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BULETIN SEADPRI

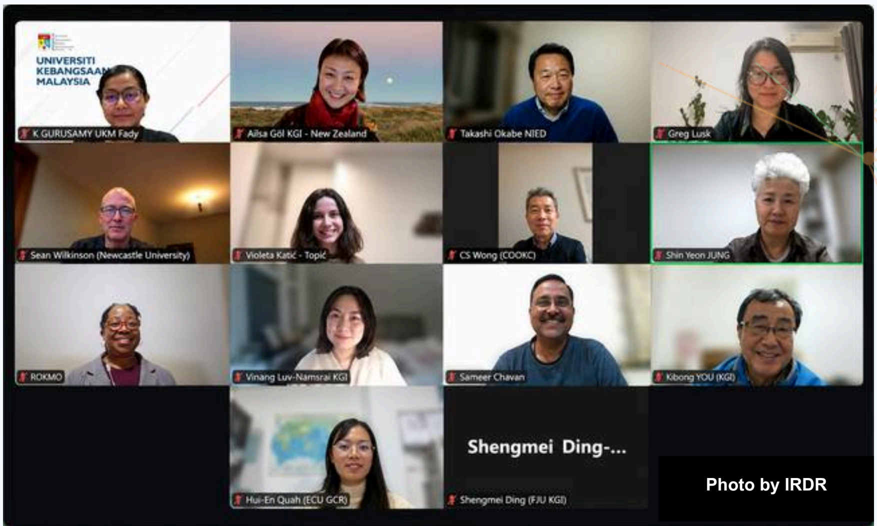
Pusat Kajian Bencana Asia Tenggara
Southeast Asia Disaster Prevention Research Initiative

ICoE-SEADPRI-UKM Engages in the Inaugural 2026 IRDR ICoEs Meeting

Nurfashareena Muhamad & Joy Jacqueline Pereira
SEADPRI-Universiti Kebangsaan Malaysia

The IRDR ICoE-SEADPRI-UKM attended the inaugural 2026 ICoEs online meeting on 4 February 2026. The session was led by IRDR Executive Director Dr. Saini Yang. The meeting focused heavily on aligning ICoEs activities with IRDR's Phase II research priorities, specifically addressing inequalities, harnessing technologies for risk reduction, and supporting science for policy and action. Discussions highlighted the transition to dynamic, collaborative work streams and stressed the urgency of accelerating the Sendai Framework's implementation to shape the post-2030 agenda. The meeting also served as an opportunity to welcome three new ICoEs into the growing global IRDR community.

Moving forward, ICoE-SEADPRI-UKM will continue its vital contributions by actively linking regional research outcomes to these newly defined Phase II priorities and participating in targeted work streams, such as risk-informed development and climate change. Drawing from the meeting's open discussions on the need to localize resilience and bridge research gaps between high- and low-income contexts, SEADPRI-UKM is well-positioned to provide regional case studies that demonstrate tangible, local impacts beyond traditional academic outputs. Additionally, our center will look to amplify its regional insights by sharing our ongoing milestones in the IRDR's publication when ready.



Representatives of IRDR's International Centres of Excellence (ICoEs) joined online for its first meeting for 2026. Pictured are several of the meeting attendees. Photo source: IRDR

ICoE-SEADPRI-UKM is closely monitoring the highly anticipated rollout of the IRDR Pilot Studies programme, which is designed to provide essential seed funding to connect the scientific activities of various ICoEs. By actively engaging in these collaborative initiatives, our centre intends to generate cutting-edge research outputs and thoroughly explore the practical applications of the newly established IRDR work streams. Ultimately, through these concerted efforts, ICoE-SEADPRI-UKM remains dedicated to producing tangible evidence of impact moving beyond traditional academic metrics to compile actionable case studies that operationalize and enhance local resilience across Southeast Asia.

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Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM)

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About SEADPRI-UKM

Universiti Kebangsaan Malaysia's Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM) has been in operation since June 2008. Based at the Institute for Environment and Development (LESTARI), the Centre addresses crucial challenges on disaster risk reduction in Malaysia and the region. The research focus is on climatic hazards, geological hazards and technological hazards, with emphasis on capacity building, mainly through post-graduate programmes and specialized training. Transdisciplinary research conducted by the Centre is action-oriented, bridges the science-governance interface and provides pathways for disaster prevention.

In 2016, SEADPRI-UKM was acknowledged by the Integrated Research on Disaster Risk Programme (IRDR),jointly sponsored by International Science Council (ISC) and the United Nations Office for Disaster Risk Reduction (UNDRR), as an IRDR International Centre of Excellence (ICoE) for Disaster Risk and Climate Extremes (ICoE-SEADPRI-UKM). Globally, SEADPRI-UKM now sits with a group of 16 institutions with similar recognition, representing various regions. The focus of ICoE-SEADPRI-UKM is to strengthen local input for addressing regional disaster risks in conjunction with national and international partners. A major flagship is the Asian Network on Climate Science and Technology (ANCST), coordinated by SEADPRI-UKM and funded by the Cambridge Malaysian Education and Development Trust, to link disaster risk reduction and climate change for building resilience in the region.

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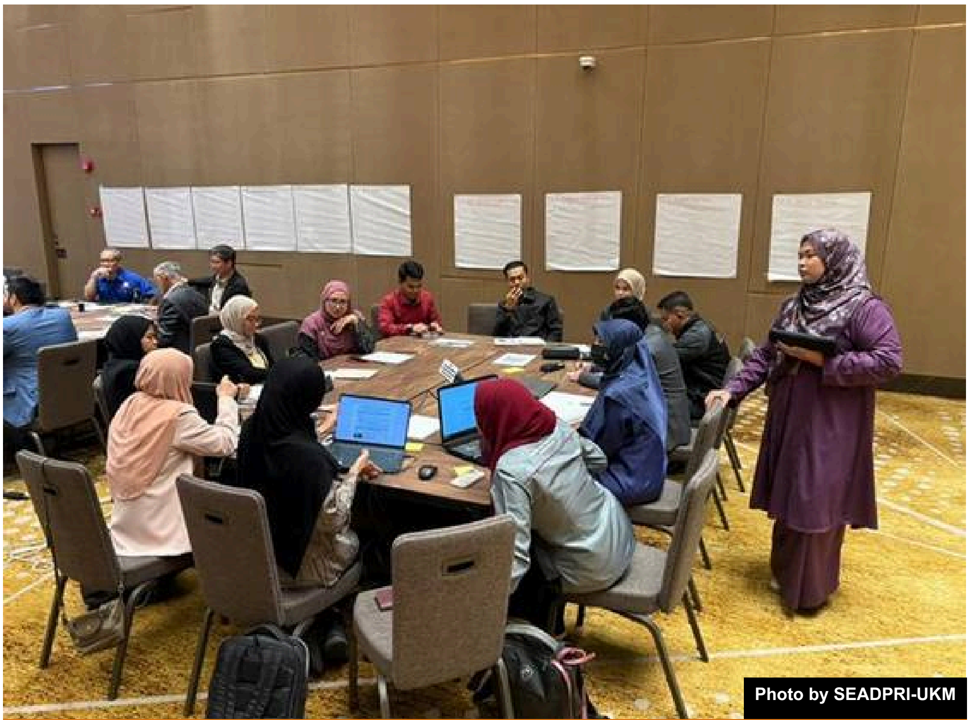
Climatic Hazards Programme

Building Climate Resilience in Selangor

Nurfashareena Muhamad, Navakanesh M Batmanathan & Joy Jacqueline Pereira
SEADPRI-Universiti Kebangsaan Malaysia



Breakout group discussions during the 11th March 2026 workshop

On 11 March 2026, SEADPRI-UKM, with funding support from the TRIGGER Project led by the British Geological Survey (BGS), convened a Knowledge Exchange and Engagement Workshop on Landslide Risks, Climate Hazards, and Climate Finance for Resilience at the DoubleTree by Hilton Hotel in Shah Alam, Selangor.

