

BULETIN SEADPRI

pusat kajian bencana asia tenggara
southeast asia disaster prevention research initiative

SEADPRI ACHIEVEMENTS IN 2021 PENCAPAIAN SEADPRI 2021

Lim Choun Sian

Tahun ini SEADPRI-UKM meneruskan tujuannya dalam bidang penyelidikan, jaringan dengan pihak berkepentingan dan jangkauan dengan masyarakat. SEADPRI telah memberi sokongan teknikal kepada Agensi Pengurusan Bencana Negara (NADMA) dalam menjayakan penyediaan buku National Risk Register (NRR) dan telah dilancarkan oleh YAB Perdana Menteri Datuk Seri Ismail Sabri Yaakob pada 8 November 2021. Tujuan buku ialah untuk pembinaan kesedaran orang awam mengenai jenis-jenis bahaya alam yang Malaysia perlu bersiapsiaga, panduan respons semasa bencana dan strategi kerajaan dalam mengurangkan risiko bencana.

Di peringkat ASEAN, projek bertajuk "ASEAN Mapping Exercise to Promote Synergy with Other Relevant ASEAN Sectoral Bodies, and Entities Associated with ASEAN on Disaster Management" telah dilaksanakan bersama rakan penyelidik daripada RIKA India Pvt. dan Keio University, Japan. Projek tersebut yang dibiayai oleh ASEAN dan Kerajaan Jepun telah menganalisis dan mendokumentasikan kekuatan badan-badan serantau dalam pengurusan bencana. Selain itu, projek sub-kajian Climate Change Impact and Adaptation (CCIA) bagi menintegrasikan risiko bencana dan iklim dalam agenda kebangsaan transformasi sektor air di bawah naungan Akademi Sains Malaysia telah dapat diselesaikan. Dalam bidang pengurusan risiko dan insurans sektor perniagaan mikro-kecil-sederhana (MSMEs), satu projek kerjasama dengan Institut

Institut Pengurusan Risiko (UUM) dan NADMA, dengan biaya Asia Pacific Economic Cooperation (APEC) telah diadakan untuk kajian survei di negara APEC dan bengkel "APEC Disaster Risk Management Strategies to Support MSMEs Business Sustainability" pada Ogos 2021 untuk menghasilkan panduan pengurusan risiko telah disempurnakan. Projek penyelidikan dalam Bencana Teknologi pula bertumpu kepada pembangunan sensor atau biosensor optik dan elektrokimia berskala nano. Antara kajian terkini yang sedang berjalan ialah "Nanomaterials-based Genosensor (Nano-GS) for improved detection method of SARS-CoV-2 RNA as rapid COVID-19 diagnosis strategy", tajaan Collaborative Research Programme-International Centre for Genetic Engineering and Biotechnology (CRP-ICGEB).

Dunia, tidak terkecuali juga Malaysia, masih bergelut dengan penularan pandemik COVID-19. Keadaan ini menjadi lebih mencabar dengan kejadian bencana alam yang menjelma secara berlata dan berganda apabila beberapa bencana yang seiringan seperti hujan mencetuskan tanah runtuh dan banjir. Kejadian hujan ekstrem pada September 2021, berlakunya tanah runtuh dan banjir di Titi Hayun, kaki Gunung Jerai, Kedah; dan Disember 2021 di Lembah Klang banjir dan tanah runtuh di Kuala Lumpur, Selangor dan negeri lain seperti Pahang dan Negeri Sembilan. Menyedari pengurusan bencana adalah kompleks, penyelidikan bersifat multidisiplin pada pelbagai skala akan dipergiatkan bagi menyokong proses membuat keputusan berasaskan ilmu.





Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM)

Buletin SEADPRI

Buletin SEADPRI is published biannually by Universiti Kebangsaan Malaysia's Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM) through Penerbit LESTARI. It contains short communications, case studies and original research on science, technology, innovation, impact, vulnerability and governance related to disaster risk reduction.

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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Research Highlight

Advancing Knowledge in Disaster Prevention: Key Publications of SEADPRI-UKM in 2021

Tariqur Rahman Bhuiyan, Sharifah Zarina Syed Zakaria & Joy Jacqueline Pereira
SEADPRI-Universiti Kebangsaan Malaysia

In 2021, SEADPRI-UKM researchers have contributed to biosensor-related studies, disaster studies covering landslides and floods, and educational aspects relating to sustainable development goals (SDGs). These studies are multidisciplinary and interdisciplinary in nature; and provide seminal academic contributions in the realm of disaster prevention and environmental studies.

THE BIOSENSOR-RELATED STUDIES cover several aspects. **Mohamad et al. (2021)** reviewed various fluorescent chemosensor designs based on 8-amidoquinoline to present a general overview of the fluorophore 8-aminoquinoline and its derivatives as Zn²⁺ receptors for zinc sensor probes. They found that derivatives of 8-amidoquinoline have vast potential as functional receptors for zinc ions primarily because of their fast reactivity, good selectivity, and bio-compatibility. **Sahudin et al. (2021)** developed a rapid and simple analytical tool to detect histamine as an indirect strategy to monitor food freshness level. Sensor probe displayed high selectivity towards histamine over other amines and it was successfully applied to detect histamine in salmon fillet. This strategy has a promising potential in assuring food quality including food safety control for healthy consumption. Similarly, an impedimetric sensor was developed by immobilizing fluoro-substituted hydroxyl functionalized Schiff base zinc (II) complex on the titanium dioxide nanoparticles-coated fluorine-doped tin oxide (nano-TiO₂/FTO) electrode for sensitive and selective determination of histamine with high recovery ability (**Sahudin et al., 2021b**). The electrochemical impedimetric sensor showed charge-transfer resistance (R_{ct}) response that is proportional to the logarithm of histamine concentration between 1.0×10^{-7} M and 1.0×10^{-2} M ($R^2 = 0.9894$); this is useful for the determination of typical histamine levels in food samples. **Nurlely et al. (2021)** developed a membrane-type potentiometric enzyme biosensor or quantitative determination of formaldehyde levels in fish samples based on H⁺ ion transfer at the electrode–electrolyte interface. The operational stability of the formaldehyde biosensor with covalently immobilized alcohol oxidase showed > 95% sensitivity throughout the biosensor lifetime experimental period of 80 days. **Fazial and Tan (2021)** developed a phenylalanine-responsive fluorescent biosensor based on graphene oxide-chitosan (GO/CT) nanocomposites film for non-invasive evaluation of fish freshness using biofluid from the fish body surface. The proposed GO/CT nanocomposites biofilm offers rapid test that can be assessed easily to rapidly analyze large numbers of samples in a short period of time.

