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institut kajian bencana asia tenggara  
*southeast asia disaster prevention research institute*

## NEWSLETTER

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Pemimpin penyelidikan dan  
pemindahan ilmu berinovatif  
secara syumul mengenai bencana

*Leader in innovative research and  
knowledge transfer on holistic  
disaster prevention*

[www.ukm.my/seadpri](http://www.ukm.my/seadpri)

## 2010 Eruptions of Mount Merapi

Ibrahim Komoo



Mount Merapi, Jawa Tengah, Indonesia

Photo by : Reuters

**R**antau Asia Tenggara merupakan antara kawasan paling aktif dilanda bencana letusan gunung berapi. Mulai 25 Oktober 2010, giliran Gunung Merapi di Jawa Tengah meletus mengeluarkan lava dan debu secara berulang, mulai mereda pada 3 November 2010. Letusan kali ini dilaporkan yang terbesar sejak tahun 1870, mengorbankan 353 penduduk dan lebih 350,000 komuniti disekitarnya terpaksa dipindahkan ke kawasan selamat.

Letusan kali ini membawa beberapa pengajaran baru dalam konteks pengurangan risiko bencana. Antaranya, walaupun pengetahuan sains mengenai letusan telah mencukupi, kesedaran dan kesediaan penduduk yang berada berhampiran gunung berapi untuk bertindak keluar dari zon bahaya sangat penting untuk mengurangkan risiko bencana. Selain itu, setiap letusan akan memberikan pengetahuan baru mengenai bencana, impak baru seperti gangguan penerbangan udara, dan pendekatan pengurangan bencana baru yang perlu dipertimbangkan.

Pengetahuan saintifik, keprihatinan masyarakat dan pendekatan pengurusan yang bersepadu sentiasa diperlukan untuk mengurangkan risiko bencana, seperti letusan Gunung Merapi ini.

*The South-East Asia Region is one of the most tectonically active areas to be hit by a volcanic eruption disaster. Starting on 25 October 2010, Mount Merapi in Central Java erupted releasing lava and ashes continuously until it began to subside on 3 November 2010. This time the eruption was reported to be the biggest since 1870; the death toll was 353 and more than 350,000 people from the surrounding communities had to be evacuated to safer areas.*

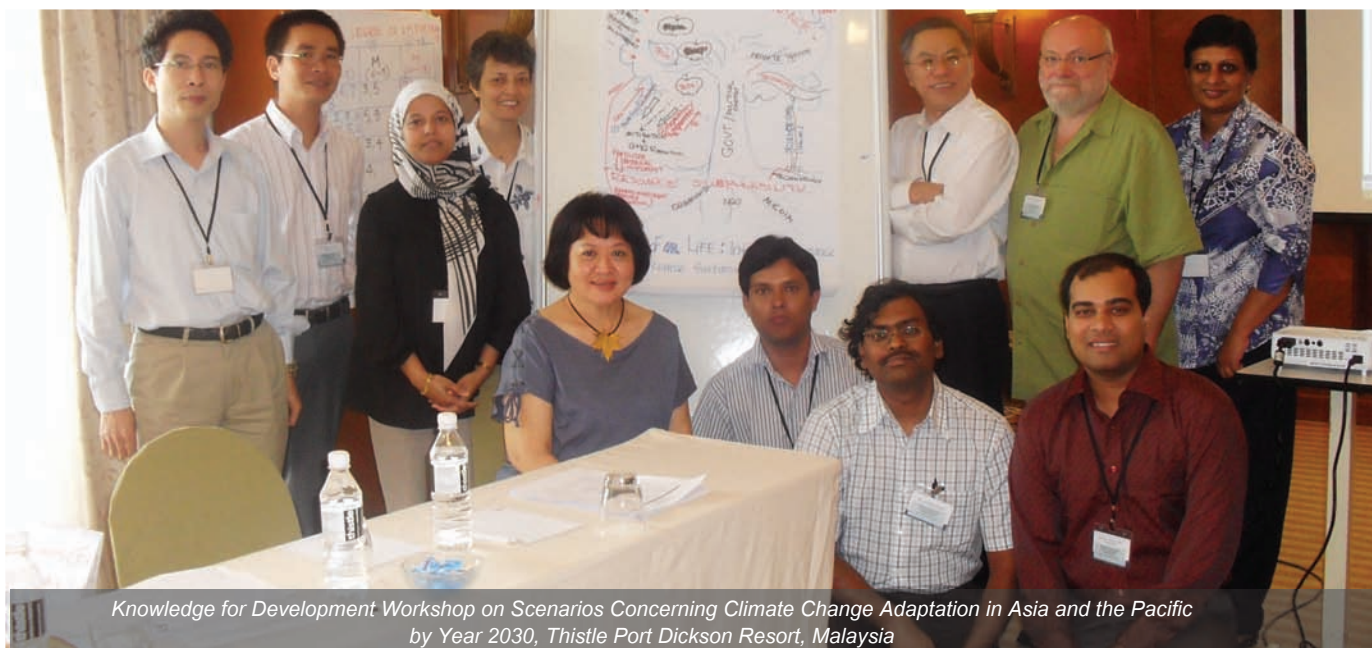
*This eruption serves as a lesson in disaster risk reduction. Even though the scientific knowledge of volcanic eruption is adequate, the awareness and commitment by villagers living nearby the volcano site is not. Evacuation from the danger zone is crucial for disaster risk reduction. Each eruption provides new challenges and impacts such as the flight interruptions caused by the Mount Merapi eruption. Different methods to reduce disaster risk need to be considered.*

