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Landslide Hazard and Hazard Vulnerability

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Abstract

A study of landslide incidence in Trinidad has shown that there is a distinct relationship between geology and geomorphology, landslide frequency, mode of failure and nature of the landslide hazard. In the steep mountainous terrain of the Northern Range, planar, wedge and block sliding predominate in deeply weathered, folded and faulted metamorphic rocks. Existing slope failures are typically small to moderate in size and pose a low to moderate threat to life and property. However, due to the combined effects of geology and human factors, potentially unstable slopes along highly-trafficked major roads and in housing developments may generate larger, more frequent failures, with a potential for widespread disruption, particularly where multiple events occur simultaneously. In contrast, rotational failures are characteristic on the moderately-sloping terrain of the

Central and Southern Ranges, where expansive clays and interbedded shale-sandstone sequences are the most landslide-prone. Individual landslides in this region are also small in size and, as single events, pose a low to moderate threat to life and property. However, the cumulative effects of annual progressive slope movement, in combination with longer failure-repair intervals result overall in high to very high economic and social impacts. Landslide hazard is low or non-existent in the lowlands of the Caroni and Southern Plains. The indicated hazard scenarios necessitate different approaches to landslide vulnerability reduction in areas of development. In the case of the metamorphic terrain in the more-developed north of the island, land use zoning and enforcement, structural mitigation and public education in landslide prevention techniques in weathered rock masses are applicable. For the landslide-prone areas of the Central and Southern Range, the application of landslide hazard - resistant design in expansive soils and public education are recommended.

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