the game-based challenges under the theme "Sustainability" and "Energy".

3) RESPONSIBLE CONDUCT OF RESEARCH (RCR)
YSN-ASM has conducted and taken part in several RCR programmes, such as World Conference on Research Integrity in Hong Kong, ASEAN RCR Project, Forum for Ethical Review Committees in the Asian and Western Pacific Region (FERCAP), and ASEAN RCR Workshop

4) ASEAN EMERGING RESEARCHERS CONFERENCE (ERC) 2019
The ASEAN ERC 2019 was an official flagship programme of the ASEAN YSN in collaboration with the Thai Young Scientists Academy (TYSA), YSN-ASM, Wolfson College, University of Cambridge, UK and Cambridge University Malaysia Society, UK.

YSN-ASM 2019

78 Members
12 New Members
113 Affiliates
22 New Affiliates

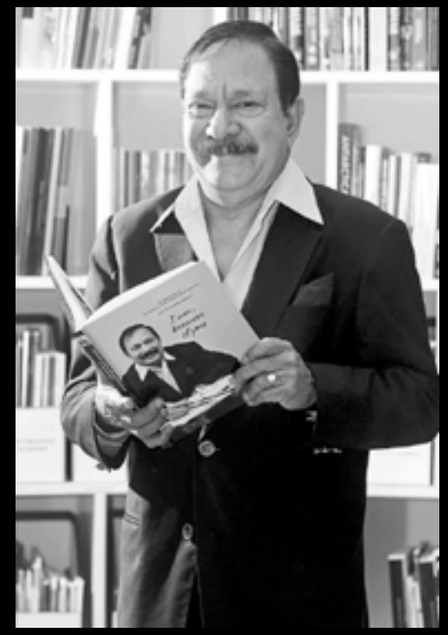
2019 YSN-ASM COLLOQUIUM

This year's colloquium was participated by 104 YSN-ASM members and affiliates as well as five representatives from ASEAN counterparts. With the theme "Fuel the Impact!", the 2019 YSN-ASM Colloquium was carried out in much different approache compared to the previous years. Apart from having the representatives from the ASEAN to connect with the YSN-ASM members, several more activities were included to ensure a more impactful discussion, sharing & connecting session as well as a networking medium. Besides, the first-ever 2019 YSN-ASM Rising Star Award was introduced, and all the winners were announced during the closing ceremony.

Young Scientists Network members strategising on future engagements at the 2019 YSN-ASM Colloquium

IN MEMORIAM

Academician Emeritus Professor Dato' Dr C.P. Ramachandran FASc



(6 June 1936 - 12 Jan 2019)

Academician Emeritus Professor Dato' Dr C.P. Ramachandran FASc is the world expert on filariasis. He earned his degree in Biological Sciences from University of Madras, in India. During this time, he developed an interest to fight against the neglected tropical diseases among the most unfortunate patients. He later decided to further his postgraduate training at the London School of Hygiene and Tropical Medicine (LSHTM) and at the Liverpool School of Tropical Medicine (LSTM) where he obtained his Doctorate.

Dato' Dr C.P. Ramachandran began his career in the Liverpool School of Tropical Medicine as a demonstrator in Parasitology from 1952 to June 1962. He returned to Malaysia in 1962, working on filariasis as a research fellow at the Institute of Medical Research (IMR) in Kuala Lumpur until 1963. He was later appointed as the Head of Filariasis at IMR from 1967-1970.

In 1979, his profound knowledge of filariasis had led him to join the World Health Organization (WHO). He was appointed as the Chief of Filariasis Control and TDR in WHO. He was responsible for the establishment of Centres of Excellence of Tropical Diseases in many developing countries of South America, Africa Southeast Asia and the Western Pacific Region. His greatest achievement was to put together a Global Strategy for Elimination of Lymphatic Filariasis through a World Health Assembly resolution in 1997 (GPELF). As a result, they were able to successfully reduced infection rates from an original 120 million prevalence to less than 40 million today and prevented millions of children from being infected. He retired from WHO in 1996 and decided to join Universiti Putra Malaysia as Professor of Parasitology.

Dato' Dr C.P. Ramachandran has contributed immensely to the field of Medical Parasitology in the country and abroad. He has published numerous scientific papers, and there are three parasites have been named after him. He has received many awards, one of which is the Mary Kingsley Medal, United Kingdom for Tropical Medicine. He was Fellow of ASM since 2003 and appointed as a Senior Fellow in 2011. He actively participated in many ASM studies and programmes and was appointed as the Alternate Chair of the Medical and Health Sciences discipline (2011-2015) and also ASM Council Members.

> "Failure doesn't matter, just don't assume that society owes you something; it is the other way around, you owe society."

Academician Tan Sri Dr Ahmad Mustaffa Babjee FASc

(31 July 1937 - 30 April 2019)

Academician Tan Sri Dr Ahmad Mustaffa Babjee FASc was dubbed nation's 'green warrior'. A believer in life-long learning, at the age of 69, he earned his seventh degree, Masters of Science in Environment Biology from Universiti Sains Malaysia. His other credentials included PhD in virology from the University of Queensland, Australia, and three honorary doctorates from University of Queensland, Universiti Putra Malaysia and Universiti Malaysia Terengganu.

Tan Sri Mustaffa has contributed immensely to science even during his postgraduate studies. He was the first scientist to successfully isolated and characterise the first Australian poultry Reovirus, turkey Herpesvirus and Adenovirus in the country. These findings were published in the high-index journal and have been quoted in American Textbooks on Avian and Poultry Diseases.

During his years as the Director-General of Veterinary Services, he established an Animal Biotechnology Research Institute in Jerantut, Pahang in 1988 to carry out research on embryo transfer, splitting and cloning. This institute is the first in Malaysia to fully dedicated to Biotechnology research and have facilities with accommodation of foreign collaborators.

At the national level, Tan Sri Mustaffa has been actively involved with the Ministry of Local Government and Environment, Ministry of Education, MARDI and Ministry of Science. His excellent leadership skills were not only known locally. In 1994, he was the first Asian President to be appointed for the World Organization for Animal Health and Chairman for several ASEAN Committees for Animal Production, Livestock and Food Handling.

Tan Sri Mustaffa was a Foundation Fellow of ASM. He had chaired several ASM Committees such as ASM Committee on Biodiversity 2010, ASM Committee on Biodiversity and Environment 2011, Chairman Mega Science Framework Study 2011. As chairman of the Biodiversity committee, he had produced a directory of biodiversity experts in Malaysia through his extensive network of experts. He also involved in the Mahathir Science Award, ASM publications and international committees.

As a talented writer, producer, director and photographer, he had published many Biodiversity books, over 75 journal or proceedings articles, over 120 articles with photographic illustrations on nature and environment, and several documentaries screened in some schools.

> "All my life, I have been curious about nature. I can sit and watch nature at work for hours."

Dato' Dr Hashim Abdul Wahab FASc

(23 February 1938 - 1 July 2019)

Dato' Dr Hashim Abdul Wahab FASc has vast experience in the agricultural field. He obtained his diploma in Agriculture from the College of Agriculture (now Universiti Putra Malaysia). He earned his bachelor and masters studies from Iowa State University, and his PhD in Agricultural Science from North Carolina State University in 1971.

He served in the Department of Agricultural and MARDI for over 20 years until he was appointed as Deputy Director-General in 1981. Due to his vast experience in agriculture, he was later appointed as the first Director-General, Malaysian Cocoa Board for seven years.

Dato' Dr Hashim was an outgoing person and active with outdoor activities. He often shared his experiences in his writing or through his motivational lectures. He published six books and more than 80 articles on agriculture, agriculture management, eco-tourism, ICT, adventure travels, wellness and happiness. He was also actively involved in voluntary and professional organisations. He had served as President of the Agricultural Institute of Malaysia, President of the Alumni Association of UPM, President of the Rotary Club of Kajang, Vice-President & Chairman of Environment Education, Malaysian Nature Society in 2002-2010.

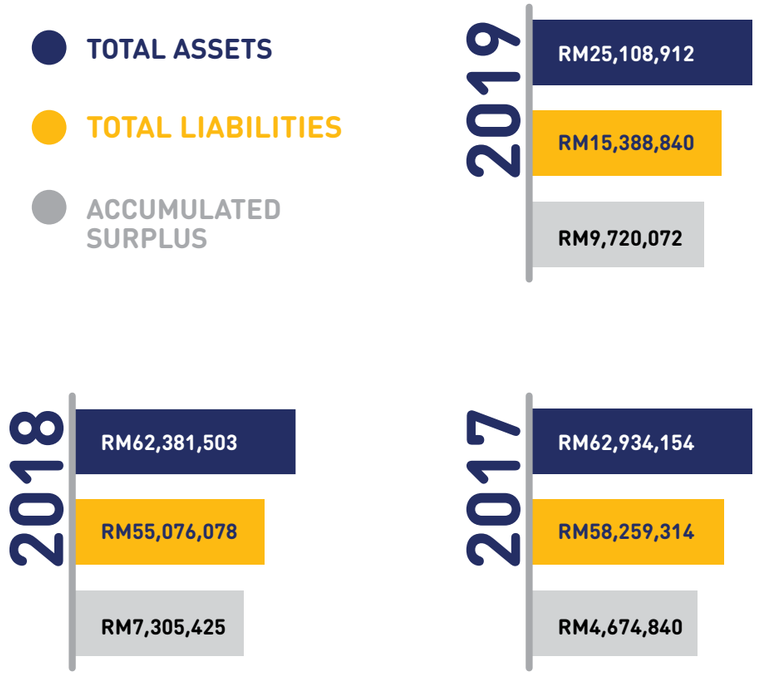
Dato' Dr Hashim has made numerous contribution to the public service and the community activities, particularly on the environment and sustainable development issues. For his outstanding contribution, he received several notable awards such as Johan Setia Mahkota 1988, Darjah Setia DiRaja Kedah 1999, Anugerah Langkawi 2005, UPM Alumni Award, Selected Torch Bearer for the Beijing Olympic 2008.

Dato' Dr Hashim was actively involved with ASM where he served as Chairperson of the Biological, Agricultural and Environmental Sciences Discipline Group (2013-2015), Council Members (2012-2014), and Membership Committee.

> "Gardening is a labour of love – love for living things such as herbs, vegetables and the landscape of ornamental plants."

FINANCIAL STATEMENTS

For a think tank like us, transparency is essential for proper valuation. The financial statements of ASM provide information on the health of our financial results and performance as well as cash flows.



Statement of ASM Financial Performance

- ASM Financial Performance for the year ended 31 December 2019 has shown a surplus before tax of RM2,688,803 compared to 2018 a surplus of RM2,630,585. The income recorded for the year 2019 was RM18,551,134. This is derived from 58% contribution by Malaysian Government amounting RM10,675,654 while 32% of income derives from amortization of deferred grants, deferred income and donation fund amounting RM5,920,781 and other income of 10% amounting RM1,954,699.

- ASM recorded a total expenditure of 86% in 2019 amounting RM15,862,331 compared to 2018 which recorded expenditure of 90% amounting RM24,330,292. The major expenditure was Science Programme amounting RM6,072,266 (38%) and Services and Supplies amounting RM5,860,156 (37%). Services and supplies also includes emolument of 66 contract staff.

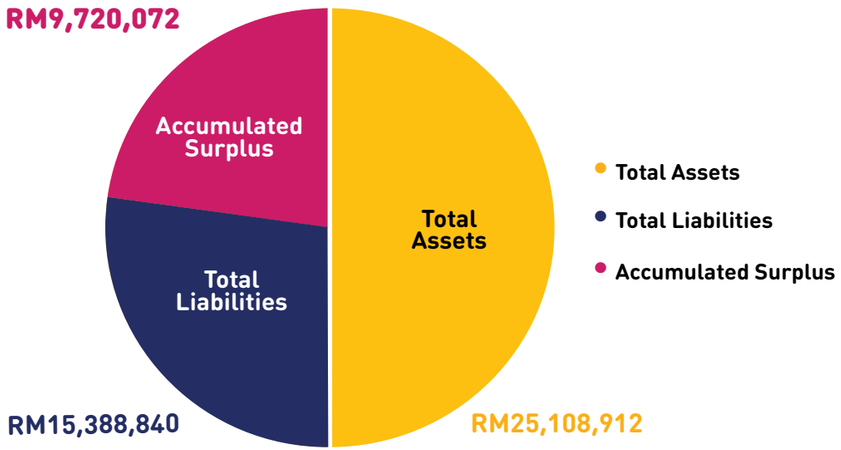
Statement of ASM Financial Position

- ASM Financial Position was strengthened in 2019 as the accumulated surplus was recorded at RM9,720,072 [2018: RM7,305,425]. The significant change in the accumulated surplus is due to declaration of ASM building as a fixed asset with a value of RM3,399,000.

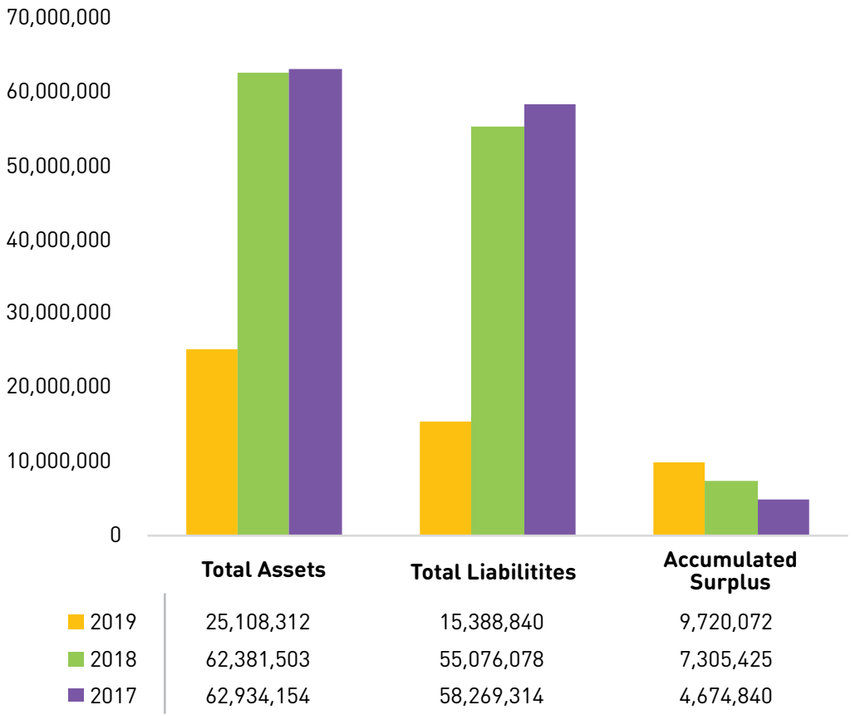
- ASM total asset was recorded at RM25,108,912 with a major contributions from fixed deposit amounting RM20,795,161. Government grants and International Grants received for operations and activities are invested in fixed deposit approved by MOF.