*Scientific knowledge, society's concern and a consolidated management approach are essential to reduce the disaster risk, such as death toll from the eruption of Mount Merapi.*

## Climatic Hazards

# Communicating Information and Knowledge for Climate Change Adaptation

*Sharifah Diyana Syed Ismail, Rawshan Ara Begum & Tan Ching Tiong*



*Knowledge for Development Workshop on Scenarios Concerning Climate Change Adaptation in Asia and the Pacific by Year 2030, Thistle Port Dickson Resort, Malaysia*

The “Knowledge for Development Workshop on Scenarios Concerning Climate Change Adaptation in Asia and the Pacific by Year 2030” was jointly organised by Orbicom, Network of UNESCO Chairs in Communication and the South East Asia Disaster Prevention Research Institute (SEADPRI) & Institute for Environment and Development (LESTARI), with funding from the International Development Research Centre (IDRC). On 26-28 June 2010 at Thistle Port Dickson Resort, Port Dickson, Malaysia about 34 participants, comprising academics, researchers and practitioners from government, non-government and international organisations as well as the private sector attended the workshop. The participants were welcomed by Tengku Azzman Shariffadeen, Vice President of ORBICOM. He expressed his appreciation to the representatives of IDRC, SEADPRI and LESTARI for their support.

The purpose of the workshop was to communicate information and knowledge for Climate Change Adaptation (CCA). The key activity was to brainstorm the identification of factors that influence CCA and what are the drivers that could overcome the problem of CCA. The workshop visualised ‘scenarios’ to identify the intangibles in order to generate knowledge and innovation for development. The other purpose of the workshop was to try to get participants out of their comfort zone and to think ‘outside the box’. The key motivation and process of concern was for meeting experts to come up with scenarios that could be used as documents for future work.

To set the current scenario, the workshop commenced with two background papers on Southeast Asia & Pacific East and South Asia. In order to address CCA, there is a need to enhance education through networking to facilitate adaptation and to understand linkage between climate change and extreme events. The main challenge is how the research addresses the DRR and CCA problems. There is also a need to break university boundaries and influence decision and policy makers and to customise social and engineering solutions for local conditions.

A list of factors and drivers were identified that will influence CCA in the region up to year 2030. A total of 54 drivers were prioritised relating to political, economic, social, technological, environmental, legal, spiritual and sustainable development issues. The degree of uncertainty and importance was also discussed and categorised into three scales i.e. low, medium and high, for each of the 54 common drivers. Driving forces of “high importance and high uncertainty” and “high importance and low uncertainty” that are likely to shape the future of climate change adaptation were identified based on expert judgement.

Key drivers identified for knowledge development are: integrated sustainable management of resources; equitable distribution of wealth; socio-economic development; enforcement; collective/mainstream political values; and good governance.

