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Enhancing Geological Terrain Mapping for Development Proposals and Environmentally Sensitive Areas – Preliminary Viewpoints

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INTRODUCTION

The pilot project on Disaster Resilient Cities: Forecasting Local level Climate Extremes and Physical Hazards for Kuala Lumpur is supported by the Newton-Ungku Omar Fund (NUOF), jointly administered by the Malaysian Industry Government Group for High Technology (MIGHT) and Innovate UK. As part of the project activity, a Roundtable Discussion on “Enhancing Geological Terrain Mapping for Development Proposals and Environmentally Sensitive Areas” was convened on 23 November 2017 at Puri Pujangga, Universiti Kebangsaan Malaysia. Led by NUOF project members Geomapping Technology Sdn. Bhd. and the Mineral and Geoscience Department Malaysia (JMG), the purpose of the discussion was to obtain initial inputs to review the current manual on Geological Terrain Mapping (GTM). A total of 42 participants attended the event, representing the private sector, government agencies and universities. The Roundtable Discussion commenced with an opening session. This was followed by three technical presentations and a discussion session in four break-out groups. A general discussion session was held before the event concluded.

The welcome remarks of Ms. Ida Semurni Abdullah, the Programme Director for MIGHT, applauded the effort of NUOF project members to enhance the Geological Terrain Mapping in Malaysia, given the emerging challenges posed by incidences of geohazards in urban areas due to climate extremes. In officiating the event, Mr. Kamal bin Daril, Deputy Director General (Corporate and Mineral Economics) of JMG welcomed inputs to improve GTM in the country and looked forward to the outcome of the discussion.

HIGHLIGHTS

Geological Terrain Mapping (GTM) is a legal requirement when preparing the Development Proposal Report (LCP) and Environmental Impact Assessment (EIA) in certain states of Malaysia (Qalam Azad 2017). The legal and technical aspects of Geological Terrain Mapping (GTM) is still not well understood among practitioners. There is a misconception that GTM has limited geohazard and engineering geology aspects. These aspects are mentioned in the manual on GTM but tend to be overlooked in practice. Landform and surface processes are among the information documented in GTM at various scales. This information is then analysed to produce among others, thematic maps on construction suitability, engineering geology, physical constraints as well as erosion and instability (where geohazards are implicitly indicated). The competency of GTM service providers and the level of compliance to the GTM procedure is currently a major challenge. The overreliance of GTM service providers on remote sensing data, instead of fieldwork and verified site-specific information, has been noted. It is important that geoscience practitioners have a sound understanding of GTM and conduct ample fieldwork in order to provide quality products to end-users such as planners and engineers.



The manual on GTM specifies explicitly the geological parameters required for development projects based on context and characteristics of an area. Critical parameters include regional and local geology, geomorphology, geo-materials, hydrogeology, structural geology, geohazards and minerals of economic significance. In the case of landslides, it is important to differentiate both new and relict features as well as detect large-scale landslides, to delineate potentially problematic areas that have to be avoided or managed carefully for development (Tajul Anuar 2017). There are several approaches to enhance GTM and these include using the total geological approach, with preparation of an explicit geohazards map, a geohazard risk register and geomaterial-based planning guidance to supplement the current products (Abd Rasid Jaapar 2017). Pilot studies in Selayang, Selangor (100-acre development project) and Ulu Kinta, Perak (800-acre development project) have indicated that this is a viable option. The findings of the pilot study could serve as the basis for enhancing GTM in Malaysia.

Participants highlighted many suggestions to enhance GTM in the country. A key point was the need to improve clarity of the current guidance on GTM with respect to its purpose, approach, scale of assessment, area of coverage, base-map selection, types of detailed studies required, checklists targeting regulators, service providers and end-users, synchronisation of colours etc.; and stress the importance of “development specific geological inputs”. Additional investigations were also proposed to improve GTM, including subsurface evaluation, soil and weathering profile assessment, as well as appraisal of coastal and other climate-driven hazards. The need to enhance capacity of practitioners involved in GTM, including regulators and service providers, was also emphasized. Another aspect of significance is to increase awareness of the importance of geological inputs among end-users, in particular, planners and other regulatory agencies involved in development control.

CONCLUDING REMARKS

It is important to note that GTM should be conducted in the earliest stage of planning, even before the development plan layout is sketched. This is more cost effective in the long-run and will help to minimise conflict between the parties involved in a development project. Geologists registered with the Board of Geologists should be engaged to conduct GTM for quality assurance. Clear guidance is also required to strengthen the practice of GTM and enhance the capacity of regulators and service providers. Increased awareness of the importance of geological inputs among end-users involved in development control is also vital. The inputs from the Roundtable Discussion has been documented and will now serve as the basis for enhancing existing guidance on GTM in Malaysia.

REFERENCE

- Abd Rasid Jaapar 2017. Proposed Enhancement of Geological Terrain Mapping: Case Studies from Private and Public Projects. Presentation Slides, Roundtable Discussion on Enhancing Geological Terrain Mapping for Development Proposals and Environmentally Sensitive Areas, 23 November 2017, Puri Pujangga, Universiti Kebangsaan Malaysia.
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- Tajul Anuar Jamaluddin 2017. Geoscience Inputs for Landuse Planning: Case Studies from Cameron Highlands and Kinta Heights. Presentation Slides, Roundtable Discussion on Enhancing Geological Terrain Mapping for Development Proposals and Environmentally Sensitive Areas, 23 November 2017, Puri Pujangga, Universiti Kebangsaan Malaysia.



Dr. Ferdaus bin Ahmad of JMG (right) moderated a break-out group discussion at the event.