Awareness Baseline Assessment in Suzhou

Status quo and recommendations for promoting awareness and behaviors in recycling low-value plastics in Suzhou.

JingSu
Creating Value from Plastic Waste along the Yangtze

Powered by: ALLIANCE TO END PLASTIC WASTE

Implemented by: giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

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EXECUTIVE SUMMARY

Suhzou outperformed many other Chinese cities in municipal waste management due to its favourable policy environment and relatively good facilities. Supported by the project JingSu: Creating Value from the Plastic Waste along the Yangtze Project, Suzhou is now working to refine its waste separation system and focus on better management of plastic waste as its share of municipal waste gradually increases.

The active participation of Suzhou citizens in waste collection and sorting is a crucial aspect of designing an effective waste management and recycling system. Therefore, this assessment is conducted to understand the status quo of public awareness of plastic waste and recyclables as well as people's willingness, preferences and motivations to adopt responsible practices in waste collection and recycling. The analysis provides a sound basis to develop targeted information material and implement effective awareness raising activities for the identified target groups i.e., Suzhou residents, students, and consumers. The assessment is carried out in residential areas, schools, and commercial areas.

The baseline indicates that residents and students in Suzhou already have a good basic awareness of some plastic waste materials and recycling practices. Both groups show a strong willingness and distinct motivations to participate in waste separation and would like to take further actions to collect and recycle low-value plastics. Some of them are already adopting aspects of the 3R (Reduce, Reuse, Recycle) principle in their daily life. Further awareness raising and educational activities are required to deepen citizens' knowledge (e.g., on recyclable items) and to adopt appropriate recycling practices (e.g., for rinsing plastic waste).

Residents aged 26 to 50 are proposed as the main target group for further awareness-raising activities. Based on an analysis of information needs and preferences, the following three event approaches are recommended to help citizens take practical action, develop a purpose for and deeper understanding of appropriate recycling practices: Cleaning campaigns, visits to final treatment facilities and offline educational workshops.

In addition, students should be targeted with awareness-raising activities and information that are appropriate to their age group, level of knowledge and cognitive abilities. For example, it has been shown that students in higher grades have a greater awareness and willingness to engage in plastic

waste reduction. Accordingly, activities should range from practical/ playful activities to more informative courses on plastic reduction and recycling.

The *assessment of commercial areas* is a separate part of this assessment and can be found on p.93 to p.124. This assessment specifically analyses data from commercial areas and informs the design of activities tailored to consumers in commercial areas with the aim of inducing behavioral change directly at the point of purchase.

1. ABOUT THE ASSESSMENT

1.1 ASSESSMENT BACKGROUND

1.1.1 SUZHOU'S WASTE MANAGEMENT AND PLASTIC WASTE MANAGEMENT

In recent years, Suzhou has made significant efforts to establish a comprehensive and well-organized system for municipal waste segregation based on different governmental departments' cooperation and the public's participation. Since June 1st, 2020, *The Separation Management of Domestic Waste Regulation in Suzhou Municipality* (*'The Waste Regulation'*) has officially been launched. It aims to encourage citizens to reduce waste at source, discourages over-packing, and promotes merchants to refine their packaging techniques to use materials more efficiently. In *The Waste Regulation,* the domestic waste has been categorized into 4 types[1], i.e., *recyclables, hazardous waste, food waste, other waste*. Two years later, *The Standards for Municipal Solid Waste Separation in Suzhou* (*'The Standards'*) were launched, comprising detailed guidelines for corresponding waste products and the sorting and disposal behaviors that citizens can obey[2].

Guided by relevant policies, the *Green Actio*n to mitigate *the White Pollution* for plastic waste has been launched in overall Suzhou City. Several initiatives have been implemented including but not limited to establishing a cooperation mechanism for plastic waste management, strengthening inspections and supervision for the generation, sales and utilization of banned or restricted plastic products, improving the plastic waste management system's recycling and disposal capacity. In 2021, the local recycling

[1] Among the domestic waste, the beverage bottles belong to the 'recyclables', while most of other plastic waste, like plastic takeaway lunchboxes, plastic bags belongs to the 'other waste'
[2] *Recyclables* should be kept as clean and dry as possible to avoid contamination, and the bottles and cans should be washed without any residue. For *other waste,* recyclables, hazardous waste or food waste should not be mixed with.

company, Suzhou SZT Recycling Company (SZT), supported by JingSu Project, started collaborating with the Sanitation Administration Agency (SESAA) to establish a comprehensive system of collection and sorting facilities for recyclable resources. Till now, the collection and sorting facilities' network has been established, with the full coverage of Gusu District and basic coverage of Suzhou Industrial Park District and High-tech District. The networks are still under development in other districts.

