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BULETIN SEADPRI
Pusat Kajian Bencana Asia Tenggara
Southeast Asia Disaster Prevention Research Initiative

SURGE TO 2030: ACCELERATING DISASTER RISK REDUCTION

Nurfashareena Muhamad
SEADPRI-Universiti Kebangsaan Malaysia

The Philippine government collaborated with the UN Office for Disaster Risk Reduction (UNDRR) to host the 2024 Asia-Pacific Ministerial Conference on Disaster Risk Reduction (APMCDRR) from October 14-18, 2024, at the Philippine International Convention Center in Manila. It was the first regional platform following the adoption of the Sendai Framework Midterm Review Political Declaration, and the working theme for the APMCDRR 2024 was “Surge to 2030: Enhancing ambition in Asia-Pacific to accelerate disaster risk reduction”. It provided a key opportunity to assess risk reduction efforts, exchange innovative solutions, and commit to actionable steps to accelerate disaster risk reduction (DRR) by 2030 in the world's most disaster-prone region.

The Malaysian delegation comprised NADMA Malaysia, Ministry of Education Malaysia (MOE), Ministry of Health Malaysia (MOH), Royal Malaysia Police (RMP), Malaysia Civil Defence Force (APM), several officers from the state government; SEADPRI-UKM, Universiti Malaysia Sabah (UMS), Universiti Teknologi Malaysia (UTM) and Universiti Tun Hussein Onn Malaysia (UTHM). The delegation was led by the Honorable Deputy Prime Minister of Malaysia, Datuk Seri Dr Ahmad Zahid Hamidi.

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Photo by SEADPRI-UKM

The official dinner with the Deputy Prime Minister of Malaysia, Datuk Seri Dr Ahmad Zahid Hamidi.

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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

In his ministerial statement, the Deputy Prime Minister highlighted our country's policy advancements in the launch of the National Disaster Risk Reduction Policy 2030, emphasizing a shift toward integrating disaster risk reduction (DRR) into development planning, using a bottom-up approach, and adopting global best practices. He also shared on several technological integration efforts in the country through advanced climate forecast systems, such as the Numerical Weather Prediction (NWP) and the National Flood Forecasting and Warning Program, which provide early warnings (up to seven days) to enhance preparedness and minimize disaster impacts. He also highlighted community engagement initiatives through the Community-Based Disaster Risk Reduction (CBDRR) program that empowers local communities, and significantly improves resilience and reduces disaster-related financial losses.

Overall, the APMCDRR 2024 called for the urgent need for increased financing in prevention, stronger early warning systems, and inclusive risk reduction approaches. With a focus on engaging all sectors, including women, youth, and local communities, the path to resilience was highlighted as a shared responsibility.

The insights gained here will shape future global discussions, from COP29 to the 2025 Global Platform.

The Malaysian delegation participated in various sessions

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Climate Change with One Health

Aida Soraya Shamsuddin[1], Sharifah Norkhadijah Syed Ismail[2], Nurulain Mustafa Udin[3]
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Participants involved in The Malaysia Youth One Health Workshop (MYOHW).

The Malaysia Youth One Health Workshop (MYOHW), organized under the auspices of the Malaysia One Health University Network (MYOHUN), convened from June 26-29, 2024, at the Sudara Beach Resort, Bachok, Kelantan. This pivotal workshop brought together 30 dedicated educators from polytechnics, community colleges, vocational institutions, and technical schools, all focused on imparting innovative One Health education to their students. The workshop was expertly led by Associate Professor Dr. Sharifah Norkhadijah Syed Ismail from Universiti Putra Malaysia (UPM), whose leadership was instrumental in shaping the success of the workshop.

The workshop curriculum was delivered through a series of comprehensive modules. These were presented by a distinguished panel of moderators and facilitators from universities such as Universiti Putra Malaysia (UPM), Universiti Kebangsaan Malaysia (UKM), International Islamic University Malaysia (IIUM), Universiti Teknologi MARA (UiTM), and Management and Science University (MSU). These sessions provided attendees with cutting-edge insights and practical strategies for integrating One Health concepts into their educational frameworks.

The highlight of the workshop was the fieldwork conducted at Pulau Perhentian, where participants engaged in hands-on activities that reinforced the theoretical knowledge gained during the sessions. This immersive experience allowed educators to observe and analyze the interconnectedness of human, animal, and environmental health in a dynamic natural setting, fostering a deeper understanding of One Health principles. The combination of expert-led sessions and practical fieldwork ensured that participants left the workshop equipped with knowledge and tools to effectively promote One Health initiatives within their institutions.

Discussion among participants during the workshop

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Menjadi Wira Alam: Mengamalkan 3R dan Penjimatan Sumber dengan Cekap

Aida Soraya Shamsuddin[1], Nurfashareena Muhamad[1], Mohd Fairus Awang[1], Muhammad Amirulamri Mohd Akhairi[2], Mohd Faizol Markom[1], Noor Shafirah Ramli[1]
[1]SEADPRI-Universiti Kebangsaan Malaysia
[2]LESTARI-Universiti Kebangsan Malaysia

a) Ceramah disampaikan oleh Gs. Dr. Aida Soraya b) Wakil Pusat SEADPRI bersama pengurusan SMAPK

Pada 3 Julai 2024, Gs. Dr. Aida Soraya telah dijemput menjadi penceramah dengan topik "Menjadi wira alam: Mengamalkan 3R dan penjimatan sumber dengan cekap" sempena pelancaran karnival TVET dan KRISS di Sekolah Menengah Agama Persekutuan Kajang (SMAPK). Penekanan kepentingan amalan 3R (Reduce, Reuse, Recycle) dalam kehidupan seharian telah ditekankan dalam ceramah ini. Dengan mengurangkan penggunaan barangan yang tidak perlu, kita dapat mengurangkan jumlah sisa yang dihasilkan. Seterusnya, dengan menggunakan semula barangan yang masih boleh digunakan, kita dapat mengurangkan pembaziran dan penggunaan sumber yang baharu. Selain itu, dengan mengamalkan 3R dalam kehidupan seharian, secara tidak langsung kita boleh mengurangkan pencemaran dan menjimatkan sumber semula jadi.

