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Air Pollution Analysis to The Better Management of The Tourism Industry In China

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1. Introduction

According to Maslow's hierarchy of needs, when people meet the needs of the basic survival stage, they will pursue a higher level of demand (Huitt, 2004). The vigorous development of tourism is the concrete behavior of mankind for the pursuit of higher level demand. And tourism is really important for the people and also play an important role in economies. And Rita and a lot of researchers had explained the importance of tourism as the largest generator of wealth, employment in the world and the importance of economic (Rita, 2000). There are a lot of researchers focus on the steady increase of the tourism industry and found that there are a lot of elements have a negative influence on tourism industry, especially the problems of environmental quality. The industrialization and urbanization of the United States entered a period of rapid development in the late 19th century. By the end of the 19th century, the United States had completed modern industrialization, industrial output value has been ranked first in the world and the level of urbanization in 1900 reached 39.6%. And two years later even reached to 51.2%. But at the same time, the urban and environmental problems brought about by industrialization and urbanization are also outstanding in industrial cities. Those cities of United States which had the most concentrated population and the most active industrial economy showed that environmental problems caused by the city's economic development had paid a heavy price. In streets, downtown and residential areas, it was seen that everywhere had a lot of garbage. What's more, sewage and a large number of industrial waste water were discharged into the rivers and lakes. In the soot as the main fuel of the city, factories, shops and home stoves discharged a lot of soot, dust, air pollution and smoke filled. This kind of dirty scene which happened in the period of the primitive accumulation of capital in the city and industrial has been described in many literature (Xu, 2000). In London, "Sulphur dioxide rose to mean levels of about 150ug/m^3 as early as the end of the 17th century, and remained as high for another 200 years. These concentrations are really very high, when one considers that annual means of less than 80ug/m^3 are considered desirable in modern industrial cities. In central London last century, stagnant winter conditions must have allowed the SO2, and smoke values to climb to many times their annual mean values ." (Brimblecombe,1977). Recent years, due to the United States and the United Kingdom for the tireless

efforts to improve the environment, the air pollution had been improved in London and cities in the United States, people can see the blue sky again. But it does not mean that London and cities in the United States have solved the environmental problems. And recently, a plenty of other countries are facing the problem now.

In recent years, due to the rapid economic development of the developing countries and the rapid development of industrialization process, a large number of pollutants have discharged to the atmosphere. The problem of air pollution is also getting worse:

"Urban air pollution is a major environmental problem in the developing countries of the world. WHO and UNEP created an air pollution monitoring network as part of the Global Environment Monitoring System. This network now covers over 50 cities in 35 developing and developed countries throughout the world. The analyses of the data reported by the network over the past 15–20 yr indicate that the lessons of the prior experiences in the developed countries (U.S.A., U.K.) have not been learned. A study of air pollution in 20 of the 24 megacities of the world (over 10 million people by year 2000) shows that ambient air pollution concentrations are at levels where serious health effects are reported. The expected rise of population in the next century, mainly in the developing countries with a lack of capital for air pollution control, means that there is a great potential that conditions will worsen in many more cities that will reach megacity status." (Mage et al, 1996)

In India, due to household air pollution resulting from solid cooking fuels, there are approximately 1.04 million premature deaths and 31.4 million disability-adjusted life years. And 627,000 premature deaths and nearly 17.8 million disability-adjusted lifer years to be caused by ambient air pollution in the form of fine particulate matter ≤ 2.5 μm in aerodynamic diameter (PM2.5) (Balakrishnan et al, 2014).

In Mexico, there are millions of children under the air pollutants. With this situation, as some researches showed that in the Mexico City Metropolitan Area megacity, a lot of children have been found the impact on children's brain, such as early brain imbalance (Calderón-Garcidueñas,2015).

In China, the average number of standard days in Beijing, Tianjin and Hebei was only 37.7% in 2013. In addition to the northern region, 10 cities in the proportion of standard days were less than 50%. While the average number of standard days in this region in 2014 was slightly higher than in 2013, it still did not reach 50% (Xiu, 2016).

