

Path Study on the Strengthening of Haze's Prevention

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ABSTRACT: Beijing-Tianjin-Hebei Region is one of the areas which haze can be usually seen. The basic reason of haze is pollution, weather and geography conditions, which is only external cause. Pollution remediation and governance haze have become top priority in Beijing-Tianjin-Hebei Region, even in national ecological civilization. This article means to provide theoretical basis for comprehensive treatment of haze in our country by analyzing theoretical and technical measures about governance haze, combining the actual situation in Beijing-Tianjin-Hebei Region to search the way for governance haze from construction of ecological agriculture and enhancing the environment. These include: eliminate straw burning and develop mushroom cultivation industry which straw is raw material. This can not only prevent haze, but also a good solution to solve the re-employment of peasants during the urbanization. Based on the theory that green plants can absorb pollutant, carry out the construction of urban road greening, residential greening and square greening.

Haze-prone is a miniature of “growing pains” which rapid developing China is suffering. Beijing-Tianjin-Hebei region is one of the areas that haze happens frequently. Haze has become a reality question which influences people’s healthy and usual life. So it is very important to manage haze in China. Therefore, combining the actual situation in China and searching for the path to manage haze is a most important part in ecological civilization construction. Which can be done through recognizing the pollution source of haze, list pollutant, dialectically view the measure that has taken, and analyze shortage, learn from the successful techniques and experience of other countries.

THEORIES AND MEASURES OF HAZE GOVERNANCE IN OTHER COUNTRIES

From 19th century to the 1980s, London has become the world-famous “Fog”. Especially the smog events happened on December 4th 1952, which 8000 people died and was called “London Smog”. This became one of the top ten environmental hazard events in 20th century. Therefore, the UK government started to manage the environment. Create eco-social while achieve industrial transformation, people started to rethink their consumption view and ethics by the influences, the haze brought to the environment and people’s life, which medias broadcasted in 1955, London considered the construction of “city green belt” as an important measure to control city planning in legislation to improve urban greening rate. In order to change the urban energy structure and raise the proportion of clean energy, London promulgated the first bill “The Clean Air Act”, which is about air pollution controlling. It is clearly defined that banning coal in the city and set up non-smoking zone; Heavy industrial facilities and power plants must close and rebuild the suburb; Transform coal stove to natural gas for urban population; Taking central heating in Winter to reduce the amount of heating fuel. In the end of mid-20th century, the total smog emissions of London declined 37%, the days of haze annually had down to 30 days. Later, “Pollution Control Act” and a series of laws and regulations were promulgated. With legal protection, expand greenbelt and awarding Green Medal to the businesses and government agencies that performed well in energy conservation and environmental protection in business. After the effort of UK government, the source of industrial pollution had been transformed from city center to city outskirts in 1970s. After that, industrial pollution almost disappeared in London city, energy structure changed accordingly, emissions of soot de-

clined significantly in the city, and haze in the London city had become well fundamentally. Since then, London continued to promote the construction of “City Green Belt”, expand the urban green area, increase urban natural surface coverage, reduce particles of dust content in the air, so that the urban air quality improved clearly.

Los Angeles, industrial city in America, suffered the air pollution at the beginning of 20th century. Especially the “Los Angeles Haze” happened in 1943 and “Photochemical smog” which happened later made the Los Angeles government determines to manage haze. After several years, it formed a series of solutions and experiences. They focused on the instruction on vehicle and power plants. The American government in 1955 passed “Air Pollution Control Act”. Environmental agencies have the power to legislate, enforce the law and punish, and work by combining monitoring, technical improvements and enforcement. After “Clean Air Act” was promulgated in 1970, America took a lot of measures and ways to manage. That includes: cars sold after 1994 must have “Diagnose System” to guarantee that the car is “clean”; Increase parking fee and encourage ride sharing to decline exhaust; The government encourages people to buy clean fuel vehicles through low-interest loans and subsidy.

THEORIES AND MEASURES OF HAZE GOVERNANCE IN CHINA

Standards” was passed by State Council executive meeting, which was convened by Premier Wen Jiabao. This standard increases the concentration limits of PM2.5. On November 2012, 18th CPC National Congress made a strategic decision that “Promote the construction of ecological civilization” which was based on the new historical starting point. That means the construction of ecological civilization, economics, politics, culture and society should rely on each other to form the overall plan of building socialism with Chinese characteristics and promote economic, political, cultural, social, and ecological progress. All of these show that China think highly of environmental protection and haze governance.