LANDSLIDE STUDIES include interpretation of satellite images based on field surveys, in situ dynamic cone penetration tests, and laboratory analyses for mineralogy and physical and mechanical properties (**Hosobuchi et al., 2021**). They found that landslides occurred at 159 locations in an area of 64 sq km, and these areas had pumice fall deposits overlying paleosols which were heavily weathered debris flow deposits. In addition, a landslide susceptibility model was developed by using a combined bivariate statistics and expert consultation approach using geographical information system, which captures landslide-conditioning parameters specific to the study area to

ensure its usefulness in practice. The approach used in this study has improved the quality of the landslide inventory and delineated key conditioning parameters. The resultant map captures local conditions, which is useful for landslide management (**Daniel et al., 2021**). A systematic review was done for assessing landslide social vulnerability in Malaysia (**Diana et al., 2021**). They identified six important indicators used to assess social vulnerability in this context.

FLOOD-RELATED STUDIES covered investigation of flash flood impact in Kuala Lumpur, Malaysia by utilizing exposure elements in open-access disaster databases that are relevant to critical infrastructure and basic services in the Sendai Framework on Disaster Risk Reduction (SDFRR) (**Muhamad et al., 2021**). The exposure elements were transformed into spatial data to investigate the impact of flash floods in the city. This study enabled an assessment of information availability in existing disaster databases and within the national system to facilitate informed decision making. The coverage of exposure elements in disaster databases is very poor; only five databases carried such information and it is not useful for local scale application (**Muhamad et al., 2021**). For the same study area, the socioeconomic impact of flash floods was investigated by using structural equation modelling. Using a structured survey approach, they found that respondents have experienced a stronger impact on direct tangible elements such as loss of household contents and damage to buildings (**Bhuiyan et al., 2021**). Flash flood induced direct loss and damage was also estimated by using direct face-to-face semi-structured interviews with 41 businessmen in the Commercial Area of Kajang, Selangor, Malaysia (**Bari et al., 2021**). The average estimated overall losses and damages per shop was RM4,510.07 due to flash floods in Kajang City in 2014, wherein the significant contribution comes from the economic side. The findings of this study provide baseline information for future studies.

Other articles published by SEADPRI-UKM researchers cover educational aspects related to the SDGs, focusing particularly on global citizenship (GC) for sustainable development. **Zakaria et al. (2021)** investigated GC elements in the Malaysian primary school curriculum on SDGs in light of the UNESCO framework. The analysis revealed that GC is taught across the curriculum in Malaysia, which aims to increase students' knowledge, skills and behaviour towards sustainability. Similarly, **Bakar et al. (2021)** studied identification of the existence of the elements of GC in key components of the Primary School Standard Curriculum (KSSR). They found that the subjects do contain the elements of GC where the application of 21st century skills and the high-level thinking skills could be found embedded in various levels. The same author group further

Research Highlight

embedded in various levels. The same author group further investigated the perceptions and role of primary school teachers in the implementation of GC education (GCE) in Malaysia through a separate study (**Bakar et al., 2021b**). They found that the main barrier to implementing GCE was the fact that teachers lacked knowledge and skills about GCE. Therefore, training and mentoring should be provided to teachers to help them implement GCE in learning activities in schools. While investigating articles about geography learning and sustainability in Indonesia from 2010 to 2020, they found that geography topics in Indonesian education contained three main elements of sustainability, namely environment, social, and economic. The most-used learning model and method was outdoor learning with contextual method by utilizing maps as a learning media and local wisdom as learning resources (**Hawa et al., 2021**).

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Research Highlight

Building on the 10-year IRDR Program

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The completion of the 10-year phase of the Integrated Research on Disaster Risk or IRDR Program (2010-2020) was spotlighted by two events: The celebration of the success of the IRDR 2021 International Conference on Advancing Risk Science for Development that was held on 8-10 June 2021 and the publication of the IRDR Compilation 2010-2020: A Ten-Year Science Quest for Disaster Risk Reduction. The overall purpose of the IRDR 2021 International Conference was to reach a renewed consensus on the mission of Science, Technology, Engineering and Innovation (STEI) and put forward a novel proposal on the Global Research Agenda for disaster risk reduction and risk-informed development toward 2030 and beyond. The IRDR Compilation 2010-2020 in turn features all significant achievements, the remaining gaps, and the lessons learnt by the IRDR community during this decade of cooperation.

The tremendous achievements of the IRDR Program throughout the 10-year phase had laid the foundation for the future of IRDR. The next phase of IRDR was discussed during the 26th IRDR Scientific Committee Meeting that was held virtually on 19 October 2021. Potential roles highlighted include 1) acting as lead in the outreach and implementation of the Global Research Agenda; 2) an international think-tank on research and policies; 3) international workplace for standard-setting in advancing risk science and policy; and 4) as a hub for centres of excellence on risk research and capacity building. In addition to that, the National Committees (NCs) and International Centres of Excellence (ICoEs) should be given more visibility in IRDR activities as well as enhancing the upstream of the science and

policy dialogue. Despite the host being so positive and supportive of the future of IRDR and the extension phase, the International Program Office (IPO) needs to provide a brief proposal to highlight the focus areas, implementation plans and expected deliverables for the next three years to further the institutional procedure.

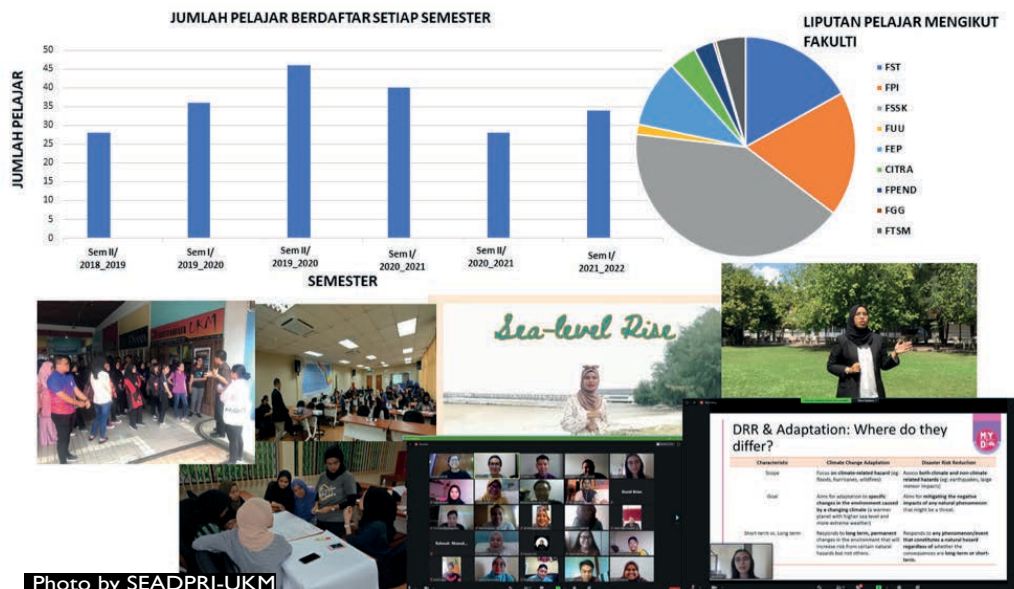
SEADPRI has been recognized as one of the IRDR International Centre of Excellence (ICoE) for Disaster Risk and Climate Extremes (ICoE-SEADPRI-UKM) since 2016. The ICoE status has increased the profile of SEADPRI at various levels. Networking and research have expanded positively at local, regional and global levels, especially in strengthening the Science & Technology Roadmap to Support the Implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030. The opportunities for international collaboration with research funding have been widened since then. In addition, ICoE-SEADPRI-UKM strongly supports engagement with youth and young professionals working on disaster risk reduction (DRR) and climate change adaptation (CCA). This has been in line with IRDR's mandate to promote capacity building of young professionals and encourage them to undertake innovative and needs-based research which makes science-policy and science-practice linkages stronger. The next phase of IRDR with a new research agenda will continue to increase the image of SEADPRI. The nine priority areas introduced in the new research agenda supports the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 and is in line with our 2020-2030 SEADPRI Strategic Plan, widening the opportunities for SEADPRI to be a major regional reference centre.

