

## THE FUTURE OF SLOPE SAFETY

### Essay Question – Part I

When it comes to education on disaster risk reduction, experience is the best teacher. The Malaysian government was barely a few months into a public awareness and education program on landslides when a major disaster hit Bukit Antarabangsa, a suburb east of Kuala Lumpur. Whereas the program had been previously running on well-researched but secondary information and material from well-known agencies such as the Geotechnical Engineering Office in Hong Kong and the U.S. Geological Survey, the program playbook was essentially rewritten when residents and government agencies got a chance to experience a real-life disaster. Serendipitously, the program manager was one of the residents and victims of the landslide. On-the-scene experiences of residents trying to dig out their fellow neighbours moments after the landslide hit, emergency first responders frantically trying to access Ground Zero in spite of a large section of the slope being displaced and sitting in the middle of the one and only access road—all these contributed to the urgency- and needs-driven program that is now consolidated into a community-based organization called SlopeWatch.

This explains the pragmatic nature of the objectives of the SlopeWatch initiatives: simply put, the programs must answer the question, is this enough to mitigate or avert another major landslide event? The list below goes through each initiative undertaken; only time will tell whether they are truly enough, however in the short- and medium-term they have shown significant results.

**COMMUNITY MONITORING** – The first line of defence against landslides is monitoring for signs of slope failures. In most landslides, signs do appear and residents must learn to recognize them. Running throughout the length of Malaysia is a stretch of mountains called the Titiwangsa Range, and within that the stretch notoriously known for landslides is the Ulu Klang area, where Bukit Antarabangsa is located. Communities within this stretch are acutely aware of the hazards and are carrying out monitoring programs.

**Results:** According to the Ampang Jaya Municipal Council, the number of slope reports is about 70 per year for the Slope Unit and about the same for the Infrastructure Unit, which handles drain maintenance. Before SlopeWatch, they did not receive any reports from the public on slope maintenance. Also, the frequency of significant landslides to hit Ampang Jaya, where the SlopeWatch program is being implemented, was approximately once every two years. Now, it has been six years since the last major landslide incident.

**REPORTING TO THE AUTHORITIES** – Monitoring alone does not avert landslides. For action to mitigate landslides to be taken, reports have to be made to the local authorities. SlopeWatch visits the sites and qualifies them as true, bona fide slope cases before preparing reports that the authorities could then follow up on.

**Results:** Together with the Public Works Department and the Ampang Jaya Municipal Council, SlopeWatch have investigated and settled a total of 125 cases within the Ulu Klang area alone. Some cases were serious, which without intervention would have led to slope failures.

**COMMUNITY MAINTENANCE** – Surprisingly, the causes of many landslides on man-made slopes in Malaysia are often mundane: forensic investigations will reveal that lack of regular inspection and maintenance was the main culprit of the failures. With urban development encroaching into the hillside areas, man-made slopes are becoming more and more prevalent. As with anything else in the built environment, slopes also have to be routinely checked with a regular maintenance

schedule. SlopeWatch provides tips on how to maintain the drainage system and other infrastructural assets found on slopes.

**Results:** More communities are including slopes as part of the regular community clean-up activities. Many neighbourhoods around Bukit Antarabangsa and a host of other neighbourhoods in the Ulu Klang area are now including drainage clearing and inspection as part of their activities.

**OUTREACH PROGRAMS AND TALKS** – In order to understand the rationale behind the signs of landslides and why they must be heeded, a bit of knowledge of the technical concepts behind landslide mechanisms, geology and soil behaviour is needed. To ensure that residents—urban or rural—can grasp these technical concepts, visual aids such as 3D animation, 2D illustration, cartoons and animated doodles are used.

**Results:** The materials used in the outreach programs have been quite effective and there have been many requests by professionals and members of the public to use the teaching material for their purposes. However, the materials have been created for the Public Works Department and as such are the intellectual property of the Department. The 'how-to' illustrations have been printed in the newspapers as full-page advertorials, and SlopeWatch received feedback from readers that they have cut out the page and kept it on hand as reference.

What makes the above activities remarkable is the involvement and cooperation from the government agencies. The Public Works Department for example has been instrumental in providing key technical advice and know-how.

## **Essay Question – Part II**

SlopeWatch was set up in March 2009 with funds donated by the Institute of Accountants England and Wales, which wanted to contribute towards the victims of the Bukit Antarabangsa landslide. The residents of the landslide-hit community decided that a monitoring program to build community resilience was the best use of the funds, which was managed by a non-profit organization called Force of Nature. Thus the donated amount of RM14,000 (approximately USD4,300) was used to conduct ten awareness and education outreach talks and start up a monitoring program consisting of volunteers.

Since then until now, the monitoring and case management activities continue purely on a volunteer basis, with an annual stipend of RM3,000 (USD900) given by the Ampang Jaya Municipal Council to cover expenses such as petrol and stationery.

In 2012, SlopeWatch received a grant of USD50,000 from the Global Environment Facility and the United Nations Development Fund, which is managed by the Small Grants Programme Malaysia. It covers activities of a two-year program to conduct awareness and education sessions to the communities as well as teach them how to start up a community-based monitoring program.

If honoured with the Sasakawa Award and prize money, SlopeWatch would use the funds to propagate the program outside the Kuala Lumpur conurbation and extend it out in other at-risk areas throughout the country, in states such as Pahang, Perak, Penang, Sabah and Sarawak, which also experience landslides.

In particular, SlopeWatch would like to focus on providing monitoring capabilities to vulnerable but more indigent communities such as the aboriginal communities that are scattered throughout the country. They are often the victims of urban development that encroach into the jungle where they live, but are ill-equipped to counter the changes in their environment.

There are two such programs currently in the planning stages for an early warning system at an aboriginal tribe community within mainland Malaysia as well as another in East Malaysia on the island of Borneo. Before installation of the early warning system, a cultural mapping will be conducted to better understand the people of the tribe and prescribe a solution that will be useful to them, rather than impose a solution based on our own mores and values. By reaching out to the indigenous communities as well as the urban, SlopeWatch aspires to have a more inclusive approach to disaster risk reduction.