Developing countries are countries with great potential for economic growth

driven by synergies between technology and trade. To promote their economic development and to improve the status of the global trading system is an irresistible way for developing countries. Compared with the developed countries, developing countries pay more attention to improve labor productivity and the pursuit of international trade brings the economic benefits but at the same time ignores the objective conditions of environmental resources (Zhu, 2007). So that environmental issues are one of the most serious problems facing the international community as a whole, especially the in developing countries.

Tourism is one of the fastest growing industries in China in recent years. According to statistics, China's tourism industry contributed directly to China's GDP of 3.32 trillion yuan, accounting for 4.88% of total GDP in 2015. Total contribution of 7.34 trillion yuan, accounting for 10.8% of total GDP. The number of direct employment for tourism is 27.98 million and the total employment in the tourism industry is 79.11 million, accounting for 10.2% of the total employed population. Direct investment in tourism exceeded the trillion yuan, up to 1007.2 billion yuan, up 42% year on year and had an increase of 10% over the previous year. With the improvement of the living standards of Chinese people, the tourism industry has changed from the early luxury consumption to the daily life part. With the frequency of tourism consumption increased, China has entered the era of mass tourism. However, China's tourism industry compared to other developed countries in Europe and America, there is still a huge gap. First of all, China's tourism infrastructure is still very imperfect. And for China's hug population of consumption, it is clearly that the most people in tourism industry consider to earn more money as soon as possible but ignore the loss in environment. Secondly, the competition of market in tourism industry is lack of order. For example, due to the lack of relevant rules and regulations, many travel agencies only focus on short-term interests, and thus forced consumption. Such as Lijiang tour guide hit the incident. This lack of orderly competition seriously endangers the reputation of regional tourism and affects the development of regional tourism. Finally, due to the rapid development of tourism, in this case, it is difficult to ensure quality. Many tourists in the tourism decision-making and activities in the process of causing irreversible damage to the environment (China National Tourism Administration,2016)[1].

Therefore, China's tourism industry is just like a younger who is in the vigorous development now. But there are still many restrictions on the development of China's tourism industry factors and one of the most serious problem is the environmental problems. With the recent years, a lot of reports of frequent haze and other air pollution shows that air pollution limits the development of urban tourism in some haze serious areas, especially in Beijing-Tianjin region.

[1] China National Tourism Administration(2017). 国家旅游局关于 2015 年度全国旅行社统计调查情况的公报, ”http://www.cnta.gov.cn/zwgk/201609/t20160908_783202.shtml”

And recently air pollution as a focus issue in China, needs to be paid more attention in tourism industry. Cause the air pollution has negative impacts of tourist activities. In Texas, the smell of the plant, the exhaust of the vehicle and the burning of the fuel all make people feel bad about the quality of the air. The taste of the car's exhaust gas and the smell of the factory waste will make people feel that the environmental pollution is very serious (Brody et al. 2004). These negative feelings will influence the choice of tourist destination. What's more, it also has negative impacts in transportation, historical site, transportation etc.

If the developing countries want the tourism industry have a rapid and steady development, negative impacts of air pollution on tourism industry can not be ignored. And China as an important part of developing countries and the world's second largest economy is facing more serious environmental problems. This paper will focus on the study of air pollution in China, and further discuss the deep impact of air pollution on China's tourism industry, so as to contribute to the better management of China's tourism industry.

2. Air pollution in China.

This part is about the air pollution in China. Firstly, the text shows the main content of the Kyoto Protocol. Secondly, there is data of air pollution in China from 2013 to 2014 to show the fact of air pollution in China. And lastly, it shows the actions and measures of Chinese government. With this structure is because it comes to air pollution to know that this is a global problem. China should work closely with other countries around the world to solve the problem rather than to separate from the whole world. China needs to make policies and measures under the guidance of the Kyoto Protocol and then combine with actual national conditions.