18th CPC National Congress brought the construction of ecological civilization, economics, politics, culture and society into the overall plan of socialism with Chinese characteristics and formed the strategic thinking that promote economic, political, cultural, social, and ecological progress. This is the first time for CPC to put ecological civilization on such an important place. Through this we can see that the CPC and our country’s determination for environmental protection and pollution governance. The so-called “ecological civilization” means the level of environmental protection about “air”, “water” and “soil”. Cleaning air is the first and necessary conditions for people’s living. Haze governance has become top priority in the construction of ecological civilization, because of the situation that haze happens frequently in our country, especially in Beijing-Tianjin-Hebei region.

MEASURES FOR HAZE CONTROLLING

Improve the construction of agricultural and ecological civilization

Text Relatively stable pollutants in the air are a most important condition to form haze. It will have bad influence for people’s health if they stay in the haze for a long time. Particulates that are smaller than 2.5 micron can get into the human tissues by alveolus, lymph or blood circulation through breathing and this can cause diseases. Most of the fine particulate matter and its precursors pollutants in the air come from industrial pollution, life pollution, agricultural pollution, vehicle emissions, dust from site, powdery materials storage site and so on. Among them, agricultural pollution mostly comes from dust of agricultural land, fertilizer abusing and agricultural waste like straw’s burning.

Develop the edible mushroom planting industry which straw is raw material

Serious air pollution happened around Beijing on October 9 2014. A survey showed that the most of the pollution came from straw burning in Shandong and Henan during National Day. Depend on the “Satellite Remote Sensin monitoring for straw burning points in the country from September 29 to

October 5 in 2014” published by the environment ministry on October 8, there are 74 suspected straw burning points in 11 provinces were monitored in the country. From the strength of straw burning points, we can see that the first five provinces which is depended on the fire points per one thousand hectares of arable land are Shandong (0.003), Henan (0.0028), Liaoning (0.0015), Hebei (0.0009) and Fujian (0.0007). Straw is not the main fuel with the improving of agricultural mechanization, developing of rural economic level, spread of coal and liquefied gas. This leads to the situation that straw burning becomes more serious. This straw treatment can not only waste the natural resources, but also pollute the environment. Straw burning will make a lot of aerosols, which will lead to different levels of haze and provide condensation nuclei for droplets’ formation. So it is very important to broadcast the harm of straw burning, change the treatment to straw, turn it into advantage and reuse it.

Actually, almost half of the product from crop’s photosynthesis appears in straw. Straw that after the harvest of cotton, food crops, oil crops and sugar-yielding crops has rich crude protein, crude fat, carbohydrate and so on. These are necessary nutrient substance for mushroom’s growing. Most studies proved that consider straw as growing media for mushroom is practicable. Ecto-enzyme that secret from mushroom’s hypha in the straw matrix can degrade cellulose, hemicellulose and lignin, turn crude fibre into the high quality protein which people can eat. After studied and analyzed the rice straw that plant *Pleurotus pulmonarius*, Zheng Guohua found that crude fiber content reduced 45.45% compare to that before inoculation, the quality of crude protein increased 31%-61.22%. So taking straw as matrix to plant mushroom can not only realize the efficient use of straw, but also develop multi-cycle models. Liang Zhirong and other people had created a new and efficient technique which use corn straw as main ingredient to plant *agaricus*, its profit can get more than 2250 thousand yuan per hectare. It also has good social and economical benefits. Using ginger that after treatment to plant oyster mushroom and using rice straw to plant *Pleurotus pulmonarius* and *agaricus blazei murill* has also got good economical benefits. Developing ecological agriculture and using straw to plant mushroom not only can be done, but also solve the reemployment of peasants during urbanization. The amount of land-lost farmers became bigger and bigger with the urbanization. How the land-lost farmers live has become one of the most important problems about “Three Rural Issues”. The key to solve the land-lost farmers problem is to get a job for them. Develop mushroom industry by taking crop straw as raw material for producing mushroom, and the industries can provide a lot of jobs, which benefit the land-lost farmers. Take a mushroom processing enterprises which can produce 40 thousand bacteria stick by putting into 15 thousand materials per year as an example, It can provide 200 jobs. It needs a person to produce 10 thousand for planting mushroom, which means it can offer jobs for thousands of people. Mushroom industry is an efficient industry, which can help farmers to get more. Suppose that plant 10 thousand mushroom per acre, it can get mushroom 80-100 ton and get almost 60 thousand yuan. After deduct the prime cost, it can get 20 thousand yuan, which amount to 20 acres’ net income, 2-3 times of the profit by planting fruits and vegetables.