- ASM total liabilities was majorly contributed by deferred grants received from Malaysian Government for ASM and International Office hosted by ASM namely ISC ROAP and ISTIC. This is decreased by 75% compared to 2018 (2019: RM12,226,504, 2018: RM48,868,740) due to return of R,D&C balance allocation to Malaysian Government amounting RM 32,040,944.43.

ASM FINANCIAL PERFORMANCE

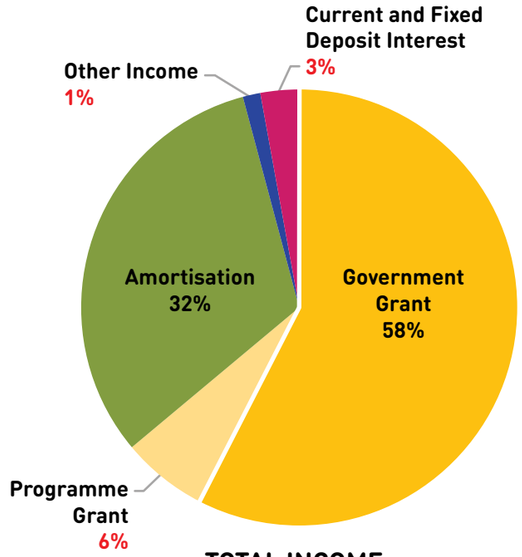


ASM FINANCIAL POSITION COMPARISON FOR 3 YEARS



ASM FINANCIAL PERFORMANCE

SOURCE OF ASM INCOME



58% - ASM Operating Grant amounting RM10,675,654.

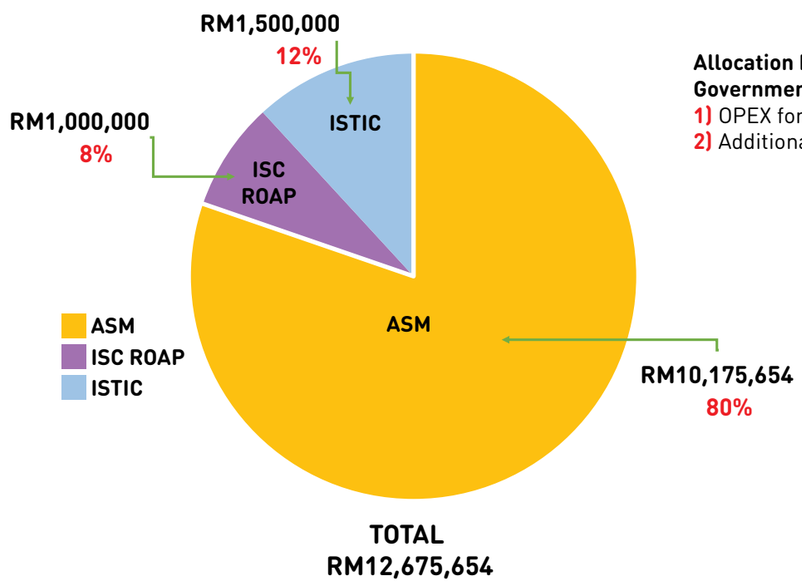
32% - Amortization of deferred grants, deferred income and donation fund amounting RM5,920,781.

6% - Received programme grants amounting to RM1,182,849.

3% - Gain on investment of ASM funds amounting RM530,345 from current and fixed deposit interest.

1% - Other income of RM241,505 from rental charges, surplus from project, GST refund and etc.

DISTRIBUTION OF ASM OPERATING GRANT

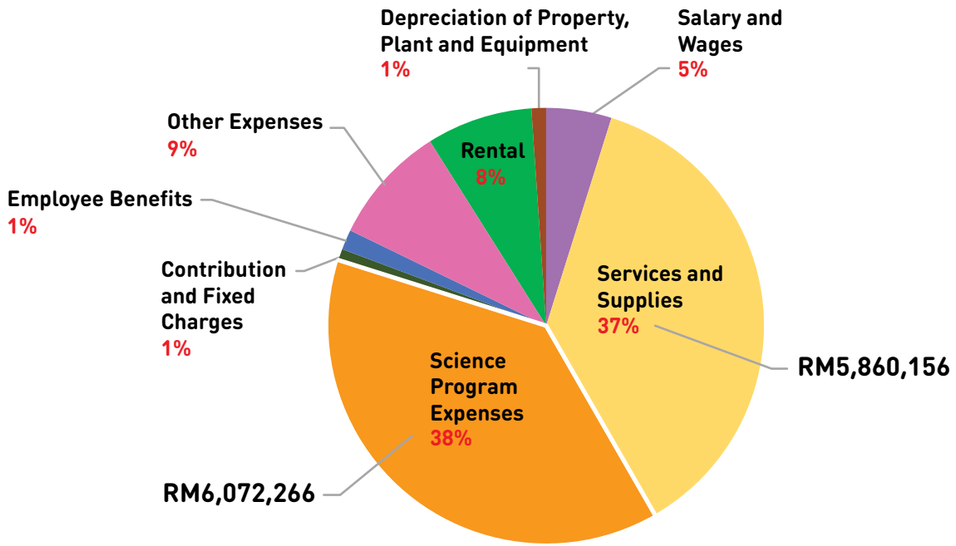


Allocation Received from Government:

1) OPEX for 2019: RM8,000,000

2) Additional fund: RM4,675,654

ASM FINANCIAL PERFORMANCE



TOTAL EXPENSES
RM15,862,331

38% - **Science Programme Expenses** amounting **RM6,072,266** is the activities undertaken by ASM to fulfill the 14 functions of ASM as stipulated in the Malaysian Academy of Sciences Act 1994.

37% - **Services and Supplies** expenses amounting **RM5,860,156** are comprises of ASM's operating expenses which are administrative expenses, wages and salaries for contract staff, science communication, membership including international affairs.

9% - **Other Expenses** amounting to **RM1,362,201** consist of fees, insurance, accrued interest and bad debt.

8% - **Rental** expenses amounting **RM1,251,995**.

5% - **Salary and Wages** for permanent staff amounting **RM771,506**.

1% - **Employee Benefits** consist of employee replacement leave and gratuity amounting **RM237,644**.

1% - **Depreciation of Asset (Property, Plant and Equipment)** amounting **RM172,332.**

1% - **Contribution and Fixed Charges** consist of contribution to KSKK ASM, pension and yearly international subscription amounting **RM134,231.**

CERTIFICATE OF THE AUDITOR GENERAL ON THE FINANCIAL STATEMENTS OF ACADEMY OF SCIENCES MALAYSIA FOR THE YEAR ENDED 31 DECEMBER 2019

Certificate on the Audit of the Financial Statements

Opinion

I have audited the Financial Statements of the Academy of Sciences Malaysia, which comprise the Statement of Financial Position as at 31 December 2019 and the Statement of Financial Performance, Statement of Changes in Net Assets, Statement of Cash Flows and Statement of Comparison Budget and Actual for the year then ended, and notes to the financial statements, including a summary of significant accounting policies, as set out on pages 3 to 36.

In my opinion, the accompanying financial statements give a true and fair view of the financial position of the Academy of Sciences Malaysia as at 31 December 2019, and of its financial performance and its cash flows for the year then ended in accordance with the Malaysia Public Sector Accounting Standards (MPSAS), Academy of Sciences Malaysia Act 1994 (Act 524) and Academy of Sciences Malaysia Regulations 1995.

Basis for Opinion

The audit was conducted in accordance with the Audit Act 1957 and the International Standards of Supreme Audit Institutions. My responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of my certificate. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Independence and Other Ethical Responsibilities

I am independent of the Academy of Sciences Malaysia and I have fulfilled our other ethical responsibilities in accordance with the International Standards of Supreme Audit Institutions.

Information Other than the Financial Statements and Auditor's Certificate Thereon

The Council of the Academy of Sciences Malaysia is responsible for the other information in the Annual Report. My opinion on the Financial Statements of the Academy of Sciences Malaysia does not cover other information than the Financial Statements and Auditor's Certificate thereon and I do not express any form of assurance conclusion thereon.

Responsibilities of the Council for the Financial Statements

The Council is responsible for the preparation of Financial Statements of the Academy of Sciences Malaysia that give a true and fair view in accordance with Malaysia Public Sector Accounting Standards (MPSAS) and Academy of Sciences Malaysia Act 1994 (Act 524) and Academy of Sciences Malaysia Regulations 1995. The Council is also responsible for such internal control as it is necessary to enable the preparation of the Financial Statements of the Academy of Sciences Malaysia that are free from material misstatement, whether due to fraud or error.

In preparing the Financial Statements of the Academy of Sciences Malaysia, the Council are responsible for assessing the Academy of Sciences Malaysia ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting.

Auditor's Responsibilities for the Audit of the Financial Statements

My objectives are to obtain reasonable assurance about whether the Financial Statements of the Academy of Sciences Malaysia as a whole are free from material misstatement, whether due to fraud or error, and to issue Auditor's Certificate that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the International Standards of Supreme Audit Institutions will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with the International Standards of Supreme Audit Institutions, I exercise professional judgement and maintain professional scepticism throughout the audit. I also:

a. Identify and assess the risks of material misstatement of the Financial Statements of the Academy of Sciences Malaysia, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

b. Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Group's and the Academy of Sciences Malaysia internal control.

c. Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Council.

d. Conclude on the appropriateness the Council use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on of the Academy of Sciences Malaysia ability to continue as a going concern. If I conclude that a material uncertainty exists, I have to draw attention in my Auditor's Certificate to the related disclosures in the Financial Statements of the Academy of Sciences Malaysia or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of Auditor's Certificate.

e. Evaluate the overall presentation of the Financial Statements of the Academy of Sciences Malaysia, including the disclosures, and whether the Financial Statements of the Academy of Sciences Malaysia represents the underlying transactions and events in a manner that achieves fair presentation.

I communicate with the Council regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control identified during my audit.

Other Matters

Academy of Sciences Malaysia did not prepare the Financial Regulations as stated in Section 12 (6) Academy of Sciences Malaysia Regulations 1995 in which the Council shall appoint working committees and working groups, as and when it deems necessary, in order to facilitate the efficient and effective operation of the Academy. The Council shall draw up the procedure for the conduct of the working committees and working groups. The audit of the financial statements carried out shows that the Financial and Accounting Procedures of the Academy of Sciences Malaysia effective from 31 July 2004 have not been updated based on the working procedures currently in use. The Council must approve the Standard Operating Procedure (SOP) adopted at the Academy of Sciences Malaysia. Academy of Sciences Malaysia must ensure that the Financial and Accounting Procedures and Standard Operating Procedure (SOP) adopted by Academy of Sciences Malaysia are updated and officially approved so that it is valid as a guide to the work procedures carried out.

This certificate is made solely to the Council in accordance with Academy of Sciences Malaysia Act 1994 (Act 524) and Academy of Sciences Malaysia Regulations 1995 and for no other purpose. I do not assume responsibility to any other person for the content of this certificate.

(MOHD NASRI BIN MOHD NASIR)
ON BEHALF OF AUDITOR GENERAL

PUTRAJAYA
15 SEPTEMBER 2020

Academy of Sciences Malaysia

PENYATA PRESIDEN DAN BENDAHARI KEHORMAT AKADEMI SAINS MALAYSIA
STATEMENT BY PRESIDENT AND HONORARY TREASURER OF THE ACADEMY OF SCIENCES MALAYSIA

Kami, **PROFESSOR DATUK DR ASMA BINTI ISMAIL FASc** dan **DATUK DR. ABDUL RAZAK BIN MOHD ALI FASc,** yang merupakan Presiden dan Bendahari Kehormat AKADEMI SAINS MALAYSIA (ASM) dan juga Ahli Majlis, dengan ini menyatakan bahawa, pada pendapat Majlis ASM, Penyata Kedudukan Kewangan, Penyata Prestasi Kewangan, Penyata Perubahan Aset Bersih, Penyata Aliran Tunai dan Penyata Perbandingan Bajet dan Sebenar yang berikut ini berserta dengan nota-nota kepada Penyata Kewangan didalamnya adalah disediakan untuk menunjukkan pandangan yang benar dan saksama kedudukan ASM pada 31 Disember 2019 dan hasil kendaliannya serta perubahan kedudukan kewangannya bagi tahun berakhir pada tarikh tersebut.