"Air pollution is contamination of the indoor or outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere. Household combustion devices, motor vehicles, industrial facilities and forest fires are common sources of air pollution. Pollutants of major public health concern include particulate matter, carbon monoxide, ozone, nitrogen dioxide and sulfur dioxide. Outdoor and indoor air pollution cause respiratory and other diseases, which can be fatal." (WHO,2017)[2]

According to the conception of air pollution form the WHO, air pollution does harm to human being and the whole Earth. So in the whole world, people began to taking measures to mitigate the hazards.

[2] WHO(2017).Air pollution,The World Health Organization, "http://www.who.int/topics/air_pollution/en/"

Because air pollution and climate change are largely due to common causes, that is, mainly caused by the combustion of fossil fuels. So the mitigation and control of air pollution and the reduction of greenhouse gas emissions should be consistent with the action (Ding et al. 2009). In the international world, there is the Kyoto Protocol which is an international community after years of arduous negotiations and the formation of an important legal document to address climate change. And in this protocol, there are several basic elements: First of all, the protocol identified six greenhouse gases that require abatement: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and carbon hexafluoride. Secondly, the reduction targets of the industrial countries are defined. Provides that the overall objective is that industrialized countries will reduce their total greenhouse gas emissions by 5.2% in the period 2008-2012 over 1990's levels. In order to achieve this overall objective, industrialized countries participating in the Convention have been allocated a certain amount of quota for the reduction of greenhouse gas emissions. Thirdly, three flexible mechanisms are put forward, including the "exclusion of sinks","net emissions", and the three flexibility mechanisms (joint implementation, clean development and emissions trading), provide a reasonable and realistic way for developed countries to fulfill their commitments of the channel. Fourth, the provisions of the "carbon sinks". "Carbon sinks" refers to the absorption of carbon dioxide by the land use and land-use change activities in the atmosphere. The Kyoto Protocol provides for changes in greenhouse gas emissions resulting from land-use change and forestry activities resulting from afforestation, reforestation and deforestation and can be used to meet the commitments under the Protocol. In addition, due to the principle of fairness, taking into account the developed countries in its history of the development caused serious damage of the Earth's atmosphere and the needs of economic development in developing countries, developed and developing countries are given different emission reduction targets. Developing countries will not assume any emission reduction obligations during the first commitment period until 2012.

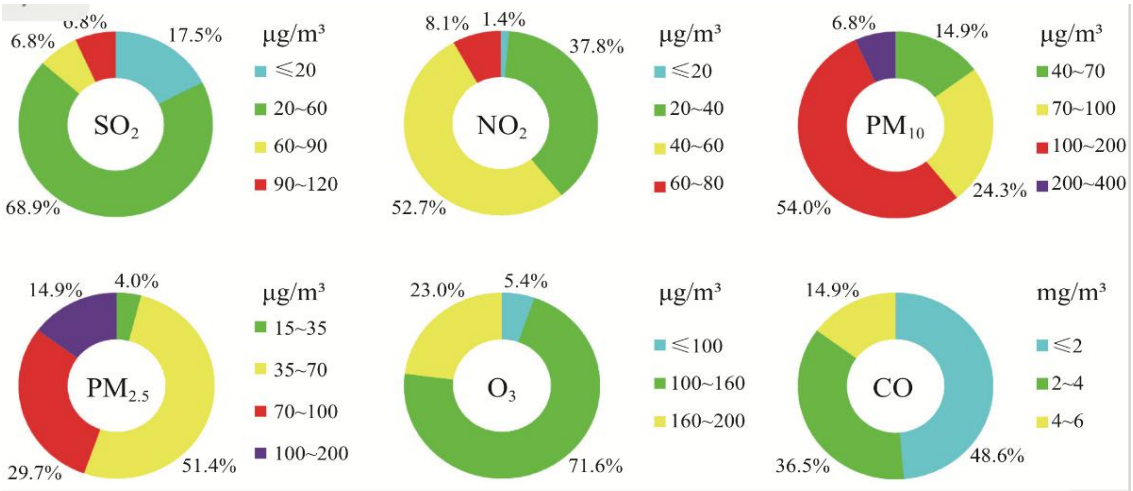
After a global perspective of relevant actions and measures, to analysis the data of the current sate of the environment in China and to understand the relevant domestic measures developed by the Chinese government based on air protection in an international context are necessary. Because it shows the short-term result of policies and measures used by Chinese government. And there are also links between the Chinese measures and the content of the Kyoto Protocol.

