

**COMBATING WITH AVALANCHE DISASTERS USING
GOOGLE EARTH - A CASE STUDY OF GYARI SECTOR
AVALANCHE IN PAKISTAN**

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ABSTRACT

Snow avalanches are highly lethal disasters due to their sudden occurrence and impacts. In Pakistan, a similar incident was occurred at Gyari Sector on 07 April 2012 at 2:00 a.m. killing 140 people. A study was conducted to monitor the major causes of such huge human losses, as well as to provide suggestions for future preventive measures. Pakistan, being Alpine glacier and Snowpack resource rich country, always requires proper monitoring, mapping and estimation of these avalanche prone areas for better planning and decision making. Environmental monitoring and mapping of all these very important areas of natural resources, can easily be addressed with advanced technologies of Remote Sensing and GIS. In the present study, free satellite images as well as DEM of Google Earth were utilized as the major data source to investigate Gyari Sector avalanche incident. Besides this, 3D Profiling utility of Google Earth was used for tracking potential avalanche paths and their slopes. It was noted that the Gyari Sector infrastructure was established exactly in the line of an avalanche path. The path of this avalanche which had smashed out all the buildings, people, and other infrastructure, was thoroughly investigated using Google Earth utilities. The slope of this avalanche path was calculated to be 37.27° , which falls under the maximum danger zone limit of avalanche occurrence. Alternate future options for installation of necessary infrastructure in the adjoining areas are also proposed in this study. Moreover, possible pre-emptive measures to retaining the existing site are also discussed. Remote Sensing and GIS techniques, in general, and Google Earth techniques, in particular, are found to be very useful in monitoring and mapping avalanche disasters as well as for their combatting efforts.

Key words: Avalanche, Disaster Management, Remote Sensing, Google Earth, Gyari Sector