

# ***Study on Urban Domestic Waste Disposal in China under the Background of Circular Economy***

**Jiakai Liu<sup>1,a,\*</sup>**

*<sup>1</sup>Shenzhen the Houde Academy, Shenzhen, China*

*a.202065@houde.edu.cn*

*\*corresponding author*

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**Abstract:** Urban domestic waste is “misplaced resource”. Urban domestic waste has become a big threat for the society and the ecosystem in China. The main purpose of this paper is to make effective use of the theory of circular economy and guide the disposal of urban domestic waste disposal in China.

## **1. Introduction**

With the rapid development of industrialization and urbanization, there is an increasing number of people living in cities whose living standards are improving day by day, leading to the increase of urban domestic waste. The waste is so numerous and complicated that environmental conditions have been afflicted, such as air, water, soil, city outlook, ecological environment and global environment. Therefore, it is necessary to make further study on environmental science, especially under the background of circular economy so that urban domestic waste could be treated with reasonable methods based on better understanding.

## **2. The Harm of Urban Domestic Waste**

Due to poor management and insufficient investment, a large amount of urban household waste is directly sent to the outskirts of the city for piling or simple landfill disposal without treatment, resulting in the occupation of a large number of farmlands, forming a situation of “garbage surrounded the city”. At the same time, the disposal process of environmental protection measures is not perfect, resulting in serious pollution of the atmosphere, surface water, groundwater and soil around the landfill.

### **2.1. Damage the Appearance of a City**

Firstly, it has been greatly advocated to ensure harmony between human and nature. Building an ecological civilization is vital to sustain the Chinese nation’s development. It is our long-term goal to achieve sustainable development featuring increased production, higher living standards, and healthy ecosystems. In the meantime, the beautiful China initiative was put forward so as to create better working and living environments for people and play crucial part in ensuring global ecological

security. However, the fact is that nearly two-thirds of Chinese cities are surrounded by rubbish, leading to so-called “garbage encircling cities”. If we do not take measures to deal with the urban domestic waste disposal, a better urban environment will certainly be difficult to achieve.

## **2.2. Damage Urban Ecological Environment**

Urban environment is not only closely related to the survival of human beings, but also influential on the entire ecological environment. Pollution of urban environment will set up a chain of reactions and produce a series of effect. Firstly, it's the polluting effect where not only the quality of air and water are affected but also vegetation, birds, insects and wildlife around suffer from it. Secondly, it's the geological effect where soil, geology and climate are all subject to different changes. Thirdly, it's the resource effect where surrounding energy, mineral resources and forests are much more exhausted; Moreover, it will produce aesthetic effect in the city's landscape, beauty, as well as the value or arts and recreations are affected in the end.

## **2.3. Soil and Water Pollution**

Specifically, when it comes to soil and water, suburban areas actually suffer more than we have imagined. The waste piling up on the outskirts of the city takes up a lot of farmland, which is a waste of land resources. If solid waste put in open air for a long time, harmful ingredients will filter out and damage the soil structure, thus influencing the activities of microorganism and retarding plant growth. Worse still, harmful ingredients accumulating in plants will do more harm to animals and human beings if they are taken in. What can't be neglected is that the water in the waste will combine with rain when there is a rainfall and form into landfill leach-ate, which will flow into water bodies with the surface runoff and get into groundwater, leading to pollution of both surface water and groundwater.

## **2.4. The Destruction of the Global Environment**

In fact, the garbage we throw away do cause unimaginable effect to the surroundings, even to the entire global environment. Under certain temperature and humidity, harmful gases will be released from domestic waste, such as methane, hydrogen sulfide and ammonia, which will pollute the surrounding atmosphere. Especially when it is close to the landfill, large amounts of landfill gas will be released, and these gases will quickly enter the atmosphere and accelerate the depletion of the ozone layer, which is much more severe than the effect of carbonic oxide.

## **3. The Urgent Problem in the Process of Municipal Solid Waste Disposal**

From what have been mentioned above, I do believe it is imperative for us to analyze what problems are there for us to solve and how to solve them. Waste management started late in China and it is still in the stage of improving the harmless treatment rate, which means resource utilization rate of domestic waste is lower compared with developed countries. It is the future trend to achieve efficient resource utilization. If we make detailed analysis of the problems, we encounter in the process of urban domestic waste management, we will find that many of the systems are yet to be improved.

### **3.1. Lack of Long-Term Planning**

An obvious problem in the treatment of urban domestic waste is that due to the lack of long-term

planning and coordination, there is no good connection between the procedures in the whole disposal process. As we can see that in many cities, refuse cans are roughly divided into two sections of recyclable and non-recyclable indeed. The fact is that a lot of people don't separate their garbage into different sections as required, even if they do, the refuse collection vehicles are not in the same set. When the vehicle arrives, all kinds of waste, in the recyclable section or the non-recyclable section, are dumped together. This approach will only make garbage sorting meaningless.

### **3.2. Lack of Uniform Standard and Policy**

There are many government administrative departments, among which there are no uniform standards and policies. The efficient integration of resources needs to be improved. For example, the efficiency of anaerobic digestion of refuse can be improved and the investment and operation costs reduced if the process of anaerobic digestion of refuse for kitchen waste and sludge are conducted together. However, because they are managed in different administrative departments, it is difficult to achieve harmonization, resulting in slow progress in marketization and industrialization in joint governance, resulting in unnecessary waste.