# Geological Hazards

## Urban Geohazards in Developing Quarried Land

*Tajul Anuar Jamaluddin*

The development of housing and industrial projects in ex-quarry areas in the outskirts of the major cities of Malaysia is ever increasing due to rapid development and population growth. It is now common to find new developments in ex-quarry sites in the outskirts of Metropolitan Kuala Lumpur and other major cities like Kajang, Ipoh, Kuantan, Seremban. Ex-quarry sites are favoured due to their exclusive locations in the hilly areas as they are isolated from hectic urban life. Good transportation networks and the relatively flat and sound bedrock of the quarry floor are favourable for reclamation and earthworks. A high demand from the public to own housing properties in the suburbs of major cities has resulted in an increase in applications for new developments in ex-quarries.

Development in ex-quarry land is often characterised by close proximity to steep, high and unstable rock slopes. The main concern is vulnerability to slope failure geohazards, notably rock fall, rockslides and landslides. In some cases, the un-engineered rock slopes are too high (up to 70-80m), and do not have any bench, have poor accessibility and thus are very

difficult to stabilise or rehabilitate. It is not easy to ensure that these high risk slopes are satisfactorily rehabilitated and stabilised.

Even though several guidelines and stringent regulations are in place to allow for new development in highly risky ex-quarry sites, errant developers still manage to find loopholes in order to continue with their development plans. This is evident from the completed housing projects in ex-quarry sites that have high levels of risk. In order to ensure sustainable and safe development, there is a pressing need that issues around geohazards in ex-quarry sites should be holistically looked into. The management approach to geohazards and risk reduction should be practiced from the very early stages of the quarry's life right until its operation comes to an end making it more feasible for the area to be reclaimed and converted for new land use. Knowledge of geohazards amongst the stakeholders, expertise of the relevant professionals and public awareness should always be enhanced and promoted.



*One of the ex-quarry in the outskirts of Kelang Valley, which has been converted into a housing project. There is a high potential for rock fall geohazards at this site*

## Technological Hazards

### Petroleum Hydrocarbons in Coastal Areas of Langkawi

*Lee Yook Heng*

The Technological Hazards Programme of SEADPRI together with LESTARI and the Faculty of Science and Technology, has been engaged in a project looking into the distribution of petroleum hydrocarbons in Langkawi's coastal areas. The project is aimed at establishing the impact of the leakage of petroleum chemical from shipping and boating activities into the waters surrounding Langkawi Island. Such data on the impact of these hydrocarbon leakages will eventually allow an ecological risk assessment to be carried out and may lead to appropriate remedial actions to be taken in the management of petroleum hydrocarbons usage in the island.

Refined petroleum products are complex mixtures containing hundreds of organic chemicals. Variation in the composition of these hydrocarbon mixtures results in different toxic effects. Low viscosity products such as gasoline, naphtha, and kerosene are known to be aspiration hazards and irritants on pulmonary tissues. The increasing frequency of contamination by petroleum hydrocarbons is now recognised as a major contributor to the threat to aquatic life, especially in contaminated sediments where there are intense anthropogenic activities. Many sources of contamination from refined petroleum products are now known. Release from leaky pipes, transfer to and from storage tanks and disposal of waste crankcase are some examples. The close proximity of many petroleum storage facilities near to the

coast also causes marine contamination and this adversely affects aquatic organisms.

The sources of possible contamination of petroleum hydrocarbons in Langkawi are likely to be near to the many jetties and ports of the island. A recent survey was conducted at the Ewa Harbour, Kilim Jetty, Langkawi Port, Porto Malai Jetty and the Kuah Ferry Jetty. Sediment and water samples were collected from these marine sites for the analysis of 15 types of petroleum hydrocarbons or polycyclic aromatic hydrocarbons (PAHs). Water samples from these sites demonstrated low levels of PAHs with total PAHs ranged from 10.69-43.44 ppb. However, the sediments from the same sites contained total PAHs of several hundred to thousand times higher, ranging from 502-8799 ppb. From the sediment samples, there is clearly accumulation of PAHs in the environment. Langkawi Port and the Kilim Jetty (a popular jetty for tourists) showed the highest contamination. This preliminary study is important as fish farms and finfish aquaculture in the coastal water surrounding Langkawi are becoming popular as a tourist attractions and seafood providers. Pollution of marine sediments can eventually lead to seafood contamination and PAHs become important hazards. Thus, their project will provide valuable information on environmental risk assessment and management for PAHs contamination in Langkawi in the future.