2.1 The data analysis of air pollution in China

With the serious air pollution in China recent years, Chinese government has taken note of the serious air pollution and has corresponding measures. However, the comparison of the 2013 and 2014 data shows that although the relevant measures are effective in the treatment of air pollution,this effect is relatively weak. Especially ozone pollution, not only did not improve but also more serious.

In China, the government environmental protection departments monitor 522 cities, of which 319 cities above the prefecture level and 203 county-level cities. And following figures show the percentage of distribution of air quality levels in 74 cities in 2013 and 2014. This classification is based on the People's Republic of China national standards GB3095-2012 “Ambient Air Quality Standards”.

In 2013, 74 cities’ SO2, NO2, PM10, PM2.5 annual average date, CO daily average date and O3 day up to eight hours average date in key areas were evaluated according to “The Ambient Air Quality Standard (GB3095-2012)” : in the 74 cities there were only 3 cities reached the air quality standards, accounting for 4.1%; and the 95.9% of the 74 cities were substandard.

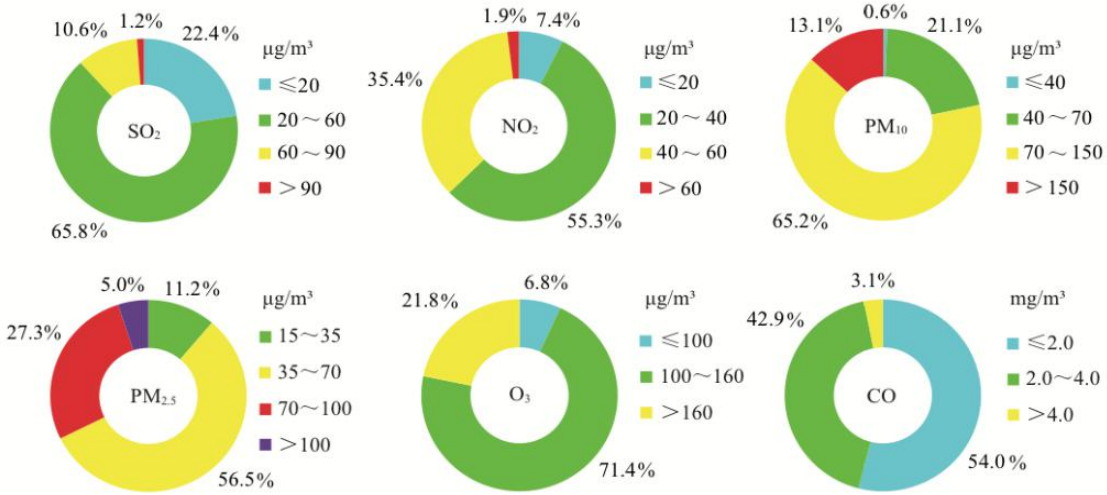


Graph1 2013 indicators of different concentrations of the proportion of the proportion of 74 cities

From the Graph1, in 2013, the range of SO2 annual concentration was from 7 to 114μg / m³, the average concentration was 40μg / m³. The proportion of standard cities was 86.5%.;The range of NO2 annual concentration was from 17 to 69μg/ m³ , the average concentration was 44μg / m³ . The proportion of standard cities was 39.2%; The range of PM10 annual concentration was from 47 to 305μg/ m³ , the average concentration was 118μg / m³ . The proportion of standard cities was 14.9%; The range of PM2.5 annual concentration was from 26 to 160μg/ m³ , the average concentration was 72μg / m³ . The proportion of standard cities was 4.1%; The range of O3 day 8 hours average 95th percentile

concentration was from 72 to 190μg / m³ ,the average concentration was 139μg / m³ . The proportion of standard cities was 77%; The range of CO day average 95th percentile concentration was from 1 to 5.9mg / m³ ,the average concentration was 2.5mg / m³ . The proportion of standard cities was 85.1% (Ministry of Environmental Protection of the People's Republic of China,2013)[3].