The workshop brought together key stakeholders from diverse sectors to discuss landslide risks, climate hazards, and strategies to enhance resilience, including the role of climate finance. It also highlighted ongoing local-level research, serving as a starting point for building a collaborative network of researchers, non-governmental organisations, and other stakeholders working on disaster risk reduction and climate change in Selangor.

During the discussion, the participants identified floods, landslides, and land subsidence as the most critical climate-induced disasters currently impacting Selangor, while also recognizing emerging threats like the Urban Heat Island (UHI) effect and accelerating coastal erosion.

Discussions emphasized the growing complexity of multi-hazard cascades such as heavy rainfall triggering simultaneous landslides and river pollution and highlighted the urgent need for localized vulnerability scoring to prioritize interventions for high-risk populations. A central focus of the workshop was on parametric insurance and catastrophe bonds.

Experts noted that current spatial data resolutions are largely too coarse to trigger specific landslide payouts. To minimize basis risk, stakeholders recommended scaling down resolution for event-specific models for broader insurance viability.

However, the transition to parametric structures is currently bottlenecked by high data costs, inconsistent premium payments by residents, and entrenched institutional data silos that restrict access to granular hazard mapping. Overcoming this requires expanding centralized data-sharing platforms, to securely bridge public hazard data with private sector loss data.

Beyond digital models, the workshop underscored the necessity of social innovation and grassroots empowerment to build resilience. The Nature-Based Solutions (NBS) including urban greening and mangrove restoration were also discussed as dual-purpose tools that mitigate disaster impacts while advancing climate adaptation and emission goals. Achieving this integration requires mobilizing youth as active climate agents and providing capacity-building resources to foster robust science communication.

To transition these insights into actionable policy, future success relies heavily on a collaboration model that unites government, academia, business, civil society, and the media where institutionalizing local action, declassifying and centralizing data Validating Financial Models are among key immediate priorities that have been discussed.

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Climatic Hazards Programme

Strengthening Landslide Resilience and Climate Finance

Navakanesh M Batmanathan, Joy Jacqueline Pereira, Nurfashareena Muhamad, Lim Choun Sian, Puteri Amirah Nabilah Azman & Siti Khadijah Satari
SEADPRI-Universiti Kebangsaan Malaysia

The TRIGGER (Trigger Index for Rainfall-Induced Landslide Risk Assessment for Enhanced Resilience) project signifies a landmark collaboration between the British Geological Survey (BGS) and SEADPRI-UKM supported by the UK Government's CARA Flexible Fund.

This initiative was launched to address a critical vulnerability in Malaysia's disaster management framework: the lack of quantified data linking extreme rainfall to specific landslide-induced economic losses. Since 1961, Malaysia has recorded over 6,400 landslides with damages exceeding £750 million, highlighting an urgent need for the risk-based models and financial instruments co-developed through this partnership.

Central to the project's success was the creation of a prototype landslide-trigger index for a pilot region in Selangor. The primary technical outcome is a multi-dataset modelling workflow that integrates rainfall information derived from CHIRPS and GEV analysis to understand triggering events over a 44-year record.

Employing machine learning to predict landslide loss potential based on rainfall intensity and antecedent soil moisture. These outputs are designed to bridge the "protection gap" by enabling the design of climate-smart insurance products. Unlike traditional insurance, these products trigger rapid financial payouts based on predefined environmental thresholds. Its impact has been solidified through an extensive capacity-building and stakeholder engagement program designed to ensure long-term sustainability.

The Earth Observation (EO) Training Program held on 16 December 2025 equipped geoscience and disaster management professionals with the skills to harness remote sensing technologies. Participants were trained in using open-source tools including the BGS Landslides Tracker, HazMapper, and the Copernicus Browser to monitor hazards.

The Knowledge Exchange & Engagement Workshops was held on March 10-11, 2026, in Shah Alam. These workshops brought together key collaborators from MET Malaysia, the Department of Mineral and Geoscience (JMG), and the Academy of Risk Management Malaysia (ARiMM).

The sessions focused on advancing landslide risk models for local stakeholders, with specific deep dives into data resolution, quality, and the integration of hazard characteristics into local policy.

As the TRIGGER project reaches its successful conclusion, it leaves behind a transformative legacy for disaster management in Malaysia. By successfully bridging the gap between advanced geoscience and innovative climate finance, the project has provided national stakeholders with the tools necessary to move from reactive recovery to proactive resilience.

This partnership stands as a testament to the power of international collaboration in building a climate-resilient future for the southeast Asian region.

Collaborative efforts in action at the workshop in Shah Alam

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Climatic Hazards Programme

Dasar DRR Negara 2030: Bengkel Sesi Libat Urus Bersama Pihak Berkepentingan

Siti Khadijah Satari & Joy Jacqueline Pereira
SEADPRI-Universiti Kebangsaan Malaysia

Bengkel Sesi Libat Urus Pelan Tindakan Dasar Pengurangan Risiko Bencana Negara pertama telah diadakan sebelum ini pada 6-8 Februari 2026, bertempat di Noble Resort Melaka. Bengkel tersebut diadakan bersama pihak berkepentingan Persekutuan dan Negeri bagi mendapatkan input dan ulasan bagi menambah baik pelan tindakan yang sedang disediakan.

Sementara itu, Bengkel Sesi Libat Urus Pelan Tindakan kedua telah diadakan pada 25 Mei 2026, bertempat di Tenera Hotel & Suites, Bandar Bangi Bangi. Bengkel ini dilaksanakan dengan kerjasama pihak Agensi Pengurusan Bencana Negara (NADMA) bagi mendapatkan input dan pandangan daripada wakil pihak badan bukan kerajaan (NGO), sektor korporat dan akademia dalam menambah baik pelan tindakan tersebut.

Bengkel Sesi Libat Urus yang diadakan di Tenera Hotel & Suites telah dirasmikan oleh Tuan Rajiun Abu Bakar, Timbalan Ketua Pengarah (Dasar), dan dihadiri oleh lebih 60 orang peserta. Sesi bengkel dimulakan dengan pembentangan mengenai perjalanan dan hala tuju penyediaan Pelan Tindakan Dasar Pengurangan Risiko Bencana Negara oleh Prof. Dr. Joy Jacqueline Pereira daripada Pusat Kajian Bencana Asia Tenggara (SEADPRI-UKM).

Sesi seterusnya ialah dari En. Muhammad Aslam bin Adenan daripada Agensi Pengurusan Bencana Negara (NADMA) telah membentangkan draf Pelan Tindakan yang merangkumi cadangan tindakan, mekanisme pelaksanaan serta peranan pelbagai pihak dalam menyokong pelaksanaan dasar tersebut.

