

LANDSLIDES - GEOLOGICAL ASPECTS

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Landslides during the last decade or so have caused serious damage to property and infra-structure mostly in the hill country of Sri Lanka. Moreover the disastrous landslides that occurred recently in the Nuwara Eliya and Badulla Districts resulted in the loss of human lives. Various Government, Semi-Government and other voluntary organizations are showing a keen interest in arresting such natural phenomena and thus ending the misery and hardships of villagers who are constantly affected specially during periods of heavy rainfall. The main cause of such earth-movements is due to the instability of slopes which gives rise to earthslips, landslides, rock falls and subsidence.

Excessive precipitation due to monsoonal or cyclonic weather has been identified as the main cause of slope instability thus giving rise to landslides. Such natural causes are beyond human control. However, the man-made reasons are the disturbance of steep slopes, specially those of a gradient of 40° and over by cultivation, deforestation and other activities such as sinking of gem pits. Most of these activities related to man are unauthorised and cause soil degradation. Areas subject to such activity are more prone to landslides and other earth-movements.

There are also areas in the hill country where the Geological conditions such as rock type and structure give rise to persistent instability of slopes. Such areas are subject to landslides during periods of excessive precipitation. A good example of such an area is the Kotmale Valley. i.e.

There is a general misconception that landslides is a problem for earth scientists. Since geology is one aspect in the study of landslides, the geologist can contribute only to a limited extent in such a study. The remedial measures to be taken in stabilising slopes prone to landslides, and rock falls have to be studied by Civil Engineers specially trained for such purpose. Engineering Geologists who specialize in arresting mass movement of soil and rock also can contribute to such studies. Therefore, the study of landslides is of a multi-disciplinary nature where the earth scientists, meteorologists, civil engineers, engineering geologists, sociologists, physical geographers and National planners should interact to achieve a lasting solution to such disasters.

According to the records maintained at the Geological Survey Department, it is generally observed that the incidence of landslides has increased since 1970. During the past ^{fifteen} 15 years most of the disastrous landslides have occurred in the Nuwara Eliya, Kandy, Ratnapura, Kalutara and Badulla Districts. There are various reasons attributed to failure of slopes in these districts, Some of those reasons are cultivation of tobacco ^{and} vegetables on steep slopes, gemming and illicit extraction of timber. However, due to socio-economic reasons there is also a heavy demand for more land in villages that are subject to rapid expansion. This problem of land-use is more acute in areas where plantations have been in existence for the past one and a half centuries.

There is an urgent need to educate the people at grass-root level in building houses and opening up homestead gardens in traditional purana villages and avoidance of such activity on steep slopes should be given serious thought. The evacuation of villagers from their traditional villages to safer areas will also cause sociological problems as the life style of the villager will be subject to drastic change.

In order to arrest such disasters, there is an urgent need to identify areas of slope instability as long term precautionary measures. In order to achieve this objective, it has been proposed to prepare landslide hazard maps giving the highest priority to the central hill country. In the preparation of such maps there should be interaction by the various specialists as indicated earlier. As a first step to such a task, the Geological Survey Department has taken up the Maturata area which was subject to disastrous landslides in January, 1986 as a case study and a team of geologists and other technical personnel are now engaged in preparation of large scale maps and marking the areas affected. Such a study will also help in identifying the main causes of slope instability.