Given increasing demand and the rapid development of the plastics industry, a large number of '*low-value plastic waste*' is generated, burnt, landfilled or dispersed into the environment. Hence, Suzhou City is firmly committed to achieving a reduction in plastic waste generation, finer source segregation and the promotion of low-value plastic waste recycling. In contrast to 'high-value plastics', which are more easily recyclable and profitable (e.g., PET water bottles) *low-value plastics* are often classified as *other waste* due to the low added value and high recycling costs. They include items such as plastic takeaway lunchboxes, beverage cups, plastic bags and packaging. However, if *low-value plastics* are collected and centrally recycled at a large scale, they can also generate a relatively high recycling value. This would especially contribute to mitigating plastic waste and to achieve Suzhou's goal of a *Waste-free City* and their ambition to reduce carbon emissions to achieve the carbon-neutrality.

1.1.2 PROJECT JINGSU

In parallel, the project *JingSu:Creating Value from Plastic Waste along the Yangtze*, also referred to as *Project JingSu*, was established to combat the negative impacts of the drastically increasing amounts of plastic waste in China, especially to reduce the plastic waste entering the environment along the Yangtze River in Suzhou City. The project is funded by the Alliance to End Plastic Waste and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. To achieve the objectives of *Project JingSu,* a better, integrative and improved plastic waste management system is to be developed in Suzhou. With the ambition to achieve finer source segregation in Suzhou, this project focuses on low-value plastic waste recycling, in which public engagement plays a vital role.

So far, Suzhou has issued a catalogue for "low-value plastics" with visual labelling and separate collection bins as part of the project to raise awareness and ensure the public's participation.

1.2 ASSESSMENT OBJECTIVE

To improve the current waste management system with a focus on better collection and recycling for low-value plastics, *the Awareness Baseline Assessment on Plastic Waste Generation and Recycling*

for Suzhou Citizens (‘*The Assessment*’) is conducted. It forms the basis for the design and implementation of the subsequent awareness-rising activities in Suzhou. The objectives for *The Assessment* are:

(1) to assess the level of awareness of the Suzhou citizens on plastic waste generation and recycling;

(2) to identify the target groups and the gaps in the awareness of Suzhou citizens to subsequently design awareness-rising strategies promoting FaBCs collection and recycling by Suzhou citizens.

1.3 ASSESSMENT METHODOLOGY

To promote better plastic waste management practices among citizens, the first step is to investigate the overall awareness of citizens of different issues along the plastic waste management process (see ‘Figure 1’), such as the status of plastic consumption and waste generation, plastic segregation and collection, as well as waste recycling and treatment, etc. *The Assessment,* after sound and specific design, represents a key milestone as it serves as the basis (see ‘Figure 2’) for the targeting pioneer groups who is easy-to-motivate and make the change and the implementation of subsequent awareness raising activities.

Figure 1. Plastic waste management process

Figure 2. From assessment to activities process

The assessment starts by identifying the places/venues where most plastic waste is generated. The methodology and target group are then clarified in order to accurately analyze the awareness, behavior and readiness of the different producer groups for awareness-raising measures.

1.3.1 TARGET GROUP AND KEY STAKEHOLDERS IDENTIFICATION

JingSu is working on three main areas according to where waste is mostly being generated in Suzhou: residential communities, schools and shopping zones/business areas. Given that there is an interest to collaborate with plastic producers and consumers directly at the point of purchase, a separate stakeholder mapping and assessment for commercial areas is conducted (from p. 93).