Bagi memastikan perbincangan yang lebih berfokus dan menyeluruh, para peserta telah dibahagikan kepada lima kumpulan mengikut lima Teras Strategik Dasar Pengurangan Risiko Bencana Negara. Setiap kumpulan dibimbing oleh seorang rapporteur yang terdiri daripada penyelidik muda daripada pelbagai universiti awam dan swasta.

Perbincangan kumpulan memberi peluang kepada peserta untuk mengemukakan pandangan, cadangan serta maklum balas berdasarkan pengalaman dan kepakaran masing-masing. Hasil daripada kedua-dua siri bengkel tersebut, pelbagai cadangan, pandangan dan maklum balas telah dikumpulkan daripada peserta yang mewakili pelbagai sektor dan bidang kepakaran.

Penglibatan aktif pihak kerajaan, sektor swasta, pertubuhan masyarakat sivil, institusi akademik dan komuniti setempat dilihat sebagai elemen penting dalam memastikan pelaksanaan dasar dan pelan tindakan yang lebih berkesan serta mampan. Maklum balas yang diperoleh daripada bengkel-bengkel ini akan diteliti dan diambil kira dalam proses pemuktamadan Pelan Tindakan Dasar Pengurangan Risiko Bencana Negara.

Pelan tindakan tersebut dijangka menjadi panduan strategik kepada semua pihak berkepentingan dalam melaksanakan inisiatif dan program pengurangan risiko bencana secara lebih terancang, bersepadu dan berkesan, selaras dengan komitmen negara terhadap pembangunan mampan dan peningkatan ketahanan bencana dan sekali gus memperkukuh kesiapsiagaan dan ketahanan negara dalam menghadapi bencana pada masa hadapan.

Photo by SEADPRI-UKM

Bengkel Sesi Libat Urus Pelan Tindakan Dasar Pengurangan Risiko Bencana Negara 2030 bersama Badan Bukan Kerajaan (NGO), korporat dan akademia

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Climatic Hazards Programme

Pencemaran Udara Berkaitan Trafik dan Kesannya Terhadap Perubahan Iklim

Mohd Fairus Awang
SEADPRI-Universiti Kebangsaan Malaysia

Pencemaran udara yang berpunca daripada aktiviti trafik, atau traffic-related air pollution (TRAP), merupakan antara penyumbang utama kepada kemerosotan kualiti udara di kawasan bandar. Aktiviti kenderaan bermotor yang semakin meningkat bukan sahaja mengakibatkan kesesakan jalan raya, malah turut melepaskan pelbagai bahan pencemar berbahaya seperti nitrogen dioksida (NO_2), karbon monoksida (CO), zarah terampai halus ($PM_{2.5}$ dan PM_{10}) serta sebatian organik meruap (VOCs).

Di negara membangun, kajian berkaitan penilaian pendedahan terhadap TRAP masih terhad. Walau bagaimanapun, trafik jalan raya telah dikenal pasti sebagai penyumbang utama kepada pelepasan CO, NO_2 dan VOC (Han & Naeher, 2006).

Secara asasnya, proses pembakaran bahan api (seperti petrol dan diesel) di dalam enjin kenderaan menghasilkan gas rumah hijau (GHG) seperti karbon dioksida (CO_2), metana (CH_4) dan nitrus oksida (N_2O). Gas-gas ini mempunyai keupayaan untuk memerangkap haba di atmosfera bumi, sekali gus menyumbang kepada fenomena pemanasan global. Walaupun pelepasan CH_4 dan N_2O adalah pada kadar yang lebih kecil berbanding CO_2, potensi pemanasan globalnya adalah jauh lebih tinggi.

Apabila kepekatan GHG meningkat, suhu permukaan bumi turut mengalami peningkatan. Keadaan ini membawa kepada ketidakseimbangan iklim global seterusnya perubahan pola cuaca seperti gelombang haba, banjir kilat, dan kemarau yang semakin kerap serta ekstrem.

Kesan TRAP terhadap alam sekitar tidak terhenti pada tahap tesebut. Bahan pencemar seperti NO_2 dan VOC boleh bertindak balas di bawah sinaran matahari lalu menghasilkan ozon troposfera (O_3), iaitu komponen utama smog fotokimia. Ozon di aras permukaan bukan sahaja memberi kesan buruk terhadap sistem pernafasan manusia, malah boleh merosakkan tanaman dan mengurangkan hasil pertanian. Menurut Kaur & Pandey (2021) aerosol turut dilaporkan memberi impak langsung dan tidak langsung terhadap sistem cuaca, fenomena pulau haba bandar (urban heat island), serta kitaran hidrologi.

Dari sudut kesihatan, TRAP telah dikaitkan dengan pelbagai penyakit kronik seperti asma, penyakit paru-paru obstruktif kronik (COPD), kanser paru-paru dan penyakit kardiovaskular. Kajian menunjukkan bahawa pendedahan jangka panjang terhadap zarah halus ($PM_{2.5}$) boleh mencetuskan keradangan sistemik dan meningkatkan risiko kematian pramatang (Zhang & Batterman, 2013).

Dalam konteks perubahan iklim pula, suhu yang semakin tinggi boleh mempercepatkan tindak balas kimia di atmosfera, sekali gus memperburukan lagi tahap pencemaran udara sedia ada. Kajian terkini menunjukkan bahawa serentak kepada TRAP dan faktor iklim seperti suhu tinggi serta kelembapan dapat meningkatkan risiko penyakit pernafasan dalam kalangan kanak-kanak dan juga warga emas (Lee et al., 2025).

Bagi menangani isu yang semakin meruncing ini, pendekatan bersepadu amat diperlukan. Kerajaan dan pihak berkuasa tempatan perlu memperkukuh dasar pengangkutan mampan dengan meningkatkan penggunaan kenderaan elektrik, menambah baik sistem pengangkutan awam, serta menggalakkan gaya hidup rendah karbon seperti perkongsian kenderaan dan penggunaan basikal.

Selain itu, penyelidikan berterusan berkaitan pemetaan spatial dan temporal TRAP perlu dipertingkatkan ntuk memahami taburan bahan pencemar serta hubung kaitnya dengan perubahan iklim di peringkat tempatan. Pinho-Gomes et al. (2023) mencadangkan agar perancangan bandar memberi keutamaan kepada mobiliti aktif dan peluasan ruang hijau sebagai sebahagian daripada strategi mitigasi.

Kesimpulannya, pencemaran udara berkaitan trafik bukan sekadar isu kualiti udara tetapi juga antara faktor penting yang mempercepatkan perubahan iklim global. Setiap individu perlu memainkan peranan dalam mengurangkan pelepasan karbon melalui perubahan amalan harian serta sokongan terhadap dasar-dasar mesra alam. Dengan kesedaran kolektif dan tindakan bersama, kita berupaya mewujudkan persekitaran yang lebih bersih, sihat dan lestari demi kesejahteraan generasi masa hadapan.

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Geological Hazards Programme

Pemeriksa Bebas dalam Kerja-kerja Pemetaan Geologi: Memperkukuh Keyakinan dan Standard Amalan

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Dalam kerja pemetaan geologi, melaksanakan skop kerja mengikuti spesifikasi merupakan satu pencapaian penting. Namun begitu, nilai sebenar sesuatu hasil kerja terletak pada tahap pematuhan dan keteguhan teknikalnya. Di sinilah peranan semakan bebas menjadi satu elemen yang menyokong dan memperkukuh keyakinan terhadap hasil yang dihasilkan.