Therefore, planting mushroom by taking straw as matrix can not only get economical and ecological benefits, but also social benefit. It can not only benefit farmers, but also reduce the pollution from straw burning and protect forest resources.

Standardize the using of chemical fertilizer

Abusing of chemical fertilizer in agriculture can pollute the soil and make hydroxide residue of agriculture products. It is also the main source of hydroxide pollution in the air and water. Abusing of chemical fertilizer has become one of the most important causes of haze, which is after industrial production and vehicle exhaust. Causes of PM 2.5 are very complex, which include primary particulate that directly discharged from burning smoke, and secondary particle that formed by the chemical reaction of pollutant in the air. The secondary particle is one of the main contributors to stable haze, which is also the most difficult point to govern the air, while ammonia is the basic cause of the formation of most secondary particle in PM 2.5. Ammonia, NH₃, colorless gas and odor are eas-

ily soluble in water, and they are the main material to make fertilizer and explosive. Large number of ammonia fertilizer that used in the agriculture and the expanding of livestock farming are the main sources of ammonia in the air. However, treatment of ammonia pollution did not cause the attention of relevant departments. Developing ecological civilization, rational fertilization, improving of organic fertilizer, promoting of efficiency techniques by saving water and fertilizer, improving the utilization ration of ammonia fertilizer, controlling ammonia pollution are part of comprehensive treatment of haze.

Strengthen the urban greening

Urban greening is the main content of ecological civilization in the city. Plants' adsorption of particulate in the air cannot be ignorant. We should reduce pollution sources for the pollution that not happen. For the pollution that has appeared, it can only be done by adsorption and digestion of plants. So based on the theory that plants can adsorb pollutants to make road greening in city, community greening and square greening is an effective way to reduce haze. But there are differences between our country and western countries. Western countries have less people and broad ground, while we have 1.3 billion people and it is crowd. Skyscrapers can be seen in cities, and ecological environment is damaged there. The ratio of buildings, roads and greening in our country: all kinds of buildings are 75%, roads are 20%, and public greenings are no more than 5%. There are some advises to improve the level of urban greening and reduce haze.

Make laws and regulations to prove the rate and volume of greening

We can learn from Japan to make and perfect laws and regulations. Make rules that new buildings must have greenbelt and roof greening. Greening in Tokyo is more trees and less grass, which requires area and volume of greening. However, there is no laws or regulations about the standard of the construction of urban greening. So it the urgent priority to perfect relevant laws and regulations, form law system of urban greening, strengthen the construction and management of urban greenbelt, and make urban greening legislate step by step.

Develop and expand roof greening

Roof greening is a new way of greening, which means to plant trees and flowers on the roof, terrace, rooftop and balcony of all kinds of buildings, structures and bridges, or on the large artificial rockery and mountain. This model can fix the shortage of urban greening and change the single environment that only has reinforced concrete in the city. Just like ground greening, roof greening has similar affection on ecological environment and it is the compensation of ground greening. It is important for urban ecological environment to green these areas for the area of roof is big and many of them can be use for roof greening. It is ruled that new buildings that more than 1000m² should have 20% of roof be covered by green plants, or there will be fine in Tokyo. The ratio of roof greening has been to 14% in Tokyo. Germany has already had 900m² roof greening in 1990, and only roof greening in Hanover revived 50% greenbelt. Roof greening takes only 30% of the area of the city in our country, so it is the best choice to expand roof greening and increase the area of urban greening for changing ecological environment.

The choice of tree species for greening

Take advantage of the plant to absorb the suspended particulate matter in the air. Usually, it is more efficient to choose plants that leaves are big, crude, pubescent and it can secrete mucus, like sycamore, mulberry, paper mulberry and so on.

Flowers also can clean the air. It can reduce the dust in the room by planting some green plants, such as mint, money plant, fishtail palm, cactus, pomegranate, pink, evergreen, lucky bamboo, ping tree, bracket plant, rubber tree and so on. These plants can reduce more than 62% respirable particulate matter in the room.

CONCLUSION

This article provides theoretical foundation for comprehensive treatment of haze by analyzing theoretical and technical measures of haze governance at home and abroad. Propose ways of haze governance from the construction of agricultural and ecological industry and improving environmental greening by combining the actual situation in Beijing-Tianjin-Hebei region.

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