Acara ini telah dirasmikan oleh Pengetua, Puan Hajah Salmah binti Yaacob dan turut dihadiri oleh Pengerusi SEADPRI, Gs. Dr. Nurfashareena Mohamad. Selain itu, beberapa pegawai-pegawai dan staf sokongan turut hadir membantu dalam memastikan perjalanan aktiviti dan pameran berjalan lancar antaranya ialah ChM. Mohd Fairus Awang, Muhammad Amirulamri Mohd Akhairi, Mohd Faizol Markom dan Noor Shafirah Ramli.

Selain ceramah, beberapa aktiviti lain turut dijalankan pada hari tersebut. Salah satunya ialah pameran 3R. Pameran ini memaparkan hasil kreatif menggunakan bahan seperti bekas pencuci pakaian sebagai pasu bunga. Melalui pameran ini, pelajar dapat melihat potensi bahan terbuang untuk dijadikan barangan berguna. Selain pameran, terdapat juga permainan interaktif. Permainan ini bukan sahaja menyeronokkan tetapi juga mendidik pelajar tentang kepentingan menjaga alam sekitar melalui amalan 3R. Aktiviti seperti ini mampu mengukuhkan pengetahuan pelajar dan menggalakkan mereka untuk mengamalkan 3R dalam kehidupan seharian mereka.

Salah satu aktiviti yang menarik perhatian ramai adalah aktiviti mencipta kapal terbang menggunakan bahan kitar semula. Pelajar diberi peluang untuk berkreativiti dengan menggunakan bahan-bahan terbuang seperti kotak dan botol plastik. Aktiviti ini bukan sahaja mengasah kreativiti tetapi turut mengasah kemahiran teknikal pelajar.

Pelancaran Karnival TVET dan KRISS SMAPK

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Moving forward with WAYS

Azliyana Azhari[1,2]
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The scientific community marked a significant milestone with the inaugural General Assembly of the World Association of Young Scientists (WAYS) which was held during the 2024 World Young Scientist Summit (WYSS) in Wenzhou, Zhejiang Province, China on 15-17 November 2024. This event brought together brilliant early-career researchers and young scientists from diverse nations across the globe. Among the international delegations, the U-INSPIRE Malaysia@UKM (on behalf of the U-INSPIRE Alliance), represented by Dr.Azliyana Azhari (from the Monash Climate Change Communication Research Hub Malaysia at Monash University Malaysia), stood out as a crucial Southeast Asian representative, highlighting the growing role of Malaysian youth and young professionals in the global scientific discourse.

WAYS was formally established at the summit as a global platform dedicated to fostering scientific collaboration and innovation among young researchers. This nonprofit, academic association aims to unite young scientists worldwide. Their mission is to address some of the world's most pressing challenges, such as climate change, health inequities, and sustainable development. Operating under the theme of "science and technology for good," WAYS seeks to provide a structured network where young professionals can work together to explore solutions through interdisciplinary research and international cooperation.

It is a momentous milestone for the U-INSPIRE Malaysia@UKM chapter to be among the founding members of WAYS. As a youth-led platform, we play a vital role in empowering young professionals in science, engineering, technology, and innovation (SETI). By fostering leadership in areas such as disaster resilience, climate action, and sustainable development, U-INSPIRE Malaysia enables youth to contribute meaningfully to both national and global challenges.

Dr Azliyana at the Early and Mid-Career Researchers Forum: Regional Scientific Collaboration in Asia and the Pacific at Wenzhou University, 16th November 2024 where the international engagement of young scientists took place.

The founding ceremony of World Association of Young Scientists (WAYS) during the 2024 World Young Scientist Summit (WYSS)

Our involvement in WAYS reflects a broader vision of enhancing the capabilities of young Malaysian scientists and professionals. Through international partnerships, knowledge exchange, and active participation in global discussions, U-INSPIRE Malaysia@UKM is committed to promoting youth-driven solutions to address the urgent issues of our time, from climate change to disaster preparedness.

This representation on a global stage not only elevates the voices of Malaysian youth but also encourages future generations to engage in scientific innovation and policy development for the greater good. Being part of WAYS solidifies U-INSPIRE Malaysia's dedication to creating opportunities for youth to lead, collaborate, and contribute to sustainable growth, ensuring that their talents and innovations help shape a resilient future for Malaysia and the world.

Key highlights of the General Assembly included the election of a dynamic leadership team with Chaoyang Lu as Chairperson and Chunbo Gao as Secretary-General, the fostering of international networking and partnership opportunities through the gathering of young scientists from diverse countries, and the organization's commitment to addressing global challenges and contributing to the United Nations Sustainable Development Goals (SDGs). This inaugural General Assembly is a significant step forward in empowering young scientists to shape the future of science and technology.

WAYS is poised to become a leading force in driving innovation, addressing global challenges, and inspiring the next generation of scientific leaders.

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Climate Change and Cities

Puteri Amirah Nabilah, Navakanesh Batmanathan, Siti Khadijah Satari & Joy Jacqueline Pereira
SEADPRI-Universiti Kebangsaan Malaysia

The recent IPCC (Intergovernmental Panel on Climate Change) Special Report on Climate Change and Cities online session convened key stakeholders from across the Asia-Pacific region to address the pressing challenges and opportunities climate change presents, specifically in urban areas. This event marked an important milestone in the 7th assessment cycle of IPCC and featured collaborative efforts from ANCST, APN, and other leading academic and research institutions.

This event was particularly significant as it underscored the crucial role played by Southeast Asia in the global climate change discourse, with two of the IPCC's co-chairs, Prof. Joy Jacqueline Pereira and Prof. Winston Chow, representing this highly vulnerable region. The forum focused on the critical need for local-level data and science-driven policy to address climate risks that urban areas face, especially in light of rapid urbanization and increased exposure to extreme weather events.