*We, **PROFESSOR DATUK DR. ASMA BINTI ISMAIL FASc** and **DATUK DR. ABDUL RAZAK BIN MOHD ALI FASc**, being the President and Honorary Treasurer of the ACADEMY OF SCIENCES MALAYSIA (ASM) as well as Council Members, do hereby declare that, in the opinion of ASM Council, the Statement of Financial Position, Statement of Financial Performance, Statement of Changes in Net Assets, Statement of Cash Flows and Statement of Comparison Budget and Actual together with the notes contained therein are drawn up in order to give a true and fair view of the financial position of ASM as at 31 December 2019 and the resulting revenues and changes in the financial position of the period ending on that date.*

Bagi pihak Majlis
On behalf of the Council

PROFESSOR DATUK DR. ASMA BINTI ISMAIL FASc
Presiden / *President*

Akademi Sains Malaysia / *Academy of Sciences Malaysia*

Bagi pihak Majlis
On behalf of the Council

DATUK DR. ABDUL RAZAK BIN MOHD ALI FASc
Bendahari Kehormat / *Honorary Treasurer*
Akademi Sains Malaysia / *Academy of Sciences Malaysia*

KUALA LUMPUR, MALAYSIA

Tarikh / *Date:* 15 SEP 2020

Menara MATRADE
Tingkat 20, Sayap Barat
Jalan Sultan Haji Ahmad Shah
Off Jalan Tuanku Abdul Halim
50480 Kuala Lumpur

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+6 03 6203 0634 F

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Academy of Sciences Malaysia

PENGAKUAN OLEH KETUA PEGAWAI EKSEKUTIF KE ATAS PENGURUSAN KEWANGAN AKADEMI SAINS MALAYSIA
DECLARATION BY CHIEF EXECUTIVE OFFICER ON THE FINANCIAL MANAGEMENT OF THE ACADEMY OF SCIENCES MALAYSIA

Saya, **HAZAMI BINTI HABIB**, No. K/P 660619-08-5516 pegawai utama yang bertanggungjawab ke atas pengurusan kewangan dan rekod-rekod perakaunan AKADEMI SAINS MALAYSIA (ASM), dengan ikhlasnya mengakui bahawa Penyata Kedudukan Kewangan, Penyata Prestasi Kewangan, Penyata Perubahan Aset Bersih, Penyata Aliran Tunai dan Penyata Perbandingan Bajet dan Sebenar dalam kedudukan kewangan yang berikut ini berserta dengan nota-nota kepada penyata kewangan didalamnya mengikut sebaik-baik pengetahuan dan kepercayaan saya, adalah betul dan saya membuat ikrar ini dengan sebenarnya mempercayai bahawa adalah benar dan atas kehendak-kehendak Akta Akuan Berkanun, 1960.

*I, **HAZAMI BINTI HABIB**, NRIC No.660619-08-5516 being the officer primarily responsible for the financial management of the ACADEMY OF SCIENCES MALAYSIA (ASM), do solemnly and sincerely declare that the Statement of Financial Position, Statement of Financial Performance, Statement of Changes in Net Assets, Statement of Cash Flows and Statement of Comparison Budget and Actual together with the notes therein, are the best of my knowledge and belief, correct, and I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Statutory Declarations Act 1960.*

Sebenarnya dan sesungguhnya diakui oleh penama di atas di Kuala Lumpur, Malaysia
Subscribed and solemnly declared by the abovenamed at Kuala Lumpur, Malaysia

HAZAMI BINTI HABIB

Tarikh / *Date* : 15 SEP 2020

PESURUHJAYA SUMPAH
W 465
KAPT (B) JASNI BIN YUSOFF
1 JAN 2019 - 31 DIS 2021
MALAYSIA

Di hadapan saya / *Before me* :

Lot 1.08, Tingkat 1,
Bangunan KWSP, Jln Raja Laut,
50350 Kuala Lumpur.

Menara MATRADE
Tingkat 20, Sayap Barat
Jalan Sultan Haji Ahmad Shah
Off Jalan Tuanku Abdul Halim
50480 Kuala Lumpur

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+6 03 6203 0634 F

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STATEMENT OF FINANCIAL POSITION
AS AT 31 DECEMBER 2019

	Note	2019 RM	2018 RM *(As Restated)*	01.01.2018 RM *(As Restated)*
ASSETS				
Current Assets				
Cash and Balance at Bank	3	596,349	1,154,784	748,589
Fixed Deposit	4	20,795,161	51,677,584	56,670,263
Short Term Deposit	5	-	618,810	109,515
Receivables under Exchangeable Transactions	6	7,379	3,628,782	788,406
Other Receivables	7	136,821	1,697,515	965,259
Total Current Assets		21,535,710	58,777,475	59,282,032
Non-current Assets				
Property, Plant and Equipment	8	3,551,676	3,604,028	3,652,122
Work in Progress	9	21,526	-	-
Total Non-current Assets		3,573,202	3,604,028	3,652,122
TOTAL ASSETS		25,108,912	62,381,503	62,934,154
LIABILITIES				
Current Liabilities				
Payables under Exchangeable Transactions	10	942,497	4,916,004	7,851,454
Employee Benefits	11	229,395	178,837	153,246
Donation Fund	12	337,385	245,202	171,856
Deferred Income	13	1,438,383	867,295	608,953
Provision for Tax	25	214,676	-	-
Total Current Liabilities		3,162,336	6,207,338	8,785,509
Non-current Liabilities				
Employee Benefits	11	23,586	21,818	18,061
Deferred Grants	14	10,613,173	47,182,050	47,967,506
Deferred Grants - International Office	15	1,589,745	1,664,872	1,488,238
Total Non-current Liabilities		12,226,504	48,868,740	49,473,805
TOTAL LIABILITIES		15,388,840	55,076,078	58,259,314
NET ASSETS		**9,720,072**	**7,305,425**	**4,674,840**
NET ASSET				
Accumulated Surplus		9,720,072	7,305,425	4,674,840
TOTAL NET ASSETS		**9,720,072**	**7,305,425**	**4,674,840**

STATEMENT OF FINANCIAL PERFORMANCE
FOR THE YEAR ENDED 31 DECEMBER 2019

	Note	2019 RM	2018 RM *(As Restated)*
INCOME			
Non-exchangeable Transactions	16	17,892,773	25,355,785
Exchangeable Transactions	17	658,361	1,605,092
TOTAL INCOME		18,551,134	26,960,877
EXPENSES			
Salaries and Wages	18	771,506	641,583
Services and Supplies	19	5,860,156	5,647,536
Science Program Expenses	20	6,072,266	16,246,953
Contribution and Fixed Charges	21	134,231	102,324
Employee Benefits	22	237,644	182,594
Other Expenses	23	1,362,201	86,652
Rental	24	1,251,995	1,196,021
Depreciation of Property, Plant and Equipment	8	172,332	226,629
TOTAL EXPENSES		15,862,331	24,330,292
SURPLUS BEFORE TAX		2,688,803	2,630,585
Tax	25	274,156	-
SURPLUS AFTER TAX		**2,414,647**	**2,630,585**

STATEMENT OF CHANGES IN NET ASSETS
FOR THE YEAR ENDED 31 DECEMBER 2019

	Note	Accumulated Surplus RM	Total RM
Balance as at 01 January 2018 *- (As Stated Previously)*		1,652,074	1,652,074
Prior Year Adjustment	31	3,022,766	3,022,766
Balance as at 01 January 2018 *- (As Restated)*		4,674,840	4,674,840
Surplus Income on Expenditure *- (As Restated)*		2,630,585	2,630,585
Balance as at 31 December 2018 *- (As Restated)*		7,305,425	7,305,425
Surplus Income on Expenditure		2,414,647	2,414,647
Balance as at 31 December 2019		**9,720,072**	**9,720,072**

STATEMENT OF CASH FLOWS
FOR THE YEAR ENDED 31 DECEMBER 2019

	2019 RM	2018 RM *(As Restated)*
CASH FLOWS FROM OPERATING ACTIVITIES		
Surplus before Tax	2,688,803	2,630,585
Adjustment:		
Tax Paid	(15,279)	-
Previous Year's Tax Payment	(44,201)	-
Depreciation of Property, Plant and Equipment	172,332	226,629
Interest from Short Term Deposits and Fixed Deposits	(530,345)	(1,058,326)
Accrued Interest	133,204	846,945
Reversal of Fixed Deposit Interest	846,945	-
Adjustment from Property and Equipment Write off	5,014	2,391
Profit from Disposal of Property, Plant and Equipment	(1,771)	(2,396)
Bad Debts	500,000	-
Amortisation of Deferred Income	(10,091)	-
Adjustment of Employee Benefits	52,326	29,348
Amortisation of Deferred Grant	(1,479,550)	(81,395)
Deficit from Operation Before Changes in Working Capital	2,317,387	2,593,781
Decrease/ (Increase) in Receivable from Exchangeable Transactions	4,682,097	(3,572,632)
Decrease in Payables from Exchangeable Transactions	(3,973,507)	(2,935,450)
Net Cash from Operating Activities	3,025,977	(3,914,301)
CASH FLOWS FROM INVESTMENT ACTIVITIES		
Income from Disposal of Property, Plant and Equipment	1,771	2,419
Purchase of Property, Plant and Equipment	(124,994)	(180,949)
Work in Progress	(21,526)	-
Interest Received	(449,804)	221,381
Net Cash from Investment Activities	(594,553)	32,851
CASH FLOWS FROM FINANCING ACTIVITIES		
Proceeds from Donation	98,233	73,346
Repayment of Donation	(6,050)	-
Proceeds from Deferred Income	1,931,363	1,688,729
Repayment of Deferred Income	(1,350,184)	(1,430,387)
Proceeds from Deferred Grant	7,498,227	9,029,816
Repayment of Deferred Grant	(42,587,554)	(9,733,877)
Proceeds from Deferred Grant - International	2,505,000	2,334,548
Repayment of Deferred Grant - International	(2,580,127)	(2,157,914)
Net Cash from Financing Activities	(34,491,092)	(195,739)
DECREASE IN CASH AND CASH EQUIVALENTS	(32,059,668)	(4,077,189)
CASH AND CASH EQUIVALENTS AT THE BEGINNING OF THE FINANCIAL YEAR	53,451,178	57,528,367
CASH AND CASH EQUIVALENTS AT THE END OF THE FINANCIAL YEAR	**21,391,510**	**53,451,178**
CASH AND CASH EQUIVALENTS:		
Fixed Deposit	20,795,161	51,677,584
Cash and Balance at Bank	596,349	1,154,784
Short Term Deposit	-	618,810
	21,391,510	**53,451,178**

STATEMENT OF COMPARISON BUDGET AND ACTUAL
FOR THE YEAR ENDED 31 DECEMBER 2019

	Total Budget Initial 2019 RM	Total Budget Final 2019 RM	Total Actual 2019 RM	Variance Budget 2019 RM	Note
RECEIPTS					(a)
Non-exchangeable Transactions					
Government Grant	10,646,932	9,498,407	10,675,654	1,177,247	
External Contributions	542,700		-	-	
Exchangeable Transactions					
Other Income	-	-	81,148	81,148	
	11,189,632	**9,498,407**	**10,756,802**	**1,258,395**	
PAYMENTS					(b)
Salaries and Wages	973,156	683,759	771,506	87,747	
Services and Supplies	9,498,638	8,147,721	7,736,479	(411,242)	
Fixed Asset	33,850	33,850	124,994	91,144	
Contribution and Fixed Charges	337,150	568,329	134,231	(434,098)	
Other Expenses	346,838	64,748	59,457	(5,291)	
	11,189,632	**9,498,407**	**8,826,667**	**(671,740)**	
NET RECEIPTS	**-**	**-**	**1,930,135**	**1,930,135**	

*Refering to the variance between Final Budget Amount and Actual Amount.

Nota (a):
(a) The significant variance in the operating grant received from the Government in the year 2019 was due to insufficient of allocation. An appeal for an additional allocation by ASM was later approved by MESTECC and MOF on 6 September 2019 which was later added to the 2019 budget.

Nota (b):
(b) As the appealed additional allocation for 2019 was only received in end of quarter 4, many of ASM planned activities were either postponed to the following year or canceled. This resulted decrease of expenditure and significant variance in the spending.

NOTES TO THE FINANCIAL STATEMENTS
FOR THE YEAR ENDED ON 31 DECEMBER 2019

(1) GENERAL INFORMATION

a) ASM Establishment and Main Objectives
The Academy of Sciences Malaysia (ASM) was established under Act 524. The objective of ASM is to pursue, encourage and enhance excellence in the fields of Science, Engineering, and Technology (SET) for the development of the nation and benefit of mankind.

b) Functional Currency for Financial Statements
The financial statements is presented in Malaysian Ringgit ("RM") which is the functional and presentation currency of ASM. Thus, all financial information is presented in RM.

c) Date of Approval of Financial Statements
ASM Financial Statements for the year ended on 31 December 2019 was approved by ASM Council on 15 September 2020.

2) ACCOUNTING POLICIES

a) Basis of Preparation of Financial Statements
The Financial Statements of ASM is prepared under the conventional historical cost in compliance with the Malaysian Public Sector Accounting Standards (MPSAS).

This is the fourth year the financial statements is prepared based on MPSAS. ASM adopted MPSAS on 1 January 2015 (earlier than the effective date of 2020). The adoption of MPSAS required application of all MPSAS standards in the preparation of the Financial Statements for the Financial Year Ended on 31 December 2016, Comparative Statements for the Preceding Year Ended on 31 December 2015 and the balance of the Statement of Financial Position as at the date of the transition to MPSAS. Previously, ASM Financial Statements was prepared based on Public Entity Reporting Standards (PERS).

The preparation of financial statements requires judgments, estimates, and assumptions that affect the use of policies and the reported amounts of assets, liabilities, revenues, and expenses.

Estimates and assumptions used will be reviewed on an ongoing basis. Revision to accounting estimates will be recognised in the revised accounting period if the revision affects that period, or the period in review and future periods if the revision affects the current and future periods.

Where these judgments, estimates, and assumptions have significant impact on the amounts recognised in the financial statements, they will be disclosed in Note 2(p) Critical Accounting Considerations and Sources of Estimation Uncertainty in the financial statements.

b) Income Recognition
Income from Non-exchangeable Business Transactions

Non-exchangeable business transactions will be recognised as an asset when there are future economic benefits expected to flow to the entity as a result of historical event and the cost or value of the asset can be measured reliably. Non-exchangeable business transactions recognised as an asset shall be recognised as income except when there's a liability that is also being recognised for the same transaction as a delayed transaction in the Financial Statements. When the obligations towards liabilities are met, the entity shall reduce the liabilities amount and recognise the income amount as equivalent to the amount reduced.

Income from non-exchangeable business transactions are as follows:

i. Government Grants
Government Grants which are not subjected to certain future performance conditions such as the operating grant are recognised as income in the financial statements. Government grants subject to certain future performance conditions such as development grants are recognised as deferred grants to be amortised as income with the liability valued at its carrying amount. Grants are amortised on a straight-line basis over their estimated useful life.

ii. Donation Fund
Donations which are not subjected to certain future performance conditions are recognised as an income in the financial statements. Funds subject to certain future performance conditions are recognised as liabilities to be amortised as an income with the liability valued at its carrying amount. Funds are amortised on a straight-line basis over their estimated useful lives.