*The Langkawi Port showed highest contamination of PAHs in the sediment when compared with other ports and jetties in Langkawi Island*

## 4th Asian Ministerial Conference on Disaster Risk Reduction Incheon, Republic of Korea 25–28 October 2010

*Tan Ching Tiong*



Photo by : AMCDRR

*4th AMCDRR Opening Ceremony, 26th October 2010*

The 4th Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR4) was held on 25-28 October 2010 in Incheon, Republic of Korea. As a result of increasing concern of magnified disaster risk due to climate change as well as the need to harmonise the management of disaster and climatic risks, the conference was aimed at addressing the overarching theme of “Disaster Risk Reduction (DRR) through Climate Change Adaptation (CCA)”. About 800 delegates and participants from 50 countries in Asia and the Pacific attended the conference. Delegates from Malaysia comprised of representatives from the National Security Council, Ministry of Energy, Green Technology and Water, Malaysian Meteorological Department, Town and Country Planning Department, National Hydraulic Research Institute of Malaysia, Kuala Lumpur City Hall, Perbadanan Putrajaya and Southeast Asia Disaster Prevention Research Institute (SEADPRI-UKM). The conference revolved around three topics through high-level roundtable

dialogues and technical sessions, including raising awareness and building capacity for DRR and CCA; developing and sharing information, technology, sound practices and lessons learned in climate and disaster risk management; and promoting integration of DRR and CCA into development for green growth.

The conference culminated in the adoption of the “Incheon Declaration on Disaster Risk Reduction in Asia and the Pacific 2010” by the Ministers and Heads of Delegation involved. The Declaration charts the way forward for the region, particularly on the implementation of Hyogo Framework for Action (HFA) in its remaining five years, through the “Incheon Regional Roadmap and Action Plan on DRR through CCA in Asia and the Pacific (Incheon REMAP)”. SEADPRI-UKM looks forward to continuously supporting the National Security Council in implementing and tracking the implementation of HFA at national, local and regional levels.

## SEADPRI-UKM contributes to the IPCC Special Report on Climate Change and Disasters

*Sharifah Diyana Syed Ismail*

The Intergovernmental Panel on Climate Change (IPCC) is producing a Special Report on “Managing Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)”. The writing teams have held two Lead Authors’ Meetings and produced their first order drafts in mid 2010. There was an open review of the drafts and the Third Lead Authors Meeting was held on 25-28 October 2010 in Geneva, Switzerland to address the comments received. The SREX Third head Authors Meeting saw the participation of Review Editors for each

chapter of the report. The role of the Review Editor is among others, to identify expert reviewers, ensure all substantive expert and government comments are given appropriate consideration and advise lead authors on how to handle contentious issues. Prof. Dr. Joy Jacqueline, Coordinator of the Climatic Hazards Programme at SEADPRI-UKM serves as a Review Editor for Chapter 7 of SREX. She was nominated by the Malaysian Government and endorsed by the IPCC in 2009.

## ASEAN Plus Three International Meeting on Disaster Management

*Lee Yook Heng*



A meeting of top government officials from ten ASEAN countries, plus Korea, China and India was hosted by Japan in Tokyo from 30 August to 1 September 2010. Malaysia was represented by Dato' Che Moin Bin Umar, Deputy Secretary (Security Management), National Security Council, Prime Minister's Department and Prof Lee Yook Heng from SEADPRI, UKM. One of the main objectives of the meeting was to review the progress and challenges in the first half decade of the Hyogo Framework of Action 2005-2015 (HFA) in the region. Another objective was to discuss and identify new challenges in the next half decade of the HFA, with a view to contributing to the Mid-Term Review of the HFA, which is currently in progress. Of particular interest is the support of the international effort of the International Strategy for Disaster Reduction (ISDR) and UNESCO in promoting the global campaign on "Making Cities Resilient to Disaster".

