

consequently increasing the pore water pressure in the loose, unconsolidated debris material which is already overburdened by single- and double-storied houses. Toe erosion by Pinder river coupled with slope-cutting of the lower portion of the slide for broadening of Karnaprayag–Simli road and subsequent alteration of the angle of repose of slide material have resulted in the head-ward extension of the slide towards Upper Bazar area (Figure 2 a).

The triggering factors for the nearby Kotwali and Police Colony slide include the unplanned cutting of slope for widening of roads in the immediate downslope area. Poor drainage network and absence of proper sewage system in the upslope of Kotwali and severe bank erosion by small seasonal drains in its vicinity may also aggravate the problem of landslide in this area. The head-ward shift of this active slide zone by about 25 m may cause subsidence of the houses in the area.

The rockfall at Bhergaon is the result of reactivation of an old rockfall zone in the upslope. Highly jointed quartzites have shown widening of joints due to blasting for road construction. These widened joints have served as conduits for percolation of water which, in turn, has exerted forward thrust and pore water pressure on the rock mass, thereby causing translational rockfall (Figure 2 b).

The Karnaprayag Nagar Panchayat building is obstructing the natural course of a high-gradient seasonal stream. Though the stream water is diverted into small cemented drains constructed between the boundary wall of Nagar Panchayat Bhawan and the road, a cloud burst in the up-

stream catchment of this seasonal stream during the rainy season may bring huge volumes of debris which can cause severe damage to the Nagar Panchayat Bhawan and the Pinder Valley Colony downstream.

Ira-Badhani village in the eastern part of Karnaprayag Nagar Panchayat is located on a solifluction lobe. The slow flow has been accelerated along seasonal streams due to toe erosion and increase in pore water pressure, as a result of high seepage through springs and blocking of scuppers on the Karnaprayag–Nauti road in the immediate upstream of Ira-Badhani.

There is urgent need for an emergency plan during monsoon or in the event of incessant rains for the evacuation of people residing in the danger zones immediately above the Karnaprayag–Simli road in the Upper Bazar area, Kotwali, Police Colony, Nagar Panchayat office and parts of Pinder Valley Colony area.

The severe hazard-prone Upper Bazar area requires terracing of downslope supplemented with the construction of retaining walls with drain holes and toe-protection measures to minimize toe erosion by the Pinder river.

Channelization of water away from the slide zones of Upper Bazar area, Kotwali, Police Colony, Bhergaon and Nagar Panchayat office, particularly the construction of scuppers in the Upper Bazar area, needs to be taken up on priority basis.

Cleaning of existing scuppers and construction of sewage lines in vulnerable localities should also be taken up.

All construction activities should be stopped in vulnerable areas and any con-

struction should be allowed only in areas recommended by geologists.

Indiscriminate cutting of slope for construction of multistoried commercial complexes should be restricted or controlled through effective policies by imposing strict land-use policy.

Constructions that block the drainage courses should be removed.

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ACKNOWLEDGEMENTS. I thank Shri K. V. Ravindran for valuable suggestions. I also thank the Department of Disaster Management, Govt. of Uttaranchal, Dr R. K. Pande, Executive Director, Disaster Mitigation and Management Centre, Dehradun and Dr Piyoosh Rautela for encouragement and support. Thanks are also extended to Nidhi and Noha.

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NIPER has new Director

P. Ramarao, who is currently the Head of the Department of Pharmacology and Toxicology at National Institute of Phar-

maceutical Education and Research, Punjab has taken over as the institute Director from C. L. Kaul.

Ramarao's research interests are determination of cause and effect relationship of diabetic complications, especially hy-

pertension, inhabitation of opioid tolerance and dependence and G-protein coupled receptor characterization and their transmembrane signal mechanisms.