

Study on the New Model of Waste Classification

-- Based on the Investigation of the Current Situation of Waste Classification in Wenzhou

Gaoxiang Chen, Guixian Qiu, Chaoqian Li, Qi Mao, Qinglin He, Xinyi Zhang,
Wenfang Zhao

Wenzhou Polytechnic, Wenzhou Zhejiang, 325025, China

Abstract

The "The 14th Five-Year Plan" pays special attention to urban development, regional development and green development, and waste classification management is one of the important means. Garbage classification has a long history, but its promotion and implementation is facing serious problems, so how to plan a new chapter of garbage classification, how to help the "The 14th Five-Year Plan" is the need to focus on research. In wenzhou city as an example, this study in wenzhou residents garbage classification as the main research object, through questionnaire survey, field interviews and other forms of data collection, research influence factors influencing residents' desire and behavior of garbage classification, and to explore from the Angle of practice and professional solve garbage classification of measures, garbage classification for the future policy direction more systematic Suggestions are put forward.

Keywords

Garbage Classification; Influencing Factors; Empirical Research; Policy Suggestions.

1. Research Overview

On March 11, 2021, the fourth session of the 13th National People's Congress (NPC) adopted a resolution on "The 14th Five-Year Plan" for Economic and social Development and the outline of the Vision for 2035, marking the beginning of China's 14th Five-year Plan for development. "The 14th Five-Year Plan" sets out development goals and plans for China's economic and social development in the next five years. The eighth, ninth and eleventh chapters pay special attention to urban development, regional development and green development, and plan solutions to many hot issues. As a once hot environmental protection topic, how to plan a new chapter of "garbage classification", how to help the "The 14th Five-Year Plan"?

Wenzhou is a famous national historical and cultural city, known as the "southeast landscape best in the world" reputation. According to the zhejiang Provincial Engineering construction standard "Urban Household Garbage Classification Standard" (DB33/T1166-2019) released by Zhejiang Provincial Department of Housing and Urban-Rural Development, Wenzhou has implemented the "Urban household garbage classification standard" from August 1, 2019. Provisions have been made on the garbage category, classified delivery, classified collection, classified transportation and classified treatment of household garbage. According to wenzhou promote the building of urban living garbage classification system implementation plan of the main objectives, by 2021, a complete coverage of urban living garbage classification collection in the basic, fundamental classification put, classified collection, classification, transportation, classification processing system of urban living garbage classification treatment ability to meet

the corresponding requirements, urban living garbage comprehensive compulsory classification.

Wenzhou in the past more than a year of garbage classification situation, how to achieve the goal in the next year? It is this question, this research tries to wenzhou city as an example, the garbage classification of wenzhou residents as the main research object, through the understanding of wenzhou residents of garbage sorting and acceptance survey, comprehensive knowledge and understanding of wenzhou urban and rural residents for garbage classification of knowledge, attitude and behavior of the status quo, analysis of implementation of the main influence factors of they sort the garbage, At the same time through on-the-spot interview wenzhou policy advisory committee of experts, municipal administration staff, full-time teachers at universities and other relevant experts, combined with the existing research data, from the Angle of practice and professional to seek solve garbage classification of measures, garbage classification policy for the future direction of more systematic Suggestions, provide a reference for promote the smooth implementation of garbage sorting, It also provides a good reference for the development of "The 14th Five-Year Plan".