Income from Exchange Transactions
Income from exchange transactions are recognised when there are possibilities for the future economy expected to flow to the entity and the benefits can be measured reliably.

Income from exchange transactions are as follows:

i. Income Derived from Interest and Other Investment
Income derived from fixed deposits are recognised based on current exchange rates taking into consideration of an effective return of investment. The rate of return of investment on asset is the profit rate required to discount the future cash inflow expectation throughout the life expectancy of the respective asset to be equalised with the brought forward value of the asset.

Income derived from interest gained from conventional deposits and investments are recognised on accrual basis.

2) ACCOUNTING POLICIES (CONT.)
ii. Rental
Income from the rental is recognised when it is received in accordance with the rental agreement.

iii. Other Revenue/Income
Other incomes are recognised when services are provided.

c) Property, Plant and Equipment
Property, Plant and Equipment are stated at cost less accumulated depreciation and impairment losses. Cost includes all of the direct costs to bring the asset to working condition for its intended use by the management. The cost of replacement of any asset that requires replacement at regular intervals will be capitalised. The carrying amount of those parts replaced will be derecognised in accordance with derecognition provision. The cost of day-to-day servicing will be recognised as an expense in the financial statement.

Property, plant and equipment of value over RM1,000 and above or in need of regular maintenance will be capitalised as property, plant and equipment.

If an asset is acquired through a non-exchange transaction, the cost should be measured at its fair value as of the acquisition date. These assets will be recognised in the financial statements unless there is a condition for the use of the asset, current liability will be recognised.

The carrying value of property, plant and equipment items should be derecognised at disposal or when no future economic benefits or potential services are expected from their use or disposal.

The gain or loss on the derecognition of property, plant and equipment is the difference of the proceeds and the carrying amount of the asset and its differences are recognised as profit or loss in the financial statements.

Depreciation for property, plant and equipment are calculated based on a straight-line basis over their accumulated useful life at the following rates:-

Building	1.67%
Office Renovation	10%
Motor Vehicle	20%
Office Equipment	20%
Computer	20%

Full depreciation is charged in the year of purchase of property, plant and equipment. The net balance of each property, plant and equipment should not be less than RM1. If there are significant changes in the factors that affects the residual value, changes in the expected useful life or pattern of consumption of benefits since the last financial year, the carrying amount, depreciation method and the useful life of the asset will be reviewed and adjusted prospectively.

Work in progress consists of work involving property and equipment that has not been completed until the end of the current financial year. Work in progress is stated at cost and is not depreciated until the asset is ready for use.

d) Impairment of Non-financial Assets
i. Cash Generating Assets
At each reporting date, ASM assesses the carrying value of its assets to determine whether there is any indication of impairment. If any indication exists, impairment is calculated by comparing the carrying amount of the asset with its recoverable amount. Recoverable amount is the highest value of the asset's fair value less costs to sell and its value in use.

In determining value in use, future cash flows are discounted to their present value using a pre-tax discount rate that reflects the current market value and specific risks associated with the asset. In determining fair value less costs to sell, most recent market transactions will be considered, if any. If there are no recent market transactions, an appropriate valuation model should be used.

An impairment loss is recognised as an expense on an ongoing surplus or deficit when the carrying amount of an asset exceeds its recoverable amount unless the asset is carried at revalued amount. Any impairment loss on a revalued asset will be reduced to the extent that the revaluation surplus is not used for the same asset.

ii. Non-cash Generating Assets
ASM will evaluate at each reporting date whether there is any indication that a non-cash-generating asset may be impaired. If any indication exists, then ASM will make an estimate of the total asset recovery service. The asset's recoverable amount is the highest of its fair value less costs to sell and value in use.

An impairment loss is recognised as a reduction in its surplus or as an expense when the carrying amount of an asset exceeds its recoverable amount.

In determining value in use, ASM has adopted depreciated replacement cost approach. Under this approach, the present value of the asset's remaining balance potential is determined as the cost of replacing the depreciated asset. Depreciation expense will be measured by taking into account the cost of replacement of the asset less accumulated depreciation calculated on that cost to reflect the potential use of the asset that has been used or expired.

In determining fair value less costs to sell, the price of an asset in a binding agreement in an arm's length transaction is adjusted to determine the disposal price of the asset. If no binding agreement exists, but the asset is actively traded on the market, the fair value of the cost of the sale is determined by reference to the current market value less the cost of disposal. If there is no binding sale agreement or active market for the asset, ASM determines the fair value less costs to sell based on the best available information.

2) ACCOUNTING POLICIES (CONT.)

For each asset, an assessment is made at each reporting date as to whether there is any indication that previously recognised impairment losses may no longer exist or have diminished. If such an indication exists, ASM estimates the amount of asset's recoverable service amount. The previously recognised impairment loss will be reversed only if there has been a change in the assumptions used to determine the amount of the asset's recoverable service since the last impairment loss was recognised. A reversal is limited to the carrying amount of the asset not exceeding the recoverable amount of the service, or the carrying value of the asset net of depreciation and had no impairment loss being recognised for the asset in prior years.

e) Financial Assets

Financial assets are recognised in the financial statements when ASM participates in the contractual provisions of the instrument.

In the initial recognition, financial assets are measured at fair value, including transaction costs for financial assets that are not measured at fair value through profit or loss which are directly attributable to the issuance of financial assets.

Following initial recognition, financial assets will be classified into one of four categories of financial assets, namely financial assets measured at fair value through profit or loss, loans and receivables, held-to-maturity investments and ready-to-sell financial assets.

The purchase or sale of a financial asset that requires the surrender of the asset within the time frame stipulated by the rules or conventions in the market will be recognised on the date the transaction is made, which is the date on which ASM makes a commitment to buy or sell the asset.

ASM has only the following financial asset categories:

i. Loans and Receivables

Loans and receivables are non-derivative financial assets with fixed or determinable payments that are not quoted in the active market. After the initial measurement, the financial assets are subsequently measured at amortised cost using the effective interest method and less impairment. An amortised cost is calculated using any discount or premium on the purchase of the asset as well as fees or costs that are part of the effective interest rate. Losses arising on impairment are recognised in the profit or loss.

ii. Held-to-maturity Investments

Non-derivative financial assets with fixed or determinable payments maturity and are classified as held for maturity when ASM has a positive intention and ability to hold to maturity. After initial measurement, the holding to maturity of the investment is measured at amortised cost using the effective interest method and less impairment. The amortisation cost is calculated taking into account any discount or premium on the acquisition and fees or costs that are part of the effective interest rate. Impairment losses are recognised in the financial statements.

iii. Impairment of Financial Assets

At the end of each reporting period, ASM will evaluate whether there is any objective evidence that the financial assets need to be impaired. Objective evidence includes:

(i) significant financial difficulties by borrowers; or
(ii) payment in arrears; or
(iii) the possibility that the borrower will go bankrupt; or
(iv) data indicating decline in future cash flow estimates.

For a financial asset category that is measured at amortised cost, if no objective evidence exists for a significant individual, then all assets in ASM with similar risk characteristics regardless of whether they are significant, will be evaluated collectively to determine whether it needs to be impaired.

An impairment loss, in respect of a financial asset measured at amortised cost, is measured as the difference between the carrying amount of the asset and its present value of estimated cash flow at the original effective interest rate. The carrying value of the asset is reduced through the use of an allowance account. Any impairment loss is recognised in profit or loss immediately. If, at any time, circumstances that led to the impairment no longer exist, the previously recognised impairment loss will be reversed directly in the allowance account. This reversal is recognised in the profit or loss immediately.

iv. Derecognition of Financial Asset

Financial assets are derecognised when the contractual right to cash flow from the financial assets expires or is settled and ASM transfers significant risks and rewards of ownership of the financial assets to another.

On the derecognition of financial assets as a whole, the difference between the carrying amount and the amount of consideration received is recognised in the surplus or deficit during the period of the derecognition.

f) Cash and Cash Equivalents

The cash flow statement was prepared using the indirect method. Cash and cash equivalents consist of cash in hand and cash at banks as well as high-risk investments with licensed banks and financial institutions with12-month or less maturity that are readily convertible to known amounts of cash which are subject to an insignificant risk of changes in value.

2) ACCOUNTING POLICIES (CONT.)

g) Employee Benefits

i. Short Term Employee Benefits

In general, ASM as a Federal Statutory Body is guided by the Public Service Department (JPA)'s employment regulations adopted by ASM and ASM's own policies. The short-term employee benefits provided are basic salaries, fixed allowances, non-fixed allowances, and various leaves including annual leave, medical benefits and insurance.

Short-term employee benefits including salaries, wages, allowances, statutory contributions and employment injury scheme and invalidity scheme (SOCSO) are recognised as an expense in the year in which the related services are provided by employees. Unutilised paid leave such as annual leave can be accumulated and carried forward to the next servicing year of the employee. Whereas for leaves that are not able to be carried forward such as sick leave, may only be taken as and when the employee applies.

ii. Post-employment Pension Benefits

<u>Employees' Provident Fund (EPF)</u>

ASM makes EPF contributions according to the rates and conditions set by EPF. The contribution rates used by ASM are 12% and 13% for employees under 60, whereas for employees 60 years and above, the contribution rates are 4% and 6%, respectively. The contribution rate is also applicable to permanent employees who opted for EPF contribution.

<u>Kumpulan Wang Persaraan (KWAP)</u>

ASM also makes contributions to public services pension fund for permanent staff who opted for pension. The contribution rate is 17.5%. as set by KWAP.

iii. Paid Leave and Compensation for Employees

<u>Permanent Employees</u>

ASM permanent employees will receive a reimbursement for annual leave (compensated absences / Gantian Cuti Rehat (GCR)) upon their retirement whether they chose a pension scheme or EPF. This reward is based on the JPA Service Circular adopted by ASM.

Reimbursement of annual leave is calculated based on the following formula:

1/30 x salary + allowances (ITP, ITKA/ keraian) x Number of leave accumulated

(subject to a maximum limit of 150 days).

Note:
- imbuhan tetap perumahan (ITP)
- imbuhan tetap khidmat awam (ITKA) / keraian

<u>Contract Employees</u>

ASM pays gratuity for each Contract of Service (CoS) according to the terms and conditions of the respective contract. ASM CoS employees are paid cash awards in lieu of leave (GCR) up to 6-days within a contract period. Remuneration and GCR payments for contract employees are in accordance with the terms and conditions set out in the civil service circular.

h) Contra of Financial Instrument

Financial assets and financial liabilities are only contravened if, and only if, there is a legal right to offset them and have the purpose of settling them to their net worth or to realize the assets and settle the liabilities simultaneously.

i) Goods and Services Tax (GST) and Sales and Services Tax (SST)

The implementation of the Goods and Services Tax (GST) took effect on 1 April 2015. ASM registered with the Royal Malaysian Customs Department on 29 December 2014 with reference number 001836703744 and later the GST was abolished by the government on 30 June 2018. The Sales and Service Tax (SST) was later re-implemented on 1 September 2018.

j) Budget Information

The annual budget is prepared on a cash basis. As the financial statements are prepared on an accrual basis, a Budget and Actual Comparison Statement is disclosed separately. The statement is prepared using the basis of the annual budget prepared and only refers to the operational budget.

The budget presented is for ASM's reference and was approved by ASM Council.

k) Provisions and Liabilities

Provisions are recognised when ASM has current (legal or constructive) obligations as a result of past events, and it is probable that an outflow of resources containing economic benefits will be required to settle the obligation and that the amount of the obligation can be estimated reliably. When ASM expects some or all of the provision to be repaid, the allocation-related expenses are presented in excess of or deductible from any refund.

l) Related Parties

ASM regards a related party as a person or entity with the ability to exercise control individually or collectively or to exercise significant influence over ASM, or vice versa. ASM Management's key employees, President and members of the ASM Council are considered as related parties.

m) Contingent Liabilities and Contingent Assets

A contingent liability is an unrecognised current obligation as there is no probable source of outflow to resolve the obligation or in the rare case where the liability cannot be recognised because it cannot be reliably measured. Contingent liabilities are not recognised but are disclosed in the financial statements. Obligations arising from past events, whose existence can only be confirmed by the occurrence or non-occurrence of one or more uncertain events, are not under the control of the entire ASM, also disclosed as contingent liabilities unless the probability of an outflow of economic resources is small.

2) ACCOUNTING POLICIES (CONT.)

Contingent assets are assets that may arise from past events whose existence will only be confirmed in the event of the occurrence or the occurrence of one or more uncertain events in the future that are not within the control of ASM. ASM does not recognise contingent assets in the financial statements but discloses their existence where inflows of economic benefits are possible, but not certain.

n) Financial Liabilities

Financial liabilities are recognised in the statement of financial position when ASM is a party to the contractual provisions of the instrument.

In the initial recognition, financial liabilities are measured at fair value, including transaction costs for financial liabilities that are not measured at fair value through profit or loss, which are directly attributable to the issue of financial liabilities.

Following initial recognition, financial liabilities are classified into two categories of financial liabilities, namely financial liabilities measured at fair value through surplus or borrowings, loans and payables.

ASM has the following categories of financial liabilities:

Loans and Repayments

After initial recognition, loans and repayments are measured at amortised cost using the effective interest method. Gains or losses are recognised in profit or loss when financial liabilities are derecognised or impaired.

Effective interest rates are a method of calculating the cost of amortising your financial liabilities and to allocate interest expense over the relevant period. The effective interest rate is the discounted rate of estimated future cash payments due to the existence of a financial liability or, where appropriate, the shorter term, with the carrying amount of the financial liability.

A financial liability is recognised when the obligation specified in the contract has been discharged, canceled or expired.

Any discrepancy between the carrying amount of the deferred financial liability and the consideration paid is recognised in the surplus or deficit during the period of the derecognition.

o) Lease

Leases of property, plant and equipment are classified as finance leases when most of the risks and rewards of ownership of property, but not legal ownership, are transferred to ASM.