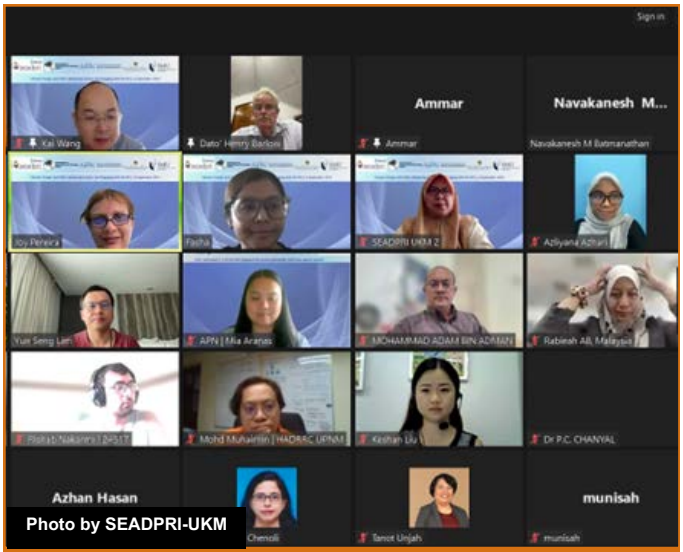
Prof. Johnny Chan provided a comprehensive keynote on the two-way interaction between urban environments and climate change, explaining how cities suffer from climate-related impacts and exacerbate these risks through local factors such as urban heat islands and anthropogenic heat emissions. He emphasized that the interaction between global climate trends and local urban conditions is a critical area of study. Prof. Chan's presentation included findings from research on megacities such as Hong Kong and the Pearl River Delta, where both urban heat and increased rainfall from polluted air are magnified due to the city's infrastructure and high emissions. His findings reinforced the importance of addressing both global-scale drivers and local-scale contributors to climate risks in urban areas.

In his presentation titled "Towards Better Management and Mitigation of Urban Heat Risks," Dr. Kai Wang highlighted the unique urban forms and climate characteristics of Asia-Pacific cities. He explained that cities in the region tend to have higher population densities and distinctive urban heat profiles which necessitate more localized climate modeling. Through case studies on cities like Kuala Lumpur, Dr. Wang demonstrated that different building morphologies and materials can significantly influence urban heat islands; he advocated for customized climate solutions that factor in the local geography and climatic conditions. He also stressed the importance of selecting appropriate tree species and urban green infrastructure, highlighting that not all tree species are suitable for all urban forms due to their varying impacts on shading, humidity, and wind dynamics.

Mr. Amar Abdullah presented operational insights into city-scale weather and climate modeling, particularly for tropical cities like Kuala Lumpur. He focused on the challenges of predicting and preparing for extreme weather events, such as flash floods and heatwaves, in dense urban environments. Drawing attention to the knowledge gaps in tropical meteorology, Mr. Abdullah emphasized the need for enhanced observational networks and fundamental research in tropical cities, which are often underrepresented in global climate models. He highlighted ongoing efforts to develop localized multi-hazard platforms that integrate real-time meteorological, geophysical, and atmospheric data to help city planners make informed decisions. His talk underscored the importance of collaboration between researchers and operational agencies to translate scientific findings into practical action.

Dr. Shibuya highlighted that the science team at APN had dedicated significant effort to implementing projects and integrating scientific results. He pointed out that previous IPCC reports have firmly established that human activities drive global warming. The focus now, he argued, is to gather evidence demonstrating how urbanization accelerates global warming. In particular, Dr. Shibuya emphasized the need to showcase the impact of rising global temperatures on the survival of coastal cities, which are under severe threat from sea-level rise and flooding. He noted that this data will be essential for informing future policy decisions and for addressing critical questions such as:

- Should we encourage people to move to rural areas to limit global warming to 1.5°C?
- Is urbanization inevitable for economic development?
- Will renewable energy and improved communication infrastructure lead to decentralized cities?
- What policies, technologies, and services are needed to support decentralization?
- What will be required after the IPCC Special Report is released to ensure its findings are translated into effective policies?



The webinar brought together a dynamic group of experts and passionate participants to explore the solutions for urban resilience in the face of climate change.

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Dr. Shibuya expressed his belief that the upcoming IPCC Special Report on Climate Change and Cities will provide valuable insights into the complex relationship between cities and climate change. He emphasized that the report will be pivotal in shaping future global strategies. He also reassured the audience that APN will continue to contribute through its research projects and capacity development programs, ensuring that the scientific community remains well-equipped to address these pressing challenges.

The event fostered an engaging dialogue between scientists, policymakers, and local stakeholders, with discussions covering a wide range of pressing climate-related issues specific to urban environments. Some of the key themes included:

1. **Bridging the Gap Between Research and Operations:**
   Speakers emphasized the critical need to bridge the gap between academic research and real-world operational practices. While scientific models and research are essential, ensuring that these models are operationally viable and context-specific is equally important. Collaboration between scientists, operational agencies, and local governments is vital to ensure that climate models and forecasts are accurate and actionable. This is especially true in Southeast Asia, where the impacts of climate change are felt acutely due to the region's urban density and vulnerability to natural disasters.

2. **Localization of Climate Models:**
   There was a strong call for the development of localized climate models that account for the unique characteristics of Southeast Asian cities. Generic models developed for mid-latitude regions are often inadequate for tropical urban areas. Localized models are necessary to provide more accurate data on temperature, rainfall, and air quality, informing urban planning and disaster risk reduction efforts.

3. **Capacity Building for Future Generations:**
   Dr. Shibuya and other panelists highlighted the importance of empowering young scientists and early-career researchers through capacity-building initiatives. APN's efforts in training programs, as well as scholarships provided by the IPCC, were cited as key mechanisms to support the next generation of climate scientists. Investing in capacity building was viewed as essential for ensuring that Southeast Asia has the expertise needed to address future climate challenges.

