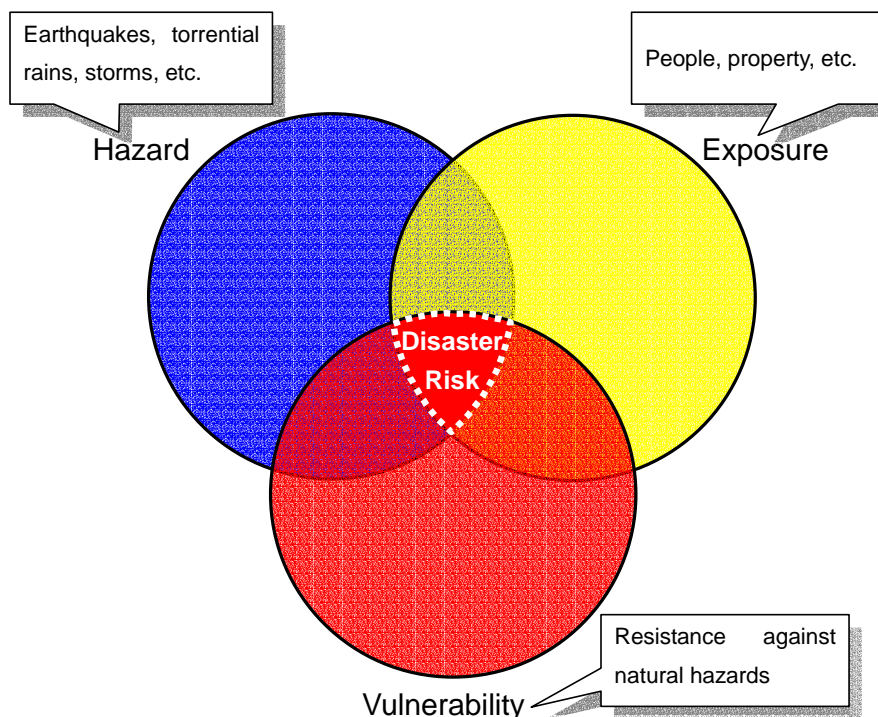


## 1.2 Definition of Disaster Risk

As mentioned in the previous section, the number of natural disasters has been increasing, as has their impact, due to such external changes as the concentration of populations and property in hazardous areas, and rapid urbanization. Figure 1.3 shows how natural disasters develop. Earthquakes, storms and torrential rains, are natural phenomena we refer to as “hazards” and are not considered to be disasters in and of themselves. For instance, an earthquake that occurs on a desert island does not trigger a disaster because there is no existing population or property affected. In addition to a hazard, some “vulnerability” to the natural phenomenon must be present for an event to constitute a natural disaster. "Vulnerability" is defined as a condition resulting from physical, social, economic, and environmental factors or processes, which increases the susceptibility of a community to the impact of a hazard. “Exposure” is another component of disaster risk, and refers to that which is affected by natural disasters, such as people and property. In general, “risk” is defined as the expectation value of losses (deaths, injuries, property, etc.) that would be caused by a hazard. Disaster risk can be seen as a function of the hazard, exposure and vulnerability as follows;

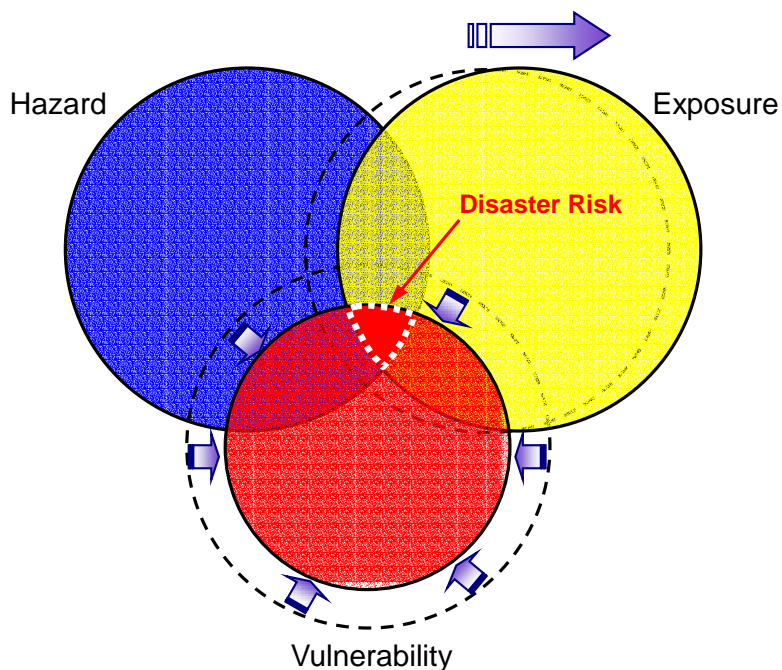
$$\text{Disaster Risk} = \text{function} (\text{Hazard}, \text{Exposure}, \text{Vulnerability})$$

Growing exposure and delays in reducing vulnerabilities result in an increased number of natural disasters and greater levels of loss.



**Figure 1.3 Mechanism Behind the Emergence of Natural Disasters**

To reduce disaster risk, it is important to reduce the level of vulnerability and to keep exposure as far away from hazards as possible by relocating populations and property. Figure 1.4 shows how disaster risk can be reduced and indicates the area of disaster risk. The disaster risk shown here is smaller than that shown in Figure 1.3. The reduction of vulnerability can be achieved through such measures as mitigation and preparedness.



**Figure 1.4 Mechanism of Natural Disaster Reduction**