ASM initially recognises the right to use and its obligations under finance leases as assets and liabilities in the statement of financial position at an amount equal to the fair value of the leased asset or, if less, the present value of the minimum lease payments, determined at the beginning of the lease. Any initial direct costs are added to the amount recognised as an asset.

Minimum lease payments are divided between finance charges and the reduction of outstanding liabilities using the effective interest method. Monetary charges are allocated periodically throughout the lease term to generate a fixed-term interest rate on the balance of the liability.

The depreciation policy for a leasehold asset is consistent with the asset's depreciable assets. If there is no reasonable assurance that ASM will acquire ownership by the end of the lease term, the leased asset will be fully depreciated over the term of the lease and its useful life. At each reporting date, ASM assesses whether the leasehold assets under finance lease are impaired.

Operating leases are recognised as an expense in the profit or loss on a straight-line basis over the lease term. The aggregate benefit of incentives provided by the lender is recognised as a reduction of rent expense over the lease term using the straight-line method.

p) Critical Accounting Considerations and Sources of Estimation Uncertainty

i. Critical Accounting Considerations

There are no critical accounting judgments that have material impact on the amounts recognised in the financial statements.

ii. Sources of Estimation Uncertainty

The key estimates of the future, and other key sources of budget uncertainty as of the reporting date, are significant risks that will result in significant adjustments to the carrying values of assets and liabilities in the next financial year.

Allocation Measurement

Budget Measurement Report (BMR) always uses the best estimates as the basis for measuring such an allocation. The estimates are based on past experience, other indications or assumptions, recent developments and reasonable future events in determining allocation.

Impairment Loss on Accounts Receivable

ASM evaluates at each reporting date whether there is any objective evidence that financial assets are impaired. To determine whether there is objective evidence of impairment, ASM considers factors such as insolvency and default or delay in payment. Where there is objective evidence of impairment, the amount and timing of future cash flows are estimated based on a history of loss experience for assets with similar credit risk characteristics.

Changes in Estimated Life Expectancy for Property, Plant and Equipment

All property, plant and equipment are depreciated on a straight-line basis over the life of the asset. Management estimates the life expectancy of property, plant and equipment over a period of five (5) to 60 years. Changes in the estimation of asset usage patterns and technology development can impact the life and residual value of those assets. This will result in a change of depreciation of the asset in the future.

3) CASH AND BANK BALANCE

	2019 RM	2018 RM (As Restated)
ASM		
Cash in Hand	3,953	3,041
Cash at Bank	592,396	936,129
Research, Development & Commercialisation Fund (R,D&C)		
Cash at Bank	-	215,614
	596,349	1,154,784

4) FIXED DEPOSITS

	2019 RM	2018 RM (As Restated)
ASM		
Fixed Deposit	20,795,161	8,019,270
Research, Development & Commercialisation Fund (R,D&C)		
Fixed Deposit	-	43,658,314
	20,795,161	51,677,584

Fixed deposits are made over a period of 12 months or less depending on ASM's immediate cash requirements and benefit at Short Term Deposit Rates. The Average Effective Interest Rate Weight as of 31 December 2019 is 3.48% per annum (2018: 2.68% per annum).

5) SHORT TERM DEPOSITS

	2019 RM	2018 RM (As Restated)
Opus Shariah Cash Extra Fund:		
Number of Units	-	600,378
Market Value	-	618,810

Short-term deposits have a 12-month maturity period and interest at Short Term Deposit Rates. The Average Effective Interest Rate Weight as of 31 December 2018 is 1.03% per annum.

6) RECEIVABLES FROM EXCHANGE TRANSACTIONS

	2019 RM	2018 RM (As Restated)
Receivables	7,379	3,693,687
Deduct:		
Provision of Bad Debts	-	(64,905)
	7,379	3,628,782

Accounts Receivable are interest-free and generally range from one (1) day to 30 days. Accounts Receivable are recognised at Fair Value at the time of initial recognition. The amount expected to be recovered within 12 months will be recognised on the original invoice amount. Otherwise, it will be recognised on the Current Value of the original invoice amount.

Analysis of account receivable aging is as follows:

	2019 RM	2018 RM
Does not exceed duration and is not affected	6,250	174
1 to 3 months	729	864,850
3 to 12 months	-	2,821,863
More than 12 months	400	6,800
	7,379	3,693,687
Affected	-	(64,905)
	7,379	3,628,782

The movements in the provision of doubtful debt are as follows:

	2019 RM	2018 RM
Balance as at 31 December	-	64,905

7) OTHER RECEIVABLES

	2019 RM	2018 RM (As Restated)
Advances to Staff	3,617	8,703
Mahathir Science Award Foundation (MSAF)	-	500,000
Accrued Interest	133,204	846,945
Accrued Income	-	500
Goods and Services Tax Receivable	-	341,367
	136,821	1,697,515

8) PROPERTY, PLANT AND EQUIPMENT

	As at 1 January 2019 RM (As Restated)	Additions RM	Disposal/ Classification RM	As at 31 December 2019 RM
COST				
Building	3,399,000	-	-	3,399,000
Vehicle	477,148	-	-	477,148
Office Equipment	881,831	17,752	-	899,583
Computer	334,000	107,242	(55,228)	386,014
Office Renovation	3,851,640	-	-	3,851,640
	8,943,619	124,994	(55,228)	9,013,385

	As at 1 January 2019 RM (As Restated)	Additions RM	Disposal/ Classification RM	As at 31 December 2019 RM
ACCUMULATED DEPRECIATION				
Building	135,960	67,980	-	203,940
Vehicle	471,854	5,288	-	477,142
Office Equipment	833,554	25,220	-	858,774
Computer	246,298	43,130	(50,214)	239,214
Office Renovation	3,651,925	30,714	-	3,682,639
	5,339,591	172,332	(50,214)	5,461,709

	As at 1 January 2019 RM
NET CARRYING AMOUNT	
Building	3,195,060
Vehicle	6
Office Equipment	40,809
Computer	146,800
Office Renovation	169,001
	3,551,676

8) PROPERTY, PLANT AND EQUIPMENT (CONT.)

	As at 1 January 2018 RM (As Previously Stated)	Additions RM	Disposal/ Classification RM	As at 31 December 2018 RM (As Restated)
COST				
Building	3,399,000	-	-	3,399,000
Vehicle	477,148	-	-	477,148
Office Equipment	888,460	24,319	(30,948)	881,831
Computer	484,933	37,904	(188,837)	334,000
Office Renovation	3,732,914	118,726	-	3,851,640
	8,982,455	180,949	(219,785)	8,943,619

	As at 1 January 2018 RM (As Previously Stated)	Additions RM	Disposal/ Classification RM	As at 31 December 2018 RM (As Restated)
ACCUMULATED DEPRECIATION				
Building	67,980	67,980	-	135,960
Vehicle	440,116	31,738	-	471,854
Office Equipment	795,750	68,747	(30,943)	833,554
Computer	395,676	37,050	(186,428)	246,298
Office Renovation	3,630,811	21,114	-	3,651,925
	5,330,333	226,629	(217,371)	5,339,591

	As at 31 December 2018 RM (As Restated)
NET CARRYING AMOUNT	
Building	3,263,040
Vehicle	5,294
Office Equipment	48,277
Computer	87,702
Office Renovation	199,715
	3,604,028

9) WORK IN PROGRESS

	2019 RM	2018 RM
Additional One-off Grant	500,000	-
Expenses	(21,526)	-
Balance as at 31 December	478,474	-

ASM received additional one-off grant from MESTECC for repairing of roof top at ASM Jalan Tun Ismail. The additional grant was received in quarter 4, 2019 and expected to be accomplished in 2020.

10) ACCOUNT PAYABLES FOR NON EXCHANGE TRANSACTIONS

	2019 RM	2018 RM (As Restated)
Payables - Institution	905,128	1,022,505
Other Payables	18,750	242,475
Audit Fees	18,619	8,563
Interest of Research, Development and Commercialisation (R,D&C)	-	3,642,461
	942,497	4,916,004

ASM has been appointed as Project Monitoring Agency (PMA) for the Research, Development and Commercialisation (R,D&C) project since December 29, 2011. As the PMA, ASM is responsible for disbursing payment for research and development (R&D) projects based on the achievement milestone and Ministry's approval. The R,D&C project was completed in 2018 and the remaining allocation was returned to the Government on 4 July 2019.

ASM places these funds in fixed deposits and the accumulated gain of investment are kept separately and owned by the Government.

11) EMPLOYEE BENEFITS

	2019 RM	2018 RM (As Restated)
Balance as at 01 January - (As Previously Stated)	200,655	378,385
Prior Year Adjustment	-	(207,078)
As at 01 January - (As Restated)	200,655	171,307
Add:		
Employee Benefit for the Year	237,644	297,767
Deduct:		
Employee Benefit Paid During the Year	(185,318)	(121,219)
Deduct:		
Adjustment		(147,200)
Balance as at 31 December	252,981	200,655

Employee Benefit for the year are as follow:

	2019 RM	2018 RM (As Restated)
Current Liability	229,395	178,837
Non-current Liability	23,586	21,818
	252,981	200,655

12) DONATION FUND

	2019 RM	2018 RM (As Restated)
Balance at 01 January	245,202	171,856
Additions	98,233	73,346
Expenses	(6,050)	-
Balance at 31 December	337,385	245,202

The breakdown of the fund is as follows:

	2019 RM	2018 RM (As Restated)
Main Fund	140,930	118,110
Talent Development Program	35,193	32,591
Science Awareness Program	5,300	5,300
ArtScience	90,151	69,200
Frontier of Science	5,011	5,001
Sustainable Development	15,000	15,000
S&T Based Start-ups	800	-
Publications	32,000	-
Young Scientists Network	13,000	-
	337,385	245,202

ASM receives donations from ASM members and non-members for the implementation of various programs. Contributions are made on a voluntary basis on a monthly, yearly or one-off basis. Contributions are based on specific objectives in which ASM is responsible for implementing the program when it achieves a certain value.

13) DEFERRED INCOME

	2019 RM	2018 RM (As Restated)
Balance at 01 January	867,295	608,953
Income	1,931,363	1,688,729
Amortisation to Financial Statements Expenses	(1,350,184)	(1,430,387)
Adjustment on Income	(10,091)	
Balance at 31 December	1,438,383	867,295

The deferred income fraction is as follows:

	2019 RM	2018 RM (As Restated)
ASM	48,697	-
ASEAN Young Scientists Network	-	-
2019 CCM STEM Up Challenge		
ISC ROAP	1,389,686	867,295
	1,438,383	867,295

Deferred income is an allocation received from a non-Malaysian government and includes international grants or grants from corporate or organizations. ASM is bound by the terms of reference and duration of the program as outlined in the agreement or letter of appointment.

14) DEFERRED GRANT

	2019 RM	2018 RM (As Restated)
Balance at 01 January - (As previously stated)	47,182,050	48,499,882
Prior Year Adjustment	-	(532,376)
Balance at 01 January - (As Restated)	47,182,050	47,967,506
Income	7,498,227	9,029,816
Adjustments (Surplus from Program)	(1,479,550)	(81,395)
Returns of Allocation	(40,603,135)	(750,000)
Amortisation to the Financial Statements Expenses	(1,984,419)	(8,983,877)
Balance as at 31 December	10,613,173	47,182,050

Deferred grants are provisions received from the Malaysian Government for a specific purpose. ASM is bound by the terms of reference and duration of the program as outlined in the agreement or letter of appointment.

Deferred grants are analysed as follows:

	2019 RM	2018 RM (As Restated)
Non-current Liability	10,613,173	47,182,050
	10,613,173	47,182,050

14) DEFERRED GRANT (CONT.)

The breakdown of the deferred grant allocation is as follows:

	2019 RM	2018 RM (As Restated)
ASM		
Study on Rare Earth	-	207,707
MOSTI Social Innovation – Duta Sains	-	203,542
Project Monitoring Team	-	260,174
Newton Ungku Omar Fund (NUOF)	3,484,360	4,279,486
National Policy on Science, Technology and Innovation (NPSTI)	-	504,972
Science Technology and Innovation Master Plan (STIMP)	-	435,528
Malaysian Antarctica Research Program and International Program	-	1,016
Scientific Expedition	-	96,898
National Nobel Laureate Programme and Scientific Advancement Grant Allocation (SAGA)	-	561
Impact Study on the Implementation of the Malaysian Research Universities	23,350	553,336
Mid - Term Review of Malaysia Education Blueprint 2015 - 2025	19,620	597,886
National Entrepreneurship Policy	3,541	-
Task Force Sg Kim Kim	94,369	-
ASEAN Foresight Alliance	8,983	-
Malaysian Collaborative Network Platform for Disruptive Innovation (i-CONNECT)	3,988,807	-
Malaysia Open Science Platform (MOSP)	991,475	-
Review & Update Study on Environmental Quality Act	1,998,668	-
Research, Development & Commercialisation Fund	-	40,040,944
	10,613,173	47,182,050

15) DEFERRED GRANT – INTERNATIONAL OFFICE

	2019 RM	2018 RM (As Restated)
Balance at 01 January - (As Previously Stated)	1,664,872	1,488,238
Income	2,505,000	2,334,548
Amortisation to Financial Statements Expenses	(2,580,127)	(2,157,914)
Balance at 31 December	1,589,745	1,664,872

Deferred grants are analysed as follows:

	2019 RM	2018 RM (As Restated)
Non-current Liability	1,589,745	1,664,872
	1,589,745	1,664,872

15) DEFERRED GRANT – INTERNATIONAL OFFICE (CONT.)

International Science Council Regional Office for Asia and the Pacific (ISC ROAP)

	2019 RM	2018 RM (As Restated)
Balance at 01 January - (As previously stated)	864,019	812,865
Income	1,000,000	871,083
Amortisation to Financial Statements Expenses	(867,785)	(819,929)
Balance at 31 December	996,234	864,019

The International Science Council (ISC) works at the global level to catalyse and convene scientific expertise, advice and influence on issues of major concern to both science and society. The ISC was launched in 2018 following a merger of the International Council for Science (ICSU), which was created in 1931, and the International Social Science Council (ISSC), created in 1952.