Research Highlight

Pembangunan Kapasiti Belia berkenaan Pengurangan Risiko Bencana: Kursus CITRA SEADPRI-UKM

Nurfashareena Muhamad

SEADPRI-Universiti Kebangsaan Malaysia



Rangka Kerja Sendai (SFDRR) dan Sustainable Development Goals (SDG) meletakkan kepentingan mempertingkatkan penglibatan belia dalam sains dan teknologi sebagai pembolehcar dalam mengukuhkan pelaksanaan dan pemantauan masyarakat yang berdaya tahan. Telah diakui bahawa golongan belia dan saintis muda dari pelbagai disiplin mempunyai potensi untuk membolehkan pelaksanaan pengurusan bencana yang berkesan dan mampan. Dalam menyokong usaha ini, sejak tahun 2018 SEADPRI-UKM telah menawarkan Kursus CITRA untuk pelajar Sarjana Muda UKM yang bertajuk Pengurangan Risiko Bencana ke Arah Membina Daya Ketahanan Komuniti.

Kursus ini menekankan konsep asas Pengurangan Risiko Bencana (DRR) dan juga aplikasi lawatan tapak untuk memupuk minat, mengukuhkan kefahaman dan membina kapasiti golongan belia di UKM. Bentuk pengajaran bukan sahaja melibatkan tenaga pengajar dari UKM malah, beberapa penceramah jemputan turut dijemput untuk memberi pendedahan persepsi pengurusan bencana dan DRR dalam sektor masing-masing untuk memastikan kefahaman belia yang terlibat dalam kursus ini lebih menyeluruh. Antara penceramah jemputan yang turut serta menjadi tenaga pengajar adalah dari MERCY Malaysia, Agensi Pengurusan Bencana Negara (NADMA), Jabatan Meteorologi Malaysia (MET Malaysia), Angkatan Pertahanan Awam Malaysia (APM), Malaysian Press Institute (MPI), Malaysian Youth Delegation dan U-INSPIRE Malaysia@UKM.

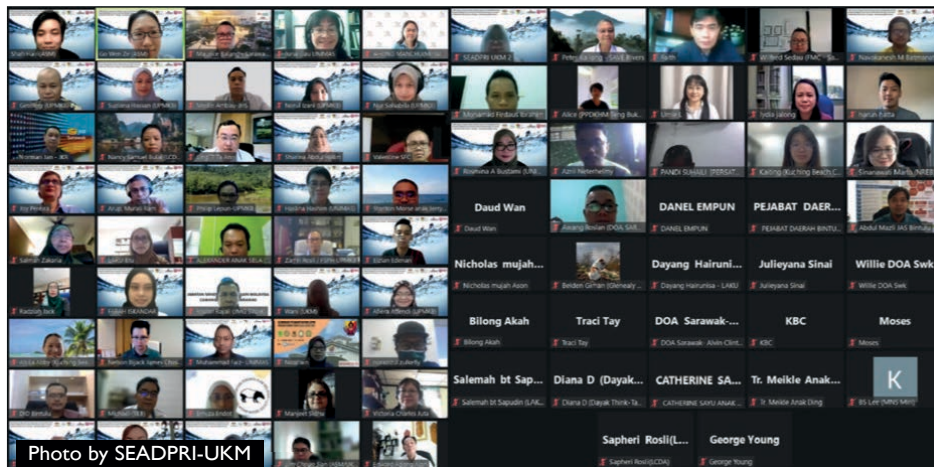
turut serta menjadi tenaga pengajar adalah dari MERCY Malaysia, Agensi Pengurusan Bencana Negara (NADMA), Jabatan Meteorologi Malaysia (MET Malaysia), Angkatan Pertahanan Awam Malaysia (APM), Malaysian Press Institute (MPI), Malaysian Youth Delegation dan U-INSPIRE Malaysia@UKM.

Sejak kursus tersebut diperkenalkan, di antara 28-40 orang pelajar daripada pelbagai disiplin telah mendaftar setiap semester. Pelajar yang berdaftar adalah daripada pelbagai fakulti di UKM tahun pengajian. Sehingga kini, pelajar dari Fakulti Sains Sosial dan Kemanusiaan (FSSK) merupakan antara kumpulan terbesar yang mendaftar ke kursus CITRA dan diikuti dengan Fakulti Pendidikan Islam (FPI), Fakulti Sains dan Teknologi (FST), Fakulti Ekonomi (FEP), Fakulti Pendidikan (FPEND), Fakulti Undang-undang (FUU), CITRA, Fakulti Pergigian (FGG) dan Fakulti Teknologi dan Sains Maklumat (FTSM). Sejak kebelakangan ini, statistik turut menunjukkan walaupun negara kini dilanda wabak COVID-19, usaha pembangunan kapasiti terhadap belia UKM masih diteruskan walaupun menunjukkan jumlah penurunan pelajar yang berdaftar sejak semester I 2020/2021. Namun, keadaan ini tidak menjadi penghalang kepada aktiviti pengajaran dan pembelajaran masih diteruskan secara atas talian. Sungguhpun lawatan tapak di luar kampus tidak dapat dijalankan, pendedahan daripada barisan penceramah jemputan dalam kursus ini telah menambah minat pelajar-pelajar untuk terus menyokong Kursus CITRA ini.