Based on a preliminary site visit and desk research, the specific stakeholders along the waste supply chain in residential communities and schools are identified and marked as dark brown in the 'Figure 3' and 'Figure 4'

KEY STAKEHOLDERS IN RESIDENTIAL COMMUNITIES

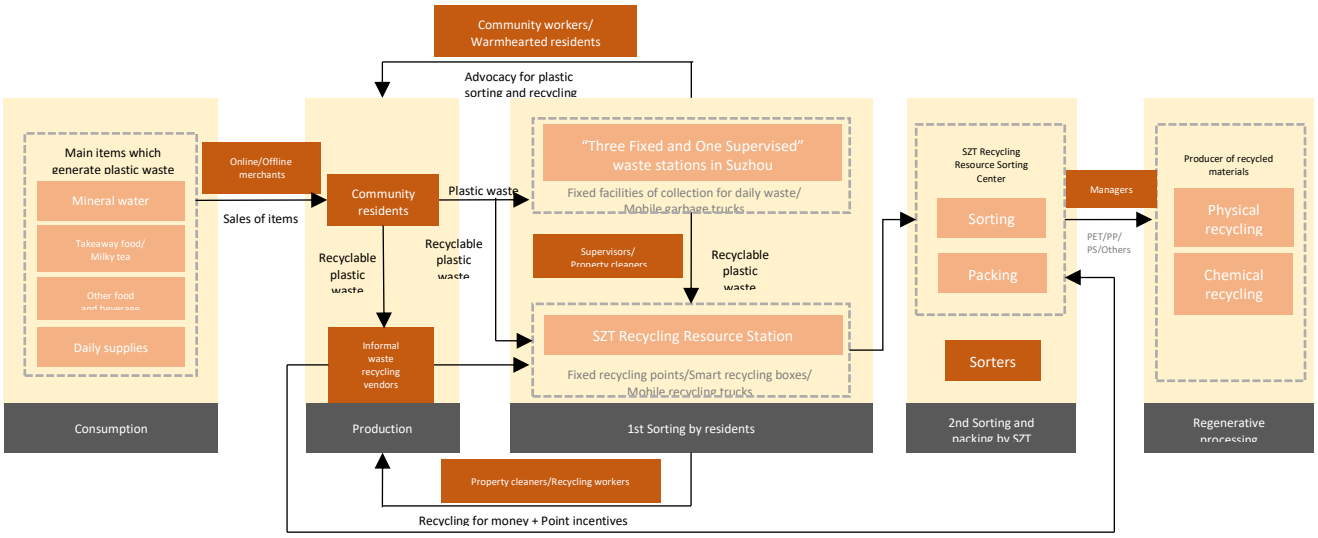


Figure 3.Plastic Waste Management Process and Identified Stakeholders of Residential Communities in Suzhou

- **Area:** Residential communities
- **Related activities within the waste management process:** consumption, waste generation, source separation and collection, sorting and packaging, regeneration treatment.
- **Key stakeholders:** merchants, community residents, informal waste recycling vendors, supervisors/community workers, sanitation workers, recyclers of fixed waste collection points, sorters and managers of renewable resource recycling institutions

- **Main categories of plastic waste:** plastic water bottles, plastic takeaway lunchboxes, plastic beverage cups, plastic fruit and vegetable packaging and other food and beverage packaging

KEY STAKEHOLDERS IN PRIMARY AND MIDDLE SCHOOLS

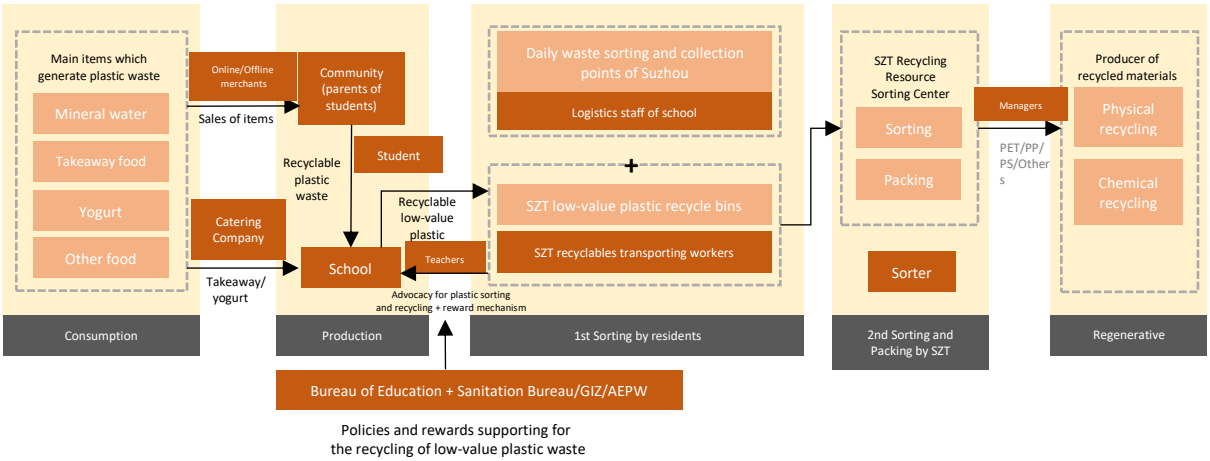


Figure 4. Plastic Waste Management Process and Identified Stakeholders of Primary & Middle Schools in Suzhou

- **Area:** Primary and Middle Schools

- **Related activities within the waste management process:** consumption, waste generation, source separation and collection, sorting and packaging, regeneration treatment.

