

Public private partnership after new waste classification policy implementation in China

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On my honor as a University Student, I have neither given nor received
unauthorized aid on this assignment as defined by the Honor Guidelines for
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Fable of tomorrow

Father took his young and adorable little daughter to her elementary school. She held his hand tightly and felt like this tall man is her whole world. As they walking along the street, the little girl found a battery left on the clean street and nobody else even took a look at it. Thus, she asked her father for a sheet of tissue paper, wrapped up the battery and threw it in the hazardous waste can, one of the four waste cans that established there. The man was surprised and complimented his biscuit.

“This is the right thing to do. I am so proud of you, my little girl. How did you learn about this knowledge?” Dad asked.

“Our teacher taught us in a class.” The little girl answered with twinkle in her eye.

“I cannot do as good as you. When I was a child, there are not waste classification and nobody cares about it.” Dad said and seemed to recall his childhood.

“Dad, but how do you know which can you should throw your waste?” Daughter asked.

“Let me tell you my experience. Back at my childhood, we just put every garbage in a waste bag and throw it away in one of the garbage can and wait a trunk to dispose it. It smells very bad and it also bad for the community.” Dad shared his story to the girl.

“Everything has changed when I was a undergraduate student, president Xi started a new policy about the waste clarification in China and it led a revolution on the waste classification system in the whole world.” Dad continued.

As they talked, they have arrived at the school. “Stay focused on class and enjoy it, Okay?” Dad kissed his girl on her face and watched his biscuit running into the school with other kids.

Introduction

With the development of technology and the internet, we are living in a society which is changing rapidly and constantly. Based on this special situation, lots of jobs disappeared and lots of new jobs have been created in order to fill different needs. Back to the beginning of the 21th century in which the smartphone was just invented, app developers appeared because of the numerous functions of the smartphone. Moreover, because of the invention of the car and delivery app, delivery service was provided and we could eat various foods at any time in less than an hour. That is just the case in America, not to mention, in China, some company has begun to use drones to deliver food. In this case, not only could we save the delivery fee, but also the time is more flexible. As for my thesis specifically, I would want to introduce a new job named “waste classification man”. I understand the confusion because I was also shocked when I first heard about this job. I have not been back to China in four years. Last time, I video chatted with my parents and they told me they hired a person to help them on waste classification. I didn’t understand at first and then did some research online. There is actually a job to help people with waste classification and the price is pretty high. This job is invented because of the strict policy about waste classification implemented in China.

Last year, president Xi encouraged to strive for cultivating the good habit of classifying garbage, with the purpose of improving people's living environment as well as promoting the green, sustainable development. This was shocking news at that time. I never thought President Xi, also the general secretary of the Communist Party of China Central Committee and the chairman of the Central Military Commission, would express such views in an instruction regarding garbage sorting. In my opinion, the president would focus on more serious and macroscopic problems such as war decision, law making and politics. President Trump is the president for America in the four years in which I studied in America. I have never seen him focusing on anything that specific even though he used twitter so often. As a Chinese student studying abroad, I just can't give up this perfect opportunity to explore the relationship between government and private sector companies after the waste classification policy changed. It will start by looking at some background for new policy in Shanghai and how it has integrated and affected people's daily lives. Finally, everything will be pulled together to provide and answer to the question, how can we understand the new waste management system to ensure it achieve the desired outcomes for everyone?

Literature Review

It all begins with the Sword Policy, which is that China launches the policy for banning the import of some types of solid waste as well as setting a strict pollution restriction regarding recyclable materials. That is to say, shipments mixed with garbage, wrongly defined recyclables or low-quality recyclables such as greasy paper goods will not allowed to enter China. Announced in July 2017, the policy came into effect on January 1, 2018 officially. Besides such kinds of bans, China also focuses on decreasing the quantity of import licenses, thus reducing the number of enterprises that import wastes.

China remains as the biggest waste importer in the world over decades. Paper, scrap metal and plastic, etc. are imported from other countries, followed by being processed for the production of export products. Nevertheless, *National Sword* was implemented, which lowers the import rate of these materials. As a result, international recycling system suffers a significant logjam, and recycled materials pile up at the material recycling facility (MRF) or even worse, into the landfill. This affects the efforts made by the United States and other countries regarding recycling.

Wastes into the recycling bin will be sent to MRFs which adopt the sorting system to remove unrecoverable contaminants such as food, hazardous waste and unrecoverable plastic, as well as reserve recyclable materials for being sold and transported later. After being sold to processing facilities, these materials will be reduced to the raw form and turned into a new form, e.g. plastic bottles are melted to form another plastic type. If the process slows, recycling related jobs will be remarkably threatened, recyclable materials will pile up and the excess supply will lead to decreased price of recycled materials [1].