Climatic Hazards Programme

Climate Change: Voices from the Local Level

Sharina Abdul Halim¹ & Go Wen Ze²
¹LESTARI-Universiti Kebangsaan Malaysia
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The workshop in Sarawak was held in collaboration with Universiti Malaysia Sarawak (UNIMAS) and Universiti Putra Malaysia (UPM), Bintulu Campus and involved 82 participants from government agencies, NGOs, the private sector and local community.

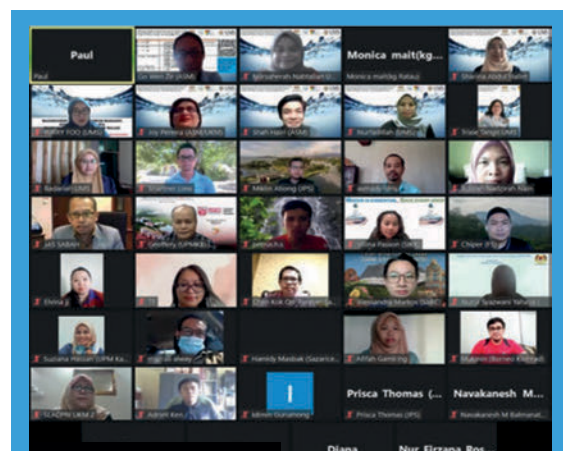
The National Agenda for Water Sector Transformation 2040 (WST2040), led by the Economic Planning Unit (EPU) of the Prime Minister’s Department, aims to transform the national water sector into a more dynamic economy. It also aims to contribute to the country’s gross domestic product and increase employment opportunities in the water sector. The Academy of Sciences Malaysia (ASM) has been appointed by the EPU as its strategic partner to undertake a study to further develop the WST2040. Under this study, one of the eight sub-sectors is the Task Force on Climate Change Impact and Adaptation (CCIA) led by Professor Dr. Joy Jacqueline Pereira FASc. The task force will prepare a strategic advisory report to provide input to the EPU; it will frame a national strategy for climate change adaptation to increase adaptive capacity and build resilience, focusing on the effects of global warming in the country. The Task Force conducted a series of workshops to obtain the insight of local communities and stakeholders on issues related to the water sector and climate change in the context of impact and adaptation.

The first workshop was conducted face-to-face on 10-11 April at the Langkawi Research Centre (PPL), UKM to hear the voices of the local communities in Langkawi. The next meetings were set in the third quarter of 2021 in the states of Sabah and Sarawak and conducted via Zoom. The three areas were selected based on several reasons related to their susceptibility towards the impacts of climate change and availability of resources, as well as support to conduct workshops based on movement restrictions imposed during the pandemic. Government agencies, private sectors, non-governmental organizations (NGOs) and local communities were the target groups invited to the focus group discussions. The objectives of the workshops were to identify issues, challenges and potentials related to the water sector and climate change in the context of impact and adaptation, and to obtain suggestions for improvements to enhance public awareness.

The workshops for Sabah and Sarawak were successfully conducted on 18 August 2021 and 6 September 2021 with assistance from the ASM and SEADPRI-UKM team members, including Mr. Navakanesh M. Batmanathan, Mr. Mohd Shahairudin Hairi, Puan Siti Khadijah Satari and Ms. Nurul Syazwani Yahya. The consultation was jointly convened

by the ASM and SEADPRI-UKM with the support of the universities operating in the local areas, namely Universiti Malaysia Sabah (UMS), Universiti Malaysia Sarawak (UNIMAS) and Universiti Putra Malaysia (UPM), campus Bintulu Sarawak.

The workshops revealed that the communities and stakeholders at the local level are already experiencing the impacts of climate variability and change, with each area being affected differently. The common disasters include floods, landslides and dry spells. With the changing climate pattern, these disasters are expected to increase significantly. On top of that, there are significant deficiencies in climate preparedness that are compounded by development activities. It was emphasized that both top-down and bottom-up approaches are required for adaptation. The potential to enhance co-production of both scientific and experiential knowledge at the local level was also highlighted. Moving forward, the involvement of universities operating in the three local areas is critical for advancing this agenda, particularly to address issues related to climate change impacts, and actions that could be taken together from all sectors of society.



The workshop in Sabah was held in collaboration with Universiti Malaysia Sabah (UMS) and involved 44 participants from government agencies, NGOs, the private sector and local community.

Climatic Hazards Programme

Training Trainers for Social Entrepreneurship in Cambodia

Nurul Syazwani Yahaya & Joy Jacqueline Pereira
SEADPRI-Universiti Kebangsaan Malaysia

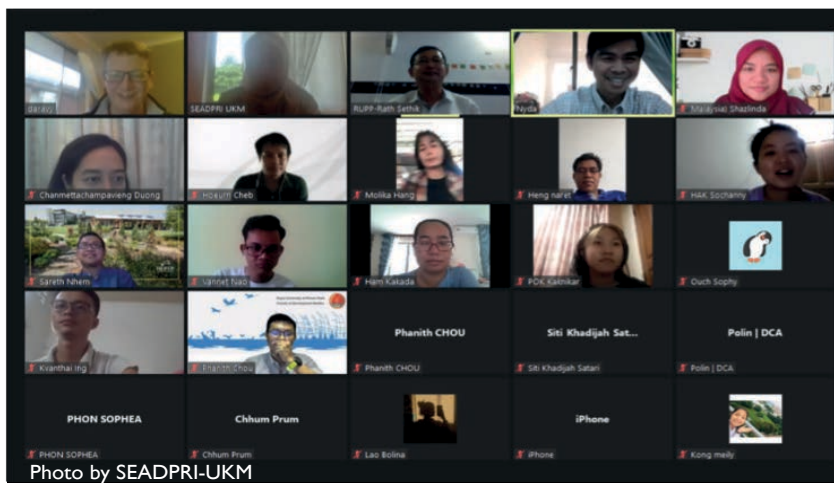


Photo by SEADPRI-UKM

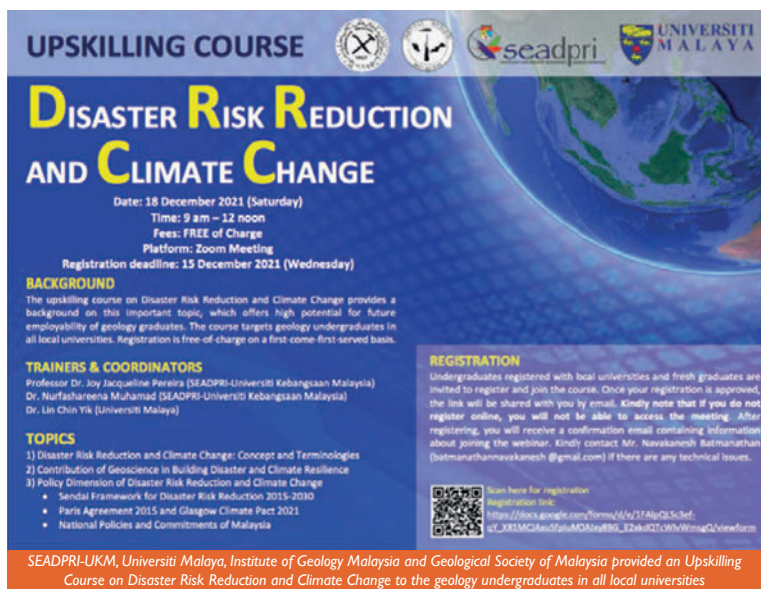
The training was delivered by Dr Isaac Lyne (top row, first left) and Ms. Shazlinda Md.Yusof (top row, first right), and attended by Dr Rath Sethik (top row, middle) who delivered the opening remarks.