ISC ROAP (formerly known as ICSU ROAP) is hosted by Malaysian Government since 19 September 2006. The hosting of the Regional Office is based on five (5) year agreement between Malaysian Government and ISC (formerly known as ICSU). The operational cost is funded by Malaysian Government and while programme funded by ISC. The third term will end on 18 September 2021.

International Science, Technology & Innovation Centre (ISTIC)

	2019 RM	2018 RM (As Restated)
Balance at 01 January - (As previously stated)	800,853	675,373
Income	1,505,000	1,463,465
Amortisation to Financial Statements Expenses	(1,712,342)	(1,337,985)
Balance at 31 December	593,511	800,853

ISTIC is UNESCO Category 2 centre hosted by Malaysian Government since 26 March 2009 (launched on 22 May 2008). ISTIC was established to develop and implement programmes for South-South cooperation in science and technology with the objective of facilitating the integration of a developmental approach into national science and technology and innovation policies; capacity building in science and technology through providing policy advice and exchange of experience and best practices; and creating a problem-solving network of centres of excellence in developing countries as well as supporting the exchange of students, researchers, scientists and technologists among developing countries.

The hosting of the Centre is based on five (5) year agreement between Malaysian Government and UNESCO. The operational cost and programmes of the Centre is funded by Malaysian Government and the third term will end on 7 September 2021.

16) NON-EXCHANGEABLE TRANSACTIONS

	2019 RM	2018 RM (As Restated)
Operating Grant	5,879,871	5,558,292
Additional Grant	4,795,783	3,759,000
	10,675,654	9,317,292
Program Grant	1,182,849	2,871,045
Amortisation of Deferred Grant	1,984,420	8,983,876
Amortisation of Deferred Grant – International Office	2,580,127	2,157,914
Amortisation of Deferred Income	1,350,184	1,430,387
Amortisation of Donation Fund	6,050	-
Other Income:		
Office Rental Charges	82,000	55,000
Refund from International program	-	172,871
Fund Collection for Dinner	400	10,500
Surplus from Project	31,089	356,900
	17,892,773	25,355,785

17) EXCHANGEABLE TRANSACTIONS

	2019 RM	2018 RM (As Restated)
Refund of Deposit	-	168,590
Program Management Charges	-	330,000
Current Account Interest	18,037	6,890
Fixed Deposit Interest	512,308	1,051,436
Recoverable Bad Debt	2,300	-
GST Refund	33,900	-
Other Income	91,816	48,176
	658,361	1,605,092

18) SALARIES AND WAGES

	2019 RM	2018 RM (As Restated)
Permanent staff:	549,976	418,256
Salaries and Wages	168,527	155,311
Fixed Allowance	40,160	30,223
Statutory Contribution to Employees	3,149	10,844
Overtime Allowance	9,694	26,949
Other Employee Benefits	771,506	641,583

ASM's permanent staff are civil servant personnel who fill out the PSD's employment warrant. Payment of salaries, wages and fixed costs are in accordance with Service Circular No. 1/2016.

19) SERVICES AND SUPPLIES

	2019 RM	2018 RM (As Restated)
Administrative Cost	1,288,425	1,240,999
Emoluments for Contract Employees	3,856,849	3,823,493
Science Communication	208,936	116,938
Membership Affairs	505,946	466,106
International Affairs	-	-
	5,860,156	5,647,536

Services and Supplies are ASM's operating expenses which are mainly administrative expenses that include expenditure for facility management, information technology, finance and accounts, The HUB and ASM committees and governance bodies. In addition, salaries and wages for ASM contract employees are designated in accordance with Service Circular No. 2/2008. Payment of wages, wages and fixed costs are in accordance with Service Circular No. 1/2016.

20) SCIENCE PROGRAMME EXPENSES

	2019 RM	2018 RM (As Restated)
Deferred Grant Expenditure		
Project Monitoring Team R,D&C	-	48,048
Newton Ungku Omar Fund (NUOF)	929,355	6,981,254
National Policy on Science, Technology and Innovation (NPSTI)	161,122	348,956
Science Technology and Innovation Master Plan (STIMP)	238,434	367,248
Research, Development & Commercialisation Fund (R,D&C)	-	748,340
Dasar Sains Teknologi dan Inovasi Negara (DSTIN Flagship)	-	448,529
Program MCCE - MOSTI	-	2,000
Bibliometric	-	28,000
ASEAN Journal	-	5,000
Impact Study on the Implementation of the Malaysian Research Universities	283,318	2,127
Mid - Term Review of Malaysia Education Blueprint 2015 - 2025	159,493	4,374
National Entrepreneurship Policy	55,775	
Minggu Sains Negara 2019	75,576	-
Task Force Sg Kim Kim	19,280	-
ASEAN Foresight Alliance	41,017	-
Malaysian Collaborative Network (i-Connect)	11,193	-
Malaysia Open Science Platform (MOSP)	8,525	-
Review & Update Study on Environmental Quality Act	1,332	-
	1,984,420	8,983,876
Deferred Grant Expenditure – International Office		
International Science Council Regional Office for Asia and the Pacific (ISC ROAP)	867,785	819,929
International Science, Technology & Innovation Centre (ISTIC)	1,712,342	1,337,985
	2,580,127	2,157,914
Deferred Income Expenditure		
ISC ROAP	1,293,160	1,430,387
2019 CCM STEM Up Challenge	23,267	-
ASEAN Young Scientists Network	33,757	-
	1,350,184	1,430,387
Collaboration and Excellence Network Activity Science	157,535	3,674,776
	6,072,266	16,246,953

The Science Program is the activities undertaken by ASM to fulfill the 14 functions of ASM as stipulated in the Academy of Sciences Malaysia Act 1994.

21) CONTRIBUTION AND FIXED CHARGES

	2019 RM	2018 RM (As Restated)
Kelab Sukan dan Kebajikan Kakitangan (KSKK)	25,000	25,000
Pension	67,696	47,274
International Subscriptions	41,535	30,050
	134,231	102,324

22) EMPLOYEE BENEFITS

	2019 RM	2018 RM (As Restated)
Permanent Employee Replacement Leave	1,768	16,213
Contract Employee Replacement Leave	25,727	3,758
Contract Employee Rewards/ Gratuity	210,149	162,623
	237,644	182,594

23) OTHER EXPENSES

	2019 RM	2018 RM (As Restated)
Fees, Insurance, Taxes, Stamp Duty	15,256	86,652
Reversal of Accrued Interest	846,945	-
Bad Debts	500,000	-
	1,362,201	86,652

24) RENTAL

	2019 RM	2018 RM (As Restated)
Office Rental	1,143,667	1,088,431
Store Rental	18,340	18,240
Parking Rental	23,400	20,577
Electronic Equipment Rental	4,248	-
Office Equipment Rental	62,340	68,773
	1,251,995	1,196,021

25) TAXATION

	2019 RM	2018 RM (As Restated)
Corporate Taxes:		
Underprovision of Current Year's Tax	214,676	-
Tax Payment	15,279	-
Current Year's Tax Allocation	229,955	-
Previous Year's Tax Payment	44,201	-
Tax	274,156	-

26) HUMAN RESOURCE

ASM has permanent staff, contracts and on secondment basis. ASM operations are managed by ASM officers and staff. The total number of ASM employees as of 31 December 2019 was 75 (2018: 73) as follows:

	2019 RM	2018 RM
Permanent Staff		
Top Management Group	1	1
Management and Professional Group	2	2
Implementing Group	6	6
Contract Staff		
Management and Professional Group	46	45
Implementing Group	20	19
Total Staff		
Top Management Group	1	1
Management and Professional Group	48	47
Implementing Group	26	25
	75	73

27) TOP MANAGEMENT

The ASM leadership is led by the ASM Council chaired by the President. The ASM Council determines the direction of ASM and sets ASM policies. All decisions of the ASM Council are carried out by the ASM Management headed by the Chief Executive Officer (CEO). CEO is the ASM Controller and has the authority and responsibility to plan, direct, implement and control ASM activities. The CEO reports on the performance and status of all activities to the ASM Council.

	2019 RM	2018 RM
Member of Council:		
Total Allowance	37,500	31,250
Member of the Finance Committee:		
Total Allowance	11,200	6,400
Member of Exco Committee:		
Total Allowance	2,500	2,500
Key Management Personnel:		
Short Term Benefits	243,764	234,385
	294,964	274,535

Council consists of 16 members which include the President and Ordinary Council members. ASM's Finance Committee members comprise the Honorary Treasurer and 8 regular members.

28) FINANCIAL RISK MANAGEMENT

i. Financial Management Risk Objectives and Policies
ASM's financial risk management policy aims to ensure that there are sufficient financial resources for business development, managing credit risk, foreign exchange, and liquidity. ASM operates under clearly defined guidelines approved by ASM and ASM's policy is not to involve ASM in speculative transactions.

ii. Credit Risk
Credit risk or third-party risk of failure to pay is governed by the application of credit approval procedures, limits and strict supervision. Credit risk is minimized and closely monitored by limiting ASM's cooperation with high-credit business partners. Receivables are monitored continuously through ASM management reporting procedures.

For cash and bank balances, fixed deposits and short-term deposits, ASM reduces credit risk by dealing exclusively with high credit rating financial institutions.

iii. Interest Rate Risk
Interest rate risk is the risk that the fair value or future cash flows of ASM financial instruments will fluctuate due to changes in the interest rate market.

iv. Liquidity Risk
Liquidity and cash flow risk is the risk that ASM will face difficulties in meeting its financial obligations due to lack of funds. ASM's exposure to liquidity risks arises from differences in the maturity of financial assets and financial liabilities. The table below shows the maturity profile of ASM's liability at the date of the report based on repayment obligations without contract discounts.

ASM manages liquidity and cash flow risks by ensuring sufficient cash and providing sufficient funds to meet its commitments from operating expenses and financial liabilities.

	Less Than 1 Year RM	More Than 1 Year RM	Total
On 31 December 2019			
Accounts Payable for Exchangeable Transactions	-	-	-
On 31 December 2018			
Accounts Payable for Exchangeable Transactions	4,916,004	-	4,916,004

v. Fair Value
Cash and cash equivalents, receivables and payables equal their fair value due to their short maturity.

29) CONTINGENT ASSET

	2019 RM	2018 RM
Unsecured:		
Warranty provided:		
Fake transaction made by former employee	1,688,475	1,688,475
	1,688,475	1,688,475

In 2018, ASM took legal action against an employee for breach of trust and fraudulent transactions and was convicted under the Civil Division in the Malaya High Court in Kuala Lumpur.

He was ordered to pay RM1,688,475 in damages to ASM for the offense. In view of his inability to pay the damages, the Malaya High Court in Kuala Lumpur advised ASM to file bankruptcy status against him. Following this, ASM filed request for bankruptcy notice on 30 August 2018. Payments due by him will be made immediately to the Insolvency Department after he has been certified bankrupt.

There are no provisions stated in the financial statements of ASM. However, related legal costs have been recognised in the statement of financial position.

30) NOTES FOR STATEMENT OF COMPARISON FOR BUDGET AND ACTUAL

ASM Budget has been approved and presented on a cash basis for the financial year 1 January 2019 to 31 December 2019. The original budget was approved by the Ministry of Energy, Science, Technology, Environment and Climate Change (known as MESTECC) by letter MESTECC.400-4/1/5 (22) dated 23 January 2019. Additional provision was approved by the Ministry of Finance Malaysia (MOF) via letter MOF.NBO.600-9 /1/176 JLD.2 (21) dated 6 September 2019. This additional provision was included in the original budget by ASM after receiving approval to summarise the final budget. In 2019, ASM recorded an additional allocation of RM4,675,653.76 with the approval of MOF and MESTECC.

31) PRIOR YEAR ADJUSTMENTS AND COMPARATIVE FIGURE

Prior year adjustments were recognised as a result of the application and compliance of several MPSAS standards. During the financial year as well, ASM has reclassified the comparative figures to comply with the current financial year presentation. The impact on the financial statements is as follows:

	As Previously Stated RM	Adjustment RM	Classification RM	As Previously Stated RM
31 December 2018				
Statements of Financial Position				
ASSETS				
Current Assets	53,451,178	-	(53,451,178)	-
Cash and Cash Equivalent	-	-	1,154,784	1,154,784
Cash and Balance at Bank	-	-	51,677,584	51,677,584
Fixed Deposits	-	-	618,810	618,810
Short Term Deposit	3,693,687	-	(64,905)	3,628,782
Receivables	785,665	846,945	64,905	1,697,515
Other Current Assets/Other Receivables				
Non-current Assets				
Property, Plant and Equipment	395,570	3,208,458	-	3,604,028
LIABILITIES				
Current Liabilities				
Payables	4,836,324	79,680	-	4,916,004
Employee Benefits	240,689	(61,852)	-	178,837
Donation Fund	-	-	245,202	245,202
Deferred Income	-	867,295	-	867,295
Non-current Liabilities				
Employee Benefits	137,696	(115,878)		21,818
Deferred Grant	48,499,882	(1,317,832)		47,182,050
Deferred Grant – International Office	-	1,664,872	-	1,664,872
NET ASSET/ EQUITY	4,428,897	-	(4,428,897)	-
Operational Fund	245,202	-	(245,202)	-
Endowment Fund	1,906,813	-	(1,906,813)	-
Project Fund	54,590	-	(54,590)	-
Capital Reserve Fund	-	915,125	6,390,300	7,305,425
Accumulated Surplus				
	118,676,193	6,086,813	-	124,763,006

31) PRIOR YEAR ADJUSTMENTS AND COMPARATIVE FIGURE (CONT.)