- **Key stakeholders:** merchants, catering companies, students' parents, students, schoolteachers (teachers of environmental protection course, logistics administrators, etc.), transporters, sorters and managers of renewable resource recycling institutions

- **Main categories of plastic waste:** yogurt cups, plastic takeaway lunchboxes, etc.

1.3.2 METHODS

QUESTIONNARES AND INTERVIEWS

Based on initial desk research and the feedback from preliminary site visits, interviews and questionnaires were designed and piloted.

The questionnaire is conducted to quantify the status quo of the public's awareness of plastic waste, waste generation, consumption habits and waste sorting and recycling behavior, with the target groups being the waste generators for each target group. The content should be easily understandable according to the cognitive abilities of the respective target groups. In addition, the qualitative interviews supplement the data derived from the questionnaire. Interviews are conducted in the form of in-depth one-on-one conversations to gain various stakeholders' insights into the difficulties encountered throughout the whole waste management process. The application of mixed methods contributes to sound suggestions to optimize the waste management and recycling in Suzhou, especially for low-value plastics

1.3.3 SAMPLING SIZE TARGETING STAKEHOLDERS

Based on *Waste Wise Cites Tool* (WaCT guideline) [3] released by UN Habitat, the sample size for different target group with different methodology is set as indicated in table 1 below. During the implementation, more responses were received due to the support from local partners (mainly SESAA and SZT):

Waste generation place	Key stakeholders	Assessment methodology	Estimated sample size	Actual sample size
Residential Communities	Residents	Questionnaire	1,000	11,110
	Community staff	Interview	3	1
	Recyclers of renewable resource recycling institutions	Interview	4	4
	Managers and sorters of renewable resource recycling institutions	Interview	4	4
Schools	Students	Questionnaire	1,000	1,006
	Teachers	Interview	5	3

[3] The Waste Wise Cites Tool (WaCT) released by UN Habitat provides guidelines for conducting research on the generation and composition of solid waste in community, which requires sampling at least 370-384 households in a city with a population size of 10,000 to 10 million, to achieve a 95% statistical confidence level and a 5% error rate under normal situation, for ensuring the accuracy and validation of the research results.

Table 1. Overall situation for target groups and sampling in communities and schools

Detailed illlustation are as below:

TARGET GROUP IN RESIDENTAL COMMUNITY

Based on the stakeholders identified in Figure 3, residents are selected as target group for the questionnaires, since they are involved in consumption, waste generation and source segregation. These are the focused activities for further awareness-raising activities following the 3Rs principle. At the same time, residents make up the majority of stakeholders in those communities.

- **SAMPLING SIZE**

Based on the WaCT's guidelines, which requires sampling at least 370 households for a city with 10,000 to 10 million population. As JingSu has covers a total of about 3 million residents in Gusu District, Suzhou Industrial Park District, High tech District, Wuzhong District and Xiangcheng District, the sample size was designed to be 1,000 to ensure the validity and minimize results deviation.

- **SAMPLING ANALYSIS**

Owing to the support from the governmental official WeChat account of SESAA, more than 10 times the expected sampling size was finally collected. The questionnaire for the Awareness Baseline Assessment on Plastic Waste Generation and Recycling for Community Residents in Suzhou counted 11,110 respondents, covering all districts, but Taicang District. Only 2 responses were invalid.

The distribution of the respondents' basic characteristics, i.e., age, gender, educational level, and districts is depicted in in 'Table 2' and 'Table 3'.

It is concluded that most of the people responded are among 18-50 years old, with the education level of professional training college and university.

