Research on the Control Path of Event Tourism Pollution in Scenic Spots

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Abstract. This paper analysed the main environment pullotions of event tourism in the Beer Festival of Liyang scenic spot and its characteristics, lastly put forward the measures for reducing negative effect of event tourism pullotions. The results showed that the main pullotion sources included solid waste, air pollution and soil pullotion. The solid waste of event tourism differs from daily garbage with more reusable materials such as paper, wood, metal and glass. While there are air pollution and soil pullotion in event tourism senic spot differ from sightseeing area. As concentrated pullotions distribution, more water in garbage and high reusability are the characteristics of Beer Festival environmental pollutions, so measures as new recycling technology, small processing stations and standardized management given to cut down the event tourism pollutions.

1. Introduction
Event tourism usually means that the scenic spot revolves a series of activities around a specific theme based on a setting goal, and organizes one-time or repetitive activities at relatively fixed time period. Compared with traditional tourism, event tourism is more likely to cause a large number of tourist flows in a small space within a short period of time [1]. This high concentration of tourists will give rise to a high-intensity impact on the environment of the host site, especially causing serious pollution problem.

According to the study of Ma Jianli which defined the event tourism waste by analyzing the waste disposal of the Shanghai World Expo. They believe that the event tourism waste is generated due to the prosperity of event industry and tourism industry in recent years, which is significantly different from household waste [2]. Dong Liangliang believes that environmental pollution problems in scenic spots are more prominent, including solid waste pollution, air pollution, and soil pollution [3]. Zeng Hao holds the view that surface runoff is the second major pollution source that affects the quality of urban water environment. Domestic garbage and road garbage will enter the rainwater pipeline along with the road runoff, and finally release into the river [4].

The Huangshan Liyang Beer Festival is held every summer (it was reduced in scale due to COVID-19 in 2020 and not be included in the scope of the study). The festival lasts for three days and includes live band performance, domestic and foreign beer supply, interactive games, barbecue and other catering service. The purpose of event is hoping to obtain income from selling beer and beverages. According to the statistical data of the scenic spot, more than 10,000 guests have attented event 2019.
2. Main causes of environmental pollution in The Beer Festival

2.1. Solid waste

According to the statistics of previous international fairs, the garbage output of event tourists is 0.3-0.35 kg per capita/day, which is far lower than the daily domestic garbage output of 0.89 kg per capita in China. However, there is a large passenger flow in event tourism areas. For example, the planned area of Expo 2010 Shanghai covered 5.28 km², with an average daily passenger flow of about 700,000. Therefore, the amount of garbage produced every day during the festival activities in the scenic spot is relatively large and concentrated.

Compared with household garbage, the types of tourist garbage in the Liyang Beer Festival are relatively few. According to field investigation, solid garbage mainly includes plastic packing materials, metal outer packing materials, food residues, paper supplies and so on. The proportion of perishable organic matter including food scraps in event tourists solid waste is lower than the ordinary urban living garbage, accounting less than 50%. Otherwise, the proportion various kinds of plastic materials, metal and glass materials, paper containers and advertising flyers is higher than the domestic garbage, accounting for 40% ~ 50% of the total. Meanwhile the same kinds of urban living garbage account for only 20% ~ 30% of the total.

| Types                    | Food Residues | Paper&Wood supplies | Plastic Materials | Metal Materials | Glass Materials | Others |
|--------------------------|---------------|---------------------|-------------------|----------------|----------------|--------|
| Domestic Garbage         | 69.1%         | 5.1%                | 12.1%             | 2.1%           | 6.5%           | 5.1%   |
| Sightseeing Tourism Garbage | 42.2%       | 27.6%               | 22.5%             | 2.8%           | 1.2%           | 3.7%   |
| Event Tourism Garbage    | 48.3%         | 24.3%               | 15.6%             | 8.2%           | 2.8%           | 0.8%   |

The output amount of sightseeing tourism garbage is mainly investigated in the hotel guests of Huangshan Scenic Area, which is about 0.3 kg per capita/day. The amount is similar to event tourists garbage output, and because of the use of disposable raincoats which leads to more plastic than beer festival tourists garbage while metal waste per capita is less than its proportion of beer festival tourists garbage.

2.2. Air pollution

During the Beer Festival, the air was polluted by the heating fuel of catering services, especially services from outdoor stalls that are not installed with smoke purification settings. According to a survey of on-site catering service providers which offer snacks, crayfish and barbecue. It's included liquefied petroleum gas (LPG), electric stove and charcoal as the heating fuel sources for catering services. During the Beer Festival, the most popular outdoor foods are barbecue and crayfish. Barbecue catering services mainly use charcoal fuel and electric stove, and crayfish mainly use LPG fuel.

All three fuels produce carbon monoxide when burned, but the degree of carbon monoxide pollution varies significantly. Among them, the barbecue stalls powered by charcoal fuel produced carbon monoxide air pollution mostly, the highest carbon monoxide concentration value exceeds 110mg/m³ within 1.5 meters of space around the stalls with the peak of consumer flow.

2.3. Soil pollution

During the Beer Festival in the scenic area, tourists are relatively concentrated in time and space. The waste in entertainment areas and dining areas is usually not treated in time, and the remaining garbage coverage is likely to affect the soil in the scenic area, especially the soil pH value of the green belt.
Secondly, the solid waste below the soil layer or not cleared in time encroached on the usable land area which degradation time is long (see Table 2).

