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Towards safer building's for Sabah

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By Datuk Seri Madius Tangau

FORTY years ago on 26th July 1976, an earthquake measuring 5.8 on the Richter scale hit Lahad Datu.

Properties were heavily damaged and permanently disfigured.

Sabahans especially, would also remember another more recent, fateful day. The Ranau earthquake on 5th June 2015 registered 6.0 on the Richter scale, the highest ever recorded in the country and surpassing the tremblor in Lahad Datu.

This tragedy cost precious lives. The government also reckoned that the repair of damaged buildings and infrastructure would incur more than RM100 million.

If you look at the earthquake monitoring screens in the headquarters of the Malaysian Meteorological Department or MetMalaysia in Selangor, you would observe that earthquakes occur frequently around the globe, thousands every day, creating events such as tsunamis, volcanos, landslides and liquefaction.

In Malaysia, Sabah is relatively prone to earthquake activities. It is located on the south-eastern Eurasian Plate, bordered by the Philippine Plate and the Pacific Plate.

It has witnessed low to moderate seismic activities due to the interaction of these main tectonic plates and several active fault lines. Between 1900 and 2016, it recorded 182 earthquakes with moment magnitude ranging from 2.9 to 6.0.

Ranau for example, has entered the phase of seismic activity. Thus Sabah especially, has to implement seismic (earthquake related) design for its structures and infrastructures as soon as possible to mitigate the safety and economic consequences due to seismic events.

The talks on the need to create policies and guidelines to make buildings survive earthquakes up to a certain magnitude had long been deliberated. In 2006, the Academy of Sciences Malaysia was commissioned by MetMalaysia, both under the

purview of the Ministry of Science, Technology and Innovation (MOSTI), to conduct a study on “The Seismic and Tsunami Hazards and Risks in Malaysia”.

It recommended that the government develop a Malaysian Code of Practice for the construction of major and critical structures to take seismic factors into consideration when planning and designing them.

Our local buildings are only designed for a top load, which are not resistant to earthquakes, making it susceptible to side-to-side movements. Following the report above, the Department of Standards Malaysia or Standards Malaysia, also under MOSTI, responded by developing a Malaysian Standards (MS) on earthquake.

Last Monday MOSTI co-organised a roundtable meeting with the Sabah government in Kota Kinabalu, to update the stakeholders on the development of the MS and to seek comments.

I co-chaired this meeting with YB Datuk Dr. Joachim Gunsala, who is the Assistant Minister for Local Government and Housing, Sabah. Over 70 participants from government agencies, industry associations, professional bodies and academia, convened to discuss this MS especially on the values of Peak Ground Acceleration (PGA) that would be implemented in Sabah. PGA is the maximum ground acceleration that takes place during an earthquake at a site.

Standards Malaysia published the draft of “Malaysian Standard (MS) EN 1998-1 Eurocode 8: Design of structures for earthquake resistance - Part 1: General Rules, Seismic Actions and Rules for Building”, in 2015.

They are currently in the process of developing the National Annex to Malaysian Standard (MS) EN 1998-1 Eurocode 8.

This draft National Annex was opened to public comments for a 60-day period from February till April this year, of which it received numerous feedbacks from concerned stakeholders. Standards Malaysia then held a national consultation forum in August to respond to these comments.

Back at the roundtable, the Academy of Sciences Malaysia, Standards Malaysia, the Technical Committee on Earthquake from the Institute of Engineers Malaysia and the Study Group for the National Annex which included the local group from Sabah were invited to present their findings.

Since the working group proposed specific PGA values for the areas in Sabah as opposed to just one PGA value by the technical committee, the roundtable meeting decided that further deliberation would be required among them to reach a consensus.

At the moment almost all countries in Europe implement Eurocode Code 8 (EC8) for the seismic consideration of structural design. It is one of the nine codes published by the European Committee for Standardization, mandated by the European Union.

In South East Asia, Malaysia, Singapore and Vietnam are applying EC8. Indonesia, Thailand and the Philippines implement American Code such as Uniform Building Code and International Building Code.

As Malaysia is migrating from British standards to EC8 that takes earthquake resistance into account when designing structures, it is crucial for us to achieve a consensus on the PGA values to implement the code.

Meanwhile, Malaysia is in fact poised to build earthquake resistant structures using our own innovation and technology.

