Research on Classification and Disposal of Urban Waste in China

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Abstract

Since reform and opening up, China's economic development is rapid, ordinary residents living standards improved significantly, however, China's living garbage output is in constant growth, the effective management of daily life garbage has become the important factors that affect the sustainable development of city of our country, living garbage management work directly determine the development level of the city. As a neighbor of China, Japan has rich experience in the classification, recycling and treatment of household waste. By deeply studying the classification system and disposal mode of Japanese household waste, the paper finds out the places that can be used for reference, and analyzes the actual situation of our country, so as to put forward scientific and reasonable Suggestions and measures for the problem of household waste faced by our country before that year.

Keywords

Environmental protection,city garbage,classification process.

1. Introduction

In his report to the 19th national congress of the communist party of China, comrade Xi Jinping pointed out that only by strengthening the disposal of solid waste and garbage can we achieve a sound urban living environment. In the five years since the 18th national congress of the communist party of China, China's urbanization rate has increased by an average of 1.2% annually, and the living standards of urban residents have also been continuously improved. Among them, Shanghai, Beijing, Chongqing, Guangzhou, Shenzhen and Chengdu are the cities with more than 5 million tons of domestic waste. The characteristics of China's municipal solid waste are: complex composition, high moisture content, increasing organic content, its storage occupies a large number of land, garbage surrounding the city, is easy to cause a series of environmental pollution problems, causing harm to the atmosphere, groundwater and soil. In addition, garbage may contain pathogenic bacteria and parasitic eggs, affecting the physical and mental health and even life safety of urban residents. Of course, municipal solid waste can also be used scientifically in accordance with the 5R principle. Combustible organic matter can generate heat after being incinerated, and methane and other gases generated by landfill fermentation can also be recycled and treated comprehensively to turn waste into treasure.

The treatment of municipal solid waste is not achieved overnight. It is a systematic project, involving many technical fields and complicated technological process, with unclear responsibility subjects and high comprehensive level. From 1980, Japan gradually established a set of strict garbage classification system. Japan produces the least waste per capita in the world, 410 kilograms a year. At the same time, it is also the country with the best garbage classification and recycling in the world, which has won the reputation of "zero waste" today. However, Japan is also a development stage from the simple mixed collection and landfill treatment to the classified collection and incineration reduction treatment to the current recycling.

At present, the domestic urban life garbage recycling is the main development direction, then the comprehensive treatment, the effective use of resources, but also due to the economic development level and across differences in emphasis, make garbage disposal rate and the treatment is different, most of the city life garbage standardized treatment have just started, the future development prospect.

2. Status Quo of Urban Waste Classification and Treatment in China

At the present stage, China's garbage classification is still in its infancy, and the implementation effect is not satisfactory. Shanghai, Beijing and other cities in China take the lead in implementing strict garbage classification system, but most urban garbage collection is still based on mixed collection, and there is hardly any classification in the garbage collection process. The collection and transportation of garbage in living quarters generally take the following ways: the household garbage is sent to the garbage cans in the community by residents, and then collected by sanitation workers and transported to the garbage transfer station by garbage trucks. Garbage cans in most residential areas have no sorting function, nor do sanitation workers carry out sorting in the process of collection and transportation. Generally speaking, garbage cans in public places in the city have sorting function, including recyclable and non-recyclable garbage cans. However, generally speaking, the classification is not careful enough. In the process of using garbage cans, most residents failed to properly put them in due to the lack of classification awareness and insufficient understanding of classification. Even if it is placed correctly, the garbage trucks used by sanitation workers to collect and transport garbage are not classified, but still collected in a mixed manner. This problem is more obvious in central and western cities. On the one hand, there is a lack of classified delivery equipment, and almost all garbage is collected by mixed collection. On the other hand, even if the corresponding equipment is configured, the correct utilization rate is low.

China's pilot waste classification work is progressing with difficulty. At the beginning of this century, the ministry of construction selected several pilot cities such as Beijing, Shanghai, Nanjing, Xiamen, Guangzhou, Hangzhou, Shenzhen and Guilin from all major cities in the country to carry out garbage sorting. However, the implementation effect of garbage classification in pilot cities is poor. By contrast, some large cities are better at garbage classification and collection due to their developed economy and high population quality. On the one hand, due to the weak environmental protection consciousness of Chinese residents, they have no concept of garbage classification and recycling, lack of initiative, and find it tedious and useless. On the other hand, some residents are not very clear about whether a certain kind of garbage is recyclable or non-recyclable, so they can't release it correctly. In addition, in the process of garbage collection and transportation, the phenomenon of classified garbage remixing is very common, which is related to the awareness of collection and transportation personnel and the matching of collection and transportation equipment. The publicity and popularization of garbage classification and recycling need to be strengthened. On the one hand, the government needs to support a series of policies and increase the investment in publicity and education. On the other hand, the active participation of residents to cooperate with the garbage classification work.