The second session of the training of trainers for Social Entrepreneurship (SE) for DRR in Cambodia was held on 10 August 2021 following the first zoom session held in Malaysia in June 2021. These training sessions, targeting young geoscientists, were a part of the activities implemented under the project "Promotion of Social Entrepreneurship in Disaster Risk Reduction", which was funded by the International Development Research Centre (IDRC) Canada and led by SEADPRI-UKM. The purpose of this training was to familiarize participants with the understanding and philosophy of social entrepreneurship, and provide a step-by-step process on how to develop as well as sustain their own social enterprises.

The online training in Cambodia was attended by over 20 participants from various academic backgrounds comprising undergraduates and graduate students, as well as academics from the Royal University of Phnom Penh (RUPP). The event began with opening remarks by Dr Rath Sethik, Dean of the Faculty of Development Study at the Royal University of Phnom Penh. This was followed by a presentation on the background

of the project and training by Dr Chinnh Nyda, project member and leader for the Cambodian pilot. The training began with a presentation on the "Status of Cambodian Social Enterprise" delivered by Dr Isaac Lynne of Western Sydney University who has been working closely with RUPP on a project related to social enterprises in Cambodia. The training continued with a session on "Social Entrepreneurship in Disaster Risk Reduction" delivered by Ms. Shazlinda Md Yusof.

Participants, especially the fresh graduates, had shown keen interest on the topic. An engaging discussion followed where the participants asked numerous questions about the various types of business models that can be adopted by social enterprises to add value towards societal well-being, as well as the differences in the regulations and practices of social entrepreneurship in Malaysia and Cambodia. The training also served as an impetus for participants to explore more opportunities and expand the practice of social entrepreneurship in disaster risk reduction to ensure long-term climate resilience in Cambodia.



UPSKILLING COURSE

DISASTER RISK REDUCTION AND CLIMATE CHANGE

Date: 18 December 2021 (Saturday)
Time: 9 am – 12 noon
Fees: FREE of Charge
Platform: Zoom Meeting
Registration deadline: 15 December 2021 (Wednesday)

BACKGROUND
The upskilling course on Disaster Risk Reduction and Climate Change provides a background on this important topic, which offers high potential for future employability of geology graduates. The course targets geology undergraduates in all local universities. Registration is free of charge on a first come, first served basis.

TRAINERS & COORDINATORS
Professor Dr. Joy Jacqueline Pereira (SEADPRI-Universiti Kebangsaan Malaysia)
Dr. Nurfashareena Muhamad (SEADPRI-Universiti Kebangsaan Malaysia)
Dr. Lin Chin Yik (Universiti Malaysia)

TOPICS
1) Disaster Risk Reduction and Climate Change: Concept and Terminologies
2) Contribution of Geoscience in Building Disaster and Climate Resilience
3) Policy Dimension of Disaster Risk Reduction and Climate Change
• Sendai Framework for Disaster Risk Reduction 2015-2030
• Paris Agreement 2015 and Glasgow Climate Pact 2021
• National Policies and Commitments of Malaysia

REGISTRATION
Undergraduates registered with local universities and fresh graduates are invited to register and join the course. Once your registration is approved, the link will be shared with you by email. Kindly note that if you do not register online, you will not be able to access the meeting. After registering, you will receive a confirmation email containing information about joining the webinar. Kindly contact Mr. Navakanesht Batmumathan (batmanathannavakanesht@gmail.com) if there are any technical issues.

Scan here for registration
Registration link:
https://docs.google.com/forms/d/e/1FAIpQL5c3ef_eY_X81MCAu-0j9iA0A99e89G_E2ak8QTcWvW0mgQ/viewform

SEADPRI-UKM, Universiti Malaysia, Institute of Geology Malaysia and Geological Society of Malaysia provided an Upskilling Course on Disaster Risk Reduction and Climate Change to the geology undergraduates in all local universities

Climatic Hazards Programme

Chocolate Talk on DRR for Young Professionals

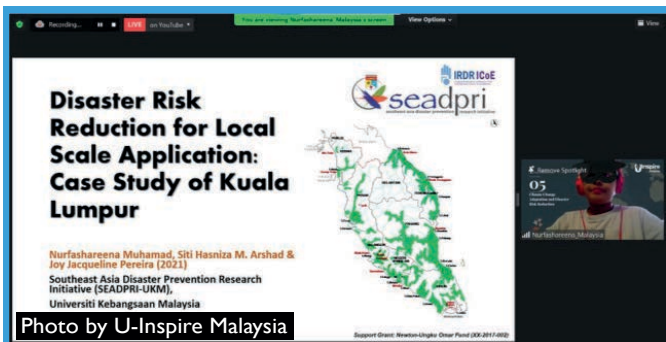
*Nurfashareena Muhamad & Mohd Khairul Zain Ismail
 SEADPRI-Universiti Kebangsaan Malaysia*



In conjunction with the 2021 UNDRR International Day for Disaster Risk Reduction on 13 October 2021, U-INSPIRE Alliance organized a Chocolate Talk on DRR for the Youth and Young Professionals (YYPs). The webinar is a monthly virtual platform for knowledge sharing amongst YYPs to present their research work related to Science, Technology, Engineering, and Innovation in DRR that will provide valuable insight to other youth in Asia and the Pacific Region. The Chocolate Talk on DRR, conducted on 30 October 2021, featured young professional speakers from Asia who are currently working in the related field.

Dr. Nurfashareena Muhamad of SEADPRI-UKM was invited to speak together with other young professionals from Indonesia and India. She presented on Disaster Risk Reduction for Local Scale Application: Case Study of Kuala Lumpur. The work was part of the Newton-Ungku Omar Fund Project on Kuala Lumpur Multi-hazard Platform led by Prof. Joy Jacqueline Pereira of

SEADPRI-UKM and Prof. Lord Julian Hunt of the University of Cambridge. Taking Kuala Lumpur as a case study, she highlighted the coverage of exposure elements in the global disaster database as well as scientific literature that is not well researched. The development of exposure element inventory for Kuala Lumpur was also presented. The gaps and challenges of related open-source databases were discussed in the presentation. She concluded the presentation with a note that the case study of Kuala Lumpur can be easily replicated in other major cities of the country. Further work is required to delineate emerging hazards due to climate change; similar efforts can also be undertaken in Southeast Asia to advance open sharing of information on disaster and climate risks. This Chocolate Talk on DRR creates experimental spaces for collaboration among YYPs, not just for the network, but for research opportunities in DRR, focusing on linking findings from research to policies at the local, national, and global levels.



