

**KEMENTERIAN TENAGA, SAINS, TEKNOLOGI, ALAM SEKITAR DAN PERUBAHAN IKLIM**

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19.	<b><u>Bill Gates mahu guna 'debu' untuk hentikan pemanasan global</u></b>	Kosmo!	Rujuk Lampiran 19
20.	<b><u>Australia offers climate funding to Pacific Island</u></b>	The Star	Rujuk Lampiran 20
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LAMPIRAN 1  
SINAR HARIAN (BUSINESS): MUKA SURAT 38  
TARIKH: 14 OGOS 2019 (RABU)

### Subang Parade menang Anugerah Cepak Tenaga Kebangsaan 2019



Hisham (dua dari kanan) menerima Anugerah Inisiatif Cepak Tenaga Kebangsaan bagi kategori Bangunan Diubahsuai pada Anugerah NEA 2019 di Kuala Lumpur baru-baru ini.

**HEKTAR** Asset Management (Hektar) menerusi pusat membeli-belah utamanya, Subang Parade muncul penerima tunggal bagi kategori Bangunan Cepak Tenaga sub kategori Bangunan Diubahsuai pada Anugerah Tenaga Kebangsaan (NEA) 2019 di Kuala Lumpur, baru-baru ini.

Acara yang dianjurkan oleh **Kementerian Tenaga, Sains, Teknologi,**

**Alam Sekitar dan Perubahan Cuaca (MESTECC) 2018** itu bertujuan memperakui sesuatu pertubuhan yang dapat memacu pembangunan ke arah sektor tenaga mampan dengan penekanan penyelidikan dan pembangunan inovatif.

Ketua Pegawai Eksekutif Hektar merangkap Pengurus bagi Hektar REIT, Datuk Hisham Othman berkata, pengiktirafan

daripada MESTECC itu akan memacu Hektar untuk meneruskan kesinambungan ke arah kelestarian hijau.

"Usaha tersebut termasuklah meningkatkan sistem reka bentuk pencahayaan di pusat membeli-belah lain dengan menggantikan mentol kepada LED bagi mengurangkan kos penggunaan tenaga elektrik," katanya menerusi kenyataan akhbar.



LAMPIRAN 2  
**KOSMO! (BUSINESS): MUKA SURAT 16**  
**TARIKH: 14 OGOS 2019 (RABU)**

Bomba sedia bantu, tunggu permohonan dari pihak berkuasa negara jiran

# Padam kebakaran di Indonesia

Oleh MOHD. AZLI ADLAN

**KUALA TERENGGANU** – Jabatan Bomba dan Penyelamat Malaysia (JBPM) bersedia membantu pihak berkuasa Indonesia untuk memadamkan kebakaran di Kalimantan dan Sumatera yang menjadi punca jerebu melanda sebahagian kawasan di negara ini dan Singapura pada masa ini.

Timbalan Menteri Perumahan dan Kerajaan Tempatan, Senator Datuk Raja Kamarul Bahrin Shah Raja Ahmad berkata, JBPM mempunyai kepakaran dan jentera yang mampu mempercepatkan proses pemadaman kebakaran sekali gus pendekatan terbaik memulihkan kembali kualiti udara di negara-negara yang terjejas akibat jerebu tersebut.

“Begitu pun setakat ini, saya difahamkan, JBPM dan **Jabatan Alam Sekitar (JAS)** masih belum menerima sebarang per-



KAMARUL



JPBM bersedia membantu pihak berkuasa Indonesia memadamkan kebakaran di Kalimantan dan Sumatera yang menjadi punca jerebu di Malaysia. – Gambar hiasan

mintaan berhubung perkara tersebut daripada pihak berkuasa Indonesia,” katanya ketika ditemui selepas mengagihkan daging korban kepada anggota bomba di Pejabat Bomba dan Penyelamat Terengganu di sini semalam.

Raja Kamarul Bahrin memberitahu, kerjasama rentas sempadan antara negara-negara Asia Tenggara berhubung isu jerebu sepatutnya dilakukan

lebih awal sebaik titik panas pertama dikesan tanpa perlu menunggu kebakaran terabit merebak terlalu luas hingga tidak terkawal.

Ujar beliau, penyelesaian jangka panjang bagi mengatasi masalah jerebu seharusnya diambil segera kerana fenomena yang telah meningkatkan bacaan Indeks Pencemaran Udara (IPU) negara-negara Asia Tenggara termasuk negara ini

kerap berlaku saban tahun.

“Kita kerap dengar berkali-kali ASEAN (Pertubuhan Negara-Negara Asia Tenggara) mengadakan perbincangan, mesyuarat dan pelbagai ketetapan telah dibuat tetapi perkara sama (jerebu) masih berlaku.

“Kebakaran hutan juga berlaku di negara-negara Barat tetapi mereka mempunyai pendekatan menjangka keburukan sebelum ia menjadi buruk. Kalau sudah terlambat baru hendak panggil (bantuan), memang susah untuk mengatasinya,” ujarnya.

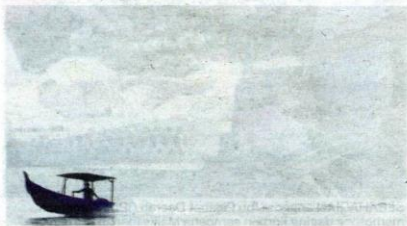
*Kosmo!* semalam melaporkan Pusat Meteorologi Khas ASEAN yang berpusat di Singapura melaporkan, imej satelit Pentadbiran Kebangsaan Lautan dan Atmosfera mengesan 56 dan dua titik panas masing-masing di Kalimantan dan Sumatera selain empat di Sarawak.

Ita telah menyebabkan bacaan IPU di Sekolah Kebangsaan Kuala Marang 2, Miri, Sarawak merekod kualiti udara berbahaya, Institut Latihan Perindustrian Miri (sangat tidak sihat), manakala Sibul dan Sri Aman pula tidak sihat.

**INFO** Bacaan Indeks Pencemaran Udara (IPU) terkini

- **Tahap Bahaya**
- 1. ILP Miri, Sarawak = **332**
- **Tahap Sangat Tidak Sihat**
- 1. SK Kuala Barang 2, Sarawak = **262**
- **Tahap Tidak Sihat**
- 1. Sri Aman, Sarawak = **126**
- **Tahap Sederhana**
- 1. Sarikei, Sarawak = **94**
- 2. Mukah, Sarawak = **86**
- 3. Johan Setia, Selangor = **87**
- 4. Sibul, Sarawak = **80**
- 5. Tasek Ipoth, Perak = **72**
- 6. Balik Pulau, Pulau Pinang = **74**
- 7. Bandaraya Melaka = **66**
- 8. Jerantun, Pahang = **61**
- 9. Kota Bharu, Kelantan = **58**
- 10. Kota Tinggi, Johor = **55**
- **Tahap Baik**
- 1. Sandakan, Sabah = **49**
- 2. Tawau, Sabah = **42**

\*Setakat pukul 7 malam semalam (13 Ogos 2019)



KEBAKARAN hutan di Kalimantan dan Sumatera, Indonesia telah menyebabkan beberapa kawasan di seluruh negara dilanda jerebu. – Gambar hiasan

## Udara ILP Miri berada pada tahap bahaya

**KUCHING** – Bacaan Indeks Pencemaran Udara (IPU) di Institut Latihan Perindustrian (ILP) Miri masih mencatat bacaan IPU pada tahap bahaya dengan bacaan 332.

Menurut data yang dikeluarkan **Jabatan Alam Sekitar (JAS)**, bacaan IPU di Sekolah Kebangsaan (SK) Kuala Barang 2 menunjukkan perubahan baik daripada kategori berbahaya kepada kategori sangat tidak sihat iaitu daripada bacaan 312 pada 10 pagi ke-

pada bacaan 262 pukul 7 malam. Seterusnya, keadaan jerebu di Sri Aman masih berada pada kategori tidak sihat dengan bacaan IPU 126.

Data keseluruhan menunjukkan keadaan semasa jerebu di seluruh Malaysia merekodkan 63 kawasan berada pada tahap sederhana, dua kawasan pada tahap baik serta masing-masing satu kawasan berada pada tahap tidak sihat, sangat tidak sihat dan berbahaya.

Bacaan IPU 0-50 menunjukkan kualiti udara sihat; 51-100, sederhana; 101-200, tidak sihat; 201-300, sangat tidak sihat dan melebihi 300, berbahaya.

Orang awam boleh merujuk laman web Jabatan Alam Sekitar (JAS) di alamat <http://apims.doe.gov.my/v2/> atau dengan memuat turun aplikasi telefon pintar, MyIPU di ‘Google Play’ bagi mendapatkan bacaan IPU terkini pada setiap jam. – Bernama



LAMPIRAN 3  
THE STAR (NEWS): MUKA SURAT 9  
TARIKH: 14 OGOS 2019 (RABU)

# Plans activated to fight haze

## DoE to coordinate measures in bid to clear unhealthy air

**KUALA LUMPUR:** The National Open Burning Action Plan and the National Haze Action Plan have been activated to coordinate measures by government agencies in addressing open burning and the haze in the country.

This was done as the air quality reached a hazardous level in Miri and a very unhealthy level in Kuala Baram, both places in Sarawak, over the past two days, said Department of Environment (DoE) director-general Norlin Jaafar.

"We have also issued directives under Section 31 and Section 37 of the Environmental Quality Act 1974 to all landowners in the peat soil areas of Kuala Baram to prevent and control fires there.

"Also, we have been conducting daily patrols in areas at risk of open burning as well as providing the Air Pollution Index (API) readings to the Sarawak state disaster management committee for further action," she said here yesterday.

Norlin explained that several measures had been taken to address the haze in Sarawak, including stepping up enforcement against open burning and other activities that can aggravate the situation.

In addition, the department is working with other agencies to implement the Standard Operating Procedure (SOP) on preventing and controlling fires on peat soil and disseminating information, she said.

Norlin said she hoped that all



**Air quality in jeopardy:** A firefighter at the scene of a peat fire measuring about six hectares near Taman Kopodim in Matang, Kuching. — ZULAZHAR SHEBLEE / The Star

stakeholders and landowners can closely monitor fire-prone areas such as landfills, forests, peat soil areas as well as agricultural and industrial land.