Seperti juruaudit dalam kewangan atau penilai dalam pewasitan penerbitan ilmiah, semakan pemeriksa bebas menyediakan satu lapisan jaminan tambahan. Dalam konteks Malaysia, peranan ini telah diperkukuhkan melalui pendekatan yang lebih sistematik, khususnya di bawah rangka kerja yang diperkenalkan oleh Jabatan Mineral dan Geosains Malaysia (JMG). Pengenalan konsep Pemeriksa Bebas sebagai satu keperluan formal mencerminkan komitmen yang tinggi terhadap kualiti dan akauntabiliti. Keperluan agar pemeriksa terdiri daripada Ahli Geologi Profesional (P.Geol.) berdaftar memastikan bahawa proses semakan dilaksanakan secara profesional dan berintegriti.

Peranan ini bukan sekadar untuk mencari kekurangan, tetapi lebih kepada memastikan bahawa semua hasil kerja adalah selaras, konsisten, dan boleh dipertanggungjawabkan secara teknikal. Pemeriksa Bebas berfungsi untuk mengesah dan menentusahkan keseluruhan output projek, daripada pengumpulan data lapangan dan pemetaan, hinggalah kepada interpretasi dan pelaporan akhir bagi memastikan hasil tersebut benar-benar mewakili keadaan geologi yang dikaji.

Dalam amalan, pendekatan ini menggalakkan semakan yang teliti terhadap keseragaman data, kejelasan interpretasi, dan kesempurnaan maklumat yang disampaikan. Ia bukan bertujuan untuk menilai kesilapan, tetapi untuk memperkukuh kualiti dan kebolehpercayaan hasil kerja secara keseluruhan.

Dari sudut yang lebih luas, pendekatan ini selari dengan amalan profesional lain yang mana verifikasi bebas menjadi satu langkah penting dalam membina kepercayaan. Lebih penting, ia menunjukkan usaha berterusan dalam mempertingkatkan kredibiliti kerja pemetaan geologi, khususnya dalam konteks yang melibatkan penilaian cerun dan bahaya geologi.

Usaha ini wajar diberi pengiktirafan. Dengan menginstitusikan peranan Pemeriksa Bebas, JMG telah memperkukuh standard penyampaian projek bukan sahaja dari segi pematuhan, tetapi juga dari aspek keyakinan, ketelusan, dan profesionalisme.

Seiring dengan perkembangan industri, penglibatan pemeriksa bebas yang berpengalaman dilihat semakin penting dalam menyokong kualiti hasil kerja. Peranan ini membantu memastikan bahawa setiap hasil bukan sahaja lengkap, tetapi juga jelas dan konsisten.

Dalam konteks ini, semakan ahli bebas bukanlah satu bentuk penguatkuasaan, tetapi satu pendekatan kolaboratif dalam memastikan hasil kerja mencapai tahap terbaiknya. Ia mencerminkan peralihan ke arah amalan yang lebih mantap, telus, dan berasaskan keyakinan agar memberi manfaat kepada semua pihak serta profesion geologi secara keseluruhan.

Gambar sesi verifikasi dan penentusahan di tapak bencana aliran puing di Taman Eko-Rimba Tembakah dan Sekayu, Terengganu sebagai sebahagian daripada aktiviti menentusahkan dan meneliti output projek yang dihasilkan oleh mematuhi keperluan dan spesifikasi teknikal yang ditetapkan.

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Geological Hazards Programme

Projek TRIGGER: Membina Hubungan antara Sains Risiko Tanah Runtuh dan Kewangan Iklim untuk Ketahanan Komuniti

Navakanesh M Batmanathan, Joy Jacqueline Pereira, Nurfashareena Muhamad, Siti Khadijah Satari, Puteri Amirah Nabilah Azman
SEADPRI-Universiti Kebangsaan Malaysia

Dalam mendepani impak ketara perubahan iklim global, kejadian cuaca ekstrem terutamanya hujan berkeamatan tinggi semakin kerap memicu kerugian kewangan berskala besar di seluruh rantau Asia Tenggara. Walaupun pemodelan bagi bencana banjir kini dilihat semakin kukuh, hubungan antara metrik hujan ekstrem dengan potensi kerugian akibat tanah runtuh masih kurang dikuantifikasi. Jurang kritikal inilah yang mendorong kepada pelaksanaan projek Trigger Index for Rainfall-Induced Landslide Risk Assessment for Enhanced Resilience (TRIGGER).

Projek TRIGGER diterajui secara bersama oleh British Geological Survey (BGS) dan Pusat Kajian Bencana Asia Tenggara, Universiti Kebangsaan Malaysia (SEADPRI-UKM). Projek berimpak tinggi ini mendapat sokongan dana sepenuhnya daripada Pejabat Luar Negeri, Komanwel dan Pembangunan (FCDO) United Kingdom di bawah program Climate Action for Resilient Asia (CARA), iaitu inisiatif Kerajaan UK bagi menyokong adaptasi dan ketahanan iklim di seluruh rantau Indo-Pasifik.

Matlamat utama projek TRIGGER adalah untuk membangunkan model berasaskan risiko yang menghubungkan sains dengan elemen ekonomi. Melalui jalinan ini, satu indeks pencetus (trigger index) yang kukuh secara saintifik dibangunkan untuk mengukur potensi kerugian akibat tanah runtuh yang dicetuskan oleh hujan.

Model perintis ini direka khas untuk menyokong reka bentuk instrumen kewangan bencana yang inovatif dan pantas, seperti insurans parametrik dan bon bencana (catastrophe bonds).

Pendekatan ini membolehkan dana bantuan pasca-bencana disalurkan dengan segera bagi melindungi komuniti rentan, mengurangkan risiko kemiskinan, serta mengekalkan daya tahan perniagaan tempatan daripada impak kejutan ekonomi akibat iklim.

Bagi memperkukuh kebolehgunaan model ini di lapangan serta merapatkan jurang antara sains dan sektor kewangan, dua siri bengkel kepakaran dan libat urus telah berjaya dianjurkan di Shah Alam, Selangor:

1- Bengkel "Modelling Rainfall-Induced Landslide Risk for Climate Finance and Resilience – Bridging the Gap" (10 Mac 2026): Sesi ini menghimpunkan para saintis, pengurus risiko, serta pakar dari sektor perbankan dan insurans untuk membincangkan reka bentuk produk kewangan bencana.

Photo by SEADPRI-UKM

Sesi perkongsian dan pembentangan model perintis oleh ahli projek TRIGGER semasa menghadiri mesyuarat bersama pihak BMCC bagi memperkukuh integrasi penilaian risiko tanah runtuh dalam sektor korporat

2- Bengkel Pertukaran Ilmu & Libat Urus (11 Mac 2026): Sesi hari kedua ini memberi tumpuan kepada pemindahan pengetahuan, tindakan antara disiplin, serta penglibatan pemegang taruh tempatan bagi membina ketahanan komuniti terhadap bahaya iklim.