2. Research Hypothesis and Model Design

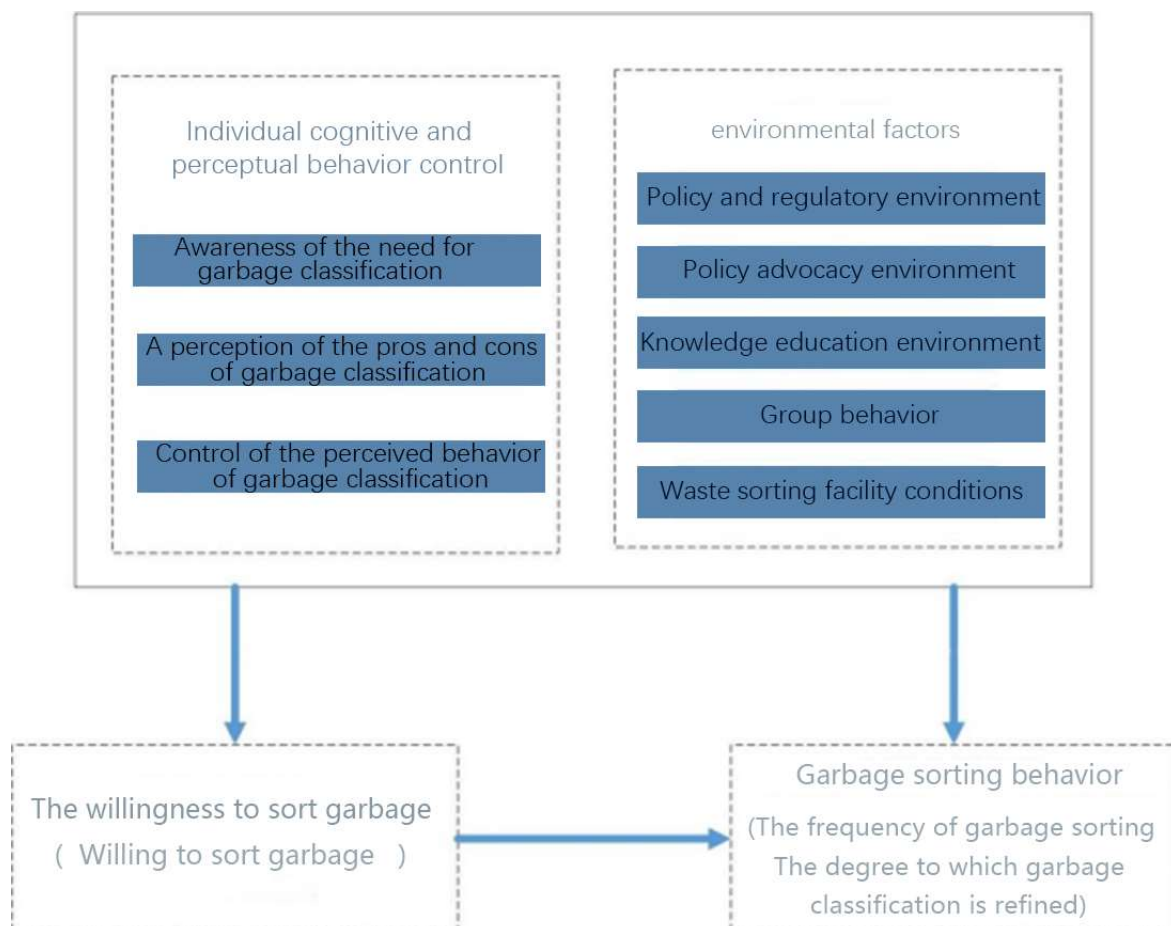


Figure 1. hypothetical model of influencing factors of residents' garbage classification behavior

The annual increase of household garbage has brought new challenges to the environmental governance of residents. Household garbage classification ultimately needs to be implemented in the garbage classification intention and behavior of residents. In recent years, the central government and governments at all levels have increased the investment and system

construction of garbage management. Then, how and what factors affect household garbage classification behavior and willingness? Based on relevant concepts, domestic literature and behavioral theories, we conducted research and design on the influencing factors of garbage classification behavior and willingness, constructed research models, proposed research hypotheses, designed questionnaires, and collected and analyzed data as the basis of analysis. The intention of garbage classification of Wenzhou residents is a comprehensive reflection of the residents' environmental awareness, social environment, garbage management policy and other internal and external factors. Based on the existing research results, this study analyzed the influence of individual cognitive and perceived behavioral control, environmental factors, including 2 categories and 8 influencing factors, on the intention and behavior of household garbage classification of Wenzhou residents. In order to further study the deep relationship between garbage classification intention and garbage classification behavior, this study proposes a hypothesis model as shown in Figure 1.

3. Survey Data Collection

3.1. Questionnaire Structure Design

According to the design of the above hypothesis model and the selection of influencing factors, we designed the questionnaire structure as shown in Figure 2. Based on this, we designed a questionnaire consisting of 45 questions including demographic variables. The questionnaire adopted the form of Likert scale to design the question form.