"The people are reminded to not carry out open burning which will affect the air quality. The DoE will take stern action against those caught for open burning under Section 29 (A) of the Environmental Quality Act 1974," she added.

As at noon yesterday, the air quality in Miri was at a hazardous level of 344 at the Industrial Training

Institute API station while the reading at the Sekolah Kebangsaan Kuala Baram 2 API station was at a very unhealthy 297.

An API level of between 51 and 100 indicates air quality that is moderate; between 101 and 200, unhealthy; between 201 and 300, very unhealthy; and above 300, hazardous.

The air quality in Sri Aman, Sarawak, was at the unhealthy level and that in Sibü at the moderate level between 4am and noon.

In Sabah, the air quality was at

the moderate level in Sandakan, Kota Kinabalu, Kuching and Keningau and in the Federal Territory of Labuan yesterday afternoon.

The DoE website showed the API for Sandakan as 55; Kuching, 56; Keningau, 58; Kota Kinabalu, 60; and Labuan, 69.

The people can surf the DoE website at <http://apims.doe.gov.my/v2/> for the API readings. They can also download the smartphone application, MyIPU, on Google Play for the readings. — Bernama

LAMPIRAN 4  
THE SUN (NEWS WITHOUT BORDERS): MUKA SURAT 2  
TARIKH: 14 OGOS 2019 (RABU)

## DOE activates two action plans to address worsening haze

**KUALA LUMPUR:** The Department of Environment (DOE) has activated the National Open Burning Action Plan and the National Haze Action Plan to coordinate measures by government agencies in addressing open burning and the haze in the country.

Its director-general Norlin Jaafar said this was done as the air quality has reached a hazardous level in Miri and a very unhealthy level in Kuala Baram, both places in Sarawak, over the past two days.

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Norlin explained that several measures had been taken to address the haze in Sarawak, including stepping up enforcement against open burning and other activities that could aggravate the situation.

In addition, the department was working with other agencies to implement the standard operating procedure (SOP) on preventing and controlling fires on peat soil and disseminating information, she said.

Norlin said she hoped all stakeholders and landowners could closely monitor fire-prone

areas such as landfills, forests, peat soil areas as well as agricultural and industrial land.

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An API level of between 51 and 100 indicates moderate air quality; between 101 and 200, unhealthy; between 201 and 300, very unhealthy; and above 300, hazardous.  
- Bernama



LAMPIRAN 5  
SINAR HARIAN (SETEMPAT): MUKA SURAT 12  
TARIKH: 14 OGOS 2019 (RABU)

## JAS aktifkan dua pelan tindakan atasi jerebu

**KUALA LUMPUR** - Jabatan Alam Sekitar (JAS) mengaktifkan Pelan Tindakan Pembakaran Terbuka Kebangsaan dan Pelan Tindakan Jerebu Kebangsaan bagi menyelaraskan tindakan oleh agensi kerajaan dalam menangani isu pembakaran terbuka dan menghadapi situasi jerebu negara.

Ketua Pengarah Jabatan Alam Sekitar, Norlin Jaafar berkata, langkah itu dilaksanakan selepas kualiti udara mencapai tahap bahaya di kawasan Miri dan Kuala Baram sejak tiga hari lalu.

"Pihak kami juga mengeluarkan notis arahan di bawah Seksyen 31 dan Seksyen 37, Akta Kualiti Alam Sekeliling 1974 kepada semua pemilik tanah di kawasan tanah gambut Kuala Baram, Sarawak bagi mencegah dan mengawal kebakaran di kawasan berkenaan.

"Kami juga menjalankan rondaan operasi harian ke kawasan berpotensi berlakunya aktiviti pembakaran terbuka selain menyalurkan



Pemandangan Tamparuli sebahagiannya diselubungi jerebu berpunca perbuatan segelintir penduduk melakukan pembakaran secara terbuka yang dirakam dari puncak Bukit Ruhiang Tamparuli petang semalam.

bacaan Indeks Pencemaran Udara (IPU) kepada Jawatankuasa Bencana Negeri Sarawak untuk tindakan susulan," katanya ketika dihubungi Bernama News Channel di sini semalam.

Beliau menjelaskan beberapa tindakan telah diambil bagi mengatasi masalah jerebu di Sarawak seperti meningkatkan penguatkuasaan terhadap aktiviti pembakaran terbuka dan lain-lain punca yang berpotensi memberi kesan kepada masalah itu.

"JAS juga akan mengambil tindakan tegas terhadap orang ramai yang menyebabkan pembakaran terbuka di bawah Seksyen 29(a) Akta Kualiti Alam Sekeliling 1974," katanya.

Setakat 12 tengah hari semalam, stesen Institut Latihan Perindustrian Miri mencatat bacaan IPU 340 pada tahap bahaya manakala stesen Sekolah Kebangsaan Kuala Baram 2 berada pada peringkat sangat tidak sihat dengan bacaan IPU 291.

- Bernama





LAMPIRAN 6  
UTUSAN MALAYSIA (SETEMPAT): MUKA SURAT 12  
TARIKH: 14 OGOS 2019 (RABU)

### JAS aktif pelan tangani isu pembakaran terbuka, jerebu



**Kuala Lumpur:** Jabatan Alam Sekitar (JAS) mengaktifkan Pelan Tindakan Pembakaran Terbuka Kebangsaan dan Pelan Tindakan Jerebu Kebangsaan bagi menyalurkan tindakan oleh agensi kerajaan dalam menangani isu pembakaran

**“ JAS akan ambil tindakan tegas terhadap mereka Norlin ”**

terbuka dan menghadapi situasi jerebu negara.

Ketua Pengarah Jabatan Alam Sekitar Norlin Jaafar berkata, langkah itu dilaksanakan selepas kualiti udara mencapai tahap bahaya di kawasan Miri dan Kuala Baram sejak dua hari lalu.

“Pihak kami juga mengeluarkan notis arahan di bawah Seksyen 31 dan Seksyen 37, Akta Kualiti Alam Sekeliling 1974 kepada semua pemilik tanah di kawasan tanah gambut Kuala Baram, Sarawak bagi mencegah dan mengawal kebakaran di kawasan berkenaan.

“Kami juga menjalankan rondaan operasi harian ke kawasan berpotensi berlakunya aktiviti pembakaran terbuka selain menyalurkan bacaan Indeks Pencemaran Udara (IPU) kepada Jawatankuasa Bencana Negeri Sarawak untuk tindakan susulan,” katanya ketika dihubungi, semalam.

Beliau menjelaskan beberapa tindakan telah diambil bagi mengatasi masalah jerebu di Sarawak, seperti meningkatkan penguatkuasaan terhadap aktiviti pembakaran terbuka dan lain-lain punca yang berpotensi memberi kesan ke-

pada masalah tersebut.

Selain itu, menjalinkan kerjasama dengan agensi lain dalam melaksanakan prosedur operasi standard (SOP) kebakaran di tanah gambut bagi mencegah dan mengawal kebakaran serta menyebarkan maklumat, katanya.

Norlin berharap, semua pihak berkepentingan dan pemilik tanah memantau secara rapi kawasan yang mudah dan sering terbakar seperti tapak pelupusan sampah, hutan, tanah gambut serta tanah pertanian dan industri.

“Orang ramai pula diin-

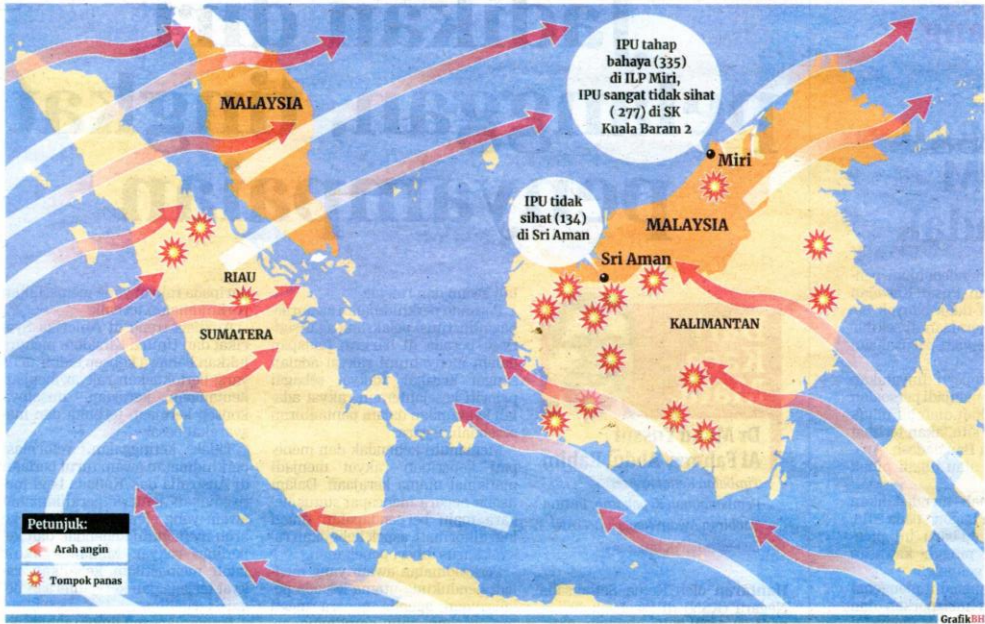
gatkan agar tidak melakukan pembakaran terbuka sehingga menjejaskan kualiti udara setempat. JAS akan mengambil tindakan tegas terhadap mereka yang menyebabkan pembakaran terbuka di bawah Seksyen 29(a) Akta Kualiti Alam Sekeliling 1974,” katanya.

Setakat 12 tengah hari semalam, stesen Institut Latihan Perindustrian Miri mencatat bacaan IPU 340 pada tahap bahaya manakala stesen Sekolah Kebangsaan Kuala Baram 2 berada pada peringkat sangat tidak sihat dengan bacaan IPU 291. - Bernama



LAMPIRAN 7
BERITA HARIAN (NASIONAL): MUKA SURAT 9
TARIKH: 14 OGOS 2019 (RABU)

TOMPOK PANAS DI INDONESIA AKIBAT PEMBAKARAN HUTAN MENYEBABKAN JEREBU



Kebakaran hutan punca bacaan IPU di Sarawak terjejas teruk

Kuching: Keadaan berjerebu di Sarawak semakin membimbangkan ekoran kebakaran hutan dan belukar yang bertambah serius ketika ini.