4. **Urban Mitigation and Adaptation Strategies:**
   Panelists discussed the urgent need for cities to adopt integrated climate strategies that address both mitigation and adaptation. Prof. Wang's research on urban heat islands underscored the importance of designing cities with climate resilience in mind, such as through the use of reflective materials, green infrastructure, and better urban planning. Additionally, speakers highlighted the importance of incorporating climate adaptation into disaster risk management, particularly in cities that are highly vulnerable to extreme weather events.

5. **Role of IPCC and Collaboration Opportunities:**
   Both Prof. Joy Pereira and Prof. Winston Chow discussed the role of IPCC in advancing global knowledge on climate change and facilitating collaboration among scientists, governments, and local communities. They emphasized that Southeast Asia's representation in the IPCC is more critical than ever, as the region faces heightened risks from climate change. The upcoming special report on climate change and cities, scheduled for release in 2027, will play a pivotal role in informing policy at the local level and will include substantial input from Southeast Asian researchers.

Next Steps and Future Opportunities:

1. **IPCC Special Report on Cities (2027):**
   Prof. Winston Chow outlined the roadmap for the IPCC Special Report on Climate Change and Cities, which is slated for completion by 2027. The report will provide crucial insights into how cities can address climate risks while promoting sustainable development. Southeast Asia is expected to play a key role in shaping the content of this report, with opportunities for local experts to contribute as authors, reviewers, or through special journal publications.

2. **Call for Author Nominations:**
   The IPCC is currently accepting nominations for coordinating lead authors, lead authors, and review editors for the Special Report on Cities. Experts from Southeast Asia are strongly encouraged to apply, as their input will be crucial in ensuring that the report addresses the unique climate challenges faced by cities in this region. The deadline for nominations is 20th September 2024, and further details can be found on the IPCC website.

3. **Collaborative Research and Capacity Building:**
   APN and ANCST will continue to play a critical role in mobilizing regional research efforts. Collaborative research projects, capacity-building initiatives, and knowledge-sharing platforms will be essential in helping Southeast Asian cities become more resilient to climate change. Both APN and ANCST encourage researchers and policymakers to engage in these initiatives, as they offer significant opportunities for advancing climate science and improving policy outcomes in the region.

The discussion concluded with a call for sustained engagement in IPCC processes, with a focus on ensuring that cities are equipped to face the challenges of a changing climate. Both co-chairs emphasized that the work of the IPCC and its partners will continue, with upcoming events and opportunities for further collaboration.

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SEADPRI Perkukuh Rangkaian Penyelidikan Daya Tahan Bencana Serantau

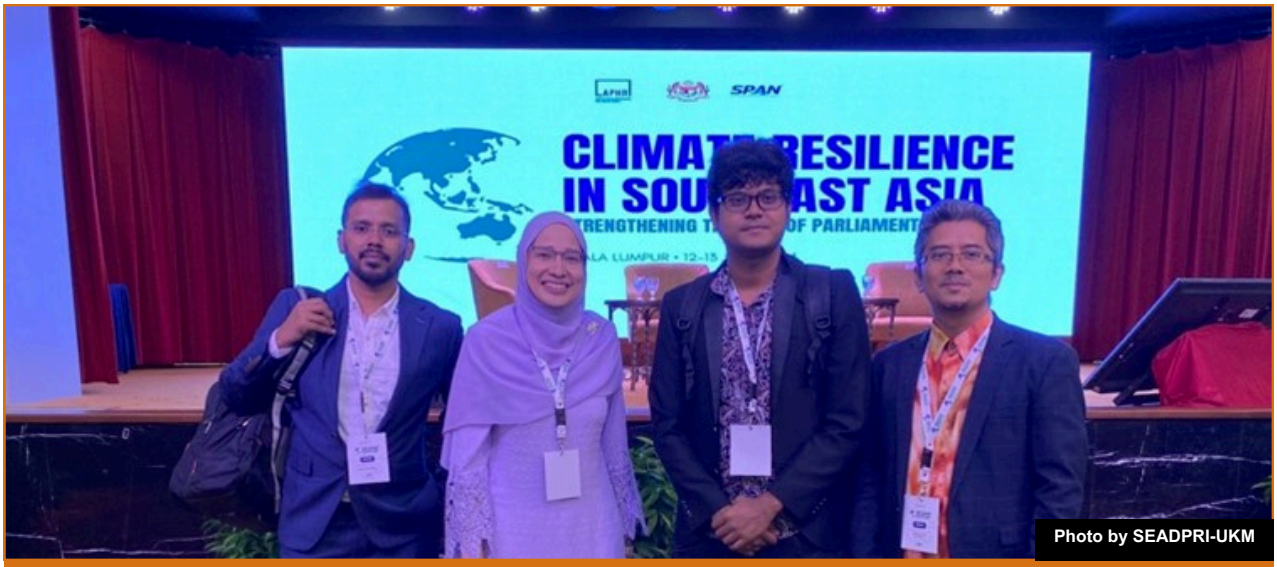
Mohammad Faizal Mansor, Navakanesh M Batmananthan & Nurfashareena Muhamad
SEADPRI-Universiti Kebangsaan Malaysia

Tahap pelepasan gas rumah hijau yang luar biasa tinggi telah menyumbang kepada peningkatan mendadak dalam pemanasan permukaan bumi. Asia Tenggara kini menghadapi kesan buruk perubahan iklim dalam bentuk kejadian cuaca ekstrem, peningkatan suhu, dan perubahan corak hujan yang akhirnya menjejaskan kepelbagaian biologi yang kaya di rantau ini. Keadaan ini mengancam mata pencarian berjuta-juta orang yang bergantung kepada sektor pertanian, perikanan, dan perhutanan sebagai sumber rezeki dan pendapatan mereka. Malah, penilaian IPCC pada 20 Mac yang lepas memberi amaran bahawa dekad 2020-an mungkin menjadi peluang terakhir untuk mengekalkan kenaikan suhu global di bawah 1.5°C (2.7°F) berbanding paras pra-industri.