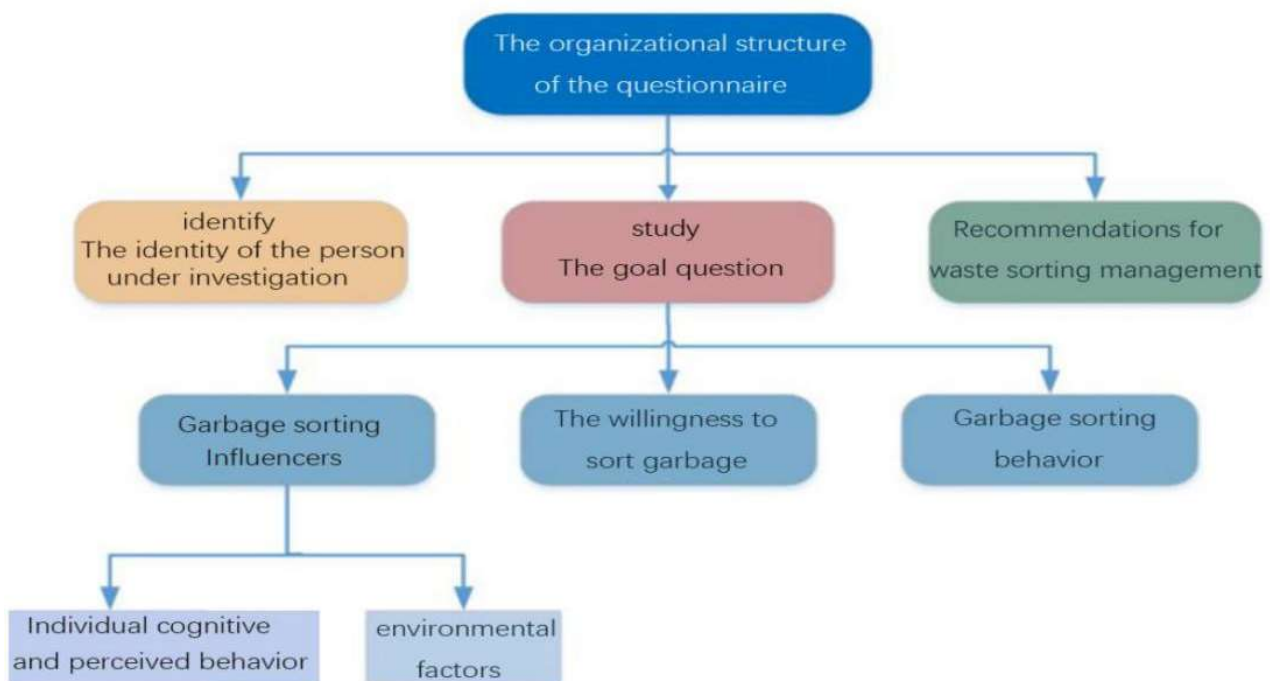


Figure 2. questionnaire structure design diagram

3.2. 3.2 Data collection and collation

This research group conducted a two week survey in October 2020. A total of 750 questionnaires were sent out and 711 were recovered with a recovery rate of 94.8%, among which 571 were effective with an effective recovery rate of 80.31%. Specific recycling results are shown in Table 1.

Table 1. Questionnaire recovery statistics by region

region	answer number	the proportion	Proportion in the total population of Wenzhou
Lucheng city	74	12.95%	13.57%
Ouhai city	152	26.61%	10.25%
Longwan city	34	5.95%	7.82%
Dongtou city	21	3.67%	1.16%
Ruian city	59	10.33%	15.46%
Yueqing city	69	12.08%	15.36%
Longgang city	27	4.72%	4.17%
Pingyang city	28	4.90%	8.95%
Yongjia city	30	5.25%	8.64%
Cangnan city	48	8.40%	9.18%
Taishun city	7	1.22%	2.75%
Wencheng city	22	3.85%	2.64%
Total	571	100%	100%

The interviewees included community managers, staff of relevant government departments, university teachers and citizens, and a total of 14 people were interviewed. The basic information of interviewees is shown in Table 2 below.

Table 2. Basic information of interviewees

respondent code	identity	gender	other information of respondents	form of interview
S1	community manager	men	A Street ** community worker	face to face
S2	community manager	women	B Street ** community director	face to face
S3	community manager	men	C Street ** community worker	WeChat
Q1	director of wenzhou advisory committee office	men		face to face
Q2	Ouhai district decision advisory committee staff	women		phone
Q3	Ouhai environmental protection Bureau	women		phone
T1	college teachers	men		face to face
T2	college teachers	women	teacher of Wenzhou ** University	face to face
T3	college teachers	men	teacher of Wenzhou ** College	face to face
T4	college teachers	men	teacher of Wenzhou ** College	WeChat
P1	citizens	women		face to face
P2	citizens	men		face to face
P3	citizens	women		face to face
P4	citizens	men		face to face

The identity codes of community administrators start with S, staff of relevant government departments start with Q, college teachers start with T, and ordinary citizens start with P.