Sejak 1 Ogos hingga semalam, sebanyak 370 kes dilaporkan dengan jumlah tertinggi harian dicatatkan semalam iaitu 65 kes.

Penolong Pengarah Operasi Jabatan Bomba dan Penyelamat Malaysia (JBPM) Sarawak, Tiong Ling Hii, berkata sehingga petang kelmarin, kawasan hutan dan belukar seluas 335 hektar terjejas akibat kebakaran.

Beliau berkata, berdasarkan pecahan mengikut bahagian pentadbiran, Kuching mencatatkan kes kebakaran belukar tertinggi kelmarin dengan 19 kes, diikuti Sibul (11), Samarahan (7), Mukah (6), Betong (4), Sri Aman (3), Miri dan Bintulu masing-masing dua kes, manakala Sarikei satu kes.

Operasi pemadaman berterusan dijalankan di tujuh kawasan dengan Kompleks Kebajikan Hamidah, di Kuala Baram, Miri mencatat operasi paling lama apabila memasuki hari ke-13, hari ini (semalam).

Pemadaman di Kampung Sedi, Pulau Bruit, dalam Bahagian Mukah memasuki hari ketujuh, katanya sambil memaklumkan secara purata, pihaknya menerima 30 laporan kebakaran hutan dan belukar setiap hari.

Operasi lain yang masih diteruskan ialah di Taman Harmoni, Sri Aman dan Jalan Marudi-Miri yang masuk hari kelima, manakala Kampung Sangki, Simunjan; Kampung Bungan, Mukah dan Kampung Tute, Betong masuk hari keempat.

Kebakaran hutan dan belukar itu turut mengancam kediaman berdekatan dengan sebuah rumah di Kampung Sedi, Pulau Bruit musnah sepenuhnya akibat api yang merebak dari belukar berdekatan manakala di sebuah rumah di Kampung Sangki, Simunjan turut mengalami kebakaran 10 peratus, katanya.

Sementara itu, Indeks Pencemaran Udara (IPU) di dua lokasi bandar raya Miri terjejas teruk apabila mencatat bacaan IPU berbahaya awal pagi semalam.

IPU yang direkodkan di Institut Latihan Perindustrian (ILP) Miri mengekalkan tahap bahaya dengan bacaan 335 pada jam 5 petang semalam.

Tahap bahaya itu dikesan berlarutan sejak jam 1 pagi semalam dan berlaku kenaikan bacaan dalam tempoh setiap jam.

IPU di SK Kuala Baram 2 dikesan tidak konsisten apabila pada jam 11 pagi semalam ia berada di tahap sangat tidak sihat dengan bacaan 266 direkodkan.

Dua pelan atasi jerebu, pembakaran terbuka

JAS bertindak selepas kualiti udara capai tahap bahaya di Miri, Kuala Baram sejak 2 hari lalu

Kuala Lumpur: Jabatan Alam Sekitar (JAS), mengaktifkan Pelan Tindakan Pembakaran Terbuka Kebangsaan dan Pelan Tindakan Jerebu Kebangsaan bagi menyelenggarakan tindakan oleh agensi kerajaan dalam menangani isu pembakaran terbuka dan menghadapi situasi jerebu negara.

Ketua Pengarah JAS, Norlin Jaafar, berkata langkah itu dilaksanakan selepas kualiti udara mencapai tahap bahaya di kawasan Miri dan Kuala Baram sejak dua hari lalu.

Pihak kami turut mengeluarkan notis arahan di bawah Seksyen 31 dan Seksyen 37, Akta Kualiti Alam Sekeliling 1974 kepada pemilik di kawasan tanah gambut Kuala Baram, Sarawak bagi mencegah kebakaran di kawasan berkenaan.

Kami juga turut menjalankan rondaan operasi harian ke kawasan berpotensi berlaku aktiviti pembakaran terbuka selain menyalurkan bacaan Indeks Pencemaran Udara (IPU) kepada Jawatankuasa Bencana Negeri Sarawak untuk tindakan susulan, katanya ketika dihubungi BERNAMA News Channel, di sini, semalam.

Beliau menjelaskan, beberapa tindakan diambil bagi mengatasi masalah jerebu di Sarawak, seperti meningkatkan penguatkuasaan terhadap aktiviti pembakaran terbuka dan punca lain yang berpotensi memberi kesan kepada masalah terbabit.

Selain itu, beliau berkata, JAS turut menjalin kerjasama dengan agensi lain dalam melaksanakan prosedur operasi standard (SOP) kebakaran di tanah gambut bagi mencegah dan mengawal kebakaran serta menyebarkan maklumat.

Norlin berharap semua pihak berkepentingan dan pemilik tanah memantau rapi kawasan yang mudah dan sering terbakar seperti tapak pelupusan sampah, hutan, tanah gambut serta tanah pertanian dan industri.

JAS akan mengambil tindakan tegas terhadap mereka yang



Norlin Jaafar

menyebabkan pembakaran secara terbuka di bawah Seksyen 29(a) Akta Kualiti Alam Sekeliling 1974, katanya.

Setakat jam 5 petang semalam, stesen Institut Latihan Perindustrian Miri mencatat bacaan IPU 335 pada tahap bahaya manakala stesen Sekolah Kebangsaan Kuala Baram 2 berada pada peringkat sangat tidak sihat dengan bacaan IPU 266.

Sementara itu di Kuala Terengganu, Timbalan Menteri Perumahan dan Kerajaan Tempatan, Datuk Raja Kamarul Bahrin Shah Raja Ahmad, berkata kerajaan sedia menghantar pegawai dan anggota Jabatan Bomba dan Penyelamat Malaysia (JBPM) membantu kerajaan Indonesia memadam-

kan kebakaran hutan yang berlaku di enam wilayah di republik itu sejak awal bulan lalu.

Beliau berkata, penghantaran pegawai dan anggota JBPM akan dilakukan sebaik kerajaan menerima permohonan rasmi daripada Indonesia.

Kebakaran hutan yang sedang berlaku di beberapa wilayah negara itu turut memberi kesan kepada cuaca termasuk di Pulau Pinang, Selangor, Kuala Lumpur, Negeri Sembilan dan Putrajaya, selain di Sarawak meliputi Kuching, Serian dan Samarahan, katanya ketika ditemui pemberita pada majlis pengagihan daging korban anjuran JBPM negeri, di Balai Bomba (BB) Kuala Terengganu, di sini, semalam.

Mengulas keadaan cuaca panas yang melanda negeri ini, Raja Bahrin Shah berkata, penduduk terutama pemilik ladang diminta mengelak daripada melakukan pembakaran secara terbuka bagi menanganai masalah jerebu.

Setakat ini, belum ada tompok panas dan aktiviti pembakaran terbuka dikesan di negeri ini.

Pemilik ladang diminta supaya tidak melakukan pembakaran terbuka yang boleh memburukkan lagi keadaan jerebu di seluruh negara, katanya.



LAMPIRAN 8  
THE STAR (NATION): MUKA SURAT 12  
TARIKH: 14 OGOS 2019 (RABU)

# Costly task to dispose of dead fish

By R. SEKARAN  
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**GEORGE TOWN:** It was hard enough coping with the losses incurred due to the mass fish die-off in Teluk Bahang. Now, there is the huge and costly task of properly disposing of the carcasses.

In the last two days, two lorries full of fish were buried in the hills at Teluk Bahang, far away from the sea.

Fish breeder Ooi Hye Hin, 57, and his friends dug deep holes in the hills to bury the dead fish on Monday.

"Not only did we lose our income, but we also had to bear the additional cost to bury them," he said.

Ooi said this disposal method was better than throwing the dead fish out at sea, which was alleged by some irresponsible people on social media.

Centre for Marine and Coastal Studies (Cemacs) director Datuk Dr Aileen Tan agreed that this was the best way to dispose of the dead fish.

"They definitely should not dump the fish into the sea. Pictures showing some dead fish floating at sea could



**Massive loss:** Dead fish floating at a fish farm in Teluk Bahang.

be the ones that 'slipped out' from the fish cages," she said.

*The Star* reported on Monday that more than 50,000 fish died in Teluk Bahang with the fishermen incurring losses of over RM2mil.

Among the dead fish found afloat over the past few days were barramundi, groupers, hybrid groupers and snappers.

Meanwhile, the Fisheries Department rubbished allegations on social media that fishermen were selling off "contaminated" fish at cheap prices at wet markets.

State director Noraisyah Abu Bakar said the cause of the mass death was still being investigated and it was not true that the fish had died of metal poisoning.

"It's true that there were dead fish in farms in Teluk Bahang and we, together with the Department of Environment and Cemacs, are investigating the cause.

"The viral messages claiming that certain fish were safe for consumption and others were not safe are baseless. All the fish sold in the markets here are safe to eat," she said.





LAMPIRAN 9  
NEWS STRAIT TIMES (NATION): MUKA SURAT 12  
TARIKH: 14 OGOS 2019 (RABU)

# BRACE FOR EVEN MORE WARMER DAYS

Minimal rainfall, temperature will be highest in next 2 months, says UKM professor

HANA NAZ HARUN  
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**M**ALAYSIANS can expect "higher than normal" temperatures within the next two months caused by the El Niño phenomenon.

Universiti Kebangsaan Malaysia Centre for Earth Sciences and Environment chairman Professor Dr Fredolin Tangang said the "weak El Niño" had affected weather patterns in the region, causing a warmer climate.

"In Malaysia, this weak El Niño has no apparent effect although warmer weather can be expected. However, we're in the southwest

monsoon period, where rainfall is minimal and temperature is the highest," he told the *New Straits Times* yesterday.

Tangang added that this El Niño phenomenon was much weaker compared with the 2015/2016 extreme El Niño, where warming occurred in the central-eastern Pacific Ocean.

Despite its weak intensity, Tangang said the phenomenon had been blamed for the prolonged drought that hit Sumatra and Kalimantan, causing forest fires and haze. The dry condition in Indonesia, he said, was expected to last until October.

He also said there would be occasional severe storms, similar to the one that hit the northern

states of Peninsular Malaysia.