	As Previously Stated RM	Adjustment RM	Classification RM	As Previously Stated RM
31 December 2018				
Statements of Financial Performance				
INCOME				
Non-exchangeable Transactions	25,111,969	(906,099)	1,149,915	25,355,785
Exchangeable Transactions	211,381	846,945	546,766	1,605,092
Other Income	1,328,055	(1,030)	(1,327,025)	-
EXPENSES				
Services and Supplies	6,545,803	-	(898,266)	5,647,536
Contribution and Fixed Charges	3,660,573	-	(3,558,249)	102,324
Employee Benefits	329,794	(147,200)	-	182,594
Other Expenses	282,643	-	(195,991)	86,652
Science Programme Expenses	12,450,496	3,796,457	-	16,246,953
Rental	-	-	1,196,021	1,196,021
Depreciation of Property, Plant and Equipment	198,410	28,219	-	226,629
	50,119,123	3,617,292	(3,086,829)	50,649,586


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Professor Dr Hanafi Ismail FASc

ASM Southern Region Chapter
Professor Datuk Dr Ahmad Fauzi Ismail FASc

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Jawatankuasa Audit
Professor Dato' Dr Roslan Abd Shukor FASc

Membership Committee
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Jawatankuasa Tatatertib bagi Kumpulan Pengurusan Tertinggi ASM
Datuk Professor Dr Awg Bulgiba Awg Mahmud FASc (Secretary-General)

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Jawatankuasa Rayuan Tatetertib bagi Kumpulan Pengurusan Tertinggi ASM
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STRATEGIC STUDIES COMMITTEES

Science, Technology and Innovation Policy Advisory Committee (STIPAC)
Professor Datuk Dr Asma Ismail FASc

Science Policy Sub-Committee under STIPAC
YM Academician Tengku Datuk Dr Mohd Azzman Shariffadeen FASc

ASM Water Committee
Dr Ir Salmah Zakaria FASc

Disaster Risk Reduction (DRR) Research Alliance Committee
Professor Dr Joy Jacqueline Pereira FASc

ASEAN Foresight Alliance Committee
Academician Professor Emerita Dato' Seri Dr Mazlan Othman FASc
YM Academician Datuk Dr Tengku Mohd Azzman Shariffadeen FASc

Special Interest Group on Machine Learning
Academician Tengku Datuk Dr Mohd Azzman Shariffadeen FASc

Task Force on Precision Medicine Initiative for Malaysia
Professor Datuk Dr A Rahman A Jamal FASc

Malaysian Blockchain Alliance
Datuk Fadilah Baharin FASc

Task Force on Sustainable Mining
Professor Dato' Dr Azizan Abu Samah FASc

Science Outlook 2020 Steering Committee
Chair: Professor Dato' Ir Dr Mohd Saleh Jaafar FASc
Deputy Chair: Professor Dr Nik Meriam Nik Sulaiman FASc

Malaysian Open Science Platform Alliance
Professor Dr Noorsaadah Abdul Rahman FASc

Special Interest Group of Hydrogen Economy
Professor Dato' Ir Dr Wan Ramli Wan Daud FASc

STI STRATEGIC INITIATIVES & PARTNERSHIPS

Science Awards Steering Committee
Datuk Professor Dr Awg Bulgiba Awg Mahmud FASc (Secretary-General)

Task Force on ASM ArtScience Initiative
Co-Chair: Ar Hijjas Kasturi FASc
Co-Chair: Emeritus Professor Dr Muhamad Awang FASc

Top Research Scientists Malaysia (TRSM) Selection Panel
Professor Dato' Ir Dr Abdul Rahman Mohamed FASc

ASM Responsible Conduct of Research Committee
Academician Emeritus Professor Dato' Dr Khalid Yusoff FASc

Top Research Scientists Malaysia (TRSM) Monitoring Committee
Professor Dr Noorsaadah Abd Rahman FASc

Dr Ranjeet Bhagwan Singh Medical Research Trust Fund Programme Steering Committee
Professor Datin Paduka Dr Teo Soo Hwang FASc

YSN-ASM Membership Selection Committee
YM Academician Tengku Datuk Dr Mohd Azzman Shariffadeen FASc (Vice-President)

Newton-Ungku Omar Fund (NUOF) Committee for Programmes with British Council
Emeritus Professor Dato' Seri Ir Dr Mashkuri Yaacob FASc

Newton-Ungku Omar Fund (NUOF) Committee for Programmes with Royal Society
Academician Tan Sri Dato' Ir Ts Ahmad Zaidee Laidin FASc

Newton-Ungku Omar Fund (NUOF) Committee for Programmes with Medical Research Council UK
Academician Distinguished Professor Datuk Dr Looi Lai Meng FASc

ASM Science Education Committee
Professor Dr Ahmad Ismail FASc

Joint-Steering Committee on National Centre for Particle Physics (NCPP)
Emeritus Professor Dato' Dr Muhammad Yahaya FASc

Joint-Steering Committee on National Centre for Nanomite
Professor Datuk Dr Halimaton Hamdan FASc

Imbak Canyon Rainforest Research & Training Programme Task Force
Academician Tan Sri Dr Salleh Mohd Nor FASc (Chairperson)
Professor Dr Ahmad Ismail FASc (Alternate Chair)

Young Scientists Network (YSN) –ASM
Dr Chai Lay Ching

S&T and Industry Linkages Committee
Ir Ts Choo Kok Beng FASc

ASEAN Network of Young Scientists Interim Committee
Professor Dr Abhi Veerakumarasivam

Malaysian Collaborative Network (i-Connect) Initiative Steering Committee
Chair: YM Academician Tengku Datuk Dr Mohd Azzman Shariffadeen FASc
Co-Chair: Ir Ts Choo Kok Beng FASc

Special Interest Group on Biodiversity
Dr Helen Nair FASc

Special Interest Group on Natural Rubber Industry
Academician Datuk Dr Abdul Aziz Sheikh Abdul Kadir FASc

Special Interest Group on Oceanography
Emeritus Professor Dr Phang Siew Moi FASc

REPRESENTATIVES IN INTERNATIONAL AND NATIONAL MEETINGS

Association of Academies and Societies in Asia (AASSA)
Academician Professor Dato' Dr Khairul Anuar Abdullah FASc
(Vice-President of AASSA)

Inter Academy Partnership for Health (IAP-H)
Academician Distinguished Professor Datuk Dr Looi Lai Meng FASc
(Executive Committee of IAP for Health)

Inter Academy Panel (IAP)
Professor Datuk Dr Asma Ismail FASc
(ASM President)

International Science Council (ISC)
Professor Datin Paduka Dr Khatijah Mohd Yusoff FASc

International Institute for Applied Systems Analysis (IIASA)
Professor Datuk Dr Asma Ismail FASc
(ASM President)

Network of Academies of Sciences in the Islamic Countries (NASIC)
Professor Datuk Dr Asma Ismail FASc
(ASM President)

Science Council of Asia (SCA)
Emeritus Professor Dr Phang Siew Moi FASc

Academy of Sciences in developing World (TWAS)
Professor Datuk Dr Asma Ismail FASc
(ASM President)

IAP-Science Education Programme
Academician Dato' Ir Lee Yee Cheong FASc
(Chairman of IAP-SEP)

Network of ASEAN Sciences Academies (NetASA)
Professor Datuk Dr Asma Ismail FASc
(ASM President)

IAP Science for Poverty Eradication Committee (IAP SPEC)
Professor Dato' Dr Aishah Bidin FASc
(Expert IAP SPEC)

International Silk Road Academy of Sciences
Professor Datuk Dr Asma Ismail FASc
(ASM President)
Permanent Alternative Rep: Vice-President

Interacademy Partnership for Urban Health
Datuk Professor Dr Awg Bulgiba Awg Mahmud FASc

ISTIC Executive Committee
YM Academician Datuk Dr Tengku Mohd Azzman Shariffadeen FASc
(ASM Vice-President)
Permanent Alternative Rep: CEO

APEC Policy Partnership on STI (PPSTI) Working Meeting
Hazami Habib
(Chair, Sub-Committee of Capacity Building Cluster)

LIST OF ACTIVITIES

JANUARY

National Policy on Science, Technology & Innovation (NPSTI) & Science, Technology and Innovation Master Plan (STIMP) Harmonisation Kick-off Meeting
3 January

STEM Programme 2019 Meeting
3 January

Meeting with United States Department's Global Innovation through Science & Technology (GIST)
4 January

Staff Assembly with CEO
7 January

Dr Ranjeet Bhagwan Singh (RBS) Grant Evaluation & Steering Committee Meeting
8 January

ASEAN Foresight Alliance (AFA) & ASEAN Young Scientists Network Coordination Meeting
8 January

Top Research Scientists Malaysia (TRSM) 2.0 Database Development Meeting
10 January

2018 ASM Annual Report Workshop
14 – 16 January

1st YSN-ASM Exco Meeting
16 January

4th Task Force Meeting Imbak Canyon Rainforest Research & Training Programme (ICRRTP)
17 January

Konsortium Institut Halal Malaysia (KIHIM) with ASM Task Force on Science Halal Initiative Meeting
17 January

Meeting on Lithium Ion Battery Technology
17 January

ASM Act Review & Amendment Workshop
19 January

130th Finance Meeting
22 January

Effective Publishing Strategies Workshop – How to Publish in High-impact Journals
23 January

Technical Committee Meeting on Blockchain and Distributed Ledger Technology (DLT)
23 January

ASM Strategic Planning Workshop II
23 – 26 January

5th Task Force Meeting on ASM ArtScience Prize
24 January

Discussion of MEB Team and Principal Investigator
28 January

133rd Council Meeting
29 January

1st Working Group Meeting on MEB Study Review
29 January

Frost & Sullivan 2019 APAC Healthcare Outlook-GIL Executive Briefing
30 January

Meeting on Special Interest Group (SIG) Precision Medicine
30 January

FEBRUARY

2nd Working Group Meeting on MEB Review
8 February

63rd Exco Meeting
11 February

Dialogue on S&T Ecosystem with Minister of MESTECC
12 February

2019 CCM Step Up Challenge Meeting
14 February

Discussion with STIMP Project Director
20 February

3rd Working Group Meeting on MEB Review
21 February

National School of Particle Physics Workshop
25 – 27 February

1st Task Force Meeting on Sustainable Mining
26 February

Meeting on the Position Paper on the Science Halal
26 February

Meeting with MESTECC Press Secretary on ASM Expert Network Communication Strategies
26 February

2019 CERN Summer Student Programme Selection Meeting
27 February

Harmonization NPSTI and STIMP Exercise Discussion
27 February

MARCH

2019 CCM STEM Up Challenge Meeting
1 March

4th Working Group Meeting on MEB Study Review
1 March

Special Meeting with Chief Secretary to Government of Malaysia on STI Governance
4 March

2nd Meeting of the Malaysian Blockchain Alliance
5 March

Workshop on the Development of Selection Criteria & Scoring Mechanism for TRSM Applications in Social Sciences
7 March

ASM Senior Fellows' Meeting on Short Listing Nominees for 2019 Senior Fellows
7 March

27th STIPAC Meeting
11 March

Meeting on 2019 Biosecurity Symposium
11 March

134th Council Meeting
12 March

6th Meeting of the Task Force on ASM ArtScience Prize
13 March

YSN-ASM Science Café: Slowly Eating from the Inside
14 March

2nd ASM Merdeka Meeting 2019
18 March

Meeting on Malaysia Open Science Platform (MOSP)
21 March

Task Force on Sustainable Mining: Meeting with Lynas Malaysia Sdn Bhd
22 March

Workshop on CCM STEM Up Challenge Module
22 March

YSN-ASM Science Café: There's Gold in the Trees
22 March

Frost and Sullivan Briefing on System and Databases
28 March

Meeting on SIG Precision Medicine
28 March

APRIL

MAKNA Research Cancer Award Ceremony
2 April

Meeting with Malaysian Association of Creativity & Innovation (MACRI)
5 April

3rd Task Force Meeting on Sustainable Mining
5 April

Special Panel Meeting for Appointment of ASM Senior Fellow 2019
8 April

Study on Horizon Scanning for Collaborative Network Discussion
8 April

IBSE Module Development Workshop
10 April

2019 Academician Tan Sri Dr B.C. Sekhar FASc Memorial Public Lecture
14 April

Malaysian Science Communication Module – Stakeholder Engagement Workshop
18 April

Meeting with Minister MESTECC on Hydrogen as a Renewal Energy Advances, Application and Deployment
22 April

Semi Final & Final CCM STEM Up Challenge
24 April

ASM-SEAPDRI Forum 2019 The Special IPCC Report on 1.5° C : Implications for Southeast Asia
25 April

12th General Assembly - Hydrogen Economy: What is the Way Forward for Malaysia
27 April

24th Annual General Meeting
27 April

2nd YSN-ASM Exco Meeting
30 April

MAY

Forum on Mapping the Malaysian Biobanking Landscape: Challenges and Opportunities
2 May

4th Task Force Meeting on Sustainable Mining
6 May

MED Entrepreneurial Policy Syndication Workshop
13 -14 May

7th Working Group Meeting on MEB Study Review
16 May

RUI Study Validation Workshop with USM Stakeholders
23 May

RUI Study Validation Workshop with UTM Stakeholders
23 May

Searching STEM Talent in You Programme
24 May

Presentation to Secretary General, Ministry of Entrepreneur Development on National Entrepreneurship Policy (NEP)
24 May

Briefing to Secretary General MEA on Recommendations from Malaysia STI Policy & Master Plan 2021-2030
27 May

Presentation on National Entrepreneurship Policy (NEP) to YB Minister MED
27 May

RUI Study Validation Workshop with UKM Stakeholders
27 May

RUI Study Validation Workshop with UPM Stakeholders
27 May

64th Exco Meeting
28 May

28th STIPAC Meeting
28 May

132nd Finance Meeting
31 May

JUNE

Presentation to Ministry of Education on the RUI & MEB Study Review Draft Final Report
13 June

Sakura Science High School Plan (SSHP) Programme
15 – 22 June

Task Force Meeting on Science of Halal Initiative
20 June

Induction Session to New ASM Fellows
25 June

Media Announcement on Outstanding Malaysian Young Scientists' Participation to International Programmes (Lindau Nobel Laureate Meeting & 2019 CERN Summer Student Programme)
25 June

Mahathir Science Award Foundation (MSAF) Board of Directors' Meeting and Annual General Meeting
26 June