The new waste classification policy states that, as regulated by *the Shanghai Municipal Solid Waste Management Regulation*, there are four categories of municipal solid waste (MSW):

(1) Recyclable waste means waste suitable for recycling, e.g. used paper, glass, plastic, fabric, and metal. (2) Hazardous waste means waste that may directly or potentially harm the health of human beings or the natural environment, e.g. waste batteries, drugs, lamps, pesticides and paints. (3) Wet waste means perishable biomass waste like expired food, leftovers, fruit core, melon peel, as well as dead plants and flowers. (4) Dry waste refers to waste beyond the above three categories. Related departments of Shanghai have deployed new waste collection points in nearly every corner of Shanghai. Figure 1 displays a commonly seen waste collection point of Shanghai which has four waste collection bins, red for hazardous waste, blue for recyclable waste, brown for wet waste and black for dry waste. Citizens shall throw waste into corresponding bins after classification. If wastes are not classified, they will not be collected. Also, citizens shall throw waste in specific time and places. Waste thrown beyond the specific time and place will not be collected as well.



Figure 1. Collection bins of different categories of waste.

Qualified firms will take charge of collecting classified waste and transporting them to corresponding sites for proper disposal: transport recyclable waste to recycling firms to be recycled for the utilization of resources; transport hazardous waste to waste treatment plants to receive different innocuous treatments via chemical and high-temperature processes, etc.; transport wet waste to waste treatment plants to undergo complicated biological and chemical treatments for the production of biogas or being natural fertilizer; and transport dry waste to waste incineration plants to be used for electricity generation after incineration or directly dump them in landfills.

Wastes have specified transportation vehicles. The government has deployed thousands of transportation vehicles of waste for the timely collection and transportation of waste. **Figure 2**

displays four commonly used transportation vehicles of waste in Shanghai. At present, Shanghai is constructing 10 new treatment plants of waste. After the completion, they will contribute to an obvious increase in the total waste disposal capacity on a daily basis in Shanghai by the end of 2020 (up to 32,800 tons/day)



Figure 2. Transportation vehicles of different categories of waste: (a) recyclable waste, (b) hazardous waste, (c) wet waste, (d) dry waste.

We have also striven for decreasing the production of waste from the source. Governmental agencies as well as institutes shall adopt products and equipment suitable for the environment during daily operation, such as recyclable papers instead of disposable office suppliers. The government encourages all enterprises, firms as well as plants in Shanghai to put recyclable, nontoxic and detachable materials and designs at the top of the priority list, and focus on producing recycle products with environmental friendliness. Neither hotels, restaurants nor shops shall actively provide customers with free disposable items. Recyclable products and other products with environmental friendliness are recommended to be purchased by citizens (EcoTechnology, 2018).

STS framework and method

In order to analyze the effect of the policy change to society, I will use the SCOT diagram also known as social construction of technology. There are several stakeholders involved in this construction including government, private company and citizens. Each of them has been significantly affected by this huge change and has shown different reflections.

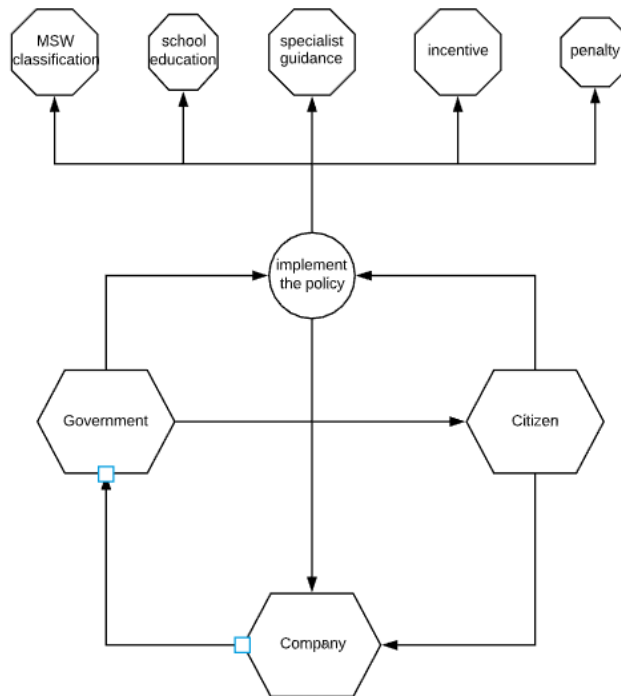


Figure 3. SCOT diagram for waste classification

Government: In order to make sure that the new policy can be implemented effectively, the government has undertaken some particular measures.