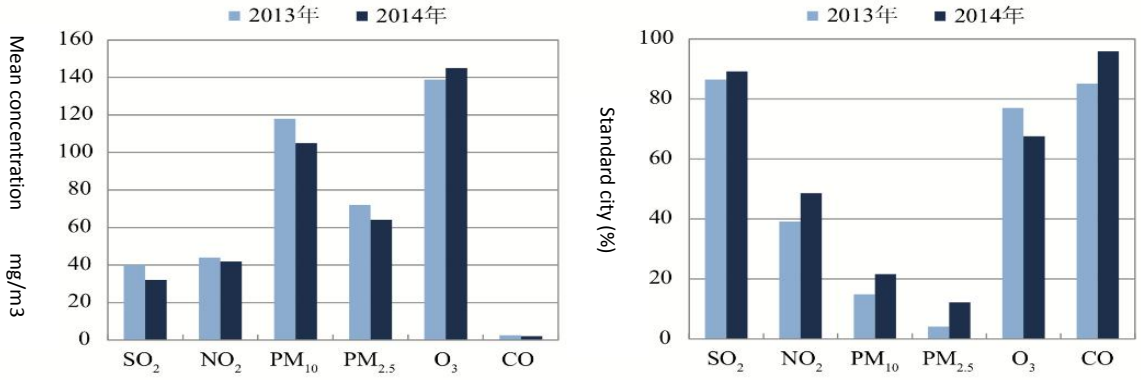
In 2014, on the base of the 74 cities, Chinese government began to monitor the other 87 cities which are called the second stage. In the 161 cities there were 16 cities reached the air quality standards, accounting for 9.9%; and the other 145 cities, accounting 95.9%, were substandard.



Graph2 2014 indicators of different concentrations of the proportion of the proportion of 161 cities

From the Graph2, in 2014, the range of SO2 annual concentration was from 2 to 123μg / m³, the average concentration was 35μg / m³. The proportion of standard cities was 88.2%; The range of NO2 annual concentration was from 14 to 67μg/ m³ , the average concentration was 38μg / m³ . The proportion of standard cities was 62.7%. The range of PM10 annual concentration was from 35 to 233μg/ m³ , the average concentration was 105μg / m³ . The proportion of standard cities was 21.7%; The range of PM2.5 annual concentration was from 19 to 130μg/ m³ , the average concentration was 62μg / m³ . The proportion of standard cities was 11.2%; The range of O3 day 8 hours average 90th percentile concentration was from 69 to 210μg / m³ ,the average concentration was 140μg / m³ . The proportion of standard cities was 78.2%; The range of CO day average 95th percentile concentration was from 0.9 to 5.4mg / m³ ,the average concentration was 2.2mg / m³ . The proportion of standard cities was 96.9%.

[3] Ministry of Environmental Protection of the People's Republic of China(2017). 2013 中国环境状况公报, "http://www.zhb.gov.cn/hjzl/zghjzkgb/lnzghjzkgb/201605/P020160526564151497131.pdf"



Graph3 The first phase of 2014 monitoring the average urban concentration and the proportion of cities in compliance with 2013

In 2014, compare the 74 cities of the first phase with the year 2013, the range of SO2 annual concentration was from 6 to 82μg / m³, the average concentration was 32μg / m³, drop 20%. The proportion of standard cities was 89.2%, up 2.7%;The range of NO2 annual concentration was from 16 to 61μg/ m^3 , the average concentration was 42μg / m^3 ,drop 4.5%. The proportion of standard cities was 48.6%, up 9.4%; The range of PM10 annual concentration was from 42 to 233μg/ m^3 , the average concentration was 105μg / m^3 , drop 11%. The proportion of standard cities was 21.6%, up 6.7%; The range of PM2.5 annual concentration was from 23 to 130μg/ m^3 , the average concentration was 64μg / m^3 , drop 11.1%. The proportion of standard cities was 12.2%, up 8.1%; The range of O3 day 8 hours average 90th percentile concentration was from 69 to 200μg / m^3 ,the average concentration was 145μg / m^3 , up 4.3%. The proportion of standard cities was 67.6%, down 9.4%; The range of CO day average 95th percentile concentration was from 0.9 to 5.4mg / m^3 ,the average concentration was 2.1mg / m^3 , drop 16%. The proportion of standard cities was 95.9%, up 10.8% (Ministry of Environmental Protection of the People's Republic of China,2014)[2].