Overall Sample		
Total Sample Number	11,110	
Age (Table 3.1 on right)	{Under 18} {18~25} {26~30} {31~40} {41~50}	2.83% 11.4% 33.95% 40.13% 10.1%

	{51~60}	1.21%
	{Over 60}	0.39%
Gender (Table 3.1 on left)	Male to female ratio	54.71 : 45.29
Educational Background (Table 3.2 on left)	Junior high school and below	2.13%
	High school	13.52%
	Professional training college	57.66%
	Undergraduate	25.06%
	Master, PhD and above	1.63%
Address (District/County) (Table 3.2 on right)	Gusu District	37.71%
	High-tech District	28.36%
	Wuzhong District	22.89%
	Xiangcheng District	4.26%
	Industrial Park District	1.77%
	Wujiang District	1.58%
	Kunshan County	1.09%
	Zhangjiagang County	0.94%
	Changshu County	0.88%
	Taicang County	0.19%
	None	0.33%

Table 2. Distribution features of respondents

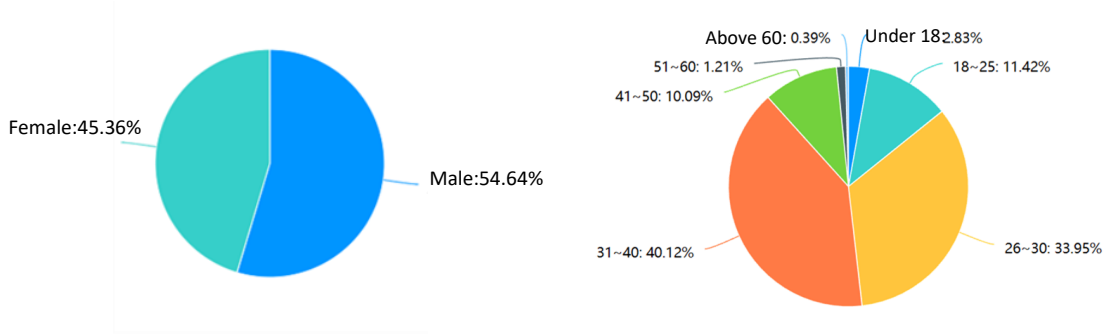


Table 3.1 Respondents' gender (left) and age groups (right)

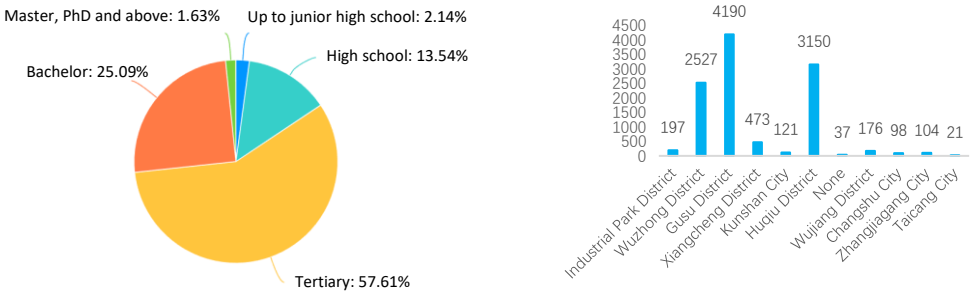


Table 3.2 Respondents' educational level (left) and locations (right)

Table 3. Respondents' basic information

TARGET GROUP IN PRIMARY AND MIDDLE SCHOOLS

Based on the stakeholders identified in figure 4, students, with their role in plastic waste production and large quantity in schools, are the main dissemination target for school questionnaires.

Given the cognitive differences among age groups, students are further dived into two categories:

1) Grade 1 to 3 students: Students from Grade 1-3 are generally between 6-10 years old, who are still in the stage of literacy learning. Accordingly, the questionnaire questions are much simpler in the less than 10 questions and mainly in picture format.

2) Grade 4 to 9 students: Students from Grade 4-9 are generally between 11-16 years old, who can read more words with developed logical thinking abilities. Hence, the questionnaire questions could be more complex ones combining with thinking and judgment questions.

- **SAMPLING SIZE**

According to WaCT guidelines, at least 1,000 students should participate in the survey, including 450 students in grades 1 to 3 and 550 in grades 4 to 9. Respondents were primarily recruited from 112 primary & middle schools participating in the 'Plastic Free Childhood' project, which covers about 207,000 students and aims to encourage students in various Suzhou's districts and counties to do FaBCs waste sorting.

