Natural Disaster Impact on Annual Visitors of Recreation Area: The Taiwan Case

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Abstract—This paper aims to quantify the impact of natural disaster on tourism by the change of annual visitors to scenic spots. The data of visitors to Alishan, Sun Moon Lake, Sitou and Palace Museum in Taiwan during 1986 to 2012 year is collected, and the trend analysis is used to predict the annual visitors to these scenic spots. The findings show that 1999 Taiwan earthquake had significant effect on the visitors to Alishan, Sun Moon Lake and Sitou with an average impact of 55.75% during 1999 to 2000 year except for Palace Museum. The impact was greater as closer epicenter of 1999 earthquake. And the discovery period of visitors is about 2 to 9 years. Further, the impact of heavy rainfall on Alishan, Taiwan is estimated. As the accumulative rainfall reaches to 500 mm, the impact on visitors can be predicted.

Keywords—Impact, Natural disaster, tourism, visitors.

I. INTRODUCTION

TAIWAN is called as Formosa, a beautiful island, which has the special geography and human environments, and attracts many domestic and foreign tourists to undertake recreational activities. In 2008 years, Taiwan formulated the development principles and action plans of service industry, in which tourism industry was regarded as the key industry. According to the Executive Information System of Tourism Bureau, M.O.T.C. Republic of China, total income of tourist industry is 61,840 million NT dollars and the international tourists to Taiwan are up to 7311470 visitors, who bring 38,450 million NT dollars of tourist income in 2012 years. It is shown that the tourist industry is playing an important role for the Taiwanese economic development.

However, earthquakes, typhoons and heavy rains are the frequent natural disasters in Taiwan, the occurrences of which are often attributed to the broken geology and steep topography. There natural disasters often cause severe property damage and casualties. The catastrophic event, the 1999 Chi-Chi, Taiwan earthquake was still a fresh reminder of the magnitude of the possible destruction and tragedy. The 1999 earthquake killed 2400 people, injured 8000 people and left about 100,000 homeless. Besides, in recent decade, there are more than two torrential rains every year in Taiwan, which case accumulatively 1171 killed, 293 missed, 3450 injured, 2353 buildings collapsed, 4437 buildings partial-collapsed and landuse loss of 4700 million NT dollars. Especially, Typhoon Morakot in August, 2009 with an accumulative rainfall of 2,361mm, buried more than 300 people at once and destructed many famous recreation areas including Alishan at Chiayi, Baolia at Kaohsiung, Lushan at Nantou, and Jhihben at Taitung. Similarly, tourists to these scenic spots descended obviously due to the devastating disaster.

There are many literatures on travel decision-making. It is proven that the natural disaster has a different influence on travel decisions. Reference [1] pointed out that the international tourist to Taiwan dropped by 15% from September to December 1999 owing to the 1999 earthquake event. This paper aims to quantify the impact of natural disaster on tourism by the change of annual visitors to scenic spots. Fig. 1 is principal scenic spots and visitors in Taiwan by year. Although influence factors of visitors are many and complicated, it is clearly presented that the increasing total visitors contributes to the increasing scenic spots, the implement of Two-Day Weekend and Taiwan’s Open-Door Policy to Mainland Chinese Tourists. Based on the regional and temporal characteristic of natural disaster, it is assumed a scenic spot in a disaster area will be influenced by a disaster occurrence; otherwise, it will not be influenced. As a period of time passes, the influence degree of natural disaster on scenic spot will descend to be zero. And the economic impact of the natural disaster on scenic spot can be expressed by the decrease of annual visitors. According to above-mentioned assumptions, the annual visitors are estimated and the decrease of annual visitors induced by the natural disaster is discussed further.

Fig. 1 Principal scenic spots and visitors in Taiwan