"However, this kind of short-lived event is difficult to predict."

Tangang said the Asian region had more than 20 typhoons a year, with the most recent being Lekima, which struck southeast China.

He, however, disagreed that Typhoon Lekima was the cause of the adverse weather that lashed Perlis, Penang and Kedah, as well as Perak and Selangor to a smaller extent on Friday.

He said Typhoon Lekima was too far away to affect Malaysia.

"Earlier reports stating that Lekima was the cause of the storm in the west coast was an incorrect assessment."

Tangang said he agreed with the assessment by weather expert Mohd Hisham Mohd Anip, who said converging strong winds from the Indian Ocean and the southern Straits of Malacca was the cause of the storms in Peninsular Malaysia.

An online news portal had quoted Hisham, a National Aviation Meteorological Centre Malaysia senior director, who said the squall lines were formed by colliding winds, bringing strong wind and rain.

Tangang said another typhoon, Krosa, was expected to make landfall in Japan today, and it would also not affect Malaysia.

"It is too far from us. Krosa will not affect us," he said.



Dr Fredolin Tangang

**LAMPIRAN 10**  
**SINAR HARIAN (SETEMPAT): MUKA SURAT 38**  
**TARIKH: 14 OGOS 2019 (RABU)**

**TNB tawar  
insentif khas**

**TENAGA** Nasional Berhad (TNB) sekali lagi menawarkan insentif khas sempena sambutan Hari Kebangsaan pada tahun ini bagi menggalakkan pengguna perdagangan menerangi bangunan dan kawasan persekitaran masing-masing dengan lampu hiasan sempena sambutan Hari Kebangsaan ke-62.

TNB menerusi kenyataan akhbar memberitahu, insentif itu diberikan kepada semua pengguna perdagangan di bawah tarif B, C1 dan C2 yang telah beroperasi sekurang-kurangnya setahun. Ia diberikan untuk tempoh dua bulan iaitu Ogos dan September 2019.

"Pemberian insentif ini melibatkan antaranya bangunan pejabat kompleks komersial, dan stesen minyak," kata TNB.

Pengguna yang layak boleh mendapatkan borang permohonan di semua kedai TNB berhampiran atau layari laman sesawang rasmi TNB. Tarikh tutup permohonan pada 15 September 2019.

**LAMPIRAN 11**  
**SINAR HARIAN (SETEMPAT): MUKA SURAT 30**  
**TARIKH: 14 OGOS 2019 (RABU)**

### SMSL lancar himpunan tolak Lynas

**KUANTAN** - Save Malaysia Stop Lynas (SMSL) dengan sokongan lebih 250 pertubuhan bukan kerajaan (NGO) di seluruh negara akan mengadakan perhimpunan Reject Lynas's Radioactive, Ahad ini.

Perhimpunan di Taman Gelora itu bertujuan mengingatkan masyarakat mengenai bahaya sisa buangan radioaktif di Lynas.

Pengerusi SMSL, Tan Bun Tet berkata, himpunan bantahan itu adalah bagi mengingatkan orang ramai mengenai bahaya sisa buangan radioaktif dihasilkan Lynas.

Menurutnya, NGO terbabit juga mahu menyampaikan info terkini perkembangan isu Lynas dan mengingatkan kerajaan supaya tidak berterusan memutar belit kenyataan serta keadaan sebenar.

"Masyarakat menganggap kami mahu memutuskan mata pencarian mereka di Lynas khususnya pekerja tetapi kami sebenarnya lebih mengambil berat mengenai sisa buangan tersebut.

"Kami tidak membantah operasi atau pengaliran ke-

luar masuk modal, peluang pekerjaan atau manfaat lain tetapi memperjuangkan kaedah kilang itu menghasilkan sisa yang memudaratkan kesihatan serta alam," katanya.

Bun Tet berkata, kerajaan sepatutnya mengarahkan Lynas menyediakan tempat penyimpanan atau pelupusan kekal sisa radioaktif terlebih dahulu sebelum operasi dibenarkan.

"Semua kilang nadir bumi di seluruh dunia perlu menyediakan tapak penyimpanan kekal sisa radioaktif terlebih dahulu dan Lynas satu-satunya yang tiada penyediaan itu tetapi dibenarkan beroperasi dengan alasan sisa boleh dikitar semula.

"Pada himpunan 18 Ogos ini kita akan cuba fahamkan orang ramai tentang kebenaran sisa radioaktif dihasilkan Lynas adalah berbahaya jika dibiarkan begitu sahaja.

"Sisa terkumpul di belakang kilang Lynas kini juga membimbangkan. Jika kerajaan masih bersetuju memperbaharui lesen kita akan bincang dengan penduduk untuk mengambil tindakan undang-undang," katanya.



LAMPIRAN 12  
 UTUSAN MALAYSIA (SETEMPAT): MUKA SURAT 28  
 TARIKH: 14 OGOS 2019 (RABU)

## Peruntuk RM20j untuk teknologi hijau

**Petaling Jaya:** Kerajaan melalui Majlis Promosi Eksport Getah Malaysia (MREPC) memperuntukkan sebanyak RM20 juta dana MREPC bagi teknologi hijau dan automasi.

Pengerusi Lembaga Pemegang Amanah MREPC, Chik Chan Chee berkata, dana itu juga adalah untuk menggalakkan dan menyokong syarikat pengeluar produk getah yang mengadaptasi teknologi hijau dan automasi.

Katanya, menerusi dana ini syarikat yang layak akan diberi geran sehingga 50 peratus daripada kos projek (nilai projek maksimum RMI juta bagi setiap syarikat).

"Dana ini merangkumi teknologi hijau dan automasi yang terdiri daripada tenaga biomas, solar, kitar semula dan tuaian.

"Sejak dana ini dibuka awal 2019, sebanyak 19 permohonan telah diterima yang mana majoriti 12 daripadanya membabitkan projek automasi dan tujuh projek teknologi hijau," katanya kepada media selepas majlis pelancaran Dana MREPC bagi teknologi hijau dan automasi di sini, semalam.



**KOK (dua dari kiri)** melawat tapak pameran pada pelancaran Dana Automasi dan Teknologi Hijau MREPC di One World Hotel, semalam.

Turut hadir, Menteri Industri Utama, Teresa Kok.

Dana MREPC terbuka untuk perusahaan kecil dan sederhana (PKS) yang terbabit dalam teknologi hijau dan automasi bagi mengurangkan peningkatan kos pengeluaran dan kos buruh.

Selain itu, Chik berkata,

industri produk getah telah mencatatkan pertumbuhan pada kadar 10 peratus setiap tahun sejak sedekad lalu.

Setakat ini, terdapat 300 pengeluar produk getah, berbanding kurang daripada 50 pada tahun 1970-an.

Beliau berkata, rata-rata syarikat terbabit mengeluarkan

lebih 1,000 jenis produk getah bagi kegunaan perubatan, perindustrian, komersial dan isi rumah.

Pada 2018, industri mencatatkan nilai eksport sebanyak RM23.7 bilion bagi produk getah, mewakili 2.4 peratus jumlah eksport Malaysia.



LAMPIRAN 13
HARIAN METRO (SETEMPAT): MUKA SURAT 12
TARIKH: 14 OGOS 2019 (RABU)

KEADAAN kebakaran belukar gambut di Taman Kopodim Matang, Kuching.



Kebakaran makin marak

Jerebu di Sarawak makin buruk Miri tahap bahaya

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Kuching

Keadaan berjerebu di Sarawak semakin membimbangkan ekoran kebakaran hutan dan belukar yang bertambah serius ketika ini.

Sejak 1 Ogos hingga hari ini, sebanyak 370 kes dilaporkan dengan jumlah tertinggi harian dicatatkan semalam iaitu 65 kes.

Penolong Pengarah Operasi Jabatan Bomba dan Penyelamat Malaysia (JBPM) Sarawak Tiong Ling Hii berkata, sehingga petang semalam, keseluruhan kawasan hutan dan belukar seluas 335 hektar

terjejas akibat kebakaran. Beliau berkata, berdasarkan pecahan mengikut bahagian pentadbiran, Kuching mencatatkan jumlah kes kebakaran belukar tertinggi semalam dengan 19 kes, diikuti Sibu (11), Samarahan (7), Mukah (6), Betong (4), Sri Aman (3), Miri dan Bintulu masing-masing dua kes manakala Sarikei satu kes.

Operasi pemadaman berterusan dijalankan di tujuh kawasan dengan Kompleks Kebajikan Hamidah, di Kuala Baram, Miri mencatat operasi paling lama apabila mema-

suki hari ke-13, semalam.

“Pemadaman di Kampung Sedi, Pulau Bruit, dalam Bahagian Mukah pula memasuki hari ketujuh,” katanya sambil memaklumkan secara purata pihaknya menerima 30 laporan kebakaran hutan dan belukar setiap hari.

Operasi lain yang masih diteruskan ialah di Taman Harmoni, Sri Aman dan Jalan Marudi-Miri yang masuk hari kelima manakala Kampung Sangki, Simunjan; Kampung Bungan, Mukah dan Kampung Tuie, Betong masuk hari keempat.

“Kebakaran hutan dan belukar itu turut mengancam

kediaman berdekatan dengan sebuah rumah di Kampung Sedi, Pulau Bruit musnah sepenuhnya akibat api yang merebak dari belukar berdekatan manakala di sebuah rumah di Kampung Sangki, Simunjan turut mengalami kebakaran kira-kira 10 peratus,” katanya.

Sementara itu, kualiti udara di Miri terus terjejas apabila satu stesen di bahagian itu mencatat Indeks Pencemaran Udara (IPU) pada tahap berbahaya iaitu ILP Miri yang mencatat bacaan 344 manakala stesen SK Baram 2 mencatat kualiti udara sangat tidak sihat iaitu 297 pada jam 11 pagi ini.

Sri Aman mencatat kualiti udara tidak sihat apabila bacaan IPU mencecah 136.

Bomba sedia bantu Indonesia tangani kebakaran hutan

Kuala Terengganu: Kerajaan bersedia menghantar pegawai dan anggota Jabatan Bomba dan Penyelamat Malaysia (JBPM) membantu kerajaan Indonesia memadamkan kebakaran hutan yang berlaku di enam wilayah di negara itu sejak awal bulan lalu.