4. Research Results and Analysis

The questionnaire of this survey involves the basic information of interviewees, such as gender and education background, as shown in Table 3.

Table 3. Statistical table of basic information of respondents

gender	men	202	35.38%
	women	369	64.62%
age	under the age of 20	75	13.13%
	20 to 29 years old	132	23.12%
	30 to 39 years old	126	22.07%
	40 to 49 years old	129	22.59%
	50 years of age or older	109	19.09%
Work and study hours per day	0-3hours	121	19.61%
	4-6hours	131	22.94%
	7-9hours	186	32.57%
	10-12hours	121	21.19%
	More than 12 hours	21	3.68%
Education Level	Primary and below	36	6.30%
	Junior high school	153	26.80%
	High school or technical secondary school	201	35.20%
	Bachelor or junior college degree	161	28.20%
	Postgraduate and above	20	3.50%
Marital status	Unmarried	185	32.40%
	Married	341	59.72%
	divorced	35	6.13%
	other	10	1.75%

4.1. Analysis of Garbage Classification Intention

From the perspective of garbage classification willingness, residents are still willing to carry out garbage classification and think they have done something, but they generally believe that there are some other reasons that prevent them from carrying out garbage classification.

On the whole, the average of Wenzhou residents' willingness of garbage classification is about 4 points (relatively agree), indicating that people are willing to carry out garbage classification.

4.2. Analysis of Garbage Classification Behavior

From the action of garbage classification, people are not willing to strictly abide by the guidelines of garbage classification outside and their behavior is not frequent; Sorting garbage at home is slightly better than outside. The average garbage classification behavior of Wenzhou

residents is about 3 points (neutral), and residents have no specific garbage classification behavior but have not implemented it. The deviation of residents' will and behavior should be paid attention to, which is also a breakthrough to solve the slow implementation of garbage classification.

4.3. Analysis of Individual Cognition and Perceived Behavior Control of Garbage Classification

It can be seen from the data that wenzhou residents think that the domestic waste pollution problem is serious and urgent to be solved, and the living environment is very important. We agree that the sorting and treatment of MSW has a positive effect on the improvement of the environment, and believe that the improper disposal of MSW will affect the health of residents and lead to the spread of diseases. In addition, people have a strong sense of identity for garbage classification, and generally agree that garbage classification is the obligation of every citizen. People generally agree that garbage classification knowledge will have a guiding influence on garbage classification behavior.

In general, the overall level of wenzhou residents' individual cognition and perceived behavioral control of garbage classification is about 3.5 points (between neutral and relatively agreed), which is not very high.

4.4. Analysis of Environmental Factors of Garbage Classification

Among the 571 questionnaires collected in this survey, the mean value of Q18 (wenzhou municipal garbage classification policy is perfect) is 3.9194 points (the highest score is 5 points, the lowest score is 1 point, the same below), indicating that people agree that wenzhou municipal garbage classification policy and propaganda are relatively perfect. Group norms have positive influence on garbage classification behavior.

In general, wenzhou residents think that the environmental impact factors of waste classification in Wenzhou area are about 4 points (relatively agree), indicating that residents have a good recognition of the overall environment.

5. Policy Recommendations

5.1. Strengthen the Leading Role of the Government

(1) Establish and improve the relevant system of garbage classification and increase the effectiveness of legal constraints

Garbage classification implementation lack of corresponding legal protection and constraints, so as soon as possible to perfect the garbage classification of form a complete set of laws and regulations, and implement the behavior main body in the garbage sorting out responsibility, more do not implement the behavior of the garbage sorting penalties, increase the cost of the residents in violation of provisions of punishment, to ensure the garbage classification system to promote.

We should give full play to the leading role of the government in waste classification work, define the leading and responsible departments, formulate work plans with quantifiable indicators, clarify reward and punishment mechanisms, and strengthen supervision and assessment.

