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# Landslide Prone Area in Malaysia and the Prevention Measures



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*Credit: myMetro*

# A

landslide is defined as a large mass of soil and rock debris that moves downhill due to the action of gravity. The mass of material

involved and the speed at which it occurs make it potentially catastrophic in its consequences due to the extensive damage it can cause to property and life.

Ulu Klang is prone to landslides and has recorded several life-taking cases. Its hilly areas are unstable mainly because of the terrain formations, human activities, and heavy rainfalls. The National Slope Master Plan (NSMP 2009–2023) has revealed that most of the landslide cases happened in developed areas and concentrated at the foothills of the Titiwangsa Range. This can be understood as the developments had touched the slopes and changed the natural forms of the hills caused the natural disturbance and imbalance in the vicinity of Ulu Klang. Several landslides and slope failure occurrences in the Ulu Klang area are listed below:

11 December 1993 – A block of the Highland Towers collapsed at Taman Hillview, Ulu Klang, Selangor caused the death of 48 people.

15 May 1999 – A landslide near Bukit Antarabangsa, Ulu Klang, Selangor.

Several landslides force the evacuation of 1,000 apartment dwellers at Bukit Antarabangsa.

20 November 2002 – The bungalow of the Affin Bank chairman General Tan Sri Ismail Omar collapsed due to an early morning landslide in Taman Hillview, Ulu Klang, Selangor, with a fatality in his family.

31 May 2006 – Landslides at Kampung Pasir, Ulu Klang, Selangor cause the death of 4 people.

6 December 2008 – The Bukit Antarabangsa landslide occurred on the eastern side of the township of Bukit Antarabangsa, 1.5 kilometers northeast of the Highland Towers. The landslide severely damaged 14 upscale bungalows, killing four people and injuring fifteen people.

12 February 2009 – A landslide at the construction site for a 43-storey condominium in Bukit Ceylon, Kuala Lumpur, killing one contract worker.

29 Dec 2012 – The collapse of a concrete embankment in Bukit Setiawangsa due to land erosion, 46 homes are evacuated.

29 May 2020 – A landslide occurred at Taman Kelab Ukay, Bukit Antarabangsa, Ulu Klang, due to continuous rain, resulting in soil movement.

25 April 2023 – A landslide occurred at Malaysian Anti-Corruption Commission Academy, Bukit Tunku, Kuala Lumpur due to the broken pipe, 76 people are evacuated.

Other than that, Genting Highland and Cameron Highland are also classified as the landslide-prone areas in Malaysia due to its hilly landform. It has been discovered that the landslides in the area were mainly triggered by the intense rainfall since the area encountered high amount of rainfall throughout the year. The soil on a hillslope being saturated with excessive water that lead to the landslide. Several landslides and slope failure occurrences at the area are listed below:

1 May 1961 – A landslide occurred in Ringlet, Cameron Highlands, Pahang.

30 June 1995 – Landslide at Genting Highlands slip road near Karak Highway, killing 20 people.

18 November 2014 – A landslide, caused by heavy rain, forced the closure of the

Km 4.2 of the Genting Sempah–Genting Highlands Highway heading towards Genting Highlands, Pahang.

2 December 2021 – A landslide, caused by continuous rainfall. Two vehicles, a lorry and a multi-purpose vehicle were buried alive at Simpang Pulai-Blue Valley road near Cameron Highlands.

16 December 2022 – A landslide occurred at the campsite in an organic farm near Jalan Batang Kali-Genting Highlands, 31 people were killed and 7 people were injured.

28 June 2023 – A landslide occurred at Simpang Pulai-Blue Valley road near Cameron Highlands due to heavy rain.

From the above landslide data, most of the landslide occurred during the raining season whereby high intensity of rain are recorded. High porewater pressure caused the soil being saturated and reduced the soil shear strength, a threat to hillside area where the stability of slope is jeopardised.

Awareness on the potential landslide occurrences are very important to prevent fatalities and catastrophic consequences. All of the landslide sign awareness activities organised by the relevant authorities namely Public Work Department (JKR) revolved on the campaign theme, "Learn, Monitor, Maintain, and Report," and also using catchphrase from The Geotechnical Engineering Office in Hong "Safe Slopes, Save Lives."

## Learn

Slope safety ideas required to be understood by the public and locals before any community action could be performed. The general population was briefed about slopes and landslides through seminars and public presentations. Residents received education on the definition of a slope, different types of landslides, factors that contribute to landslides, triggers for landslides, and important geological and water management principles as well as slope cover and retaining walls. With this foundational understanding, residents were better equipped to guarantee the program's sustainability and comprehend the rationale for the actions recommended by JKR.

## Monitor

While there are instances when landslides happen suddenly, there are typically warning indicators that people in hillside areas miss because they are not aware of them. Slope safety depends on keeping an eye out for indications of slope collapses when urban expansion encroaches on slopes. Particularly, man-made slopes are become increasingly common and require periodic inspections. In order to do this, JKR assembled a set of photos, as seen in Figure 1, that depict landslide indicators as they manifest within and outside of buildings, as well as on and near slopes. Equipped with this understanding, locals may visually assess slopes in their neighborhood.



Figure 1. Landslide indicators within and outside of buildings, as well as on and near slopes by JKR

## Maintain

If not maintained, even well-designed slopes will collapse. Even though maintenance is easy, it is frequently ignored. The difference between safety and calamity can be determined by proper maintenance. Examining a slope is the first step in maintenance. If they have a basic understanding of maintenance rules, people, municipal agencies, and private slope owners can do this task. The need for both

professional engineers and laypeople residents to do routine maintenance is one of the activity's important takeaways. In an ideal world, there would be three different types of maintenance: basic upkeep that homeowners could perform, like cleaning out drains and returfing vegetation on the slope; more complex upkeep that requires skilled engineers to examine features like retaining walls and rock anchors. Examining water pipes for seepage and leaks is the third type. Although slope owners bear the responsibility for upkeep, community members are urged to participate as it impacts their safety and means of subsistence.

## Report

If the essential message of keeping an eye out for landslide warning indicators is not followed up with the appropriate authorities for repair or mitigation, the observational data will remain ineffective. As a result, locals are asked to report any indicators that seem to call for action, including damaged drains that let water soak into the slope. Since they handle infrastructure issues on public land, the engineering department of the municipal government is often the authority to be approached. The local government would get in touch with the landowner to take appropriate measures if the slope in question is on private property. A Notice to Take Action may be sent in certain situations if the landowner does not respond. As a slope agency, JKR gets its fair share of public reports. In these situations, JKR will forward the matter to the relevant landowner or agency.

As a conclusion, awareness on the potential landslide occurrences is crucial as landslides are commonly occurred in our country especially raining season and had caused a catastrophic and fatalities. Awareness can be raised through education as well as public advertisement via media social, newspaper, magazine, etc. by the relevant authorities and educator.

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