Timbalan Menteri Perumahan dan Kerajaan Tempatan Datuk Raja Kamarul Bahrin Shah Raja Ahmad berkata, penghantaran pegawai dan anggota JBPM akan dilakukan sebaik kerajaan menerima permohonan rasmi daripada Indonesia.

Katanya, setakat ini kerajaan belum menerima permohonan, tetapi semua pegawai dan anggota JBPM sudah bersedia siaga untuk melaksanakan tanggungjawab terutamanya membantu pasukan penyelamat negara itu memadamkan kebakaran.

“Masalah kebakaran hutan secara terbuka di beberapa wilayah di negara itu setiap tahun berlaku sehingga menyebabkan berlakunya jerebu, tetapi belum ada jalan penyelesaian walaupun pelbagai tindakan sudah diambil kerajaan Indonesia.

“Kebakaran hutan yang sedang berlaku di beberapa wilayah negara itu turut memberi kesan kepada cuaca termasuk di Pulau Pinang, Selangor, Kuala Lumpur, Negeri Sembilan dan Putrajaya, selain di Sarawak meliputi Kuching, Serian dan Samarahan,” katanya ketika ditemui pada majlis pengagihan daging korban anjuran JBPM negeri di Balai

Bomba (BB) Kuala Terengganu di sini, semalam.

Turut hadir, Pengarah JBPM negeri Mohamad Shoki Hamzah dan timbalannya Sharikan Bustaman.

Terdahulu, empat ekor lembu dikorbankan sempena Hari Raya Aidilfitri disertai oleh 150 pegawai dan anggota yang melakukan kerja penyembelihan, melapah dan memasak serta daging turut diagihkan kepada golongan asnaf.

Mengulas keadaan cuaca panas yang melanda negeri ini, Raja Bahrin Shah berkata, penduduk terutamanya pemilik ladang diminta untuk mengelak daripada melakukan pembakaran secara terbuka bagi menanganai masalah jerebu.

Katanya, belum ada titik panas dan aktiviti pembakaran terbuka dikesan di negeri ini.

“Pemilik ladang diminta tidak melakukan pembakaran terbuka yang boleh memburukkan keadaan cuaca berjerebu di seluruh negara,” katanya.



RAJA Kamarul

FAKTA
Sebanyak 370 kes dilaporkan sejak 1 Ogos lalu



LAMPIRAN 14  
 HARIAN METRO (SETEMPAT): MUKA SURAT 14  
 TARIKH: 14 OGOS 2019 (RABU)

**Mega**  
**sains** f mega utusan malaysia

# Air laut untuk minum

**T**EKNOLOGI kini memungkinkan segalanya. Itulah yang dilakukan oleh sekumpulan penyelidik dari Pusat Penyelidikan Teknologi Membran Termaju (AMTEC), Universiti Teknologi Malaysia (UTM) apabila membangunkan sistem penyahgaraman air laut menggunakan membran semula jadi untuk dijadikan air tawar yang boleh diminum.

Teknologi tersebut diharap memberi khabar gembira kepada penduduk yang tinggal di kawasan tekanan air rendah atau kurang sumber bagi memperoleh bekalan air bersih.

**>> Lihat muka 24**



LAMPIRAN 15
UTUSAN MALAYSIA (MEGA SAINS): MUKA SURAT 17
TARIKH: 14 OGOS 2019 (RABU)

Air minum
teknologi
membran

SECARA umumnya negara mempunyai banyak sumber air, namun bekalan air bersih semakin berkurangan sedangkan permintaan terhadapnya semakin meningkat.

Keadaan ini timbul akibat peningkatan jumlah penduduk dan pelbagai kegiatan yang berkaitan dengannya.

Peningkatan suhu global antara faktor menyebabkan bekalan air bersih berkurangan. Suhu persekitaran menyebabkan kehilangan air akibat proses penyejatan.

Peningkatan suhu global menyebabkan kadar penyejatan air ke atmosfera adalah tinggi. Justeru, bagi mengatasi masalah tersebut banyak usaha dilakukan bagi menghasilkan lebih banyak air bersih untuk kegunaan harian termasuk yang lebih penting untuk minuman.

Dalam pelbagai usaha dilakukan untuk meningkatkan bekalan air bersih, teknologi desalinasi atau proses penyahgaraman air laut telah dipraktikkan. Ini kerana, air laut merangkumi 97 peratus daripada air yang ada di muka bumi berbanding air bersih iaitu satu peratus sahaja.

Antara teknologi desalinasi yang ada ialah membran RO (reverse osmosis), sistem penapisan berperingkat, loji air dengan menggunakan teknik rawatan haba dan sistem membran penyulingan. Antara semua teknologi yang ada, sistem membran penyulingan menunjukkan potensi yang tinggi terhadap proses penyahgaraman air laut kerana mampu mengasingkan garam yang mempunyai kepekatan yang

Oleh LAUPA JUNUS
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tinggi daripada air dengan kadar 100 peratus. Teknologi tersebut berjaya dibangunkan oleh sekumpulan penyelidik dari Pusat Penyelidikan Teknologi Membran Termaju (AMTEC), Fakulti Kejuruteraan Kimia dan Tenaga, Universiti Teknologi Malaysia (UTM).

Kumpulan tersebut dianggotai Prof. Madya Dr. Mohd. Hafiz Dzarfan Othman selaku ketua, Siti Khadijah Hubadillah, Dr. Mohd. Hafiz Puteh, Mohd. Ridhwan Adam, Tai Zhong Sheng, Mohd. Haiqal Abd. Aziz, Prof. Datuk Dr. Ahmad Fauzi Ismail, Dr. Mukhlis A. Rahman, Prof. Madya Dr. Juhana Jaafar, Prof. Dr. Madzlan Aziz, Mohd. Sohaimi Abdullah dan Ng Be Cheer.

MESIN SIL-RH untuk menyuling air menggunakan membran.



DR. MOHD. HAFIZ DZARFAN OTHMAN (tengah) dan penyelidik bersama menyelenggara sistem penyulingan membran bagi proses penyahgaraman air laut.

Menurut Mohd Hafiz Dzarfan, kumpulannya yang menggunakan teknologi membran membangunkan sistem tersebut menerusi penyelidikan Sil-RH Membran Penyulingan: Menukar Air Laut Kepada Air Minum. Katanya, sistem membran penyulingan adalah sistem yang menggunakan mekanisme pemindahan haba dan jisim. Menerusi mekanisme tersebut, air laut akan berubah menjadi wap air iaitu 100 peratus air bersih dan boleh diminum.

Walau bagaimanapun, sistem ini mempunyai beberapa kekurangan antaranya ia menggunakan membran polimer yang tidak tahan lasak pada suhu panas dan ketahanan kimia yang tinggi.

Sehubungan itu, teknologi berkenaan telah melalui beberapa peringkat awal ke arah penggunaan membran daripada bahan seramik bagi menggantikan membran

polimer. Secara umumnya, membran seramik komersial adalah diperbuat daripada alumina yang merupakan bahan yang sangat mahal. "Oleh itu, kami mencari bahan seramik alternatif iaitu bahan buangan sekam padi bagi menggantikan alumina. "Membran daripada sekam padi adalah jantung baharu untuk sistem membran penyulingan dan diberi nama Sil-RH Membran Penyulingan. "Teknologi Sil-RH membran penyulingan merupakan teknologi yang direka khas untuk menghasilkan air bersih. Ia bukan sahaja mampu mengasingkan garam daripada air laut, malah zarah-zarah bahaya lain seperti logam berat yang boleh ditemukan dalam air," ujarnya.

Berkongsi lebih lanjut Mohd. Hafiz Dzarfan berkata, idea kajian bermula semasa kumpulannya membuat kajian literatur untuk mencari bahan seramik berkos rendah.

Katanya lagi, mereka pada mulanya memilih kaolin, sejenis tanah liat sebagai bahan utama.

Hasil kajian menunjukkan bahawa kaolin mempunyai swelling problem iaitu ia mengganggu prestasi membran tersebut untuk jangka masa yang panjang. Kemudian, mereka

mendapati bahawa bahan buangan sekam padi boleh ditukarkan kepada silika iaitu sejenis bahan seramik yang mempunyai takat lebur yang rendah dan bebas daripada bahan toksik serta selamat digunakan.

"Menariknya pada kajian ini adalah membran seramik yang dihasilkan bukan sahaja berkos rendah, malah dapat menyelesaikan masalah bahan buangan sekam padi yang berlebihan," katanya.

Oleh kerana sistem tersebut beroperasi menerusi mekanisme pemindahan haba dan jisim, maka hanya wap air yang dibenarkan melalui membran ini.

Membran yang dihasilkan daripada sekam padi ini dihasilkan menggunakan teknik penyongsangan fasa dan kemudian diubah sifat fizikal permukaannya kepada anti air menggunakan teknik FAS grafting.

Kemudian, air laut yang mengandungi kepekatan garam yang sangat tinggi akan dipanaskan pada suhu 60 darjah Celsius dan menghasilkan wap air.

Wap ini kemudiannya akan melalui membran anti-air tadi. Akhirnya, air bersih tanpa garam akan terhasil.

Susulan kejayaan tersebut, pasukan penyelidik merancang meneruskan penyelidikan dengan mengintegrasikannya dengan sistem solar.



## LAMPIRAN 15 (samb) UTUSAN MALAYSIA (MEGA SAINS): MUKA SURAT 18 TARIKH: 14 OGOS 2019 (RABU)



MEKANISME sistem SIL-RH membran penyulingan.

Dengan ini, sistem tersebut akan lebih sesuai digunakan di mana-mana sebagai contoh di atas kapal di tengah laut.

Tambahan pula, beberapa langkah pengkomersialan telah dijalankan.

Pertama, AMTEC sebagai Pusat Kecemerlangan Pendidikan Tinggi (HiCoE) dalam bidang khusus Penambakan Air dan menjadi pusat rujukan nasional dan global.

Secara tidak langsung, AMTEC akan menjadi pusat rujukan terutama dalam bidang rawatan air sisa oleh pelbagai jenis industri. Antara kerjasama yang dijalankan bersama

industri ialah Aliran Ihsan Resources (AIR) Berhad dan Philos Co. Ltd, Korea.