(2) Strengthen the propaganda of garbage classification knowledge, enhance residents' environmental awareness

Garbage classification is the life of ordinary citizens is still very far away, the relevant departments to extensive propaganda, education and advocacy work they sort the garbage, let people fully understand the garbage classification knowledge, for example, can be in the community on a regular basis to carry out the garbage classification of commonweal lectures

on environmental protection, can exchange activities, such as by integral for household garbage classification is well done, offer certain material rewards.

(3) Vigorously develop waste classification supporting facilities, establish and improve the recycling system

Bucket stations are equipped in each residential area of the city, temporary storage points for large garbage are set up, and electric collection vehicles for garbage classification are equipped. In addition, promote each community to gradually improve the daily management, the property management company in the community with property management to implement the standard management of garbage classification subject responsibility, the rest of the old community, resettlement houses, return houses and other communities without property management, can hire a third-party service company to improve the daily management of garbage classification.

Garbage classification needs to be linked in the whole chain. After citizens put garbage into classification, sanitation and other relevant departments should also carry out effective classification and disposal. Otherwise, the front end of the public classification, but in the garbage transport and disposal link is "mixed", or ultimately all the previous efforts wasted. Therefore, the government should formulate a set of effective measures to ensure that garbage from collection, transfer to disposal are in the state of classification, which is the key to the final success of garbage classification work. Through "Internet plus" and other emerging models and technological means, garbage classification is simplified and the difficulty for the public to participate in garbage classification is reduced.

5.2. Strengthen the Principal Role of the Public

In the survey found that most of the residents to participate in the intent of garbage classification is very strong, but owing to lack of understanding of garbage classification knowledge level, the influence of the imperfect recycling facilities such as resistance, lead to the implementation of garbage sorting line dynamics is insufficient, therefore, only to mobilize the garbage classification subject participation in the urban garbage classification in the related work, Only in this way can the initiative and enthusiasm of residents to participate in garbage classification be stimulated, which is very important for the government to effectively promote garbage classification.

Due to the individual differences among the public, the cultural quality, life experience and work position of individuals determine their classification awareness, behavior habits and other behaviors. On the one hand, it is necessary to strengthen the promotion of garbage classification, which starts from children and continues to penetrate into the daily life of the public. On the other hand, we should make use of the idea of maximizing personal interests of the public, weaken its negative externalities by establishing incentive mechanism, and pay attention to the use of fairness theory to establish equal reward mechanism.

5.3. Strengthen the Participation of Social Forces

Guide social capital to inject into the field of garbage classification, increase the development of multifunctional garbage separation products for household, and solve the situation that household garbage is easy to mix randomly; The product identification of household waste should be consistent with international standards to help people who have difficulties in garbage classification, make their lives more intelligent, reduce the time of garbage classification, and facilitate the promotion of garbage classification projects.

Building more garbage sorting processing facilities, increase investment in infrastructure, to innovate, its purpose lies in the more intelligent and cost savings, can make you more convenient garbage classification, convenient, also can improve the rubbish indirect can let more people do to protect the environment and garbage classification, provide more

convenient service to each and every resident, Let garbage classification and residents' life together, increasingly become a habit.

Integrate the resources of various social groups, such as communities, volunteers, environmental and public welfare groups, and make them independently become the organizers, propagandists and promoters of MSW classification.

References

- [1] Wang Xiaonan. The influence mechanism of class identity and environmental values on garbage classification behavior [J]. Journal of Beijing institute of technology (social science edition), 2019,21 (3) : 57-66.
- [2] Chen Jian, Lin Weibin, Li Yujun. Urban Review,2020,1:133-143. (in Chinese with English abstract).
- [3] Jiang Wen lu. Research on the classification and management of urban household garbage in Ou hai District of Wenzhou [D]. Fujian: Fujian Agriculture and Forestry University,2019. (in Chinese with English abstract).
- [4] Weng ShiLie, Luo Yonghao et al. Research on sustainable comprehensive Utilization strategy of Large Urban Household waste [M]. Shanghai: Shanghai Science and Technology Press, 2016.
- [5] Liu Shuangsheng, Study on the problem of municipal solid waste classification and treatment: Based on the case study of Shanghai community [J]. Economic Research Guide, 2018 (2) : 97-98.
- [6] (in Chinese with English abstract) Xiao Panpan. reduction measures of household waste in Sweden and its enlightenment to China [J]. Renewable resources and circular economy, 2018,11 (3) : 40-44.