Climatic Hazards Programme

Sharing at the 5th Global Summit of GADRI

Lim Choun Sian
SEADPRI-Universiti Kebangsaan Malaysia



Photo by SEADPRI-UKM

Panelists at the GADRI session on Contributions to Climate Change Adaptation

The Global Alliance of Disaster Research Institutes (GADRI) is a forum for sharing knowledge and promoting collaboration on topics related to disaster risk reduction (DRR) and resilience to disasters. The network was established after the meeting at the 2nd Global Summit of Research Institutes for Disaster Risk Reduction: Development of a Research Road Map for the Next Decade in March 2015. This meeting was held at the Disaster Prevention Research Institute (DPRI), Kyoto University to discuss how the disaster research institutes can contribute in the next 15 years in accordance with the goals of the Sendai Framework. As a GADRI member, SEADPRI has participated and shared with its members new developments of DRR at the Global Summit held biannually. The 5th Global Summit of GADRI on the theme Engaging Sciences with Action was conducted virtually on 31 August and 1 September 2021 across two continents. In Asia, it was hosted by Disaster Prevention Research Institute (DPRI) at Kyoto University, and in Europe at the Institute for Catastrophic Loss Reduction (ICLL) at Western

University, Canada. The Summit was inaugurated by Professor Paul Kovacs, Chair of GADRI Board of Directors from (ICLL) at Western University, Canada, and Professor Hirokazu Tatano, GADRI Secretary-General and Professor of DPRI Kyoto University, Japan. The Special Representative of the Secretary-General for DRR at UNDRR, Ms Mami Mizutori, also delivered a message. SEADPRI was represented by Dr. Lim Choun Sian as a panellist discussing the topic Contributions to Climate Change Adaptation: Action Orientated Agenda Regards Integrated Disaster Risk Reduction and Climate Change Adaptation for the Next Decade. In the session, examples of integrated research on climate-related geohazard risks, impacts of climate change on expected impacts of 1.5°C global warming and planning policy were shared. Case studies on geological hazards, forensic studies and projects on meteorological forecasting and early hazard warning-based systems for local level climate extremes and physical hazards for cities management were illustrated.



| Main themes | | |
|---|--|--|
| <p>Disaster Risk Governance Strengthening disaster risk governance to address systemic risk.</p> | <p>COVID-19 recovery Social and economic recovery from COVID-19 for all.</p> | <p>DRR financing Financing for DRR and risk-informed investments and development.</p> |
| Cross-cutting themes | | |
| <p>Sendai Framework Stocktaking Stocktaking and accelerating progress in achieving the goal and targets of the Sendai Framework.</p> | <p>Leave no one behind Leave no one behind – focusing on local actions and empowering the most at risk.</p> | <p>SDGs and climate action Accelerating and integrating disaster risk management to sustainable development and climate action.</p> |

Persidangan Platform Global bagi Pengurangan Risiko Bencana (GPDRR2022) Tahun 2022 akan diadakan pada 23-28 Mei 2022, bertempat di Bali, Indonesia. Bertemakan “From Risk to Resilience: Towards Sustainable Development for All in a COVID-19 Transformed World”, Persidangan ini akan diadakan secara hibrid, dengan kehadiran peserta secara atas talian dan kehadiran terhad secara bersemuka. Persidangan GPDRR2022 adalah merupakan edisi yang ke-7 penganjurannya dan akan dianjurkan oleh UNDRR dan dihoskan oleh negara Indonesia. Butiran lanjut mengenai pendaftaran, permohonan side events, maklumat persidangan dan sebagainya, boleh didapati di dalam laman web persidangan <https://globalplatform.undrr.org/about>

Geological Hazards Programme

SEADPRI-UKM at the 57th CCOP Annual Session

Lim Choun Sian

SEADPRI-Universiti Kebangsaan Malaysia



Screenshots of the participants of the 57th CCOP Annual Session

The 57th CCOP Annual Session and the 77th CCOP Steering Committee Meeting was held online on 23-24 and 25 November 2021 respectively, in cooperation with the General Department of Geology and Minerals of Vietnam (GDGMV). The Coordinating Committee for Geoscience Programmes (CCOP) in East and Southeast Asia (CCOP) is an intergovernmental organization. Its mission is to facilitate and coordinate the implementation of applied geoscience programmes in the region in order to contribute to economic development and the improvement of the quality of life in the region. It was founded under the auspices of the United Nations in 1966. Its members are mainly represented by the geological survey departments of the respective countries in the region. CCOP is supported by 14 cooperating countries outside Asia as well as cooperating organizations.

SEADPRI-UKM, as one of its members, was also represented in the Advisory Group meeting. The Advisory Group, comprising representatives of the cooperating countries, organizations and Honorary Advisors, meet once a year to consider the technical, scientific and research aspects of CCOP's work programme.

Many activities have been jointly undertaken by UKM and CCOP over the past decade under the auspices of the Department of

Mineral and Geoscience Malaysia. The activities were organized to recognize the importance of regional cooperation, capacity building and exchange of geoscientists to address issues related to regional sustainable development; this encompasses geohazards, climate change adaptation, disaster resilient cities & DRR-SDGs, geoparks, geoheritage and geotourism, and young geoscientists.

Over the past 5 years, young and early career geoscientists from CCOP member countries were funded by ongoing projects for capacity building and knowledge sharing parallel to the research being carried out, namely meteorological and geological modelling. One such project is the Promotion of Social Entrepreneurship in Disaster Risk Reduction to Build Community Resilience, funded by the International Development Research Centre (IDRC) Canada. Key partners are the Royal University of Phnom Pehn (RUPP) and Geological Society of Malaysia (GSM). This project focuses on fostering long-term community resilience to climate change in Malaysia & Cambodia, and empowering young female social entrepreneurs to develop disaster resilient plans via the use of GIS, open source and crowd-sourcing technology. The opportunities for capacity building and training will be shared with CCOP members to benefit young and early career geoscientists.



SEADPRI-UKM yang diwakili beberapa ahli telah terlibat menjadi sukarelawan dalam misi bantuan banjir di beberapa daerah terjejas di Selangor iaitu di Hulu Langat dan Puchong. Bantuan yang diberikan adalah dalam bentuk pembersihan rumah mangsa, sumbangan barangan keperluan dan sokongan emosi bagi meringankan beban mangsa banjir.