Siri bengkel ini turut mendedahkan cabaran utama dalam pelaksanaan model ini secara holistik, terutamanya isu perkongsian data antara agensi dan keperluan terhadap "Punca Kuasa" (Source of Authority) yang jelas. Keberhasilan komersial dan operasi model ini amat bergantung kepada integrasi data granular yang merentasi tadbir urus silo, serta keperluan bagi mewajibkan penggunaan model risiko seumpama ini dalam kelulusan perancangan bandar dan Penilaian Impak Alam Sekitar (EIA) oleh Pihak Berkuasa Tempatan (PBT).

Melalui model kolaborasi Pentahelix yang melibatkan kerjasama antara kerajaan, akademik, industri, media, dan komuniti, projek TRIGGER diharap dapat menterjemahkan sains geobencana kepada dasar tindakan praktikal. Inisiatif ini bukan sahaja meletakkan Malaysia sebagai pelopor dalam inovasi kewangan iklim di rantau ini, malah memastikan pengurusan risiko bencana negara beralih daripada pendekatan responsif tradisional kepada strategi pengurusan risiko yang proaktif, berdaya tahan, dan berpacukan bukti saintifik.

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Geological Hazards Programme

Kerja Lapangan Bahaya Geologi Tingkat Kesedaran Pelajar UKM terhadap Risiko Bencana

Mohd Faizal Aziz, Mohd Faizol Markom & Aida Soraya Shamsuddin
SEADPRI-Universiti Kebangsaan Malaysia


Photo by SEADPRI-UKM


Photo by SEADPRI-UKM

Dalam usaha memperkukuh kesedaran dan daya tahan komuniti kampus terhadap risiko bencana, pelajar Kursus Citra, LMJS1512: Pengurangan Risiko Bencana ke Arah Membina Daya Ketahanan Komuniti telah menjalankan sesi kerja lapangan bertemakan bahaya geologi, khususnya fenomena tanah runtuh, di sekitar kampus Universiti Kebangsaan Malaysia (UKM), Bangi pada 22 April 2026. Sesi kerja lapangan tersebut dikendalikan oleh Gs. Dr. Aida Soraya Shamsuddin dibantu oleh dua kakitangan SEADPRI.

Program yang dilaksanakan setiap semester ini melibatkan pelajar ijazah sarjana muda UKM daripada pelbagai latar belakang pengajian seperti sains sosial, sains dan teknologi, pendidikan, ekonomi, kejuruteraan, perniagaan serta bidang-bidang lain yang tidak terhad kepada jurusan alam sekitar. Pendekatan ini memberi peluang kepada pelajar daripada pelbagai disiplin untuk memahami risiko bencana dan kepentingan pengurusan risiko dalam kehidupan seharian.

Sepanjang kerja lapangan, pelajar telah menjalankan pemerhatian terhadap beberapa lokasi berisiko di sekitar Kolej Ibu Zain (KIZ), UKM dan kawasan berhampiran. Antara risiko bencana geologi yang dikenal pasti termasuk cerun yang menunjukkan tanda-tanda hakisan permukaan, kawasan lereng yang mempunyai sistem saliran kurang berkesan, pergerakan tanah kecil pada tebing cerun, serta kawasan yang berpotensi mengalami kegagalan cerun akibat pengumpulan air hujan yang berlebihan.

Pelajar turut didedahkan kepada tanda-tanda awal ketidakstabilan cerun yang boleh menjadi petunjuk kepada kejadian tanah runtuh. Antara petunjuk tersebut ialah kemunculan retakan pada permukaan tanah, pokok atau tiang yang condong secara tidak normal, hakisan pada kaki cerun, pergerakan batuan kecil, perubahan bentuk permukaan cerun, serta kewujudan aliran air yang tidak biasa pada kawasan cerun.

Pemerhatian lapangan mendapati beberapa lokasi menunjukkan petunjuk awal yang memerlukan pemantauan dan penyelenggaraan berterusan bagi mengurangkan risiko kejadian tanah runtuh.

Fenomena tanah runtuh merupakan antara bencana geologi yang sering berlaku di kawasan berbukit dan berlereng, terutama apabila pembangunan infrastruktur dan pengubahsuaian cerun semula jadi tidak diurus secara mampan. Oleh itu, aspek pengurusan cerun yang baik, penyelenggaraan berkala dan perancangan pembangunan yang teliti amat penting bagi memastikan keselamatan warga kampus serta mengurangkan risiko kerosakan harta benda dan gangguan aktiviti harian.

Secara keseluruhannya, kerja lapangan ini telah memberikan pengalaman pembelajaran secara langsung kepada pelajar mengenai bahaya geologi tanah runtuh serta meningkatkan kefahaman mereka terhadap strategi pengurangan risiko bencana. Program ini mencerminkan komitmen SEADPRI dalam melahirkan generasi yang peka, berpengetahuan dan bersedia menghadapi cabaran risiko bencana, selaras dengan matlamat pembangunan mampan dan usaha memperkukuh keselamatan komuniti kampus.


Photo by SEADPRI-UKM

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Technological Hazards Programme

Makmal Bencana Teknologi di Universiti Kebangsaan Malaysia

Tan Ling Ling, Mohd Faizal Aziz & Mohd Faizol Markom
SEADPRI-Universiti Kebangsaan Malaysia

Makmal Bencana Teknologi di Pusat Kajian Bencana Asia Tenggara (SEADPRI) yang bertempat di Aras 6, Blok 1, Bangunan Keris Mas.

Makmal Bencana Teknologi telah dibangunkan pada 7 Julai 2014 berikutan kelulusan pihak Pejabat Keselamatan dan Kesihatan Pekerjaan [kini dikenali sebagai Pusat Pengurusan Risiko, Keselamatan & Kesihatan Pekerjaan (ROSH-UKM].

Makmal ini dibangunkan menggunakan peruntukan Geran Galakan Penyelidik Muda (GGPM-2014-035) dan Dana Pembangunan Penyelidikan Kumpulan Penyelidikan (DPP-2014-060) di Pusat Kajian Bencana Asia Tenggara yang bertempat di Bilik 11, Aras 6, Blok 1, Bangunan Keris Mas.

Makmal Bencana Teknologi merupakan makmal instrumen yang melibatkan ujian sampel bahan kimia yang kecil dan cair, yang mana tidak melibatkan bahan kimia meruap dan berasid kuat. Kesemua sampel yang telah dianalisis akan dibawa semula ke makmal di mana penyediaan sampel dijalankan untuk pelupusan.

Antara instrumen utama yang diperoleh daripada geran penyelidikan yang diketuai Prof. madya ChM. Dr. Tan Ling Ling ialah Spektrofotometer UV-Vis yang berjenama JASCO V-730 iRM (Jepun), diperoleh bawah geran penyelidikan Dana Impak Perdana UKM (DIP-2016-028.

Selain itu instrument multi potentiostat/galvanostat μStat-i 400 (Metrohm DropSens, Belanda) yang disambungkan ke desktop komputer dengan perisian DropView 8400 untuk perolehan data.

Perolehan untuk instrumen ini menggunakan ganjaran penerbitan tahun 2020 (GP-2020-K020205) dan geran penyelidikan antarabangsa International Centre for Genetic Engineering and Biotechnology (ICGEB, XX-2020-011).

Turut dilengkapi dengan ketuhar makmal kawalan digital berjenama Haida International dan model HD-YQ-E801A (China) adalah diperoleh menggunakan geran penyelidikan antarabangsa ICGEB kedua Dr. Tan (ICGEB, XX-2022-002); dan sistem penulenan air ultratulen Sartorius, model arium® pro DI yang diperoleh bawah geran penyelidikan Dana Impak Perdana (DIP), Universiti Kebangsaan Malaysia (DIP-2020-013).