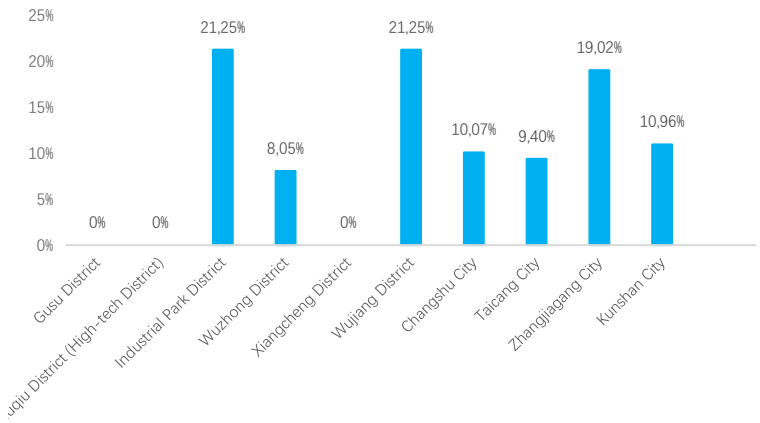
- **SAMPLING ANALYSIS**

With support from SESAA and the Suhzou Education Bureau, 1,006 responses were received in total, including 447 in grade 1-3 and 559 in grade 4-9.
The distribution of the respondents' basic characteristics, i.e. educational level, age and districts can be seen in 'Table 4' and 'Table 5'.

Overall Sampling		
Total Sample Number	1,006	
Education level / Age	{Year 1-3/ 6-9}	44.43%
	{Year 4-9/10~16}	55.57%

Address (District/County) for Year 1-3	Gusu District	0
	High-tech District	0
	Wuzhong District	8.05%
	Xiangcheng District	0
	Industrial Park District	21.25%
	Wujiang District	21.25%
	Kunshan County	10.96%
	Zhangjiagang County	19.02%
	Changshu County	10.07%
	Taicang County	9.4%
Address (District/County) for Year 4-9	Gusu District	8.05%
	High-tech District	0
	Wuzhong District	17.53%
	Xiangcheng District	0
	Industrial Park District	8.77%
	Wujiang District	8.41%
	Kunshan County	20.57%
	Zhangjiagang County	13.42%
	Changshu County	17.71%
	Taicang County	5.55%

Table 4. Distribution features of respondents



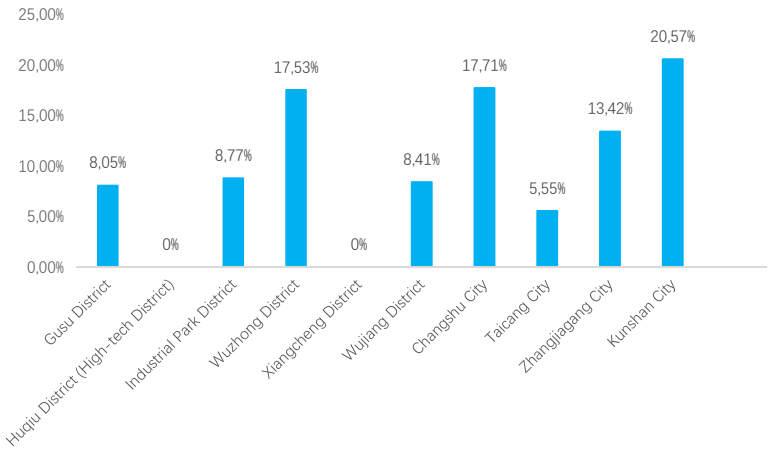


Table 5. Respondents' schools location: Year 1-3 (above) and Year 4-9 (down)

2. ASSESSMENT RESULTS

This chapter evaluates the Suzhou student's and resident's awareness, willingness to participate and behavior toward plastic waste management and low-value plastics segregation and recycling.

2.1 RESIDENTS

2.1.1 CURRENT SITUATION OF PLASTIC CONSUMPTION, AWARENESS AND COGNITIONS FOR LOW-VALUE PLASTIC WASTE AND PLASTIC WASTE RECYCLING

Residents in Suzhou generate a lot low-value plastic weekly. Generally, they possess a relative high awareness on plastic waste management via 3Rs-related pro-environmental practice, where 'reducing' is the main principle of followed by the majority. The questionnaire results indicate:

- Among all the low-value plastics, film plastics (incl. plastic bags and snack packings) are the most generated ones, followed by plastic food packing boxes and beverage cups.

- Over 55% of residents are aware of that low-value plastic waste is recyclable, with a good but lower awareness level than the recyclable domestic waste.

- The awareness for carrying out plastic waste segregation behaviors shows a good baseline level, however, the awareness for rinsing before collection is relatively lower.