In the late 1970s, the Malaysian Rubber Board (MRB) and University of California, Berkeley, initiated a joint research and development to evaluate the use of seismic rubber bearings as base isolation for structures.

The findings were positive and led to a wider acceptance of seismic bearing throughout the world.

Some of the advantages of seismic rubber bearings over mechanical structural support system are:

Simple design - Less or no maintenance is required - No moving parts - Resistant to environmental hazards - Economical - No additional damping mechanism required

MRB had promoted this innovation to earthquake-prone countries such as Iran, Dubai, Indonesia and Turkey.

Its initial projects were commissioned by China and Indonesia, in the construction of an 8-storey demonstration apartment and a 4-storey demonstration building respectively, both completed in 1994.

Other large successful projects were in Vanadzor, Armenia, and Parand, a new town in Iran.

In Malaysia, the first base isolated building with rubber bearings is a 3-storey building in Lahad Datu, Sabah, competed in 2001 and owned by the Malaysian Palm Oil Board.

In the construction of the second Penang Bridge, MRB and the Tun Abdul Razak Research Centre (TARRC) were involved in the designing of the 2 300 high damping natural rubber (HDNR) bearings that were eventually installed under the deck of the longest bridge in Southeast Asia, allowing it to withstand earthquake magnitude of up to 7.5 on the Richter scale.

In terms of earthquake preparedness, there is much to learn from our neighbour, the Philippines.

We invited two experts from the Philippine Institute of Volcanology and Seismology to share best practices at the roundtable meeting.

As the Philippines sits on the Pacific Ring of Fire, it experiences very frequent earthquake and volcanic activities.

I particularly remember a presentation slide by them that highlighted the extremely concentrated distribution of active faults and trenches throughout their entire country!

They have a comprehensive priority strategic approach to contend with strong earthquakes, that covers institutional framework, capacity building for relief and recovery, strengthen community preparedness, implementing buildings codes and enhancing national security.

I was especially impressed with their education and outreach programmes in ensuring that all citizens, from schoolchildren to rural coastal communities, are well-versed with disaster preparedness and risk reduction measures.

MetMalaysia regularly carries out such programmes too, but I hope earthquake drills would eventually be expanded to all schools, such as the mandatory fire drills.

With the development of our own National Annex for structures to be earthquake resistant, the availability of local anti-earthquake technology and the sharing of best practices with experienced countries, I am optimistic that we are on the right track towards better earthquake mitigation measures.

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103 Local Research Products Commercialised With Returns Reaching RM155 Mln

KUALA LUMPUR, Dec 2 (Bernama) -- A total of 103 local research products have been successfully commercialised until November this year, in line with Malaysia Commercialisation Year 2016 (MCY'16).

Science, Technology and Innovation (MOSTI) Minister Datuk Seri Wilfred Madius Tangau said the products managed to generate a revenue reaching RM155 million.

"All the products were produced by 25 agencies and learning institutions under nine ministries managing research and development (R&D)," he told reporters after a reception with the media in conjunction with MCY'16, here, today.

MCY'16 is a joint initiative between MOSTI and the Finance Ministry which aims to foster an entrepreneurial culture and to raise awareness about the commercialisation of R&D and its impact on national development.

The highlight of the MCY'16 programme is on Dec 8 and 9 at the Kuala Lumpur Convention Centre which is expected to be officially opened by Prime Minister Datuk Seri Najib Tun Razak.

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Amaran Angin Kencang, Laut Bergelora Di Perairan Phuket

KUALA LUMPUR, 3 Dis (Bernama) -- Angin kencang dan laut bergelora dijangka berlaku di kawasan perairan Phuket bermula hari ini sehingga esok.

Jabatan Meteorologi Malaysia dalam kenyataan hari ini berkata angin kencang timur laut dengan kelajuan 40 hingga 50 kilometer sejam (kmsj) dengan ombak mencapai ketinggian sehingga 3.5 meter dijangka berlaku di kawasan itu.

"Angin kencang dan laut bergelora turut dijangka berlaku di kawasan perairan Perlis, Kedah dan Pulau Pinang bermula hari ini sehingga esok," kata kenyataan itu.

Keadaan itu berbahaya kepada bot-bot kecil, rekreasi laut dan sukan laut, menurut kenyataan itu.

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