Instrumen lain seperti alat penimbang analisis Ohaus® PX224 (US) diperoleh menggunakan dana daripada Tabung Agihan Penyelidikan (TAP-K020205); pH meter jenama SI Analytics dari Jerman (FRGS/1/2019/STG01/UKM/02/4) dan PHS-3E dari China; lampu inframerah (MT-810, China), pengempar mikro berjenama Eppendorf (Jerman) dan DLab Scientific, model D1012UA (China); pengadun vortex ZX3 (Velp Scientifica, Itali).

Satu unit pemancar ultra lembahyung (UV, UVP-C-15, China); pump vakum GAST (US); pembersih ultrasonik digital pro (China); pengacau plat panas jenama Fischer Scientific dan IKA© C-MAG 7 masing-masingnya dari US dan Jerman; projektor SHARP LCD yang dilengkapi dengan pendakap siling dan sangkar, model PG-LX2000 (China), peti sejuk beku Midea MUF-208SD (Malaysia); dan peti sejuk Hisense (110L HSE-RR129D4ABN1, China).

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SEADPRI Expands Research Collaboration with Industrial Partners on Disaster Risk Reduction

Nurfashareena Muhamad
SEADPRI-Universiti Kebangsaan Malaysia

Representatives from Industrial Partners Nippon Koie Japan, Nippon Koie Mobility Sdn. Bhd. Malaysia and JICA attended meeting in SEADPRI

The Southeast Asia Disaster Prevention Research Initiative (SEADPRI), Institute for Environment and Development, Universiti Kebangsaan Malaysia continues to strengthen its research and engagement efforts in disaster risk reduction (DRR) through strategic collaboration with industrial partners.

Over the past several months, a series of discussions and meetings have been held with Japanese partners under the Japan International Cooperation Agency (JICA) initiative on Private Sector Technology Needs for Demand-Driven Disaster Risk Reduction (DRR) Project Development in ASEAN.

The initiative focuses on selected ASEAN countries, including Malaysia, Indonesia, Vietnam, and the Philippines. These engagements have centered on identifying local disaster resilience challenges and exploring opportunities for the transfer, adaptation, and application of Japanese technologies to support DRR efforts, particularly within the Malaysian context.

Particular attention was given to ensuring that proposed solutions are demand-driven, locally relevant, and aligned with national and sub-national priorities.

In parallel, SEADPRI has also initiated discussions on a potential collaboration with Japan Aerospace Exploration Agency (JAXA) on Strengthening Disaster Resilience Infrastructure through an Integrated Insurance and Satellite-Based Solution Model. The proposed initiative aims to leverage satellite technologies, risk information, and innovative insurance mechanisms to enhance disaster preparedness, response, and recovery capacities.

For Malaysia, the collaboration is expected to focus on local-level applications within Kuala Lumpur and Selangor, where urban-related hazards continue to pose significant challenges. The initiative seeks to explore how Japanese technological expertise can be adapted to local contexts and integrated into existing disaster risk management frameworks.

As an initial step, SEADPRI plans to facilitate a state-level engagement dialogue with relevant government agencies, industry stakeholders, and local authorities in the coming months. This dialogue will help identify priority needs, potential pilot areas, and pathways for implementation. Updates and outcomes from these engagements will be featured in the next edition of the newsletter.

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Technological Hazards Programme

Mapping the Flow: Understanding Microplastic Risks in River Basins

Aida Soraya Shamsuddin
SEADPRI-Universiti Kebangsaan Malaysia

Microplastics are small plastic particles measuring less than 5 millimetres (mm) in size, which is about the size of a pencil eraser, to 1 nanometer (nm) (USEPA, 2025). They originate either from the breakdown of larger plastic items such as bottles, bags and packaging, or from manufactured micro-sized materials found in products like synthetic textiles and personal care items. Because of their small size and light weight, these particles are easily transported by wind and rainwater into drains, streams and rivers. Once in aquatic environments, they can persist for long periods, settle in sediments or be ingested by fish and other aquatic organisms. Although often invisible to the naked eye, microplastics are increasingly detected in freshwater systems and are now recognised as a widespread form of pollution (Banaee et al., 2025).

Rivers that flow through rapidly developing areas are particularly exposed to this form of contamination. Changes in land use, especially the conversion of forests and agricultural land into housing, commercial areas and industrial zones, alter the natural movement of water across the landscape. Urban areas contain a high proportion of impervious surfaces such as roads, pavements and rooftops (USEPA, 2026). These surfaces prevent rainwater from infiltrating into the soil. Instead, rainfall becomes surface runoff, flowing quickly into drainage systems and carrying plastic debris from streets, open spaces and waste disposal sites into nearby waterways (USEPA, 2026).

The risk of microplastic pollution is not evenly distributed along a river. Areas with dense populations, extensive road networks and active industrial zones are more likely to generate and transport plastic waste (Haque et al., 2024; Jaikumar et al., 2025). Physical characteristics of the landscape also play a role. Steeper slopes can increase the speed of runoff, while low-lying or flood-prone areas may accumulate plastics carried from upstream locations. Drainage density, proximity to waste disposal facilities and the condition of solid waste management systems further influence how plastics enter and move within river systems (Mohsen et al., 2023; Al Khoeriyah & Sembiring, 2024). Understanding these spatial patterns is important for identifying locations where pollution pressures are higher.

Geographic Information Systems (GIS) provide a practical way to examine these patterns across an entire river basin. By combining spatial data on land use, infrastructure, topography and hydrology, GIS can be used to map areas that are more vulnerable to microplastic contamination (Abd Wahid et al., 2025; Sharma et al., 2025). Such mapping helps to visualise how human activities and landscape features interact to influence pollution pathways. With clearer spatial information, river management efforts can focus on high-risk areas, improve waste handling practices and support more sustainable land use planning to protect freshwater environments.

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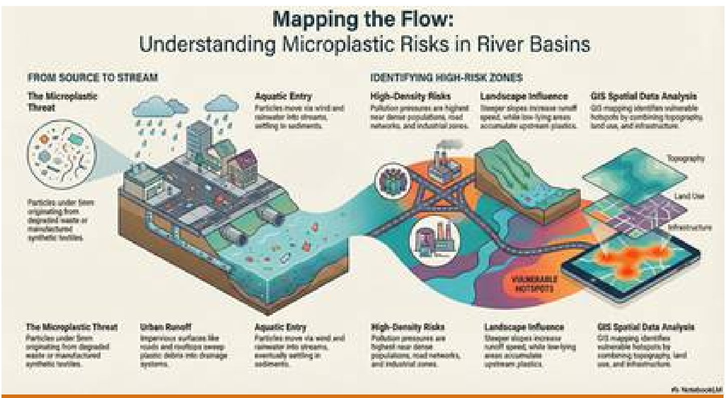

The flow of the microplastic risks in river basin

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Technological Hazards Programme

Climate Change on My Plate: Bridging Science and Tradition in the APAC Region

Navakanesh M Batmanathan
SEADPRI-Universiti Kebangsaan Malaysia

Rising temperatures are slowly transforming traditional plates and regional ecosystems. For a deeper look into these narratives and the data behind them, visit the full story at: https://storymaps.arcgis.comstories/68006e2faf9543d7a32fd16753f9d169

The climate crisis is no longer a distant projection or a collection of abstract statistics. It is a transformation that is unfolding directly onto our dinner tables. "Climate Change on My Plate" serves as a vital chronicle of this transition, born from the collaborative spirit of the National Geographic Society's APAC Leadership Workshop 2.0 held in Hong Kong in December 2025.