3. The Main Problems of Urban Garbage Classification and Disposal in China

3.1. Waste Disposal is Under Great Pressure

China's annual garbage collection volume is about 170 million tons, which has surpassed the United States and become the world's largest producer of solid waste. Among them, about 36%

are incinerated and over 60% are still landfill disposal. With the improvement of people's living standards, the amount of waste increased greatly, increasing the actual pressure of waste disposal.

3.2. The Dual-track Garbage Collection System Nourishes the Wrong Recycling Concept

China's garbage recycling into formal channels and informal channels and informal channels. Informal recycling system plays an active role in waste reduction and recycling, but its collection and transportation mode of "selling garbage" hindering the establishment of garbage charging system, and nourishes the wrong concept that residents classify garbage according to "selling money" and "not selling money". At the same time, the informal recycling system "intercepting" valuable waste in advance, which makes the regular recycling enterprises unable to use the income from renewable resources to reduce the disposal cost of non-renewable waste. According to Japan's waste disposal law, waste recycling must be qualified and approved for range adjustment, time change or suspension. Otherwise, illegal activities may face huge fines or even punishment.

3.3. Burning Enterprise Integrity Mechanism is Missing

China has not yet established a sound social integrity mechanism for enterprises, and the punishment for tampering with emission data and exceeding emission standards will not directly have a serious impact on their social credit. On the one hand, the information transmission of the faithless lags behind, which is not easy to be found. On the other hand, because of the high cost of recovery, even court decisions are not always enforced, so victims have no incentive to punish those who break faith.

3.4. Nimby Problems Plague Local Governments

The not-in-my-back-yard effect has happened in many countries in the world. The causes of nimby problem in domestic waste incineration facilities in China are complex. Even though the incineration facilities can fully discharge to the standard and experts and scholars actively participate in the scientific explanation, the public resistance is still difficult to alleviate. At the same time, many countries have a complete set of public participation mechanism and compensation mechanism in the face of the possible deterioration of urban quality in some regions and the loss of tangible or intangible assets, such as the living conditions of citizens and the housing price. However, China has not formed a unified understanding on the compensation of residents around the incineration facilities.

4. Current Status of Garbage Classification in Japan

Thanks to an orderly system of sorting and collecting rubbish, Japan's streets are clean without bins and its population is dense without mountains of rubbish piling up. Japan usually divides garbage into the following four categories: (1) general garbage, including kitchen waste category, paper scraps category, vegetation category, packaging category, leather products category, container category, glass category, tableware category, non-resource bottle category, rubber category, plastic category, cotton white shirt clothing wool category. (2) combustible resource waste, including newspapers, cartons, paper boxes, magazines, old cloth, milk drinks in paper boxes. (3) non-combustible resource waste, including beverage bottles, tawney bottles, colorless transparent bottles, bottles can be directly reused. (4) large pieces of garbage that can be broken, including small household appliances, metal, furniture, bicycles, ceramics, pots of irregular shape, bedding, straw mats, long chains. Japan not only has fine garbage classification, but also has specific requirements for different garbage disposal laws. Such as: kitchen waste need to drain the water wrapped in newspaper, sticks cut into about 50 cm of the length of the binding, cooking oil or waste oil needs to be wiped clean with a cloth, bottle mouth with

newspaper closure, milk boxes as far as possible recycling to the supermarket at the door of the recycling box; Items containing metal or ceramic are "non-combustible waste" and hoses need to be cut to 30cm in length. Plastic bottles to unscrew the cap, remove the plastic trademark, wash the bottle with water, squash the bottle, into a transparent or translucent plastic bag; Garbage pockets with fluorescent sticks, dry batteries and thermometers must be marked with the word "harmful". Thermometers without mercury are classified as "non-combustible garbage". Handling large amounts of waste requires making an appointment by phone and paying a "disposal fee", among other things.

