Chapter 10
General Trends and New Perspectives on Landslide Mapping and Assessment Methods

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ABSTRACT
Landslides and their consequences are of great importance throughout the world and they constitute an important responsibility on the damages and fatalities among the natural or man-made hazards. Landslide mapping and assessment studies have become a very important issue for the geoscientists and the decision makers to prevent from the consequences of the landslides, particularly in the last decades. In addition to the increase in population and poor economic conditions, unconsciously built settlements, located in the landslide-prone areas, were the most influencing factors on these losses and damages sourced from the landslides. This section particularly focuses on the landslide mapping and assessment methods considering the chronological development of these methods. In addition, this section also summarizes the landslide inventory, susceptibility, hazard and risk concepts, considering the scientific landslide literature. Furthermore, past-actual trends and new perspectives on these issues were also compiled to show the readers how this subject emerged and evolved progressively.

1. INTRODUCTION

Natural hazards such as earthquakes, landslides, tsunamis, floods have been occurring on the Earth since the beginning of the planet. Actually, these events have been involved in the auto-dynamics of the Earth. But, if the human beings and their living environments are included in these natural events, they are transformed into the natural hazards. It means that if a natural event affects the people and
the inhabitants around them, it is called a natural hazard. These natural events, to some extent, natural hazards, not only affects the people but also harms their living environment including plants, animals, buildings, transportation lines etc. In other words, although these events are natural and they occur in nature, their deleterious consequences affect all living creatures and their environment. If so, who is guilty? Nature? Faults, soils and rocks as the geological materials? Of course, they are not. Human beings are mainly responsible for these consequences since they unconsciously build their residences, roads, living environments in the hazardous regions on the Earth, and cause irretrievable damages to their environment for their own needs. Of these natural events, the landslides play an important role on these losses and damages and they affect many people and the environment throughout the world. For example, when EM-DAT (Emergency Events Database) launched by CRED (The International Disaster Database, the Centre for Research on the Epidemiology of Disasters, CRED) database is examined, it is clear that the natural hazards affect many people and cause dramatic consequences all over the world. Based on a recent research from the internet link (http://emdat.be) performed for this chapter selecting the years between 1900-2015, disaster types as hydrological, meteorological and geophysical, number of total affected people sums up to 4954745590 with total deaths of 11260586, injured of 7387664 and 26033499164 (‘000 $) of total damage. In this research, disaster type includes earthquake, extreme temperature, flood, landslide, mass movement (dry), storm and volcanic activity. Some research results related to all types in concern with respect to number of disasters and total economic damage are shown in Figure 1 and Figure 2.

These figures practically summarize the situation at which the number of disasters and the total damage tend to increase proportionally as the time passes. Of these events, landslides constitute an important effect on the results throughout the world. During the period between 1900 and 2015, 660 landslides affected 13768377 people, caused 62296 deaths and 8875998 (‘000 $) economic damage. 91 countries from different continents were exposed to landslide events. The same conclusions can be done for the landslides, and the analyses results can be seen in Table 1, using the same database (EM-DAT) and selecting the disaster type as landslides.

Table 1 should be considered and interpreted according to only the recorded events, i.e. landslides, related to the considered database. Of course, there might be some deficiencies and lacking data in the considered database, but, it gives a general idea about the situation and summarizes the cause-effect (landslides-consequences) relations overall the world. For example, China is the most affected country.