Asia Tenggara juga menghadapi ancaman kenaikan paras laut yang semakin meruncing akibat pelepasan gas rumah hijau buatan manusia, perubahan iklim, pemanasan air laut, hujan lebat, dan pencairan ais di Artik serta Antartika yang semakin mempercepat. Justeru, pelbagai usaha telah berjalan serantau dan juga kebangsaan dalam bertindak balas terhadap keadaan mendesak ini dan ketika Malaysia juga sedang bersiap sedia untuk menerajui ASEAN pada 2025. Pusat Kajian Bencana Asia Tenggara (SEADPRI) turut hadir ke persidangan serantau mengenai Daya Tahan Iklim di Asia Tenggara: Mengukuhkan Peranan Ahli Parlimen di mana Malaysia bertindak sebagai tuan rumah dalam Persidangan yang telah berlangsung selama dua hari iaitu pada 12 hingga 13 Julai 2024 di Dewan Bankuet, Blok Utama, Kompleks Parlimen Malaysia. Persidangan ini melibatkan penyertaan kira-kira dua ratus (200) orang peserta yang terdiri dari sebahagian Ahli Parlimen, Ahli Dewan Undangan Negeri, wakil Kementerian, ahli Akademik, Pertubuhan Bukan Kerajaan (NGO), pengamal media dan lain-lain pihak berkepentingan di Malaysia dan dari beberapa negara-negara Asia antaranya Singapura, Thailand dan Indonesia. Matlamat utama persidangan adalah untuk membincangkan isu-isu kritikal yang berkaitan dengan perubahan iklim dan cabaran yang semakin meningkat, khususnya di rantau Asia Tenggara. Prof. Madya Dr. Sharina Binti Abdul Halim selaku Timbalan Pengarah, Institut Alam Sekitar dan Pembangunan (LESTARI), Universiti Kebangsaan Malaysia juga merupakan salah seorang Ahli Panel dalam Persidangan di atas. Topik perbincangan utama sepanjang persidangan adalah mengenai cabaran kompleks yang dibawa oleh perubahan iklim, termasuk bencana alam seperti banjir dan ribut yang semakin meningkat, penebangan hutan secara berleluasa, serta kenaikan aras laut yang semakin mengancam kumpulan rentan di kawasan pantai. Isu kecairan ais yang menambahkan jumlah air di lautan turut diutarakan sebagai ancaman serius.

Persidangan ini turut menekankan keperluan tindakan segera oleh pihak pembuat dasar, terutamanya dalam menangani perubahan iklim yang memerlukan pendekatan jangka panjang. Kenyataan Yang Berhormat Menteri Kementerian Sumber Asli dan Kelestarian Alam (NRES) "Take action now, not tomorrow" menjadi seruan utama, memandangkan kesan buruk yang akan dirasai oleh generasi masa hadapan jika langkah-langkah pencegahan tidak diambil segera.

Dalam usaha mengukuhkan daya tahan iklim, dialog dan kolaborasi antara negara-negara Asia Tenggara dilihat sebagai kunci utama. Wakil-wakil negara yang hadir berkongsi amalan



Prof. Madya Dr. Sharina dari LESTARI UKM selaku salah seorang Ahli Panel Jemputan bersama dua orang wakil Pelajar LESTARI

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terbaik dari negara masing-masing, sambil belajar daripada satu sama lain mengenai strategi menangani perubahan iklim. Sebuah kumpulan kerja juga dibentuk untuk memastikan langkah-langkah yang disyorkan dapat dilaksanakan secara kolektif di peringkat serantau.

Di peringkat kebangsaan pula, Pusat Kajian Bencana Asia Tenggara (SEADPRI) telah dijemput untuk turut serta ke Asian Pacific and Economic Conference (APEC) dengan tema persidangan "Sustainability and Environmental Education for Post Disaster" (APEC SEE-PD) diadakan selama dua (2) hari iaitu pada 20 dan 21 Ogos 2024 bertempat di Hotel Le Quadri, Kampus Universiti UCSI, Kuala Lumpur, Malaysia. Majlis Perasmian disempurnakan oleh Professor Ts Dr Lionel In Lian Aun, selaku Pengarah Pusat Kecemerlangan Penyelidikan, Inovasi Nilai dan Keusahawanan, UCSI Universiti. Persidangan ini bertujuan untuk membincangkan isu-isu kritikal dengan meneroka dan berkongsi idea, pengalaman serta penyelidikan terkini dengan memberi tumpuan kepada pasca bencana melalui pemerkasaan kefahaman juga kesedaran pendidikan alam sekitar dan kelestarian. Kesedaran bahawa sebarang bencana akan memberi risiko yang besar kepada kehilangan nyawa, kerugian harta benda dan kesan terhadap alam sekitar. Beberapa ucaptama telah disampaikan oleh pakar jemputan antaranya termasuk juga Professor Dr. Rajib Shaw dari raduate School of Media and Governance, Keio University, Japan dan Encik Muhammad Fauzie Ismail dari Agensi Pengurusan Bencana Negara (NADMA) dengan ucaptama masing-masing bertajuk Role of Science Technology Innovation for Disaster Risk Reduction and Climate Change Adaptation dan Disaster Support and Rehabilitation: Learning from Malaysian Experiences. Jemputan khas lain turut membentangkan ucaptama dalam pelbagai persepsi berkaitan seperti kesihatan mental dan kecemasan, pendidikan, keupayaan sosial, kelestarian dan lain-lain.

Photo by SEADPRI-UKM

Sebahagian perkongsian dapatan Kajian dari Pembentang luar Negara (Jepun) Prof. Dr. Rajib Show.