5. Characteristics of Garbage Classification in Japan

5.1. Fine Classification and Timely Recovery

Japan's large garbage classification has combustible, non-combustible, resources, coarse waste, these categories are subdivided into several sub-projects, each sub-project can be subdivided. A cigarette case, for example, with the paper inside, the plastic wrap around it, and the aluminum foil around it. The cigarette case is divided into three categories: plastic for the cover, paper for the box, and metal for the aluminum foil, so the item is divided into three categories. In previous years yokohama has broken down the five categories into ten and issued a 27-page manual with 518 items to each citizen.

In recycle respect, although did not establish classified dustbin, also can have specific regulation to the specific time specific place specific rubbish bag that throws rubbish, pull in time by special person. For example, in the Tokyo port area, combustible garbage is collected every Wednesday and Saturday morning, non-combustible garbage is collected Monday morning, and resource garbage is collected Tuesday morning. In many communities, the rule is to drop trash before 8 a.m., or until noon, but all are removed the same day, without polluting the environment or attracting pests and crows.

5.2. Management in Place and Appropriate Measures

Every December, every household receives a special "calendar" for the coming year. The date of each month is marked by yellow, green, blue, red and other colors. Each color represents what kind of garbage can be dumped that day. The almanac is also equipped with cartoons of various kinds of rubbish, telling people what is included in the non-combustible rubbish and what is included in the recyclable rubbish. When foreigners arrive in Japan, they have to register with the government of their place of residence, and then they will often get local regulations on throwing rubbish. There are detailed rules on how to throw rubbish, including newspapers, magazines and cardboard boxes that must be neatly packed and roped together before they can be thrown to designated collection points. Still broken glass, broken pieces of China, they must be put in a thick transparent bag is not easy to pierce, and then put the bag strong mouth can be thrown away. Old bikes that can still be ridden will have a note on them saying they don't want them, etc. Coarse garbage to charge, let everyone consciously make less of this garbage, and reduce the financial expenditure.

Japan is full of inspection teams, all made up of volunteers. Their job is to search for illegal garbage bags, find evidence, and remind the owners of illegal garbage to dispose of their garbage properly, and they will return the illegal garbage to their owners. Japanese television station TBS has a program that seeks out people across the country who don't deal with garbage.

5.3. Everyone is Self-conscious and Careful

The first lesson the Japanese teach when they go to kindergarten is garbage sorting, incorporating garbage into their social studies textbooks for primary school students to educate their adults. It has long been a household and well-known rule that garbage should be classified and regularly dropped. If you do not strictly according to the rules classification

operation, according to the specified time to throw to the designated place, will face a huge fine, in the residential community as a unit of the regional society, leaving a "not to perform garbage classification" reputation, is a very disreputable thing. Therefore, garbage classification has become a Japanese living habit, everyone can consciously carefully and carefully do garbage classification.

5.4. Waste Utilization, Energy Conservation and Environmental Protection

Newspapers are sent to paper mills to produce recycled paper. Many Japanese take pride in having "recycled paper" printed on their business cards. Used milk cartons are recycled into toilet paper and sold again. Beverage containers are sent to related factories to become renewable resources; Waste electrical appliances are sent to specialized companies for decomposition; Combustible waste can be used as fertilizer after combustion; Non-combustible waste can be used as raw materials for land reclamation after compression and non-toxic treatment.

In Japan, e-waste recycling is also in place. In April 2001, Japan officially implemented the household appliance recycling law. The law not only obligates companies to recycle products they produce, but also requires consumers to include recycling costs in the price of household appliances. At present, there are more than 40 recycling centers and recycling factories in Japan.

6. Enlightenment to the Classification and Treatment of Urban Waste in China

6.1. Formulate Relevant Environmental Protection Laws, Regulations and Supervision Mechanisms

In foreign countries, there are corresponding laws and regulations and supervision mechanisms for the management and classification of household waste to restrain residents' daily behaviors. In order to ensure the effective implementation of the household waste management system, it is necessary to give full play to the normative and mandatory laws and regulations on residents' behaviors. Therefore, it is very necessary for the Chinese government to formulate and improve a series of laws and regulations for the management of household waste, so that the daily management of household waste has laws to follow. The formulation of relevant laws and regulations must be specific and practical.

