Landslides constitute one of the major damaging natural hazards in mountainous regions and each year these are responsible for enormous loss of human lives and property in the Himalayan area. Recent studies show that landslides occur due to complex interaction of several geo-environmental parameters such as lithology, geological structures, geomorphology, slope gradient/aspect, soil texture/type, drainage, land use and anthropogenic factors. Efforts have been made to integrate these factors based on heuristic or statistical approach to produce landslide hazard zonation maps showing relative susceptibility of a given area to landslide hazards. However, such methods have several limitations and therefore, an attempt is hereby made to integrate layers by training the data set using Artificial Neural Network to arrive at more reliable results. The methodology was applied within the Himalayan Giri valley, Himachal Pradesh, India. Causative parameters and landslide maps were derived from interpretation of satellite, topographic and field data. These parameters were taken into consideration while using the back-propagation of neural network method. The weights obtained from the trained network were consequently utilized for map integration and classification. The resulting landslide susceptibility zonation map delineates the area into five classes: Very High, High, Moderately High, Low and Very Low. These classes were validated by correlating the results with actual landslide occurrences. The early results are very encouraging and attempts are being made to further improve the training and classification results. The mapping results would be useful for providing landslide hazard information needed for planning and mitigation purposes in the area.