Selain itu, AMTEC juga telah mengadakan projek komuniti di Kelantan.

"Kami juga telah memfailkan paten untuk projek ini dan dalam proses untuk menghasilkan air minuman jenama kami sendiri yang diberi nama *Seafresh*."

Penyelidikan tersebut menerima pembiayaan antarabangsa antaranya Kurita Water and Environment Foundation, Jepun dan Nippon Sheet Glass Foundation, Jepun.

**Minggu depan: Rawatan air untuk kawasan bencana**



## Kos lebih murah

**P**ROJEK yang bermula sekitar 2015 telah siap di peringkat makmal. Penyelidik telah membuat ujian awal terhadap air yang ditapis menggunakan sistem ini dan membandingkannya dengan air minuman yang dikeluarkan oleh beberapa syarikat tempatan dan antarabangsa antaranya Desa, Spritzer dan Evians.

Kos penyelidikan tersebut dianggarkan antara RM15,000 dan RM20,000 bagi seunit sistem membran penyulingan yang mempunyai kapasiti 0.55 meter padu sehari (145 gelen sehari).

Kos tersebut melibatkan sistem termasuk penyejuk, pemanas dan sistem



perapaian yang lain manakala untuk kos membran sahaja, Sil-RH merupakan membran berkos rendah iaitu RM5 semeter persegi. Ia jauh lebih murah berbanding membran alumina seramik yang mencecah RM500 semeter persegi dan membran polimer komersial antara RM50 hingga RM70.

Ini kerana Sil-RH membran tidak memerlukan kos bahan utama. Mohd. Hafiz Dzarfan berkata, teknologi membran penyulingan adalah satu teknologi yang dikomersialkan pada sekitar 1980 dan telah dipraktikkan di beberapa buah negara iaitu Amerika Syarikat (AS), Sweden, Jerman dan Jepun.

Namun, teknologi tersebut agak mahal kerana menggunakan seramik membran yang diperbuat daripada alumina

yang harganya dalam lingkungan RM1000/kg selain kos operasi yang tinggi kerana melibatkan penggunaan tenaga elektrik yang sangat besar.

"Oleh kerana teknologi ini masih baru di Malaysia, ia adalah sangat perlu untuk Malaysia. Tambahan pula, kos teknologi yang kami wujudkan berkurang hampir 70 peratus daripada teknologi yang sedia ada.

"Sehubungan itu, saya berharap teknologi ini akan dapat dipraktikkan di Malaysia dan membantu ramai pihak," ujarnya.

Selain itu, teknologi tersebut bukan sahaja boleh digunakan untuk penyulingan air laut, malah boleh juga diaplikasikan ke arah rawatan air sisa.

"Kami bercadang menghasilkan air minuman jenama *Seafresh* dalam jangka panjang," ujarnya.

■ **ESOK: Air, manusia berpisah tiada.**

### INFO

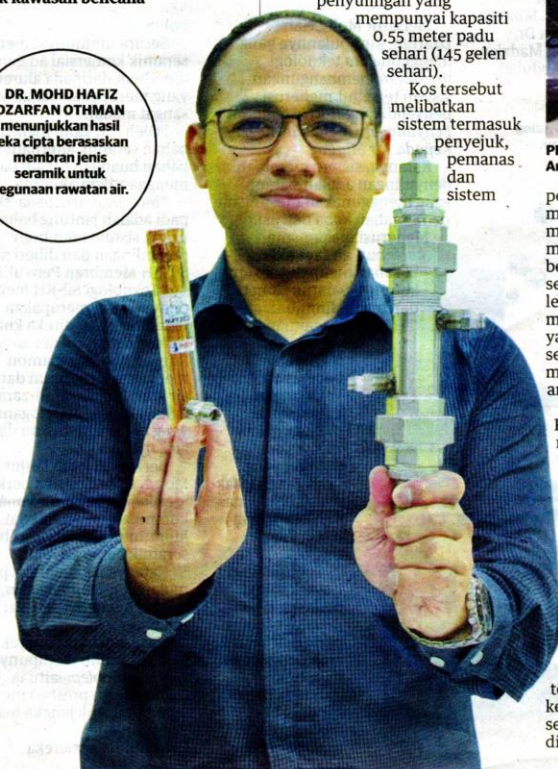
#### KELEBIHAN

- Sil-RH merupakan teknologi hijau yang berkos rendah.
- Dapat menghasilkan air minum daripada air laut berbanding teknologi konvensional.
- Sil-RH membran menggunakan tenaga yang sedikit dan suhu yang rendah untuk beroperasi.
- Memerlukan tekanan yang sangat tinggi untuk menapis air berbanding teknologi membran reverse osmosis.
- Teknologi ini dijangka dapat memberi manfaat kepada komuniti terutama apabila bencana alam seperti banjir.

#### PENGIKTIRAFAN

- Anugerah Khas dan pingat emas pada Pameran Reka Cipta Antarabangsa Seoul (SIIF) di Korea pada 2017.
- Pingat perak pada Pameran Teknologi dan Industri Seni ke-19 (INATEX) di UTM pada 2017.

**DR. MOHD HAFIZ DZARFAN OTHMAN** menunjukkan hasil reka cipta berasaskan membran jenis seramik untuk kegunaan rawatan air.





LAMPIRAN 16  
UTUSAN MALAYSIA (MEGA SAINS): MUKA SURAT 18  
TARIKH: 14 OGOS 2019 (RABU)



**HIGHER**

**ED**

**Research  
in teaching**

THE IMPACT OF RESEARCH  
ON TEACHING AND  
LEARNING AT UNIVERSITY

» PAGES 26-27

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LAMPIRAN 16 (samb)  
 UTUSAN MALAYSIA (MEGA SAINS): MUKA SURAT 18  
 TARIKH: 14 OGOS 2019 (RABU)

# Is university research good for teaching?

RÓZANA SANI  
 rsani@nst.com.my

**T**HE main role of academics at universities is to teach and do research. There are differing points of views that argue the two activities could either complement or contradict each other.

In fact, there have been allegations where academics who are too focused on research fail to bring the same level of enthusiasm to the lecture halls in their role of imparting knowledge to their students, thus affecting the quality, or bringing about a negative impact on teaching.

Associate Professor Dr Wan Zuhainis Saad, the director of the academic excellence division at the Ministry of Education's department of higher education, noted that for academics it is very easy to quantify research work in terms of the amount of grants or number of publications, and in many promotion exercises, research outputs were given big scores.

"For young staff, the career path is very clear for promotion through research but not so in teaching. Subsequently, teaching staff will focus more on their research work and just fulfil the minimum requirements of teaching," she pointed out.

"Research can be impactful in a positive way for teaching if researchers are able to connect their findings to the relevant courses or give opportunities to undergraduate students to participate in the research work in their labs," Wan Zuhainis added.

But she remarked that it would be different or the other way around if researchers were doing research merely for the sake of it, with no connection to the curricula or undergraduate teaching.

## THE IMPORTANCE OF RESEARCH

Professor Dr Ishak Yusoff, the pro-vice chancellor (Strategy & Corporate Development) at Universiti Kebangsaan Malaysia (UKM), said research projects bring new information and knowledge that should be shared with students.

"The traditional roles of a university are teaching and research with the aim of developing society and contributing positively to the national economic development. Thus, the function of universities apart from offering education necessary for personal development, is to provide professional training for high level jobs required by the country's economy. It is crucial to ensure that the university's research is being used in the teaching and learning processes," he revealed.

Professor Mahendhiran Nair, the deputy president (Research and Development) at Monash University Malaysia, said, "Research connects us to new knowledge in the field; identifies limitations of current knowledge; informs us on what needs to be studied, re-examined and researched further; and what measures to take to overcome the limitations of current knowledge. Research is essential to update one's knowledge base and to enable a horizon of new possibilities," he said.

"Only research-inspired scholars or academics will be able to expose their students to new ideas, discoveries and knowledge through first-hand experience. All others are borrowed experiences and ideas.

Furthermore, research-intensive universities across the globe are also at the forefront of innovative and creative course curriculum design and



**Only research-inspired scholars or academics will be able to expose their students to new ideas, discoveries and knowledge through first-hand experience. All others are borrowed experiences and ideas.**

**PROFESSOR MAHENDHIRAN NAIR**  
 Deputy president (Research and Development) at Monash University Malaysia



Research-inspired scholars and academics will be able to expose their students to new ideas, discoveries and knowledge through first-hand experience.

teaching pedagogy. Through their research, they will not only continuously improve their courses, but keep these courses updated in a world that is constantly changing at a rapid pace," he divulged.

"Research is not just about extending and generating new knowledge, but it is also about solving problems and evaluating current policies and practices," said Professor Dr Mohamad Kamal Harun, deputy vice-chancellor (Academic and International) at Universiti Teknologi Mara (UiTM).

"Any part of research — identification of the problem, the theories, the methodology or the findings — can be teaching topics and classroom discussion points. Academics are tasked to nurture critical thinkers and innovators, thus students too must be exposed and able to dissect current problems and provide possible solutions," he said.

## RESEARCH IN THE CLASSROOM

According to Professor Dr Noorsaadah Abd Rahman, deputy vice-chancellor (Research & Innovation) at Universiti Malaya, given the right pedagogy and lesson plans, research and teaching can complement one another.

"For example, lecturers who are doing research on a particular topic would be able to formulate assignments and group work that are more hands-on and practical, hence allowing for a deeper sense of thought towards the topic rather than imparting superficial or second-hand knowledge from textbooks or references provided by third parties — such as the authors," she pointed out.

At Universiti Malaya, in addition to research in their respective fields, Noorsaadah said lecturers are also encouraged and given support to conduct research on their own teaching practice, through a relatively small grant known as Learning Improvement & Teaching Enhancement Research (UM LITER).

"Lecturers who undertake Scholarship of Teaching & Learning (SoTL), Action Research and Educational Research, are able to use the findings from their research to update their curriculum design, improve teaching delivery and most importantly, enhance student learning," she said.

"For a research university like UKM, it is normal to bring research to the classrooms, not only for science or technical-based subjects but also among the social sciences classes.