Photo by SEADPRI-UKM

Sebahagian Pembentang dan Para Peserta Persidangan

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SEADPRI strengthens its partnership with CCOP

Lim Choun Sian & Nurfashareena Muhamad
SEADPRI-Universiti Kebangsaan Malaysia

Hosted by the CCOP Technical Secretariat in cooperation with the Government of Malaysia through the Department of Mineral and Geoscience, the 60th CCOP Annual Session was held in Langkawi, Kedah (November 3-8, 2024). The session was attended by delegates representing the geological survey or science agencies of Member Countries namely Brunei Darussalam, Cambodia, China, Indonesia, Japan, Republic of Korea, Lao PDR, Malaysia, Myanmar, the Philippines and Thailand; Cooperating Countries (Denmark, Finland, Poland and United Kingdom), Cooperating Organizations (EuroGeoSurveys, Hanyang University, IUGS, and UKM).

UKM, as one of the cooperating organization members, was represented by SEADPRI, with Dr. Nurfashareena Muhamad as its Head this year. 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, build capacity and exchange of geoscientists in the East and Southeast Asia regions in addressing issues related to regional sustainable development, including geohazards, climate change adaptation, disaster resilient city, geoheritage and young geoscientists.

In this annual session, activities with regional partners were presented. This included the project, 'Promotion of Social Entrepreneurship in Disaster Risk Reduction to Build Community Resilience', funded by the International Development Research Centre (IDRC) Canada. The key partners in this project were Royal University of Phnom Pehn (RUPP) and Geological Society of Malaysia (GSM). The presentation also highlighted SEADPRI's active engagement with the youth and young professional group to foster long-term community resilience to disaster risk reduction and climate change.

This year, SEADPRI-UKM led the Thematic Session on the topic, "Geoscience in Transition" in which 67 speakers gave presentations on the latest research achievements in the region with over 100 geologists from CCOP member countries and cooperating countries attending. Here, Prof. Dr. Joy Jacqueline Pereira of SEADPRI delivered her keynote speech titled "Energy Transition and Global Warming of 1.5°C".

Delegates from various countries (left); keynote speaker from SEADPRI (top right) and one of the presenters (bottom right)

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Technological Hazards Programme

Porcine Gelatin and Halal/Kosher Authentication

Tan Ling Ling
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Gelatin is a mixture of polypeptides obtained by partial hydrolysis of collagen derived from bones and hides/skins originating from bovine or porcine. Gelatin is widely used as a primary product for quality improvement of foodstuffs and medications due to its gelling, thickening, and stabilizing properties. In the food industry, gelatin can be found in innumerable products, such as cheese, marshmallows, gummy candies, jelly, ice cream, chocolate, yogurt, etc. In the pharmaceutical industries, gelatin is used in both soft and hard capsules, for binding in tablets, as sponges for treating wounds, and as a colloid to expand the plasma after severe blood loss. However, the source of gelatin is usually from porcine and bovine, and less commonly from vegetables and fish. Therefore, it is neither vegan nor even vegetarian.

The source of gelatin has become a debated issue globally. For instance, Muslim and Jewish communities are concerned about the respective Halal' and Kosher issues where consuming porcine gelatin is considered non-Halal/non-Kosher, whereas Hindus are concerned about bovine gelatin, particularly from the cow. Individuals living vegetarian and vegan lifestyles are concerned about whether the gelatin is extracted from the bodies of animals.

The inclination towards porcine gelatin in the late 1990s was primarily due to the bovine spongiform encephalopathy outbreak or 'mad cow disease' in the United Kingdom and its extension to other countries, which have led the regulatory authorities to make restrictions in the use of bovine gelatin for human consumption, cosmetic, and pharmaceutical products. Besides, gelatin from porcine has been more popular among manufacturers due to the low cost and bulk quantity of the raw materials. Therefore, it becomes necessary to develop analytical methods for the identification of the gelatin origin.

Previous studies have shown that porcine gelatin can be differentiated by physicochemical methods, such as principal component analysis of amino acid content and calcium phosphate precipitation test. These methods can only be applied to pure gelatin samples, whereas a mixture of gelatin from different origins in a sample cannot be analyzed accurately. Although the immunological method using polyclonal anti-peptide antibodies in indirect and competitive indirect enzyme-linked immunosorbent assay (ELISA), and polymerase chain reaction (PCR) technique, which was based on the amplification of porcine DNA, were claimed to be able to overcome this issue, these methods are highly complex and expensive.

Gelatin production involves acidic or basic hydrolysis of connective tissue raw material, high-temperature extraction with water, sterilization, and drying treatments. However, these processes have rendered the final gelatin product where both proteins and nucleic acids are highly degraded. Therefore, protein-based analysis of highly processed gelatin samples, such as high-performance liquid chromatography (HPLC), mass-spectrometry, ELISA, isoelectric focusing, spectroscopic method, and electrophoretic analysis may be hindered by progressive denaturation of the protein markers due to pH and extreme temperature treatments during the manufacturing process, resulting in the loss of heterogeneity and antigenicity of the proteins.

PCR-based methods have been the most successful in terms of both specificity and sensitivity of species detection, whereby extraction of good quality DNA is an important prerequisite of PCR-based analysis. However, this can be a potential problem if there has been extensive heat processing and chemical treatments. Additionally, the amount of DNA in gelatin is very low and differs from material to material. The Low DNA concentration recovered from highly processed gelatin-based products has rendered it difficult to detect porcine contamination using conventional PCR techniques.

All the issues mentioned above give rise to the need for analytical methods to determine the source of gelatin, particularly from porcine.