During the festival, the author selected different experimental areas for soil testing by litmus paper colorimetry, and analyzed the changes in soil pH in the experimental areas before and after the festival. The average soil pH before and after the festival was 4.42 and 4.69. The results indicate that the concentrated disposal of garbage by the tourists during the Beer Festival will cause changes in soil pH. If there is no improvement, it will affect vegetation growth.

During the Beer Festival, the treatment of solid waste in the Liyang Scenic Area is mainly to clean up and transport the waste by adding temporary sanitation. A single waste treatment method can easily lead to delayed cleaning and limited cleaning area and encroach on the usable land area.

### Table 2. Degradation Time of Garbage in Various Types

| Types              | Food           | Paper&Wood       | Plastic                      | Metal            | Glass                        |
|--------------------|----------------|------------------|------------------------------|------------------|------------------------------|
|                    | Peel, food residue | Disposable wooden chopsticks and paper cups, paper towels, waste leaflets | Disposable plastic water cups, food packaging, etc. | Metal cans        | Glass food containers        |
| Degradation Time   | 1~6 months       | Paper: 3~6 months; Disposable wooden chopsticks: 1~5 years | 100~200 years; Iron cans >10 years; | 4000 years       |                              |

3. Characteristics of Beer Festival environmental pollutions

3.1. Concentrated distribution

The space distribution area is relatively concentrated that solid waste, air pollution and solid pollution are mainly distributed around the dining and entertainment areas, in low vegetation on both sides of the trail, under tall grass or near street-stalls.

The time distribution is relatively concentrated. During the festival, the average number of tourists per day exceeds 10,000, but more than half of the tourists come to Liyang from 6:30 to 10:00 pm. The short-term influx of a large number of tourists brings serious garbage problems, including solid waste disposal and air pollution in catering services. During this time slot, cleaners are under pressure to remove garbage, and the slow transfer of garbage will pollute the soil of the scenic spot through surface infiltration.

3.2. High garbage water content

According to the research results of Ma Jianli and others [2], the moisture content of event tourism waste is higher than that of domestic waste, but the moisture content varies slightly with seasons. For example, Shanghai event waste has a higher moisture content in summer, up to 76.4% while in winter it is low as 57.8%, and the moisture content of exhibition tourism garbage is about 69% on average.

The Beer Festival is held in the summer of August, which is the time when rainfall is heavy in the Huangshan area. According to the research results of Sun Peng and others [5], the spatial distribution of summer precipitation in Anhui Province has a large gap between the north and the south. The summer precipitation in the mountainous area of southern Anhui varies from 550 to 1 000 mm. The precipitation in August is second only to June and July, exceeding 300 mm. The moisture content of the festival garbage in August reaches 75.3%, which is higher than that in September. The large amount of precipitation on the one hand leads to an increase in the water content of the garbage, on the other hand it accelerates surface penetration and pollutes the soil.

3.3. High reusability

During the Beer Festival, the garbage in scenic spots is mainly a small amount of food residue, paper and wood products, plastic disposable packagings and metal cans. It can be seen from Table 1 that the
perishable organic matter of event waste such as fruits, vegetables and food accounting for 48.3% is lower than that of household waste. On the other side, there is a large amount of plastic, metal, glass, paper and wood packaging supplies, accounting for 50% of the total event waste. While paper, plastic, metal and glass of ordinary daily solid waste just accounts for 26% of the total. Compared with domestic waste, event tourism waste is characterized by relatively simple composition and a high degree of resource utilization.

4. Environmental pollution control measures at Liyang Beer Festival

4.1. New technology for solid waste reuse
For solid waste, new environmental protection technologies can be used, such as biological anaerobic hydrogen production technology dealing with food residues, peels and other solid wastes. The physiological metabolism of fermenting bacteria converts hydrocarbons into hydrogen during anaerobic fermentation. Wood fiber and plastic monomer or low polymerization degree resin are made into wood-plastic composite material by heating and pressing, which has better performance than single wood material or plastic product.

4.2. Small processing stations for waste transportation
In the event tourism area, adopting new resource technology to establish a small resource processing center on the basis of the existing garbage transfer station is important, including a garbage classification system, a compression system and a small anaerobic power generation system. In order to ensure the full-load operation of the processing stations, the surrounding office waste, restaurant waste, highway service area waste can also be combined for treatment.

4.3. Standardized management for environmental pollution sources decrease
The environmental protection regulations were taken to highlight the source of environmental pollution, such as increasing the number of trash cans in non-road areas as much as possible, increasing cleaning personnel in tourist areas to reduce solid waste. Encourage restaurant owners to replace charcoal fuel with liquefied petroleum gas fuel or electric fuel to reduce the source of air pollution.

5. Conclusions
In the past decade, event tourism has developed rapidly because of its tremendous economic promotion in scenic spots, but it also has a negative impact on environmental protection. Taking event tourism pollution as the research object, and the Beer Festival in Huangshan Liyang Scenic Area as a case, analyze the characteristics of event tourism pollution, and finally construct a circular economy development model for the treatment of event tourism pollution in the scenic area. This circular economy concept includes reducing air and soil pollution, while recycling various resources in solid waste, so that it can re-enter the flow of material resources.

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