According to this data, air pollution still needs to be focused. Although the situation have been a little bit better, but still needs more process and policies to make a good improve in the future. Government needs to develop more powerful air pollution control policies to improve the serious situation.

2.2 Relevant actions and measures by the Chinese government.

China as one of the important part of developing country, responding the protocol quickly. Firstly, the government issued the Air Pollution Prevention Law with a clear local government responsibility and a substantial increase in penalties. And strengthen regional cooperation. Establishing air quality

objectives to improve the early warning system, quarterly to the provinces (autonomous regions and municipalities) people's government to inform the air quality improvement situation and improving the obvious provinces and cities in recognition of the slow progress. Secondly, promoting pollution control in key industries, Issuing the petrochemical industry VOCs pollution source troubleshooting work guide and petrochemical enterprise leak detection and repair work guide to enhance the petrochemical industry VOCs pollution prevention and to control the fine management level at the same time to improve the operational measures. Thirdly, motor vehicle pollution prevention and control. Strengthen the new production of motor vehicle environmental standards supervision, actively promote new energy vehicles and actively promote the improvement of oil quality which means that the national comprehensive supply of four standard vehicle gasoline and diesel and Beijing, Tianjin, Shanghai and other places are the first supplier of five standard vehicle gasoline and diesel (Liu, 2015).

3. Impacts of air pollution on tourism industry

In 2012, in China's major cities began appearing frequent haze phenomenon, PM2.5 was included in the detection of the atmosphere for the first time. After that, the haze pollution was continued hot and attracted the whole society's attention. The decline in air quality and visibility caused by haze not only induced traffic paralysis, flight delays, breathing sensitive population of high disease, but also led to people's own health concerns. According to the study estimated that in January 2013 the haze invasion, the national direct impact of traffic and health is estimated at about 23 billion yuan, resulting in emergency and outpatient health economic losses are non-haze cases of nearly 2 times (Quan et al. 2013). With the deteriorating air quality, people's perception of their risks has touched on all aspects of life, including employment, study, tourism, business investment and so on. China Tourism Research Institute published the "China Inbound Tourism Development Annual Report 2014" pointed out that the current air quality has become a major factor restricting China's inbound tourism (China Tourism Academy, 2014)[4]. In this part will show the impacts of air pollution on tourism industry especially the pollution of haze. And the part will firstly focus on the haze, due to the significant harm in Beijing: in early 2014, due to take into account the international tourists to travel to Beijing may suffer from the health risks of haze, Beijing was included in the warning destination by Wiki Travel. And then we show the impacts on the international tourism area.

[4] China Tourism Academy(2017). 中国入境旅游发展年度报告 2014, "http://www.ctaweb.org/html/2014-10/2014-10-20-16-9-37401.html"

3.1 The influence of haze's perception.

This part mainly analyzes the main area of Beijing. The reason is that China's research and monitoring of haze just started around ten years ago, so the relevant data and literature are lack.Compared to all the data, only the relevant content of Beijing is the most comprehensive and specific. Therefore, Beijing is as the main research area.