At present, our country has made some relevant laws and regulations and garbage classification processing, including waste management legislation of the basic law on the basis of the constitution, represented by the environmental protection law of the comprehensive law and to the law on the prevention and control of environmental pollution by solid waste such as "circular economy promotion law" special law, in addition, there are a few local governments formulate local regulations, such as guangzhou issued the "guangzhou city living garbage classification management interim provisions". However, the legislation system of the classification and disposal of domestic waste is not perfect. Most of the current laws are in principle provisions, lack of corresponding supporting regulations and implementation rules, and the content is not detailed and clear enough, which is not conducive to practical operation. In addition, there is a lack of effective disciplinary mechanism, and laws and regulations do not make clear provisions on relevant responsible parties, resulting in poor enforcement of some laws and regulations. In the process of making laws and regulations in the future, attention should be paid to clarifying the responsibilities of all government departments, realizing the unification of powers and responsibilities, and avoiding the prevarication of garbage classification and treatment services caused by the overlapping functions of all departments; Local governments should be fully mobilized to play the role of public services. At the same

time, the responsibilities of the central and local governments, producers, sellers, consumers and other parties shall be clarified, and supporting measures shall be improved.

At the same time, law enforcement should be stepped up to ensure that there are laws to follow, laws must be followed and law enforcement must be strict. The punishment of illegal garbage dumping should be increased, and at the same time, a broader civil society supervision network should be built, and public supervision and feedback channels should be improved.

6.2. Cultivate Public Awareness of Environmental Protection and Form a Consensus of the Whole People on Environmental Protection

Environmental education and awareness of environmental protection start from the grass-roots level, gradually popularize the awareness of environmental protection and resource conservation, and make the public recognize and participate in the classification and recycling of tedious household waste, all of which need to start from the grass-roots level. At the present stage, there is still a long way to go for the publicity and education of domestic waste classification and recycling. Most people not only lack the common sense of household waste disposal, but also lack the way and channel to learn about household waste. Therefore, the publicity and education of household waste should focus on the environmental protection education of primary and secondary schools, and take household waste classification as compulsory courses for students. Gradually improve the next generation's environmental protection awareness and concept of garbage classification, and promote the participation of parents and adults.

Through media publicity, school education, community guidance and other means to create an atmosphere of concern about environmental protection, first of all, we should change people's traditional environmental concepts, publicize the correct relationship between man and nature, economic development and environmental protection, change the public's existing understanding of "garbage". Relevant government departments or environmental protection workers should walk into the community and publicize the importance of garbage classification in various ways. Pass on the knowledge and concept of circular economy to local residents, and let the masses gradually realize the importance of environmental protection.

6.3. Formulate Scientific Waste Classification Standards and Disposal Methods

Only sorted waste can be treated more effectively. Meanwhile, it can effectively prevent secondary pollution caused by waste disposal. It is recommended to classify according to uniform standards, such as combustible, non-combustible, recyclable, non-recyclable, etc. Some classification is not scientific, so many people's garbage is mixed, more than 80% of the way we deal with garbage is landfill, people divided into half a day, the back end or mixed processing, can only be a waste of people and property. Previous efforts have failed because city officials failed to properly dispose of sorted waste and there was a lack of trust between the public and the government.

The root causes of the problems in the disposal of household waste are: single disposal mode, lagging construction of incineration and comprehensive treatment facilities, and unclear responsibilities of the government. Many years ago, we advocated garbage classification, but the work of classification transportation and classification treatment has not kept up, and the garbage after classification is remixed when being cleaned and transported, which not only makes garbage classification a mere formality, but also damages the credibility of the government.

6.4. Information Management through Cloud Platform

The intelligent classification data management cloud platform is set up to realize the collection, storage, statistics and summary of garbage classification data through the information management, so as to enable the garbage to be processed from leaving the house and realize

the full channel digital control. Smart collection trucks are used to collect garbage from house to house. Digital chips are installed in household garbage bins, and real-name management is adopted for garbage classification, so that the active distribution of garbage classification can be traced back. At present, some areas in China have carried out relevant pilot projects. According to the early feedback, after the implementation of intelligent garbage classification, the participation rate of residents has reached 96%, and the accuracy rate of release has reached 81%.

7. Conclusion

Garbage classification is a resource in the wrong place. It is an important link to improve the quality of living environment to provide the possibility for the maximum utilization of garbage through garbage classification management. Garbage classification is not only the reform of the traditional way of garbage collection and disposal, but also the urgent problem to be solved in the face of the increasing garbage production and the deteriorating environment. On the basis of learning from the successful experience of foreign countries, the relevant environmental protection laws and regulations and supervision mechanism are formulated. Cultivate the public awareness of environmental protection and form the consensus of the whole people on environmental protection; Formulate scientific waste classification standards and disposal methods; Information management through cloud platform will promote the orderly progress of China's urban waste classification.

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