"For science-based subjects, it is compulsory for



Research projects bring new information and knowledge that should be shared with university students.

the students to get involved with laboratory works which are frequently closely related to research projects especially among postgraduate students. For technical subjects like engineering or IT (Information Technology), students are frequently being asked to come up with projects to produce prototypes which are also research-based," said Ishak.

Research elements are also embedded in the teaching and learning of social science subjects.

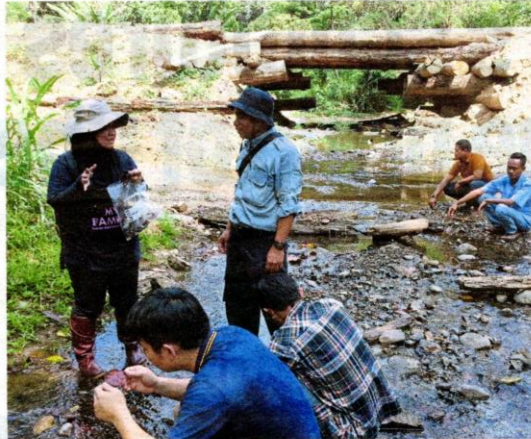
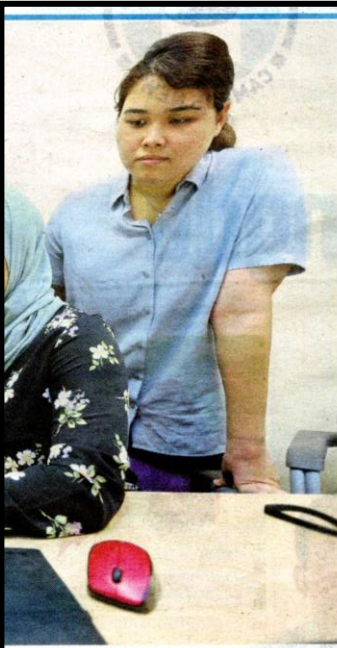
"Students conducting surveys or undertaking special investigations on specific issues will present their findings in the classroom under close supervision by their lecturers, which is a norm among social science students.

"To strengthen and further encourage such practices, UKM has decided to award 50 per cent of the tuition fees in the form of research grants to lecturers who supervise research students. In doing so, we believe that students will benefit in terms of pioneering frontier knowledge through research activities," he revealed.

To bring research to the classroom, Mahendhiran said traditional and didactic teaching approaches must give way to more creative and experiential learning approaches, supported by building strong



LAMPIRAN 16 (samb)  
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Being involved in research as a student will increase independence of thought, bring about a more intrinsic motivation to learn, and enable for a more active role in learning.

"Many universities including Universiti Malaya are now offering lecturers the option of building their academic careers either via Research Pathway or Teaching Pathway, where theoretically, innovative curriculum design, excellent teaching, along with impactful research in Teaching & Learning [T&L] will be assessed," she shared.

At UiTM, four pathways are adopted in determining an academic's career — Inspiring Educators, Accomplished Researchers, Experienced Practitioners and Institutional Leadership describe the attributes needed to be an accomplished academician.

"While they cannot be mutually exclusive, in most cases, academics tend to display some strengths over another. Researchers, for example, tend to fare better in research activities compared to institutional leadership and as such, their promotional exercises shall consider all indicators and outputs like research grants, publications, patents etc," said Mohamad Kamal.

"However, academics who spend more time in the classroom and curriculum construction such as those in the teaching and learning track are also expected to do research in order to enhance innovation in teaching and learning.

"This also includes action research. The findings of this type of research is equally publishable and can make an impact in the teaching of the subject matter. There are many learning problems that are yet to be solved, and there are also advanced technologies bringing new challenges that require exploration and research as to how students can learn the best," he said.

**STUDENTS' SAY**

Muhammad Afiq Hariz Khatem, who is studying for a Bachelor in Business Administration Entrepreneurship at UiTM, believes that academicians who are heavily involved in research make good teachers.

But they have to be able to also focus on their students through an innovative way of communication and learning to make sure that students are well taken care of even if the lecturers have time constraints.

"For me, the best is if the academician has field work experience in the courses that they are currently teaching. The sharing of past research and being involved in research as a student would increase independence of thought, resulting in a more intrinsic motivation to learn, and a more active role in learning," said Muhammad Afiq.

On being involved in a lecturer's research, he said the university should set some rules on the extent of student involvement to avoid them being

used unscrupulously.

"The student should have a minimal role that is based on the consensus of the students and the university, and they should also receive certain credits in terms of financial aid or other benefits in some way as they are fully committed in the research," he said.

Ummie Carmiela Norsam, a Bachelor of Mass Communications (Honours) Public Relations student at UiTM, also shares similar concerns about time management where academic-researchers are concerned.

"Based on my experience, some of my lecturers who are doing research and teaching simultaneously, don't really know how to use their time properly. They will come late to class or they would not show up at all. They rarely do class replacements, instead they give extra assignments which I doubt will be of benefit to students," she said.

On being involved with the academics' research, she said it would be a win-win situation for both parties.

"It will benefit the lecturers as they will be able to garner different perspectives from their students, and the students will most likely gain knowledge by helping their lecturers.

"However, when the lecturers main motive is only to get ideas from the students then it becomes unfair, unless the lecturer credits them in his or her research. Thus, it's more preferable for a lecturer to focus on one thing at a time," she opined.

Samuel Loh Yung Jian, who is pursuing a Bachelor of International and Strategic Studies at Universiti Malaya, commented that academicians at institutions of higher learning need to have exposure to research. Not only does this improve their soft skills, he said it also helps to provide knowledge and insights from a more empirical perspective.

"If my lecturers have a holistic portfolio, that enhances their ability to deliver knowledge and educate. Nonetheless, there are those who are too academic and incapable of delivering what's needed to their targeted audience, and heavy involvement in research does increase such a risk," he remarked.

Loh also said that being involved in a lecturer's research is a matter of personal preference.

"Personally, I like the challenge that comes with involvement. Not only does it help me to learn new things outside of the lecture hall, it also improves my soft skills in many areas. However, depending on the course, I too prefer having lecturers that are focused on teaching — at the very least, lecturers who can make time for their students for consultations. Lecturers from my department balance that well, and I am able to meet them outside the classroom for consultations, despite their busy schedules," he said.

Fardila Mohd Zaihidee, who is pursuing a PhD in Electrical Engineering at Universiti Malaya after obtaining a Master of Engineering (Mechatronics), is of the opinion that researchers do make good, if not better, teachers.

"Every academician can teach theories to students, but only those who are involved in research can relate the theories to current scenarios and future developments in their field. Furthermore, with an in-depth understanding from their experience in research, they can provide relevant examples and analogies to further support the theories being taught," she said.

For Fardila, hands-on activities enable her to understand theories better, which helps to generate interest in her area of study.

"As the field evolves, research activities allow me to connect the theories I have learnt to recent enhancements in that field. Involvement in research creates a more effective learning environment, where theories are applied in real-world situations.

"From my experience, I can retain and comprehend theoretical knowledge better when hands-on activities are incorporated. On the other hand, in my opinion, teaching without involvement in research tends to make students learn only through the memorisation process," she said.



Muhammad Afiq Hariz Khatem



Samuel Loh Yung Jian



Ummie Carmiela Norsam



Fardila Mohd Zaihidee



LAMPIRAN 17  
 UTUSAN MALAYSIA (LUAR NEGARA): MUKA SURAT 34  
 TARIKH: 14 OGOS 2019 (RABU)

ORANG ramai berjalan di tepi Sungai Kapuas yang dilanda jerebu teruk di Pontianak, Kalimantan Barat. - AGENSI

# Jerebu Sumatera, Kalimantan semakin buruk

■ JAKARTA 13 OGOS

**K**OTA Pontianak dilaporkan masih dilanda jerebu teruk akibat kebakaran hutan di sejumlah wilayah di Kalimantan Barat.

Lapor *CNN Indonesia*, jerebu terbabit mengakibatkan jarak penglihatan terhad kepada 100 hingga 200 meter.

Penduduk tempatan bimbang tentang keadaan berkenaan dan khuatir jika jerebu berterusan, akan menjejaskan kesihatan kepada mereka.

"Ketika menuju ke masjid untuk solat Subuh, saya menghidu bau asap yang agak kuat," kata seorang penduduk tempatan, Tomi, seperti dipetik oleh *Antara News*.

Tomi berkata, dia berasa bimbang dengan kesihatan ahli keluarganya kerana sejumlah penduduk tempatan sudah ada yang mengalami radang tekak.

Menurutnya, keadaan itu sudah berlaku sejak beberapa minggu lalu.

Dalam perkembangan lain, Menteri Alam Sekitar dan Perhutanan Indonesia, Siti Nurbaya berkata, kebakaran hutan dan kawasan yang berlaku di Riau semalam tidak seteruk minggu lalu.

Namun jelas beliau, keadaan di Riau tetap membimbangkan.



SITI NURBAYA

Pihaknya bersama Ketua Polis Negara, Jeneral Tito Karnavian dan Komander Tentera Nasional Indonesia, Hadi Tjahjanto akan memadamkan kebakaran di Riau.

Jelasnya, proses 'water bombing' terus dilakukan dalam usaha memadamkan kebakaran.

Ketua Perkhidmatan Kesihatan Sumatera Selatan, Lesty Nuraini memberitahu, jumlah pesakit jangkitan saluran pernafasan akut (ISPA) di Sumatera Selatan mencapai 274,502 orang bagi tempoh Januari hingga Jun lalu.

2020 ET AKIM







LAMPIRAN 18  
UTUSAN MALAYSIA (LUAR NEGARA): MUKA SURAT 33  
TARIKH: 14 OGOS 2019 (RABU)

## Tenaga pemanasan global 43 peratus lebih kuat

**WASHINGTON 13 Ogos** - Pembebasan gas rumah hijau ke atmosfera Bumi mencatatkan rekod pada tahun lalu dengan tenaga pemanasan global kini 43 peratus lebih kuat berbanding 1990.

CNN melaporkan, menurut laporan baharu dikeluarkan American Meteorological Society, setiap tahun sejak abad

ke-21, gelombang haba semakin meningkat daripada purata pada 1981-2010.

