Study on the Status and Development of Tourism Meteorological Disaster Emergency Warning System

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Abstract. Meteorological disaster is an important factor to hinder the development of the tourism industry. Construction of meteorological disaster emergency warning capability of tourism is important embodiment of refined and user-friendly development of meteorological services, and also important guarantee of visitor safety and sustainable tourism development. From the perspective of environmental carrying capacity, this paper introducing the main impact of meteorological disasters. The paper summarized travel emergency and early-warning management system of meteorological disasters in China, and proposed meteorological tourism disaster emergency warning system model conception.

Introduction

Meteorological disasters are one of the most common and serious natural disasters. Tourism meteorological disasters is means that a disaster caused by weather or climate change and influence the development of tourism. It is includes like rain (snow), lightning, fog, drought, dust storms and typhoon. this disasters not only undermines the original appearance of the tourist resources, it also affects the progress of tourism activities smoothly [1].

The tourism Meteorological disaster warning system is a complex set of meteorological disaster emergency system, it used for reminder tourists weather-induced disasters and solve travel security incidents. Before disaster strikes corresponding prevention measures, it will be a positive role to strengthen the analysis of meteorological disaster on tourism research, develop a set of orderly emergency warning system to promote the development of tourism and protection of human health. However, the burst weather disaster also occurred many of the public safety and security issues and vulnerabilities can be found. These issues are beneficial to reassess the current emergency alert system, improve the management of meteorological service for tourism, so as to better promote the study of the meteorological disaster emergency management.

1. Effects of Tourism Meteorological Disasters

Meteorological disaster is one of the most common and serious disasters in natural disasters. The loss caused by meteorological disasters in China has accounted for more than 70% of the losses in natural disasters [2]. Tourism meteorological disaster is a disaster that is directly related to the tourism industry, including the tourism geology and geomorphology, the disaster caused by the climate change in the tourist area and the tourism biological disasters. Drought, floods, typhoons, storms and other weather disasters can not only destroy the tourism resources, and also more influenced the progress of tourism activities in many ways. Heavy rain, lightning and wind are often greater intensity and frequency of the occurrence, effect tourism traffic and ornamental activities, and even can triggered flash floods, mudslides, landslides, water pollution, coastal erosion and other secondary disasters to destruct tourism landscape environment. Drought, low temperatures and snow also inhibit the growth of animals and plants in the tourist resort.
In China, the resource of mountain landscape abundantly. Mountaineering, adventure, expedition, hiking, ski and mountain tourism and leisure, sports and fitness and other forms of tourism in recent years has also been developed.

But caused most scenic mountain area terrain rugged, sparsely populated, thin air, changeable weather, coupled with the most area away from the city, traffic inconvenience, facilities, travel circuit design and safety management is still not perfect, so that the impact of meteorological disasters tourism serious than the other regions. The scenic mountain areas in Sichuan Province of China are mainly concentrated in the in Ganzi and Aba. Except Emei and Qingcheng Mountain, others are geographically isolated and inaccessible. Therefore, in order to ensure that tourism activities tourists can safely and smoothly, to establish a scientific and rational, workable security system is particularly important.

2. Development Status of China’s Tourism Meteorological Emergency Warning

Tourism meteorological emergency and early warning management is the response and management of public safety emergencies caused by extreme weather in tourist attractions. Its purpose is in the process of respond to emergencies, by taking the corresponding measures to optimize decision, through operational research, information technology, strategic management etc. ways, analysis the causes, processes and consequences, and put forward early warning, control and processing methods to reduce the loss eventually [3]. Tourism meteorological emergency and early warning management is a set of emergency early warning program to deal with the sudden meteorological disasters in tourist attractions, including the observing information, release warning signals and emergency response. Meteorological departments to collect and analysis of meteorological disaster data, release meteorological disaster warning information, and then setting up an emergency team handling of emergencies accurately and timely by the government.

In China, the tourism meteorological disaster emergency early warning work has already started. A monitoring system of early warning lightning and a series of tourism meteorological disaster prevention system have been established by Huangshan Mountain in Anhui Province. When the lightning disaster occurs, it can accurately predict the location and grade of the disaster and reduce the damage to the tourists and the tourist facilities. In order to facilitate the national tourist inquiries travel weather conditions, the National Tourism Administration and the China Meteorological Administration launched the China Tourism Weather Network jointly [4], it provided domestic and international tourist attractions weather, travel index, tourist routes, weather inquiries and other common services for tourists. The construction of tourism meteorological disaster emergency warning system is an important part of tourism meteorological services, which is related with the regional economic, tourist life and property safety and sustainable development of tourism [5]. Landscape variety in China, government needs to set different emergency warning schemes according to different main meteorological disasters in tourist areas. But cause less researches on meteorological disaster emergency warning, in some city or scenic spots the meteorological disaster emergency warning schemes have not complete, so it also needs to further improve the subject.

3. Emergency Early Warning System Model of Tourism Meteorological Disasters

3.1 Tourism environmental carrying capacity theory

Tourism environment is an important part of the tourism system. Tourism is also dependent on the environment, including natural, economic, social, and cultural increasingly, all king of this interrelated and interact with each other, which forms the basic conditions for the sustainable and stable development of regional tourism industry, and influences the development of the tourism industry.

The tourism environmental carrying capacity mainly includes three aspects: resource capacity, environmental capacity and social capacity. Resource capacity is mainly refers to the carrying
capacity of water resources and ecological resources in tourism environment. Environmental capacity is including the traffic environmental carrying capacity, tourism land and development capacity, tourism environmental carrying capacity, and the pollution of the natural environment. Social capacity mainly refers to the economic capacity, tourism or local residents’ mental capacity, regional development capacity, and limit capacity [6].