These stories bring together a diverse tapestry of voices from the rice paddies of Sri Lanka to the warming coastlines of Malaysia to document how rising temperatures are fundamentally altering our relationship with food. It moves beyond the sobering data provided by the World Food Programme, which warns that a mere 1°C increase in global temperature could push an additional 76 million people into acute food insecurity, and instead focuses on the intimate, human stories behind these numbers.

Throughout these pages, contributors explore how the traditional foodways evaporates away. We see this in the struggle to preserve ancient rice varieties like Heenati, once the fuel for builders of irrigation tanks and stone carvers, and in the stunted growth of Moringa trees in Sungai Petani, Malaysia.

The narrative travels across the "fruit bowl" of New Zealand's Hawke's Bay, scarred by the fury of Cyclone Gabrielle, and into the kitchens of South Korea and Nepal, where the specific ingredients for cultural anchors like gamtae-kimchi and yomari are becoming increasingly elusive.

These stories highlight a bitter realization: while education and technology can help us understand the science of soil degradation and warming seas, they cannot easily replace the abundant joy of a heritage that was once taken for granted.

Ultimately, this publication is an invitation to witness both a loss and a lingering hope. It acknowledges that the era of treating nature's bounty as an infinite gift has ended, replaced by a new reality that requires intentionality and resilience.

By documenting the peppery bite of a struggling crop or the disappearance of a local fish, these stories transform the kitchen into a classroom and food into a symbol of our shared future.

It is a call to recognize that while the climate may be changing the way our food grows, the act of sharing these stories provides the communal strength necessary to face an uncertain horizon. I hope these pages inspire a deeper appreciation for the fragile ecosystems that sustain us and a renewed commitment to protecting the culinary traditions that define who we are.

A compilation of climate stories from 14 explorers across the APAC region

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Electrochemical Aptamer-based Biosensors for Sepsis Diagnosis: Recent Advances, Challenges, and Future Perspectives

Tan Ling Ling & Nur Syamimi Mohamad
SEADPRI-Universiti Kebangsaan Malaysia

Sepsis, a life-threatening organ failure caused by a dysregulated host response to infection, is a global health crisis, impacting an estimated 48.9 million people each year and accounting for 11 million fatalities globally. This septic infection has a significant negative impact on healthcare systems in terms of both public health and economics, especially in low- and middle-income countries (LMICs) where fatality rates might surpass 40%. Therefore, prompt and precise diagnosis is essential for lowering mortality. However, the clinical signs of sepsis are often ambiguous, which causes delays in diagnosis and treatment. Due to patient individuality and pathogen diversity, conventional diagnostic techniques, such as blood cultures (BCs) and biochemical assays, are not only time-consuming but also prone to false negative results. These drawbacks highlight the critical need for quick, accurate, and sensitive diagnostic strategies that can support early detection and treatment.

Therefore, a biosensor is an effective alternative since it offers speed, specificity, and the possibility of real-time monitoring. Significant progress has been made in biosensor technology in recent years to identify sepsis biomarkers, such as procalcitonin (PCT), C-reactive protein (CRP), and interleukins (IL), each of which provides important information on inflammation and early immunological responses. The specificity and adaptability of optical sensors, especially those that employ aptamer-based techniques, are excellent for detecting biomarkers, such as CRP and interleukin-6 (IL-6). To achieve great sensitivity and facilitate early sepsis identification, these sensors make use of gold nanorods based on localized surface plasmon resonance (LSPR) and graphene oxide/nickel/platinum nanoparticle micromotor (MM) with fluorescence detection, respectively.

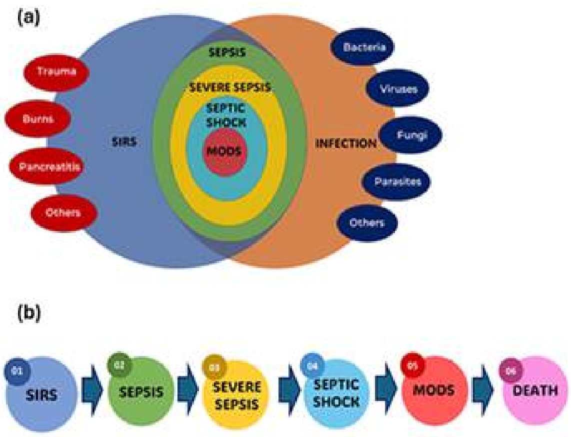
Other than that, electrochemical sensors are being emphasized for their affordability and versatility in point-of-care (POC) diagnostics, which makes them a viable choice for sepsis because of their quick reaction time and excellent sensitivity, even at low concentrations of biomarkers. More precisely, inventive possibilities for improving sensor performance have been made possible by the incorporation of nanomaterials and aptamer-based recognition components into biosensor technology.

While aptamers, a single-stranded DNA or RNA molecule with a high binding affinity, offer an excellent replacement for antibodies in biomarker recognition, particularly for unstable proteins in complex biological samples, nanomaterials like gold nanoparticles (AuNPs), carbon nanomaterials, and quantum dots have shown exceptional electrical and optical properties.

While aptamers, a single-stranded DNA or RNA molecule with a high binding affinity, offer an excellent replacement for antibodies in biomarker recognition, particularly for unstable proteins in complex biological samples, nanomaterials like gold nanoparticles (AuNPs), carbon nanomaterials, and quantum dots have shown exceptional electrical and optical properties.

Despite these developments, there is still a significant gap between clinical adoption and the advancement of technology, as only a small portion of biosensor-based diagnoses have made it to clinical practice. This is due to challenges involving regulatory approval, protocol uniformity, scalability, and reproducibility across various patient populations. This disparity highlights the need for thorough validation studies that improve biosensor sensitivity and specificity while also guaranteeing dependability in real-world settings. This is particularly important in areas where sepsis is endemic and resources for sophisticated diagnostics are limited.

In addition, the field also faces a critical trade-off between multiplexing and operational complexity. While several platforms target individual biomarkers with high sensitivity, sepsis is inherently a multi-factorial condition. Diagnosis and staging require the simultaneous profiling of inflammatory markers (IL-6 and TNF-α), bacterial components (LPS), stress proteins (HSP70), and host-response indicators (PCT, CRP, and miRNAs). However, many current aptasensors are not designed to handle multiplexed detection, or they require complex signal deconvolution schemes. The few systems that do achieve multiplexing often face limitations in fabrication scalability, cross-reactivity, or increased assay times.



A conceptual overview and diagnosis of systemic inflammatory response syndrome (SIRS), infection, sepsis, severe sepsis, septic shock, multiple organ dysfunction syndrome (MODS), and death. (a) complex interrelationships; (b) progression from SIRS to death.