3.1.1 Beijing residents' perception of haze.

According to a research: Firstly, In the case of frequent haze, the vast majority of Beijing residents could feel the negative impact of haze on the visual and olfactory way. Most of the residents of Beijing felt that Beijing is facing a very serious haze problem. Most residents could directly feel the harmful substances in the air was damaging the human body. In addition, the haze on the residents of the psychological impact also occurred: most residents felt depressed, irritability and anxiety in haze day. Secondly, the needs of Beijing's residents to escape from the haze were very strong. When the heavy haze struck, most residents had the desire to flee Beijing, and more than half of the respondents wanted to travel to other destination with a clear decision making tendency: more like fresh air travel destination. Thirdly, there were significant differences in the attitude and perception of haze in different groups of residents: In general, women were more sensitive to haze than men; middle-aged and young people were more aware of haze than the elderly; high-income people are more sensitive to haze than low-income people; haze awareness was higher in the high-educated people than the low; employees of enterprises, institutions, private owners and individual business people were very sensitive to haze. However, farmers, soldiers and students' sensitivity of haze was relatively low; the population of living in Beijing for a long time was more sensitive than those with short time (Peng et al. 2016).

All of these show that haze has a strong negative impact on the feelings of Beijing residents which further affects the tourism related decision making behavior of Beijing residents and directly negatively influence the tourism industry in this area.

3.1.2 Mainland Chinese residents' perception of the risk caused by haze.

Mainland residents had a strong sense of health risks caused by haze in Beijing and more than 90% of respondents had known or heard haze. 93.6%agreed or strongly agreed that the serious haze had harmful substances;

92.5% agreed or strongly agreed that the problem of Beijing's haze is very serious; 89.4% who travel to Beijing was likely to suffer haze; 90.8% thought that traveling to Beijing in haze day would damage the health; less than 10% of the respondents disagreed that the haze would damage the health.

Mainland residents also had a perception of tourism experience risk caused by haze in Beijing. In haze days, the air visibility greatly reduced will damage the scenery and the quality of tourism photos. Therefore, for the characteristics of arrival of high frequency, the degree of heavy, wide range of haze in Beijing, the quality of their tourism may face a certain risk. 94.8% of the respondents considered that the haze would influence their experience of tourism. 92.4% of the respondents considered that the haze would influence the transportation of the tourism.

Mainland residents' thought of the impact of the reputation of Beijing. Cause the haze became a hot issue, the reputation of Beijing as a destination had been injured a lot. The majority of respondents thought that the haze injured the reputation of Beijing and thought that Beijing had been a "fog city".

And for the mainland residents, 81.3% thought that they would not travel to Beijing during haze days; 87.2% would do protection method to protect from the haze during their traveling of Beijing; 79.3% thought that during the haze days, they would persuade their family members and friends do not go to Beijing. And for the mainland residents' also had similar group differences as the Beijing's residents (Peng et al, 2016).

3.2 The influence of haze on the inbound tourism.

3.2.1 The influence of haze on the amount of inbound tourism of Beijing.

In 2016, two researchers used the monthly data of 2013 and 2014 of the number of inbound tourists and the number of days of air quality in Beijing , and analyzed the correlation between the two. The result was: There were positive correlation property between the number of inbound tourists and the number of days with standard air quality in Beijing both in 2013 and 2014 (Yan& Zhang,2016). And also from the other research also showed the same result (Li& Zhao,2016) :Haze days on the impact of the number of inbound tourists in Beijing was very obvious. And all of these described the dependence of the tourism industry on the environment and the sensitivity of the tourism industry to the environment.

3.2.2 The influence of haze on the amount of inbound tourism of China.

Based on the data analysis of Beijing, Tianjin and Hebei in 2005-2004, it is concluded that haze pollution will have a significant negative impact on incoming passenger traffic. Fog haze pollution increased by 1% for each time, traffic will drop 0.6% (Gao et al, 2016). According to the analysis of data of Beijing, Shanghai and Guangzhou from 2013 to 2016, showed that Beijing and Guangzhou's inbound tourists network concerns had no relation with the haze index. Shanghai's inbound tourists network concerns had relation with haze index: haze weather index for each rise of 1 unit, Shanghai inbound tourists network attention down 68.687 units; Through the analysis of the number of days of inbound tourists' flow and the number of air standard days, the haze weather in Shanghai and Guangzhou had no effect on the number of inbound tourists, but the haze weather in Beijing had an impact on the number of inbound tourists: the percentage of air quality standards is reduced by 1 percentage point and will reduce the number of inbound tourists by 44.5558 million; The overall impact of haze on potential inbound tourists varies from city to city: the impact of haze on potential inbound tourists in Beijing was 3.63, the impact on potential inbound tourists in Shanghai was 3.57, and the impact on potential inbound tourists in Guangzhou was 3.43.