Technological Hazards Programme

Harmful Red Tides

Tan Ling Ling

SEADPRI-Universiti Kebangsaan Malaysia



Photo by Google image

Red tides threaten marine ecology and aquatic product cultivation.

Water quality contaminations are frequent issues touching the concerns of many people, both locally and globally. In recent years, water contaminations from Harmful algal blooms (HABs) have become a concern in aquatic environmental pollutions. HABs of dinoflagellates or diatoms are often called red tides because they can make the water appear red. Dinoflagellates are the most common cause of algal blooms in salt water. Rapid production of various species of harmful microalgae in waters can cause fish kills, contamination of drinking water and seafood with toxins. Dinoflagellates and diatoms can cause harm to people and animals by making such toxins or growing too dense.

Climate change and nutrient enrichment of waters are some of the causes of toxic dinoflagellate bloom. This phenomenon which results in toxins in water and aquatic food sources, which will lead to serious human health problems, fatality and damage to ecosystems causing huge economical losses, especially in aquaculture industries. The detection of these toxic phytoplankton in the aqueous environment is important for protecting public and environment health.

Traditional methods for the analysis and detection of these toxic HAB species are complicated, and not robust enough for rapid assessment. One of the more important limitations to HAB-monitoring technology is the use of cell count techniques for HAB assessment. With this technique, it is impossible to detect extremely low concentrations of toxic algae cell densities in the aqueous environment without pre-concentration. Filtration of large volumes of samples is commonly practiced when identification and quantification of toxic algae is required. Accuracy of cell counts is currently the limiting factor of all systems.

Another problem is the very limited number of existing phytoplankton probes and they must be validated for each region of HAB-occurring events. Therefore, there is a need to develop ultrasensitive and selective DNA biosensors by using a platform technology to enable robust, especially direct, portable and user-friendly analysis and management of these hazardous biological organisms in water. The development of biosensors that address these challenges is currently in progress.



Tahniah dan Syabas diucapkan kepada pelajar SEADPRI, Cik Nurul Syazwani Yahaya (P99952), pelajar di bawah seliaan Prof. Dr. Joy Jacqueline Pereira telah berjaya memenangi anugerah Kategori Abstrak Lanjutan Terbaik dalam Kolokium Siswazah LESTARI 2021 yang diadakan pada 13 Oktober 2021 secara atas talian. Kolokium Siswazah LESTARI 2021 dijalankan bertujuan untuk memastikan pelajar berada di landasan yang betul semasa menjalankan penyelidikan sehingga berjaya menghasilkan penyelidikan yang baik serta memberi impak kepada universiti khususnya.

Technological Hazards Programme

Latihan Penggunaan Instrumen Metrohm DropSens

Tan Ling Ling & Mohd Faizol Markom
SEADPRI-Universiti Kebangsaan Malaysia



Photo by SEADPRI-UKM

Latihan penggunaan instrumen Metrohm DropSens pada 9 Mac 2021 di Makmal Bencana Teknologi.

Program Bencana Teknologi, Pusat Kajian Bencana Asia Tenggara (SEADPRI-UKM) telah mengadakan Latihan penggunaan instrumen Metrohm DropSens pada 9 Mac 2021 bertempat di Makmal Bencana Teknologi, SEADPRI-UKM. Jurulatih dari Metrohm (Malaysia) Sdn. Bhd. telah dijemput untuk memberi ceramah dan latihan mengenai komponen utama dan konsep operasi asas instrumen Metrohm DropSens termasuk teknik pengukuran elektrokimia menggunakan kaedah voltammetrik, amperometrik, potentiometrik dan spektroskopi impedans elektrokimia (EIS). Instrumen dan peralatan Metrohm DropSens telah diperolehi menggunakan geran penerbitan tahun 2020 (GP-2020-K020205) dan geran penyelidikan antarabangsa International Centre for Genetic Engineering and Biotechnology

(ICGEB, XX-2020-011), yang diketuai Prof. Madya Dr. Tan Ling Ling. Metrohm DropSens bermodel μ Stat-I 400s dengan julat keupayaan sebanyak ± 4 V dan arus terukur maksimum ± 40 mA, membekalkan analisis potentiostat/galvanostat/impedans mudah alih dan tanpa wayar yang boleh digunakan untuk pengukuran voltammetrik, amperometrik, potentiometrik dan EIS, di mana ia menyediakan penyelesaian lengkap untuk kerja makmal dan kerja lapangan. Ia menawarkan pelbagai aplikasi seperti analisis kakisan; penilaian pencirian sensor, biosensor dan bahan baru; mengikutkan proses elektrodeposisi dan prestasi penyalitan dan polimer; dan membangunkan kaedah analisis pengesanan kejadian pencemaran dalam biosensor.

Setinggi-tinggi ucapan tahniah kepada semua graduan SEADPRI kerana telah berjaya menamatkan pengajian di Universiti Kebangsaan Malaysia.



Pj. (PA) Dr. Haji Norhafifi bin Haji Ismail

• PhD (Doktor Falsafah)
Keberkesanan Latihan Kesiapsiagaan Terhadap Komuniti Tempatan Menghadapi Bencana Banjir Di Kelantan



Dr. Nur Fadhilah bt Mazlan

• PhD (Doktor Falsafah)
Pembangunan Biosensor DNA Denggi Berasaskan Matriks Penyokong Berlainan Melalui Kompleks Logam Salfen Sebagai Label DNA Dan Kepentingan Penglibatan Komuniti Dalam Integrasi Biosensor DNA Sebagai Peranti Sistem Amaran Awal



Che Siti Noor binti Koh Poh Lee @ Che Mamat

• Master
Pendekatan Pengurusan Risiko Bencana Tanah Runtuh di Semenanjung Malaysia

Technological Hazards Programme

Kursus Maya qPCR 101: Pengenalan kepada PCR Masa Nyata

Tan Ling Ling & Nurul Yuziana Mohd Yusof

SEADPRI-Universiti Kebangsaan Malaysia SEADPRI-Universiti Kebangsaan Malaysia



Kursus qPCR 101: Pengenalan kepada PCR Masa Nyata yang ditaja oleh geran antarabangsa (XX-2020-011), Collaborative Research Programme-International Centre for Genetic Engineering and Biotechnology (CRP-ICGEB) telah diadakan secara atas talian melalui Microsoft Teams pada 4 dan 5 Ogos 2021. Kursus latihan selama dua hari dijalankan secara maya adalah untuk mengongsi pengetahuan asas mengenai prinsip asas dan penggunaan PCR masa nyata dan latihan praktikal analisis qPCR yang mudah dengan saintis muda dari negara anggota ICGEB secara percuma.