### **3.3. Lack of Supporting Supervision and Management System**

In addition, there is no supporting supervision and management system. On the one hand, there is no effective supervision towards the supervision object, the source of urban domestic waste, namely the residents. On the other hand, the supervision and management system are not sound enough for all the links in the whole waste treatment industry chain to implement according to the standards and requirements.

## **4. The Theory of Circular Economy and Urban Domestic Waste Disposal**

In the treatment of urban domestic waste, circular economy is the basic path to realize the new development concept with ecological value as the core. It is both a scientific concept and an advanced economic model. The core of circular economy is the recycling and conservation of resources, maximizing the efficiency of resources, saving resources, improving efficiency and reducing environmental pollution.

Based on the current limited environmental capacity in China, it is both an opportunity and challenge we face with in urban domestic waste disposal to reduce the pollution of waste to the environment and effectively recycle the energy, biomass and other resource materials contained inside. Leap-forward development can be made possible if we could take advantage of China's huge environment and market demand by means of technological innovation. Therefore, how to effectively combine the concept of recycling economy with the current situation of urban domestic waste disposal in China?

Looking at the whole world, we will find that as the economy develops, more and more countries are making efforts to implement material recycling and energy utilization of domestic waste. In the Directive 2008/98/EC on waste (Waste Framework Directive), some basic waste management principles are laid down: it requires that waste be managed without endangering human health and harming the environment, and in particular without risk to water, air, soil, plants or animals, without causing a nuisance through noise or odors, and without adversely affecting the countryside or places of special interest. Member states are required to manage waste in accordance with the five priorities of source control, waste prevention, direct recycling, energy recovery and final disposal. It is undeniable that garbage collection has become the target of waste management.

## 5. Suggestions on Urban Domestic Waste Disposal in China

As far as Chinese cities are concerned, some policies and strategies have already been put forward to deal with urban domestic waste disposal. Taking Shanghai as an example, since July 1, Shanghai residents have been asked to classify garbage, and divide their domestic waste into four categories including recyclables, wet garbage, dry garbage and hazardous waste. At first, a large number of residents were quite confused about which particular garbage they belonged to. Due to the publicity efforts, some residents even explored their own methods of categorizing trash by relating them to the pigs. Coercive measures have also been issued to promote the implementation of policies. According to the regulation, individuals who fail to do so will be fined up to 200 yuan. For companies and institutions, the fine goes up to 50,000 yuan. In addition, transport operators can refuse to pick up the waste if it's not properly sorted. Despite all kinds of difficulties, Shanghai's household waste segregation has achieved remarkable results. Although it started late, it is undeniable that it improves the efficiency of recycling. Efforts have expanded to such a large scale that ordinary people could also do their own job so that waste disposal factories don't need to classify the waste little by little. It's all about saving energy and earth's resources, but only in an idealistic scenario when everyone does obey the rules. The disposal of domestic waste depends not only on the promotion and management of the government, but also on the awareness of our own residents on the classification and disposal of waste.

Actually as early as March 2017, the central government set out a plan for a standardized system and regulations for rubbish sorting by 2020, with a target for 46 major cities, including Shanghai, to recycle 35 per cent of their waste by then. If such the practice of Shanghai is to be expanded to all the Chinese cities, some institutional frameworks and policies must be established to ensure its implementation.

Firstly, a complete management system for urban household waste must be established and improved. It is necessary to clarify the responsibility subjects and ensure the coordination of government departments to improve the standards and norms of waste disposal and resource utilization.

Secondly, many countries have clearly prescribed the principles for recycling domestic waste by adopting different types of incentives. It might be effective if we could learn from other advanced practices and adjust measures to local conditions. For example, enterprises that use more than 50% of renewable raw materials can get tax cuts; Sellers are required to put labels on in disposable containers and charge corresponding deposit from consumers; The subsidies should be increased to support enterprises that build and manage household waste incineration plants; The government could also adopt financial subsidies to promote the development of household waste incineration power generation.

Thirdly, policies should be formulated to encourage the development and utilization of urban household garbage resources. Under the current situation of the shortage of energy resources, all countries have been making efforts to strengthen the development and utilization of clean energy. As a major energy consumer, China also needs to spare no effort in this regard. If the organic matter in the waste could be converted into energy, and the nutrients could be fully recycled and used, the greenhouse gas emissions will be reduced and huge environmental and social benefits will be generated. Therefore, we should actively encourage the recycling of municipal solid waste through preferential subsidies for renewable energy and carbon emissions, thereby strengthening the technology development and promotion of waste recycling.

Last but not least, capital investment must be ensured to increase investment in urban domestic waste processing scientific research to encourage the development and demonstration of new

technologies. In recent years, great progress has been made in new technologies for waste disposal by enterprises, colleges and universities despite the critical situation of waste disposal. However, it is still far from meeting the huge market demand. There is still a big gap in the recycling of urban domestic waste between China and other developed countries. Therefore, more research must be carried out on waste treatment and recycling, so that more investment will be invested in the industrialization of new technologies and major equipment, and a series of new technology demonstration projects will be established, so that China's huge market demand and technical support can be fully utilized. Thereby converting waste into resources.

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