15 Common foods that may contain hidden porcine gelatin. (Google image)

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Palm Oil Industry Faces Climate Change Challenges

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Researchers from MPOB and SEADPRI engaging in a collaboration discussion

In a significant step towards addressing the growing impact of climate change on Malaysia's palm oil industry, a key discussion was held between the Malaysian Palm Oil Board (MPOB) and the Southeast Asia Disaster Prevention Research Initiative (SEADPRI) on October 4, 2024. The session, which focused on the development of climate adaptation strategies for oil palm cultivation, was attended by Dr. Vijaya Subramaniam, Head of the Sustainability Climate Change, and Biodiversity Unit, at the Biology and Sustainability Research Division, Dr. Zahidah Ayob, Group Leader of the Climate Change and Ecosystem Sustainability Group, Miss Siti Zulaikha Rusmadi, Research Officer of the Climate Change and Ecosystem Sustainability Group, and Mrs. Noorazah Zolkarnain, Research Officer of the Environmental and Product Assessment Group, Quality and Environmental Assessment Unit, Advanced Oleochemical Technology Division, MPOB.

The discussion centred on the alarming effects of climate change on the palm oil industry, a sector vital to Malaysia's economy. Erratic weather patterns, prolonged droughts, and increased flooding have already begun to threaten palm oil yields, with potential long-term implications for both production levels and the sustainability of the industry. The participants exchanged insights on the challenges faced by oil palm plantations, focusing on how climatic factors such as temperature fluctuations and changing rainfall patterns affect crop growth and soil conditions. The meeting also explored how the Geographical Information System (GIS) technology can be used to model the climate adaptation of oil palm, particularly in identifying vulnerable areas and developing targeted interventions. This form of spatial analysis is critical for predicting the future impacts of climate change on oil palm plantations and guiding adaptation measures.

As part of the discussion, both institutions agreed to deepen their collaboration, with plans to conduct joint research projects that integrate GIS-based modelling with field data from oil palm plantations across Malaysia. The session concluded with a shared commitment to continue leveraging science and technology for the betterment of the palm oil industry, with both MPOB and SEADPRI anticipating future meetings to build on the progress made. As climate challenges intensify, such collaborations will be key to securing the future of Malaysia's palm oil industry, ensuring its resilience and sustainability for generations to come.

Group photo of MPOB and SEADPRI representative

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Perubahan Iklim dan Sindrom Bangunan Sakit: Memahami Kesan Kualiti Udara Dalaman dan Pengurusan Kelembapan

Mohd Fairus Awang & Aida Soraya Shamsuddin
SEADPRI-Universiti Kebangsaan Malaysia

Perubahan iklim adalah isu global yang memberi kesan besar terhadap alam sekitar dan kesihatan manusia. Perubahan ini termasuk peningkatan suhu global, perubahan taburan hujan, dan kejadian cuaca ekstrem seperti kemarau, banjir, serta ribut yang semakin kerap. Salah satu implikasi perubahan iklim terhadap kesihatan manusia adalah peningkatan risiko Sindrom Bangunan Sakit (SBS). SBS merujuk kepada keadaan di mana penghuni bangunan mengalami gangguan kesihatan seperti sakit kepala, keletihan, iritasi mata, hidung, atau tekak, yang sering dikaitkan dengan kualiti udara dalaman yang kurang baik (Dominski et al., 2021; Sundell et al., 2011).

Kualiti udara dalaman adalah elemen utama yang menyumbang kepada SBS. Perubahan iklim boleh memperburukkan keadaan ini melalui peningkatan suhu global, yang mendorong penggunaan penghawa dingin secara intensif. Walaupun penghawa dingin membantu mengawal suhu, ia juga meningkatkan bahan pencemar udara seperti karbon dioksida (CO_2) dan bahan organik meruap (VOCs). Kajian menunjukkan bahawa suhu tinggi merangsang pelepasan VOCs daripada bahan binaan dan perabot seperti cat dan pelekat, yang boleh meningkatkan risiko gejala SBS (Que et al., 2013). Pengumpulan VOCs di ruang tertutup menjadi pencetus utama gejala ini (Mendell & Heath, 2005).

Selain suhu, kelembapan adalah faktor penting dalam menentukan kualiti udara dalaman. Perubahan pola taburan hujan akibat perubahan iklim meningkatkan kelembapan relatif dalam bangunan, yang memudahkan pertumbuhan kulat. Kekerapan hujan lebat dan banjir membawa kepada kemasukan air ke struktur bangunan, menyebabkan pertumbuhan kulat yang menghasilkan spora dan bahan kimia berbahaya. Pendedahan kepada spora ini boleh mencetuskan gejala seperti batuk, hidung tersumbat, dan sesak nafas (Bortolini & Forcada, 2021). Tambahan pula, kelembapan yang tinggi boleh merosakkan bahan binaan, meningkatkan risiko kerosakan struktur yang mengancam keselamatan penghuni (Al Hallak et al., 2023).

Untuk mengurangkan risiko SBS, langkah-langkah pencegahan perlu diambil. Pertama, sistem pengudaraan perlu dipastikan berfungsi dengan baik untuk meningkatkan aliran udara segar. Penggunaan bahan binaan rendah VOC juga dapat mengurangkan pencemaran udara dalaman. Kedua, kawalan kelembapan yang efektif diperlukan, termasuk penggunaan dehumidifier, pengurusan saliran air yang baik, dan pemantauan tahap kelembapan relatif dalam bangunan. Dalam jangka panjang, strategi adaptasi perubahan iklim perlu diintegrasikan ke dalam reka bentuk dan pembinaan bangunan bagi meningkatkan daya tahan terhadap perubahan iklim.

Penyelidikan lanjut amat diperlukan untuk memahami hubungan antara perubahan iklim dan SBS dengan lebih mendalam. Hal ini termasuk mengenal pasti langkah-langkah pencegahan yang lebih efektif untuk melindungi kesihatan penghuni bangunan daripada kesan perubahan iklim.

Secara keseluruhannya, perubahan iklim memberi kesan besar terhadap kualiti udara dalaman dan kelembapan, yang seterusnya meningkatkan risiko SBS. Oleh itu, pendekatan yang komprehensif dan tindakan proaktif amat diperlukan untuk menangani masalah ini dan memastikan kesihatan penghuni bangunan sentiasa terpelihara.