Seramai empat orang penceramah telah dijemput dalam kursus ini dari kalangan pensyarah dan pegawai sains Universiti Kebangsaan Malaysia (UKM) serta pihak industri. Dr. Nurul Yuziana Mohd Yusof dari Jabatan Sains Bumi dan Alam Sekitar, Fakulti Sains dan Teknologi, UKM adalah seorang ahli biologi molekul khususnya dalam bidang teknik molekul terutamanya pengekstrakan asid nukleik, pengklonan, aplikasi berasaskan PCR, kajian berkaitan genomik termasuk penjujukan DNA dan analisis

bioinformatik asas. Tajuk kuliah dan praktikal beliau dalam kursus ini merangkumi pengenalan kepada qPCR; kimia PCR masa nyata dan kuantiti mutlak dan relatif; reka bentuk eksperimen; dan kaedah menjalankan qPCR serta tindak balas qPCR.

Prof. Madya Dr. Tan Ling Ling ialah seorang ahli kimia dan juga Felo Kanan dari Pusat Kajian Bencana Asia Tenggara (SEADPRI), Institut Alam Sekitar dan Pembangunan (LESTARI), UKM. Kajian beliau adalah bertumpu kepada pembangunan sensor atau biosensor optik dan elektrokimia berskala nano yang sensitif berasaskan bahan termaju dan terbitan berfungsinnya. Tajuk pembentangan beliau adalah berkaitan dengan prinsip optik dan elektrokimia sensor atau biosensor. Selain itu penceramah dari Apical Scientific Sdn. Bhd. iaitu Cik Loh Keat Lay telah dijemput untuk memberi ceramah mengenai penentuan kepekatan dalam qPCR, dan seorang lagi Pegawai Sains Kanan, Puan Ryia Illani Mohd Yunos dari Institut Biologi Molekul Perubatan (UMBI), UKM telah membentangkan kajian kes-qPCR sebagai alat diagnostik untuk COVID-19.



DR. LIM CHOUN SIAN

TAHNAH DAN SYABAS kepada Dr. Lim Choun Sian di atas kenaikan pangkat ke jawatan Ketua Pegawai Penyelidik Gred Q48.

Pihak SEADPRI amat berbangga dengan kejayaan yang diperolehi dan berharap dengan pelantikan tersebut dapat meningkatkan lagi kecemerlangan perkhidmatan dalam bidang kepakaran untuk SEADPRI khususnya dan UKM amnya.

Semoga dengan kenaikan pangkat ini akan memberi aspirasi kepada semua staf SEADPRI untuk terus berusaha dengan gigih dalam melaksanakan tugas dan amanah yang dipertanggungjawabkan.

SEKALUNG PENGHARGAAN DAN TERIMA KASIH diucapkan kepada En. Mohd Khairul Zain Ismail, Pegawai Sains Kanan (C44) atas khidmat dan jasa bakti sepanjang bertugas di SEADPRI. Beliau telah berkhidmat di SEADPRI dari Disember 2009 hingga November 2021.

Semoga terus cemerlang dan maju jaya di masa hadapan.

**MOHD KHAIRUL
ZAIN ISMAIL**



SELAMAT DATANG DAN SELAMAT BERTUGAS di SEADPRI kepada En. Mohd Fairus Awang, Pegawai Sains Kanan (C44) dari FKAB, UKM yang menggantikan tempat En. Mohd Khairul Zain Ismail.

Semoga dengan pertukaran penempatan bertugas dapat meningkatkan lagi kecemerlangan Pusat di masa hadapan.



**MOHD FAIRUS
AWANG**

Landskap Risiko Bencana di Era Perubahan Iklim: Webinar dan Pelancaran Daftar Risiko Bencana Kebangsaan

Nurfashareena Muhamad,¹Joy Jacqueline Pereira,¹Siti Khadijah Satari¹ & Siti Mariam Abu²

¹SEADPRI-Universiti Kebangsaan Malaysia

²Agensi Pengurusan Bencana Negara (NADMA)



Kejadian bencana adalah dinamik dan semakin kompleks dengan wujudnya keadaan pandemik dan bahaya baru muncul akibat perubahan iklim. Menurut laporan terbaharu “Intergovernmental Panel on Climate Change” (IPCC), pemanasan global sebanyak 1.5°C dijangka menyebabkan peningkatan cuaca ekstrem dan menyebabkan bencana iklim seperti banjir dan tanah runtuh menjadi lebih kerap dan menjelma di kawasan baru. Dalam membantu negara menangani cabaran cuaca ekstrem, Agensi Pengurusan Bencana Negara (NADMA) dengan sokongan daripada SEADPRI-UKM dan Panel Pakar Sains dan Teknologi untuk Pengurangan Risiko Bencana (STEP) telah menganjurkan Webinar Risiko Bencana di Era Perubahan Iklim pada 21 Oktober 2021. Webinar tersebut yang dihadiri oleh 280 peserta bertujuan untuk meningkatkan pemahaman mengenai landskap risiko bencana dalam iklim yang berubah dan mengintegrasikan sains, teknologi dan inovasi dalam dasar dan pengurangan risiko bencana di pelbagai tahap dan skala.

Webinar ini dimulakan dengan ucapan YAB Dato' Sri Ismail Sabri bin Yaakob, Perdana Menteri Malaysia dengan refleksi beliau terhadap kepentingan menangani bencana berganda pada setiap

masa melalui beberapa kejadian bencana terkini di sekitar negara. Beliau mengengahkan isu perubahan iklim dunia yang perlu menjadi perkiraan dalam memahami bencana, perkaitannya dengan pola bencana selain kekerapan dan magnitud kejadian bencana. Perkara ini telah diberi penekanan oleh kerajaan melalui strategi utama yang terkandung dalam Rancangan Malaysia Ke-12. YAB turut berkongsi berkenaan penggubalan dasar pengurangan risiko bencana kebangsaan yang sedang dilaksanakan oleh NADMA. Webinar ini turut menyaksikan pembentangan hebat daripada ahli STEP dalam membicarakan elemen pengurusan risiko bencana mengikut kluster kepakaran masing-masing.

NADMA dengan sokongan teknikal daripada SEADPRI-UKM juga telah membangunkan Daftar Risiko Bencana Kebangsaan (National Risk Register, NRR) bagi meningkatkan kesedaran mengenai bahaya semula jadi dan bencana yang pernah berlaku di Malaysia. YAB Dato' Sri Ismail Sabri bin Yaakob, Perdana Menteri Malaysia turut melancarkan NRR pada 8 November 2021 di Hotel LeMeridien Putrajaya bersempena dengan Bulan Kesiapsiagaan Nasional 2021. Pelancaran NRR telah mendapat liputan luas oleh media dan pelbagai pihak berkepentingan.

Southeast Asia Disaster Prevention Research Initiative (SEADPRI-UKM)

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ISSN 2180-1142



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