Figure 1. Structure of environmental carrying capacity.

In the context of global warming, the occurrence of chilling injury is obviously increased and extreme meteorological disasters may be prone to multiple trends. High-temperature, drought, flood, and other meteorological disasters damage tourism water resources and ecological systems, hinder traffic, affecting agriculture and local economic development.

Breaking the tourism environment carrying capacity, will inevitably affect the tourism activities, and even a threat to personal safety. Therefore, it is of great practical significance to strengthen the analysis of tourism meteorological disasters.

3.2 Structure of tourism meteorological emergency warning system

The early warning system of tourism meteorological disaster is a set of integrated meteorological disaster detection and emergency plan. It is through the observation of scenic spots of meteorological disasters to publish safety information, evacuation of tourists, and many other complex systems.

The tourism meteorological emergency management is divided into four stages, which are prevention, preparation, response and recovery. Prevention is the first phase of emergency management. The mainly work is to analyze the disaster information and data, and then establish disaster warning system and prevention plans. Preparatory phase is mainly the pre-disaster emergency management and rescue and other preparatory work. In response phase, the main work is organization of people to rescue the victims and important materials timely. Recovery phase, including the government should promptly formulate the recovery and reconstruction plans, providing funds for reconstruction and stabilizing social order. In the emergency response process, the organization is in the base position to promote coordination between the government departments, clear the responsibilities and work processes between organizations at all levels [5].
The early warning system is a combination of the relevant theoretical basis, processes the data and issues the warning information. The system is divided into five parts: information collection system, data management system, decision-making system, alarm system and feedback system [6]. The whole process firstly collects the tourism meteorological data, using the data management system to collect the data, translate the information into a simple and intuitive signals or indicators, and then exclude the existence of false information and false information. The next step is to use the decision-making system to make use of analytical methods and models to determine the crisis. According to the decision-making subsystem, timely and clear to the tourism organization issued a warning signal. Finally, the information of implementation, the monitoring and early warning is fed back to the analysis center.

The tourism meteorological disaster warning system is including lightning warning, rainstorm warning, flood warning and snow disaster early warning, drought and low temperature warning etc. The information of temperature, relative humidity, visibility and lightning location were monitored by lightning locator, radar and other technology. According to the analysis the level of early warning and the specific location of meteorological disasters, disaster emergency measures will be taken to prevent tourism meteorological disasters and take appropriate measures to gain time, when the system identify major disasters. According to the characteristics of various types of meteorological disasters, flash floods and geological, snow and road icing, drought and other professional defense measure can relief or minimize losses [7].

Figure 2. Structure of emergency organization.

Figure 3. Working flow chart of early warning system.
4. Suggestions and Measures for the Emergency Warning System of Tourism Meteorological Disasters

It is a necessary condition for the rapid development of the tourism industry to establish a set of emergency early warning system for the tourism meteorological disasters. In the state of analysis and prediction of meteorological disasters, establish a system of tourism disaster statistics index and evaluation with a method that comprehensive investigation of meteorological disasters in major tourist regions and analysis the harm degree and risk degree of meteorological disaster.

In the field of tourism meteorological science, putting The tourism meteorological disaster emergency knowledge into student classroom and guide training, tourism scenic spots can established electronic screen facilities to play the tourist meteorological disaster popular science knowledge, improve people’s awareness of meteorological disasters and the ability to Self-rescue, so that more people understand the tourist holiday may occur meteorological disasters [8].

With global warming, extreme weather disasters like floods, drought, rainstorm and various lightning, high winds and other more prominent. Greenhouse gas emissions and excessive development of scenic spot are also induced by meteorological disasters, so to curb the trend of meteorological disasters occurs frequently can from the source, it is necessary to strengthen the protection of the ecological environment, returning farmland to forest and grassland, implement low-carbon tourism strategy and strict implementation of the environmental impact assessment (EIA) system, prohibit the high pollution and consumption development of tourism projects and strict control of natural scenic area of land development to ensure that the tourism industry along the direction environmentally and sustainably [9].

In financial terms, increasing funds and personnel investment in Developing High-tech to improve meteorological disaster forecasting, promoting the legal system of tourism meteorological disaster warning, encouraging environmental protection and advocating sustainable tourism is also an important link in deepening the ability of tourism meteorological disaster emergency warning.

Develop specific emergency early warning plan need take different Scenic spots and categories of disasters into consideration, formulate specific and detailed early warning mechanism and emergency measures, strengthen the linkage and cooperation of departments and strengthen the ecological environment protection to ensure the safety of tourists’ lives and property and promote the sustainable development of tourism.
5. Summary and Prospect

China’s diverse topography and climate make the tourism resources are very rich, but the meteorological disasters occur frequently, the tourism industry has brought harmer than ever. Early warning of tourism meteorological disaster not only needs high-tech support and meteorological department linkage, also need to understand the tourist awareness and understanding of meteorological science knowledge. Visitors are the main object of tourism meteorological disaster emergency management. This system to convey the warning information of tourism meteorological disasters to visitors timely, not only protects the tourists in the area of personal and property safety, but also prevents meteorological disasters on the area of direct and indirect damage.

With the popularization of network technology and the application of mobile intelligent terminal, the rapid development of tourism cloud computing and Internet of things will enable tourists to through smart phones and iPad receive weather and warning information easily and quickly. Based on 4G, Bluetooth and NFC network communication technology, integrate computers, smart phones, electronic displays and other electronic products into the intelligent tourism disaster early warning and disaster relief platform, to provide early warning information and rescue services on tourism meteorological disaster high-quality and accurately [10]. Future travel weather emergency alert services should be diversified, refinement and development of humanity.

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