All ASEAN Member States are now actively encouraged to participate in the global campaign. They are also encouraged to nominate participating cities and role model cities in their respective countries to join the campaign. Awareness in urban disaster risk management is becoming vital because of rapid urbanisation, greater concentration of population density and economic assets in risk areas, the low building standards that often occur in some disaster prone cities, ecosystem decline and weak local governance (lack of preparedness plan for disasters). The campaign will partly focus on mayors and city councils by making them aware of priorities in disaster risk reduction; help them understand the risk and take action to build a culture of safety and resilience at all levels to be prepared and ready to act.

# Ecological Risk Assessment – A Research Collaboration Between SEADPRI–UKM and Mahidol University, Thailand

Lee Yook Heng



*Earthquake-induced Landslide massive debris flooded the valley of Yamakoshi Highland, Niigita, Japan*

Research into hazards in the environment can be performed in a more holistic manner via ecological risk assessment. The determination of the probability of an adverse effect occurring to an ecological system is the main concept involved in ecological risk assessment. Both ecology and ecotoxicology are integral parts of ecology risk assessment. They define the relationship between chemical exposures and resultant adverse effects on ecosystems and their component organisms. Through risk assessment, evaluating adverse effects under a great deal of uncertainty is often carried out with criteria depending on societal perceptions and values. In ecological risk assessment, the estimation of hazard is essential to determine the exposure of the ecosystem to an identified substance or substances and the likelihood of that exposure occurring. The exposure conditions and their effect on an ecosystem are often complex. The potentially hazardous substance, which may be referring as a stressor can cause harm to a biological system.

SEADPRI is embarking on carrying out research on ecological risk assessment under her Technological Hazards Programme. A preliminary discussion was held recently at Langkawi Island with a group of scientists from Mahidol University, Thailand to look into opportunity for research collaboration in the field of ecological risk assessment. The meeting was organised by SEADPRI with support from the UKM Integrated Water Resource Management Research Group and LESTARI. The main outcome of the meeting was to establish an ecological risk assessment project at Langkawi Island adopting the model currently used at Phuket Island of Thailand. Such research is important for a sustainable and holistic environmental protection of Langkawi Island, which is now a member of

UNESCO Global Geoparks Network. An ecological risk assessment of Langkawi Island will allow interaction with various levels of stakeholders via risk communication and implementation of suitable environment quality standards and policies. This will eventually aid in ecological restoration, environmental conservation and performing corrective actions by authorities when there is degradation in the island's ecology.



*UKM-Mahidol Joint Research Workshop on Ecological Risk Assessment*

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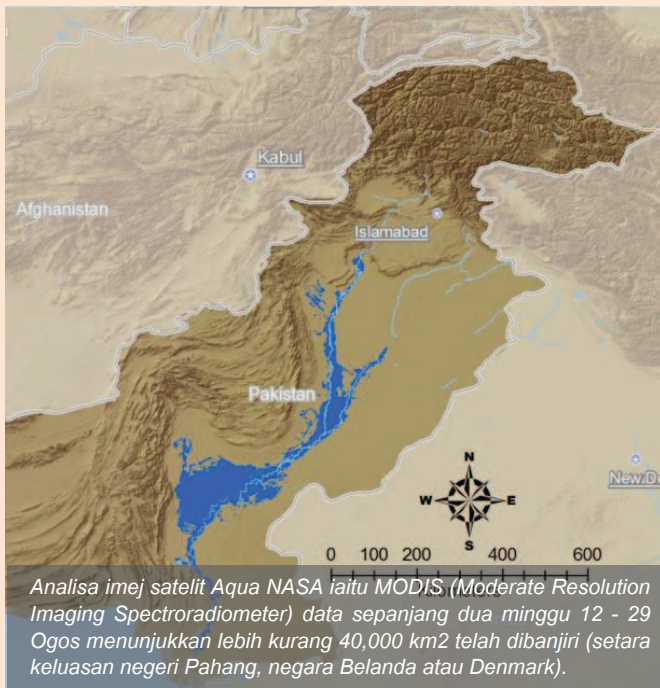
**Managing Editors** : Sharifah Diyana Syed Ismail

## Banjir di Pakistan

*Lim Choun Sian & Ibrahim Komoo*

Pada Julai hingga Oktober 2010, bencana banjir besar yang melanda hampir satu per lima keseluruhan negara Pakistan dikatakan berpunca daripada hujan Monsun yang luar biasa, air hujan yang melampau purata dan dikaitkan dengan fenomena La Nina, menurut agensi Kajiucua Negara dan NASA. Tambahan pula, kegagalan empangan di utara Sukkur memburukkan lagi keadaan dan menyebabkan air banjir merebak ke barat Sungai Indus, di mana letaknya kawasan pendudukan padat dan pertanian.