"Pada 2018, gas rumah hijau dominan iaitu karbon monoksida, metana dan nitrus oksida dilepaskan ke atmosfera Bumi terus meningkat ke paras tertinggi yang baharu," jelas laporan itu.

Laporan tersebut diketuai Pusat Maklumat Alam Sekitar,

Pertubuhan Atmosfera dan Lautan Kebangsaan, dan disumbangkan lebih 475 saintis dari 57 negara.

Berikut antara penemuan utama laporan *State of the Climate in 2018*:

- 2018 merupakan tahun keempat terpanas dalam rekod, (terdahulu 2015, 2016 dan 2017).
- Paras laut meningkat tertinggi

buat tujuh tahun berturut-turut.

- Glasier terus mencair pada kadar membimbangkan buat 30 tahun berturut-turut.

Selain itu, laporan tersebut menggariskan kesan yang semakin bertambah disebabkan pemanasan global.

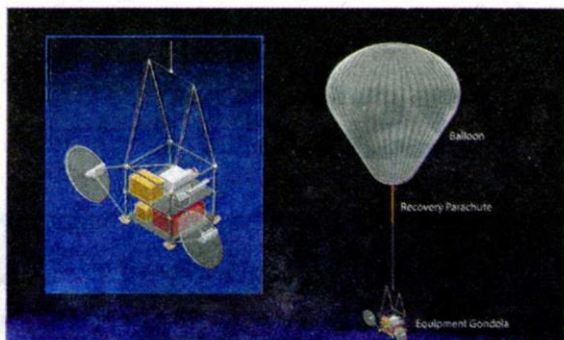
Paras laut tahunan global juga meningkat buat tujuh tahun berturut-turut dan men-

catat rekod tinggi iaitu 81 milimeter bagi 26 tahun sejak satelit melakukan rakaman.

Trend itu berterusan setiap tahun melibatkan perubahan impak paras laut terhadap komuniti pesisir menyebabkan banjir dan hakisan.

Paras laut global turut meningkat secara purata 3.1 sentimeter setiap dekad.

LAMPIRAN 19  
 UTUSAN MALAYSIA (LUAR NEGARA): MUKA SURAT 33  
 TARIKH: 14 OGOS 2019 (RABU)



PROJEK SCoPEx akan menggunakan belon bagi menabur berjuta-juta tan debu halus ke dalam atmosfera Bumi bagi menghentikan pemanasan global.



PENYEBARAN debu halus itu ke stratosfera turut dikhuatiri boleh merosakkan lapisan ozon yang melindungi manusia daripada radiasi ultraungu.

# Bill Gates mahu guna 'debu' untuk hentikan pemanasan global

**CAMBRIDGE, Massachusetts**

Bilionair dan pengasas Microsoft, Bill Gates telah menaja satu projek untuk menabur berjuta-juta tan debu halus ke dalam atmosfera Bumi bagi menghentikan kesan pemanasan global, lapor akhbar *Daily Mail*.

Projek rintis sekumpulan penyelidik Universiti Harvard itu akan menggunakan 800 belon untuk membawa debu halus berkenaan pada ketinggian lebih 19 kilometer dari permukaan Bumi sebelum ditabur bagi memantulkan sebahagian daripada pancaran cahaya matahari.

Secara teori, kaedah itu akan menghasilkan pelindung tiruan daripada



matahari seterusnya mengekang impak pemanasan global. Ujian pertama Eksperimen Pertubasi Terkawal Stratosfera (SCoPEx) bernilai AS\$3 juta (RM12.6 juta) itu bagaimanapun telah ditangguhkan susulan terdapat kebimbangan projek tersebut akan menyebabkan kesan berangkai buruk, mengganggu iklim dunia dan mungkin meragut berjuta-juta nyawa. "Idea kami memang

menakutkan tetapi begitu juga dengan perubahan iklim," kata seorang pengarah projek tersebut, Lizzie Burns. Satu badan penasihat yang terdiri daripada pakar-pakar bebas akan menilai dahulu risiko projek tersebut sebelum ia diteruskan.

Inspirasi untuk projek tersebut diambil daripada bencana alam yang berlaku secara semula jadi seperti letusan gunung berapi yang melepaskan kepulan awan debu tebal ke stratosfera, memantulkan cahaya matahari, seterusnya menyebabkan suhu Bumi menurun.

Bagaimanapun, rancangan untuk menghasilkan pelindung tiruan daripada cahaya matahari mungkin membawa impak besar, malah lebih berisiko berbanding perubahan iklim itu sendiri.

Antara kebimbangan utama adalah lapisan debu tiruan itu akan merosakkan lapisan ozon yang melindungi manusia daripada radiasi ultraungu, malah pakar cuaca khuatir eksperimen tersebut

mungkin mengubah aliran air laut yang mengawal kitaran cuaca Bumi. - Agensi

AFP  
**LETUSAN** sebuah Gunung Berapi Gunung Pinatubo di Filipina pada tahun 1991 melontarkan awan debu tebal ke stratosfera Bumi.

© AFP/Getty Images





LAMPIRAN 20  
THE STAR (STAR ASEAN): MUKA SURAT 21  
TARIKH: 14 OGOS 2019 (RABU)

# Australia offers climate funding to Pacific islands

**SYDNEY:** Australia announced a A\$500mil (RM1.4bil) climate change package for Pacific countries, but received a lukewarm response from low-lying island nations demanding urgent action from their powerful neighbour to curb its carbon emissions.

Prime Minister Scott Morrison said yesterday that the funding, drawn from Australia's existing international aid budget, would help Pacific island nations invest in renewable energy and climate change resilience.

The climate-sceptic leader made the announcement before travelling to the Pacific Islands Forum (PIF) in Tuvalu, where island nations threatened by rising seas have vowed to put global warming at the top of the agenda.

Smaller members of the 18-nation group-

ing have been sharply critical of Australia's climate policies ahead of this year's summit amid a diplomatic push from Canberra to counter China's growing power in the region.

High-level representatives from the likes of Tuvalu, Palau and Vanuatu have criticised Australia for not doing enough, with Fiji's Frank Bainimarama saying Canberra's reliance on coal posed an "existential threat" to low-lying islands.

There has also been disquiet in the Pacific that Australia recently approved the giant Adani coal mine in Queensland state.

Tuvalu Prime Minister Enele Sopoaga did not directly address islanders' concerns.

"No matter how much money you put on the table, it doesn't give you the excuse not to do the right thing," he told reporters in the

tiny nation's capital Funafuti, which is hosting the PIF meet.

"(The right thing) is cutting down your emissions, including not opening your coal mines. That is the thing we want to see."

Morrison has staunchly defended Australia's climate record, insisting that the country would meet its 2030 emissions reduction target set under the Paris Agreement.

"The A\$500mil we're investing for the Pacific's renewable energy and its climate change and disaster resilience builds on the A\$300mil (RM850mil) for 2016-2020," he said in a statement.

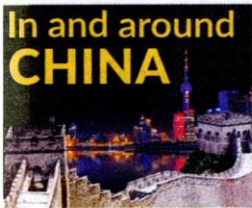
"This highlights our commitment to not just meeting our emissions reduction obligations at home, but also supporting our neighbours and friends." — AFP

#ANAK ANAK  
**MALAYSIA WALK**  
FOR UNITY, HARMONY & TOLERANCE  
BETTER AND BETTER MALAYSIA  
**Registration 3 days left**  
Date: 31 August 2019  
Venue: Eco Ardence Sales Gallery, Shah Alam  
bit.ly/aaamwalk2019  
For enquiries: 03-7967 1388 ext 1039 / 1437  
or email: events@thestar.com.my

LAMPIRAN 21  
THE STAR (STAR ASEAN): MUKA SURAT 21  
TARIKH: 14 OGOS 2019 (RABU)

# Typhoon Lekima death toll hits 49

## 300 million yuan allocated for relief work in three affected provinces



**BEIJING:** China has allocated 300 million yuan (RM178mil) in central fiscal funds to help with rescue and relief work in three provinces affected by Typhoon Lekima.

Lekima hit the three Chinese provinces of Zhejiang, Shandong and Anhui over the weekend and forced more than one million residents to flee.

China's official news agency Xinhua said late on Monday that at least 49 people were dead with dozens still missing.

A total of 150 million yuan (RM89mil) was allocated to Zhejiang province, following a 30 million yuan (RM17.8mil) relief fund previously given to the province, according to the Ministry of Emergency



**Escalating disaster:** Streets in Linhai, Zhejiang province, submerged in floodwaters. — Xinhua

Management (MEM).

The MEM and the Ministry of Finance allocated another 100 million yuan (RM59mil) to Shandong province as well as 50 million yuan

(RM29mil) to neighbouring Jiangsu province.

As of yesterday, the typhoon had left close to nine million people impacted in Zhejiang, Jiangsu,

Shandong, Anhui, Fujian, Hebei, Liaoning and Jilin as well as the city of Shanghai, while some 1.71 million people were relocated, the ministry said.

Footage on state broadcaster CCTV showed flooded fields and streets, submerged vehicles, scattered debris and trees blown over as strong winds and rain pounded cities along the seaboard.

Zhejiang bore the brunt of the damage after the storm hit with winds of nearly 190 kph and pounded the coast with waves several metres in height.

Xinhua said the rainfall recorded this weekend in Shandong province was the largest since records began in 1952.

The natural disaster has inflicted economic losses of at least 26 billion yuan (RM15.4bil), according to authorities.

CCTV footage showed rescue workers using boats and rope pulleys to carry out stranded residents over the weekend.

Thousands of flights were cancelled and train routes disrupted due to the typhoon, the state broadcaster reported, as Beijing, Shanghai and other major cities grounded planes.

Hundreds of tourist sites along the coast, including Shanghai Disneyland, were closed ahead of the storm. — Xinhua/AFP





LAMPIRAN 22  
BERITA HARIAN (DUNIA): MUKA SURAT 72  
TARIKH: 14 OGOS 2019 (RABU)



**Angka maut  
Taufan Lekima  
kini 49**

Petugas penyelamat dan sukarelawan membantu membersihkan kawasan dilanda Taufan Lekima di Linan, wilayah Zhejiang, China, kelmarin. Angka maut meningkat kepada 49 dengan 21 lagi dilaporkan masih hilang.

(Foto AFP)