Electrochemical Continued on page 15

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Electrochemical Continued from page 14

Looking forward, future progress will require a systems-level approach. This includes integrating aptasensors with microfluidic sample handling, real-time signal processing, smartphone-based readout systems, and cloud-connected databases for epidemiological tracking. Advances in machine learning can further accelerate aptamer selection, enabling in silico evolution of high-affinity sequences tailored to complex targets or multiplex panels. The development of reusable sensor cartridges with self-cleaning or anti-fouling surfaces could also reduce cost and improve sustainability, particularly in low-resource settings. Most importantly, collaborations between materials scientists, clinical microbiologists, and bioengineers must intensify.

Clinical validation needs to be at the forefront of biosensor development, not an afterthought. Future studies should prioritize patient-derived samples, multi-center trials, and regulatory readiness. Bridging the lab-to-clinic divide will not only require innovation, but also alignment with healthcare workflows, data interoperability, and human-centered design. Hence, electrochemical aptamer-based biosensors are no longer an emerging technology, they are on the cusp of clinical relevance. However, realizing their full potential in sepsis diagnostics will depend on a new generation of biosensors that are more sensitive, smarter, simpler, truly integrated with the realities of clinical care, grounded in clinical validation, and aligned with regulatory readiness.

BELASUNGKAWA
Lord Julian Hunt (1941 - 2026)

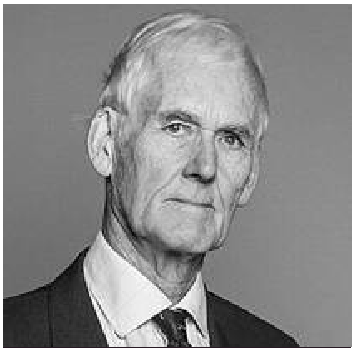
Warga SEADPRI-UKM merakamkan rasa dukacita yang mendalam atas pemergian Profesor Lord Julian Hunt, seorang saintis terkemuka dunia yang telah memberikan sumbangan besar dalam bidang sains atmosfera, perubahan iklim, pengurangan risiko bencana dan pembangunan bandar berdaya tahan.

Sepanjang penglibatan beliau bersama SEADPRI-UKM, mendiang Profesor Lord Julian Hunt memainkan peranan penting dalam memperkukuh kerjasama penyelidikan antarabangsa, membimbing penyelidik muda serta memajukan usaha memahami dan menangani cabaran perubahan iklim dan bencana alam. Idea, kepakaran dan kepimpinan beliau telah membantu melahirkan pelbagai inisiatif strategik yang memberi manfaat kepada Malaysia dan rantau Asia Tenggara.

Sebagai seorang ilmuwan yang disegani, beliau bukan sahaja dikenang atas kecemerlangan akademiknya, malah atas sifat rendah hati, kebijaksanaan serta komitmen yang tidak berbelah bahagi terhadap pembangunan ilmu pengetahuan untuk kesejahteraan masyarakat.

Pemergian beliau merupakan satu kehilangan besar kepada komuniti saintifik antarabangsa. Namun demikian, legasi ilmu, inspirasi dan sumbangan beliau akan terus menjadi panduan kepada generasi penyelidik dan pembuat dasar pada masa hadapan.

Warga SEADPRI-UKM menzahirkan ucapan takziah kepada keluarga, sahabat handai dan rakan sekerja mendiang. Semoga mereka diberikan ketabahan dalam menghadapi saat yang sukar ini, dan semoga segala jasa serta sumbangan Lord Julian Hunt terus dikenang dan dihargai. Beliau dikenang sebagai seorang tokoh yang meninggalkan impak besar melalui ilmu, kepimpinan dan khidmat baktinya kepada masyarakat global.



Sumber foto - https://kids.kiddle.co/Julian_Hunt,_Baron_Hunt_of_Chesterton

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Bengkel Sesi Libat Urus Pelan Tindakan Dasar DRR Negara 2030

Siti Khadijah Satari & Prof. Dr. Joy Jacqueline Pereira
SEADPRI-Universiti Kebangsaan Malaysia

Tuan Rajiun Abu Bakar, Timbalan Ketua Pengarah (Dasar) bersama peserta Bengkel Sesi Libat Urus Pelan Tindakan Dasar Pengurangan Risiko Bencana Negara 2030.

Kolaborasi Pusat Kajian Bencana Asia Tenggara (SEADPRI-UKM), Institut Alam Sekitar dan Pembangunan bersama pihak Agensi Pengurusan Bencana Negara (NADMA) telah diteruskan dengan kerjasama bagi penganjuran Bengkel Sesi Libat Urus Pelan Tindakan Dasar Pengurangan Risiko Bencana Negara 2030 yang diadakan pada 6-8 Februari 2026, bertempat di Noble Resort Hotel Melaka. Kolaborasi stategik yang berterusan ini bagi menyokong NADMA dalam penyediaan Pelan Tindakan Dasar Pengurangan Risiko Bencana 2030 dengan memperincikan senarai inisiatif, aktiviti dan sasaran khusus untuk mencapai matlamat dan sasaran yang digariskan dalam Dasar. Ini bagi memastikan pelan tindakan yang disediakan adalah menyeluruh, inklusif dan mampan serta selaras dengan pematuhan kepada kerangka antarabangsa seperti United Nations Office for Disaster Risk Reduction dan Sendai Framework for Disaster Risk Reduction.

Bengkel Sesi Libat Urus yang diadakan telah dirasmikan oleh Tuan Rajiun Abu Bakar, Timbalan Ketua Pengarah (Dasar) dan dihadiri oleh lebih 70 orang peserta terdiri daripada wakil Kementerian, Jabatan, Agensi Persekutuan dan Kerajaan Negeri bertujuan mendapatkan input dan pandangan ke atas draf Pelan Tindakan yang disediakan. Pembentangan mengenai draf Pelan Tindakan telah disampaikan oleh En. Muhammad Aslam bin Adenan (NADMA) dan Prof. Dr. Joy Jacqueline Pereira (SEADPRI-UKM). Peserta telah dibahagikan kepada lima (5) kumpulan mengikut lima Teras Strategik Dasar iaitu: menambah baik pemahaman risiko; mengukuhkan tadbir urus; melabur dalam pengurangan risiko bencana; meningkatkan kesiapsiagaan untuk tindak balas bencana yang efektif dan pemulihan selepas bencana; dan membangunkan keupayaan dan penglibatan komuniti. Setiap Kumpulan diketuai oleh pegawai daripada pihak NADMA dibantu pegawai daripada SEADPRI-UKM sebagai rapporteur. Perbincangan bertumpu kepada inisiatif dan aktiviti yang terpilih dalam setiap tindakan.

Bengkel selama tiga hari yang dianjurkan telah berjaya mencapai matlamat dalam menambah baik pelan tindakan yang disediakan. Beberapa cadangan untuk mempertimbangkan Garis Panduan sebagai alat penguatkuasaan dalam kawalan kepada pelan tindakan untuk tujuan pengurangan risiko bencana telah dicadangkan. Melalui bengkel ini, tanggungjawab Kementerian, Jabatan, Agensi Persekutuan dan Agensi Negeri juga dapat diselaraskan mengikut fungsi, peranan dan bidang kuasa mereka dalam mencapai enam (6) Sasaran Utama Dasar. Bengkel Sesi Libat Urus kedua dijangka akan diadakan bersama pihak Badan Bukan Kerajaan (NGO), korporat dan akademia bagi memperkukuh lagi pelan tindakan yang disediakan dan seterusnya mencapai matlamat ke arah membentuk Malaysia yang selamat dan berdaya tahan.

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