5th Task Force Meeting on Sustainable Mining
28 June

JULY

Science Awards Steering Committee Meeting
1 July

136th Council Meeting
4 July

Meeting on 25th Anniversary
4 July

Meeting on the Way Forward of the National Biotechnology Policy 2005-2020
12 July

Finalisation of Report for Mid-term Review of MEB 2015-2025 (Higher Education)
15 – 16 July

Publication Committee Meeting
23 July

6th Task Force Meeting on Sustainable Mining
24 July

Meeting on Malaysian Code of Responsible Conduct in Research (MCRCR) Committee
24 July

2019 YSN-ASM Interview Session
24 July

2nd Task Force Meeting on Sg Kim Kim and Pasir Gudang Incidents
25 July

31st IdeaXchange - Waste to Wealth: Exploring New Horizons
29 July

SIG Machine Learning Meeting with MIMOS
29 July

AUGUST

Minggu Sains Negara Johor
3 – 4 August

3rd Task Force Meeting on Sungai Kim Kim and Pasir Gudang Incidents
7 August

133rd Finance Meeting
9 August

Task Force Meeting on Sustainable Mining with Malaco Mining Sdn Bhd
14 August

Deploying AI and ML for Common Good - Setting the STI Agenda for Home-Grown Solutions" Workshop
15 August

65th Exco Meeting
20 August

Sharing session with Malaysian Technical Cooperation Programme (MTCP) 2019: Economic Planning & Management on Industrial Revolution 4.0
22 August

Meeting on Strategising ASM Input for 12th Malaysia Plan Strategy Paper on Digital Economy
23 August

8th Working Group Meeting on MEB Study Review
26 August

Brainstorming on National Science Challenge (NSC) 2020
27 August

3rd YSN-ASM Exco Meeting
28 – 29 August

ASEAN YSN Online Collaborative Platform
29 August

1st ASM Integrated Water Resources Management Awareness-Raising, Advocacy & Capacity Building (IWRM-AACB) Working Group Meeting
30 August

SEPTEMBER

ASM Endowment Fund Committee Meeting
6 September

Final Workshop of Taskforce on Sg Kim Kim and Pasir Gudang Incidents
10 September

Discussion on National Centre for Particle Physics (NCPP)
12 September

Final External Review - IBSE Module Development Meeting
19 September

29th STIPAC
19 September

Effective Implementation of Student-Centred Learning Techniques: Active Learning
20 – 21 September

Meeting on Precision Medicine
26 September

ASM Strategic Plan 2021-2030 Meeting
26 September

Special Finance Meeting
27 September

Presentation by ASM on Big Data in the Policy Cycle: Policy Decision Making in the Digital Era
30 September

OCTOBER

Deploying AI and ML for Common Good - Setting the STI Agenda for Home-Grown Solutions Focus Group Discussions: Smart Cities
7 October

Deploying AI and ML for Common Good - Setting the STI Agenda for Home-Grown Solutions Focus Group Discussions: Digital Manufacturing
8 October

1st SIG Meeting on Hydrogen Economy
8 October

11th Task Force Meeting on ASM ArtScience™ Prize
9 October

134th Finance Meeting
11 October

Special Briefing to YAB PM with YB Minister MESTECC on Strengthening the STI Collaborative Ecosystem & Governance to Move Malaysian Research & Innovation
14 October

SME Clinic on Industry 4.0 - Angel Investors Initiatives for Healthcare Sector
15 October

32nd IdeaXchange - Haze Problem: A Blame Game or An Endgame?
15 October

Deploying AI and ML for Common Good - Setting the STI Agenda for Home-Grown Solutions Focus Group Discussions: Precision Farming
17 October

Meeting with the Science Outlook 2020 Chair
17 October

1st SIG Meeting on Oceanography
22 October

Special Presentation to YAB Prime Minister on STI Ecosystem
23 October

Asia Pacific S&T Conference on DRR 2020
26 October

Workshop on Intergovernmental Panel on Climate Change (IPCC) Role, Findings and Activities with Malaysians Youth, Professionals and Media
26 October

NOVEMBER

1st National Alliance Meeting on Malaysia Open Science
2 November

Deploying AI and ML for Common Good - Setting the STI Agenda for Home-Grown Solutions Focus Group Discussions: Connected Healthcare
4 November

2nd SIG Meeting on Biodiversity
5 November

YSN-ASM Election Committee Meeting
5 November

1st Task Force Meeting on Natural Rubber
6 November

Introductory Session & Launching of Malaysian Collaborative Network Platform for Disruptive Innovation (I-CONNECT) and Malaysia Open Science Platform (MOSP)
7 November

66th Exco Meeting
8 November

SO2020 Harmonisation Workshop
11 November

The Inaugural FAScinate
12 November

SIG Machine Learning Syndication Workshop to finalise the "Deploying AI and ML for Common Good – Setting the STI Agenda for Home-Grown Solutions" Position Paper
12 – 13 November

1st Task Force Meeting on Local and Transboundary Pollution Law Feasibility Study (LT-PLFS)
13 November

1st Steering Committee Meeting on SO2020
26 November

ASM Task Force on Precision Medicine: Public Engagement Workshop
28 November

30th STIPAC Meeting
28 November

DECEMBER

1st Steering Committee Meeting on the Review of the Environmental Quality Act 1974
2 December

135th Finance Meeting
3 December

Conferment of Fellowship & Announcement of the 2019 TRSM
4 December

138th Council Meeting
5 December

Science Outlook 2020 - Special Edition Scoping Workshop
7 December

31st ASM Water Committee Meeting
11 December

1st SO2020 Working Group Meeting on Environmental Impact
11 December

ASEAN Foresight Alliance Workshop
11 – 13 December

YSN-ASM Colloquium 2019
13 – 15 December

3rd Task Force Meeting on LT-PLFS
16 December

IDRC Project: Preliminary Discussion to Develop ToR and Technical Guide for Mobile App
23 December

ASM MANAGEMENT

AS OF DECEMBER 2019

CHIEF EXECUTIVE OFFICE
Hazami Habib
Chief Executive Officer
Nina Azrah Razali
Special Officer CEO
Norazirah Ramli
Secretary

BUREAU OF INTERNATIONAL AFFAIRS
Nurhanani Zainuddin
Executive
Aimi Suraya Abdul Kahar
Executive
Hazman Al-Hafiz Hazal
Assistant Executive

STI STRATEGIC STUDIES UNIT
Nitia Samuel
Principal Analyst
Jagdish Kaur Chahil
Senior Analyst
Nur Zuriany Zaki
Senior Analyst
Loh Chia Hur
Analyst
Mohd Ikhwan Abdullah
Analyst
Ratnamalar Rajasingam
Analyst
Noraina Jamal Rashid
Analyst
Muhammad Haikal Hikmal Hazam
Analyst
Mohamad Akmal Mahmud
Analyst
Areej Mohd Taufik
Analyst
Noratiqah Ahmad
Analyst
Nurhani Mat Razali
Analyst
Teng Yu He
Analyst
Sazarul Aini Sabot
Assistant Executive

STI STRATEGIC PROGRAMMES UNIT
Tengku Sharizad Tengku Chik
Senior Executive
Norazwa Musiran
Senior Executive
Nur Dayana Razmi
Executive
Hendy Putra Herman
Executive
Norain Farhana Ahmad Fuaad
Executive
Afiah Nasuha Aznan
Executive
Alang Iskandar Alang Rejab
Executive
Khalil Munawar Makhdum Munawar
Executive
Varsheta Selapah
Executive
Muadz Norazan
Executive
Siti Farhana Bajunid Shakeeb
Arsalaan Bajunid
Executive
Helmy Akmal Zulkurnain
Executive
Musliha Asha'ari
Assistant Executive
Norehan Kadir
Clerk

SCIENCE COMMUNICATION UNIT
Dharshene Rajayah
Head of Unit
Hazrul Liki
Executive (Publications)
Nazmi Lao
Executive (Writer)
Mohamad Haziq Rosli
Executive (Graphic Designer)
Syazwani Abu Bakar
Executive (Editor)
Mohd Najmie Mohd Yusoff
Executive (Multimedia Designer)
Muhammad Syafiq Mohamad Shafiee
Assistant Executive (Corporate Communication)

CORPORATE SERVICES DIVISION
Seetha Ramasamy
Manager

HUMAN RESOURCE UNIT
Nur Shafawaty Ahmad
Assistant Executive
Suhaila Sabri
Assistant Executive
Murni @ Zahani Ariffin
Senior Clerk

FACILITY MANAGEMENT & IT UNIT
Saiful Suhairi Suarni
Senior Executive
Norsuhada Adnan
Executive
Syed Abdul Haliq Syed Abdul Malik
Executive (IT)
Ahmad Khudri Abd Razak
Assistant Executive (IT)
Mohd Zairi Mansor
Senior Clerk
Rohani Mohd Yusop
Clerk
Khairul Nisak Alias
Receptionist
Muhammad Saiful Bahri Wan Din
Clerk
Rusli Othman
Assistant Operation
Mohd Zuhairi Zakbar
Driver
Mohd Azmy Abdul Rahman
Driver

EVENTS & LOGISTIC UNIT
Natrah Rafiqah Mohd Jalil
Executive
Shahridzal Aizat Shahrum
Executive
Muhammad Zakwan Shah Shahrudin
Assistant Executive
Mohamad Fathorossoim Al-Sani Abdullah Sani
Assistant Coordinator
Mohd Zefri Mohd Zulkefli
Assistant Coordinator

FINANCE & ACCOUNTS UNIT
Anis Adilla Mohd Arif
Senior Accountant
Nurul Ain Asyimah Mohammad
Accountant
Nurhani Zawani Posari
Assistant Accountant
Nur Idayu Abd Aziz
Assistant Accountant
Siti Maslinda Basiron
Assistant Accountant
Nor Hayati Johan
Clerk

INTERNATIONAL OFFICES HOSTED BY ASM

THE INTERNATIONAL COUNCIL FOR SCIENCE REGIONAL OFFICE FOR ASIA AND THE PACIFIC (ICSU ROAP)
Ahmad Sufyan Mohamed Aslam
Science Officer
Hannah Norazharuddin
Administrative Executive
Nurul Farhana Mohd Farizah
Assistant Executive (Administrative)

THE INTERNATIONAL SCIENCE, TECHNOLOGY AND INNOVATION CENTRE CENTRAL FOR SOUTH-SOUTH COOPERATION (ISTIC)
Zarmila Salmi Sabot
Admin Officer
Abdul A'dzim Abd Rashid
Science Officer
Mohd Azim Noor
Information Technology Officer
Intan Diana Fishal
Science Officer
Shareeza Shaari
Driver

ASM MANAGEMENT

AS OF DECEMBER 2019

ACRONYM

AASSA - Association of Academies and Societies of Sciences in Asia
AFA - ASEAN Foresight Alliance
AI - Artificial Intelligence
APEC - Asia-Pacific Economic Cooperation
ASEAN - Association of Southeast Asian Nations
ASM - Academy of Sciences Malaysia
BEP - Biosecurity Engagement Program
CAST - Chinese Association for Science and Technology
COE - Centre of Excellence
DKN - Dasar Keusahawanan Negara
FID - Flame Ionisation Detectors
GCMS - Gas Chromatograph/Mass Spectrometer
GIST - Global Innovation through Science and Technology
ICCA - Imbak Canyon Conservation Area
ICRRTP - Imbak Canyon Rainforest Research and Training Programme
IDB - Islamic Development Bank
INGSA - International Network for Government Science Advice
IPCC - Intergovernmental Panel on Climate Change
IRDR - Integrated Research on Disaster Risk
ISC ROAP - International Science Council Regional Office for Asia and the Pacific
KDNK - Keluaran Dalam Negara Kasar
KKM - Kementerian Kesihatan Malaysia
KPM - Kementerian Pendidikan Malaysia
LAMP - Lynas Advanced Material Plant
LDC - Least Developed Country
MAKNA - Majlis Kanser Negara
MARDI - Malaysian Agricultural Research and Development Institute
MBBA - Malaysian Biosafety and Biosecurity Association
MCRCR - Malaysian Code of Responsible Conduct in Research
MEB (HE) - Malaysia Education Blueprint (Higher Education)
MEDAC - Kementerian Pembangunan Usahawan dan Koperasi
MESTECC - Ministry of Energy, Science, Technology, Environment and Climate Change
ML - Machine Learning
MOSP - Malaysia Open Science Platform
MOSTI - Ministry of Science, Technology & Innovation
MRU - Malaysian Research University
MSN - Minggu Sains Negara
NCCP - National Centre for Particle Physics
NEP - National Entrepreneurship Policy
NGO - Badan bukan kerajaan / non-governmental organisation
NPSTI - National Policy on Science, Technology & Innovation
NSC - National Science Challenge
NUOF - Newton-Ungku Omar Fund
OIC - Organisation of Islamic Cooperation
OTEC - Ocean Thermal Energy Conversion
P&P - Penyelidikan & Pembangunan
PID - Photoionisation Detectors
PKS - Perusahan Kecil & Sederhana
SEADPRI - Southeast Asia Disaster Prevention Research Initiative
SET – Science, Engineering and Technology
SF – Sabah Foundation
SIGML – Special Interest Group on Machine Learning
SME – Small & Medium Enterprise
STEM – Science, Technology, Engineering, Mathematics
STI – Science, Technology and Innovation
STIMP – Malaysia Science, Technology & Innovation Master Plan
STIPAC – STI Policy and Advisory Committee
STRIDE - Science and Technology Research Institute for Defence
TRSM – Top Research Scientists Malaysia
TWAS – The World Academy of Sciences
TYSA – Thai Young Scientists Academy
UiTM – Universiti Teknologi Mara
UKM – Universiti Kebangsaan Malaysia
UM – Universiti Malaya
UNDRR - United Nations Office for Disaster Risk Reduction
UPM – Universiti Putra Malaysia
USM – Universiti Sains Malaysia
UTM – Universiti Teknologi Malaysia
VR – Realiti Maya
WHO – World Health Organization
YSN-ASM – Young Scientists Network-Academy of Sciences Malaysia

ACADEMY OF SCIENCES MALAYSIA
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