Analisis imej satelit Aqua NASA iaitu MODIS (Moderate Resolution Imaging Spectroradiometer) data sepanjang dua minggu 12 - 29 Ogos menunjukkan lebih kurang 40,000 km<sup>2</sup> telah dibanjiri (setara keluasan negeri Pahang, negara Belanda atau Denmark). Sumber terbaru kerajaan Pakistan melaporkan 100,000 km<sup>2</sup> (keluasan Sarawak atau negara Iceland) telah dilanda banjir. Turut 1,600 nyawa terkorban dan gangguan terhadap 21 juta orang. Juga, dianggarkan sebanyak 200 ribu haiwan ternakan dan 4.25 juta ekar tanaman termusnah.



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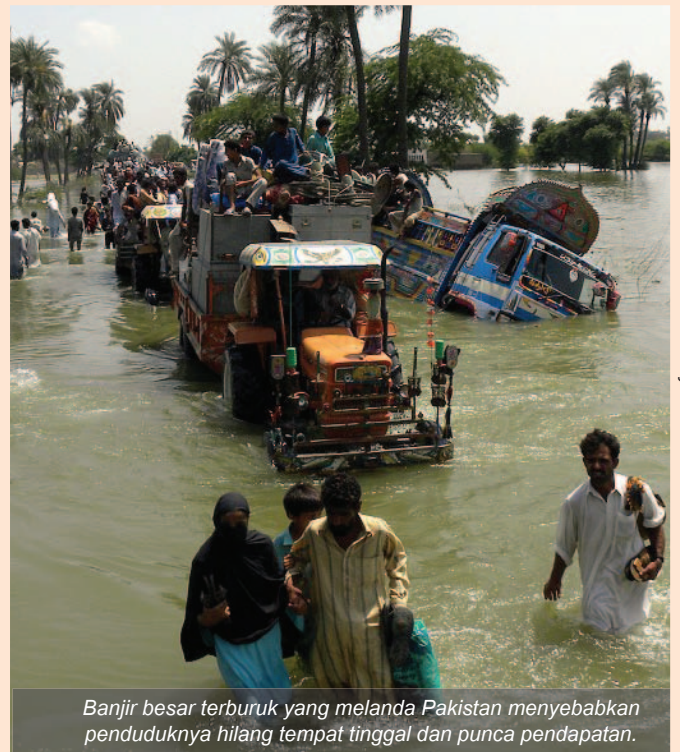


Photo by : EPA

Banjir besar terburuk yang melanda Pakistan menyebabkan penduduknya hilang tempat tinggal dan punca pendapatan.

Laporan bertarikh 2 November 2010 oleh NASA, hasil analisis data MODIS menunjukkan banjir telah surut secara perlahan-lahan, dan paras sungai dan tasik adalah telah hampir di paras normal berbanding dengan awal Oktober yang parasnya sedikit di atas normal tetapi masih banyak lumpur dan air bertakung seakan-akan membentuk tasik di permukaan dataran.

Walaupun banjir hanya berlaku di negara Pakistan tetapi bilangan mangsa yang terlibat adalah paling teruk dan dibandingkan dengan Tsunami 2004 dan gempa bumi di Haiti 2010. Mangsa banjir bukan sahaja hilang tempat tinggal dan punca pendapatan kini berdepan dengan masalah makanan, malnutrisi dan penyakit seperti malaria. Tekanan hidup kian meningkat terutamanya musim sejuk makin menjelang. Sehingga Oktober 2010, tujuh juta rakyat Pakistan dilaporkan masih tidak mempunyai tempat tinggal akibat banjir.