3.3 The influence of haze on resources, transportation and body.

Haze and other air pollutants in addition to the people's tourism decisions and feelings have a negative impact, for the tourism facilities, the destination of the natural cultural landscape, transportation and so have a profound impact. So in this part, will focus on the haze's negative impact for tourism resources, transportation and health.

3.3.1 The influence of haze on tourism resources.

Haze affects the water quality and water landscape. December 2013, due to haze, Hangzhou West Lake waters temporarily closed (Zhejiang Communications,2013)[5]. Haze and other air pollution will have a certain impact on the biosphere, biodiversity and ecosystems (Maibach, 2008). Haze has a negative impact on the remains of the site and the traditional festival activities. In the haze days, the attractive festival activity maybe cancel or delay. And the haze will also do harm to the old buildings.

[5] Zhejiang Communications(2017). 杭州西溪水域因雾霾临时封航, "http://www.zjt.gov.cn/art/2013/12/9/art_17_723149.html."

3.3.2 The influence of haze on tourism transportation.

Haze has the impact on tourism transportation, especially in the tourism transportation's safety and daily operation (Hein et al,2009), mainly related to civil aviation, highways and water transport: on the one hand, haze affects the aircraft takeoff and landing which will lead to the occurrence of flight accidents (Koetse et al. 2009). Haze also leads to a large number of flight delays or cancellations. Due to the forced landing, return...caused by haze, the airlines and tourists will face great losses that making the tourists' scheduled trip be delayed or canceled. For example, in Beijing, low visibility pollution caused by air pollution had caused non-punctual traffic nearly 4000, about 8000 takeoff and landing and the affected tourists were nearly 50 million people (Zhao, 2011). More seriously, the failure to forecast the heavy haze timely will reduce aviation visibility and easily lead to flight accidents. On the other hand, in the days of low visibility caused by haze, easily happen traffic accidents of tourism car; and if the highway is temporary limited or closed due to the bad weather, it is easily to lead to a travel delay or cancellation which will also increase uncertainty of the travel. What's more, serious haze can also affect the operation of the water transport facilities which may lead to temporary outages.

3.3.3 The influence of haze on tourists' body.

PM10 is one of the major air pollutants (Hein et al. 2009). Exposure to such contaminants for short-term or long-term may increase the incidence and mortality of tourists, such as increased acute asthma in children, increased respiratory and cardiovascular and other diseases of the hospitalization rate and mortality (Brunekreef et al. 2002). Particulate matter as the main component of haze, does great harm to the health of tourists: can breathe into the bronchus, lungs and produce precipitation. Long-term role prome to bronchial inflammation and so on. In the haze days, the air relative humidity increases and when tourists in the outdoor leisure activities, body sweat can not be ruled out and lead to increased blood pressure, chest tightness and so on. The impact of haze on physical health and human life is obvious, however, the impact on human psychology and spirit is easily overlooked by us (Carter et al. 1976). The appear of frequently extreme weather events and the spread of infectious diseases caused by haze will make visitors to have a fear of travel and the formation of social impact is not conducive to tourism. All in all, haze weather can have a serious impact on the physical and metal health of tourists.

4. Conclusion

Air pollution is one of the focus issues in China recently. The impact of air

pollution on the tourism industry is omnidirectional: firstly, haze pollution has a bad effect on traffic and public health in haze areas. Secondly, the climate is the key to support tourism resources and attract factors and has a direct impact on the comfort and satisfaction of tourists. And the haze caused by air pollution has a significant impact on tourism-related activities, which will further affect the economic development of air pollution areas. Every sectors of tourism industry should pay more attention on environmental protection, further strengthen the promotion of sustainable tourism and have a thorough system optimization.

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