Risk can be described as where hazard meets a vulnerable human population (Tilling 1989), i.e. the combination of the anlysis of hazard and vulnerability. In our case, this is implemented using a Python script and GRASS GIS. Both aspects are reclassified on a scale from 0 to 5 with areas without any hazard set to NULL. Since the risk is especially high in areas where both hazard and vulnerability have critical values, the aspects are multiplied equally. Thus, you get significantly higher values for the risk in areas where both aspects have a high rating compared to areas where only one aspect has a high rating.

Tilling, R.I. (Ed.), 1989. Short Courses in Geology, Vol. 1: Volcanic Hazards. United States Government Printing Office, American Geophysical Union, Washington, DC.