Secara tuntas, perubahan iklim mempunyai kesan yang signifikan terhadap SBS melalui pengaruhnya terhadap kualiti udara dalaman dan tahap kelembapan di dalam bangunan. Kenaikan suhu dan perubahan taburan hujan boleh meningkatkan risiko pencemaran udara dalaman dan pertumbuhan kulat, yang memburukkan lagi gejala SBS. Oleh itu, adalah penting untuk mengambil langkah-langkah pencegahan yang menyeluruh bagi mengurangkan impak perubahan iklim terhadap kesihatan penghuni bangunan.

Punca dan gejala Sindrom Bangunan Sakit akibat dari pengurusan udara dalam yang kurang efisien (Public Health Malaysia Facebook)

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Bridging Climate Science and Policy to Accelerate Action

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YB Nik Nazmi Nik Ahmad, Minister of Natural Resources and Environmental Sustainability, presenting a token of appreciation to Professor Sir Jim Skea, Chair of the IPCC, during the outreach event

Universiti Kebangsaan Malaysia (UKM), in collaboration with the British High Commission in Kuala Lumpur and the Ministry of Natural Resources and Environmental Sustainability (NRES), hosted a one-day outreach event on climate science and policy on 14th December 2024 at the DoubleTree by Hilton Kuala Lumpur, Malaysia. The event follows the IPCC Seventh Assessment Report (AR7) Scoping Meeting held in Kuala Lumpur from 9th to 13th December 2024. The meeting brought together global climate experts, including the IPCC Bureau, chaired by Professor Sir Jim Skea, a renowned expert in sustainable energy from the UK.

The outreach event aimed to strengthen the science-policy interface by highlighting recent advancements in climate science and policy, emphasizing leadership by Malaysia and the UK. It also seeks to inspire and engage Malaysian scientists, particularly early career researchers, to actively participate in the IPCC process, contributing to global climate action. The event fostered collaboration between Malaysia and the UK, reinforcing bilateral ties through joint initiatives to address climate change.

Professor Lim Yun-Seng, a Lead Author of the WG III Assessment Report in the sixth cycle of the IPCC, was a Commentator at the outreach event.

The day began with a welcoming address by David Wallace, Chargé d'Affaires from the British High Commission. YB Nik Nazmi Nik Ahmad, Minister of Natural Resources and Environmental Sustainability, delivered the opening remarks, focusing on Malaysia's climate action progress, recent developments, and the vital role of science in shaping policies. Professor Sir Jim Skea then delivered the keynote address, titled "IPCC AR7 – Supporting Accelerated Climate Action," which set the tone for the day by emphasizing the urgency of translating scientific findings into actionable climate strategies.

The outreach event featured four thematic sessions addressing critical climate science and policy topics. The first session, moderated by YM Academician Datuk Dr. Tengku Mohd Azzman Shariffadeen, focused on empowering the next generation of climate leaders by translating the IPCC's AR7 findings into actionable outcomes. The second session, led by Professor Dato' Dr. Nor Aieni Mokhtar, explored knowledge gaps and opportunities in urban climate science, emphasizing resilience, mitigation, and sustainable development. The third session, moderated by Murugadas Loganathan, examined emerging issues in energy, transport, and carbon capture storage, showcasing how scientific evidence can guide policy decisions. Finally, the fourth session, moderated by Dato' Yap Kok Seng, discussed strategies to enhance international engagement among researchers, particularly early-career scientists, and foster collaboration on global science-policy platforms such as the IPCC. These sessions had distinguished panelists from the IPCC, academia, and government, providing a platform for insightful discussions and actionable solutions. Several actionable steps to enhance climate science and policy integration were proposed.

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IPCC AR7 Scoping Meeting in Malaysia

Puteri Amirah Nabilah, Navakanesh Batmanathan, Siti Khadijah Satari & Joy Jacqueline Pereira
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Experts from over 70 countries at the IPCC AR7 Scoping Meeting in Kuala Lumpur, Malaysia.

The Intergovernmental Panel on Climate Change (IPCC), a United Nations body dedicated to assessing climate science, held its Seventh Assessment Report (AR7) Scoping Meeting in Kuala Lumpur, Malaysia, from 8th to 13th December 2024. The event, hosted at the DoubleTree by Hilton, marked a significant milestone in the IPCC's seventh assessment cycle. Established in 1988 by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), the IPCC has been instrumental in guiding global policymakers with its periodic scientific assessments on climate change.

The meeting brought together over 230 experts from more than 70 countries, all collaborating to draft outlines for the AR7 contributions. These contributions include reports from the three Working Groups and a Synthesis Report. Collectively, they will address emerging scientific insights since the publication of the Sixth Assessment Report (AR6) in 2023.

The AR6 underscored the urgent need for transformative action. It highlighted that global warming had already reached 1.1°C above pre-industrial levels by 2020 due to over a century of burning fossil fuels and unsustainable land use practices. The report warned of more frequent and intense extreme weather events, disproportionately impacting vulnerable communities -- approximately 3.3 to 3.6 billion people worldwide. It also emphasized the narrowing window to limit global warming to 1.5°C, urging immediate emissions reductions and the accelerated adoption of renewable energy and other mitigation tools.

Building on these findings, the AR7 will address pressing issues of the day. The AR7 Scoping Meeting represents a vital step in addressing the climate crisis. As the world faces increasingly severe climate impacts, the scientific insights generated through the IPCC work will be crucial in guiding efforts to adapt to and mitigate these challenges. The outcomes of the seventh assessment cycle will not only influence policy but also empower societies to take bold and decisive action for a sustainable future.

Professor Joy Pereira, Co-Chair of IPCC Working Group III, moderating the Working Group meetings during the IPCC AR7 Scoping Meeting

Participants of the IPCC AR7 Scoping Meeting at the opening session, featuring distinguished scientists and experts from around the world

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