First of all, The MSW classification publicity started earlier in 2017 through internet, TV, newspapers and magazines regarding the publicity videos, slogans and posters. Shanghai government organized to send brochures to citizens and held promotional activities in the last two years. At present, Shanghai citizens have recognized the importance exhibited by MSW classification. Second, school teachers shall pay attention to educating students regarding the MSW classification and all students shall teach parents about things they have learned from teachers after getting home. Third, volunteers or temporarily employed persons (most are warm-hearted retirees,) are deployed to different waste collection points for guiding citizens about correct waste classification after receiving training. Fourth, related departments widely distribute the Green Accounts, an incentive mechanism, to citizens of Shanghai. For instance, residential communities of Shanghai are equipped with a Green Account card together with an automatic exchange machine of credit and goods. The Green Account has a smartphone capable of giving credits to people who correctly classify waste and these credits can exchange for different goods. Last but not least, relevant laws and regulations have been formulated specific to the whole process

of throwing, collecting, transporting and disposing waste. For example, as regulated by the *Shanghai Municipal Solid Waste Management Regulation*, for people who throw waste and/or improperly classify waste, the penalty reaches CNY 50-200, and for waste transportation firms which mix classified waste, the penalty reaches CNY 5000-50,000. Law enforcement officers take charge of the inspection at various waste collection points. (Zhou et al., 2019).

Effectively implementing the policy is not the responsibility of only the government. The ideal way is that company and government work together to ensure the implementation.

With the skyrocketing need of waste classification and lack of awareness of citizens, some new job has been created to help people to get familiar with this unexpected change. There is an increase of job opportunities for the whole society. For example, as reported, the BEIJING -- Garbage sorting has contributing to many well-paid jobs in China. Liepin.com, an online recruitment platform of China claims that garbage sorting related jobs usually have a much higher salary compared with the average income of the whole society. To be specific, the monthly salary per capita averaged at 7,855 yuan (\$1,142) or so in cities and towns of Beijing in 2018, by contrast, the monthly income per capita of garbage sorting related jobs averaged at 16,000 yuan in Beijing, Shanghai, Zhejiang and others in H1, 2019, based on the data of Liepin.com. Ba Ran in the Liepin.com described that the annual income of garbage sorting related jobs averages at 70,000-200,000 yuan. The China State Council set a goal in 2017 that the recovery rate of household garbage shall reach 35% by 2020, and 46 cities shall be the first to implement the mandatory residential waste classification (*Garbage sorting generates high-paying jobs: Agency—Chinadaily.com.cn*, n.d.). However, this situation won't last for a long time. It is created by this special time period. After all people get familiar with waste classification, no one will hire someone to help them with waste classification at this high price.

Data analysis

In this paper, I used a large amount of data from previous results including the weight of waste production in 2020 in Shanghai and so on. Moreover, I designed a total of 8 questions for the students in Zhejiang University. My questions focus on their daily life. However, the change in social environment and relationship among citizens, company and government could be reflected from those questions. I hope I could get positive results from the responses which could demonstrate the new policy not only protected the environment but also made the society more efficient.

Discussion

The government of China actively promotes waste-to-energy (WTE) which can the most effectively assist in managing MSW and even the energy issues around the world. The procurement model of public-private partnership (PPP) widely contributes to the management efficiency improvement. In spite of this, lack of hands-on experiences and poor risk management make the industry confronted with many risk events.

Conclusion

Based on the results collected from the survey, eight out of 10 people are familiar with the waste classification and could name all the types and even give an example of each type. The average time spent on waste classification is about one hour each week. Most of them think they could handle the problem very well and don't need extra help. With the execution of the policy, their daily life have been hugely impacted in both ways. Some think that their life become more convenient and some think that their life become more complicated. Since the policy is still new, there are few signs for the product in market that help people to identify the waste type. The penalty is not very harsh related to the policy which gives people more time to get familiar and accept this new change. People get education and information about waste management in various ways including newspapers, government reports, online social media, online news, TV programs, and university websites, which suggest that government has done a great job in propagating the information.

Appendix

Survey Questions:

1. Have you got familiar with the waste classification yet? Can you name all the types of waste and give an example for each type?
2. How much time do you spend on waste classification each week? Do you consider it as time-consuming?
3. If you are hiring a person to help you with waste classification, how much time did he/she spend and how much did you pay them?
4. Is there any change related to this policy in your life? Please give an example.
5. When you go shopping, do you notice any change in the marks on the things you buy which could help you with waste classification?
6. When you go shopping online such as Taobao, do you notice any product that is related to waste classification that you have never seen before?
7. Is the penalty really that harsh? Is there someone you know got a ticket because of not doing it right?
8. Where did you get the education and information about this new policy? Who or What institution taught you about this?

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