CURRENT SITUATION OF PLASTIC CONSUMPTION

The most low-value plastic waste generated over 4 pieces by residents weekly in Suzhou are plastic bags and snacks packings (71.4%), followed by plastic food packing boxes (71.16%) and plastic beverage cups (67.69%) and the least one is plastic fruit and vegetable trays (47.58%). Among the plastic FaBCs waste, the plastic takeaway lunchboxes generation amount is relatively low among residents with 54.66%.

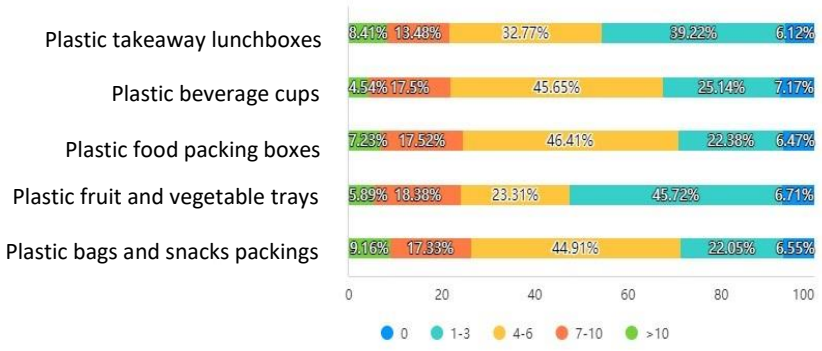


Table 6. Question: How many pieces of low-value plastic waste do you produce on average each week?

AWARENESS AND COGNITIONS FOR ALL PLASTIC WASTE

Over 55% of respondents think the listed plastic waste items are recyclable, among them, the water bottles in PET, as already been listed as recyclable waste in *The Waste Regulation,* take the largest share of 68.03%. As for remaining plastic waste, which are currently categorized as “residual waste”, 65.81% of the residents think plastic food containers possess recycling value and can be recycled, ranking the highest among low-value plastic, while plastic fruit and vegetable trays have the least recognition rate of 55.79%.

Among the communities in different districts, the cognization level in Gusu District is the highest with on average 75% residents admitting the recyclability of plastic waste, which due to its better and longer-established collection and recycling facilities compared to the communities in other districts.

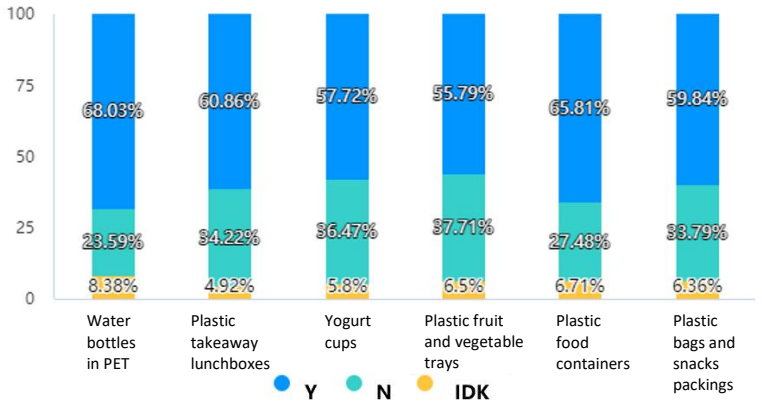


Table 7. Question: For the following plastic waste, do you think they are recyclable or not?

(Y： yes, N: no, IDK: I don't know)

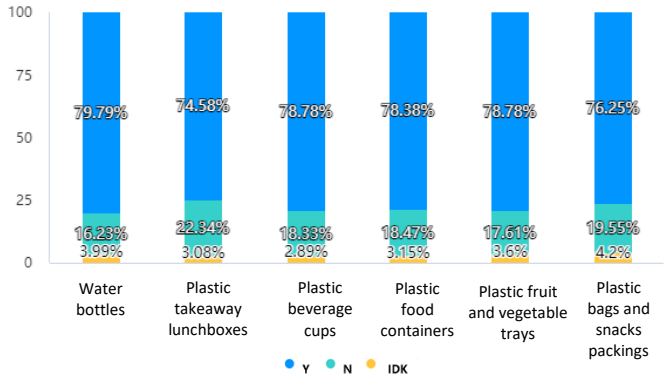


Table 8. Perception for recyclable plastic waste in Gusu District

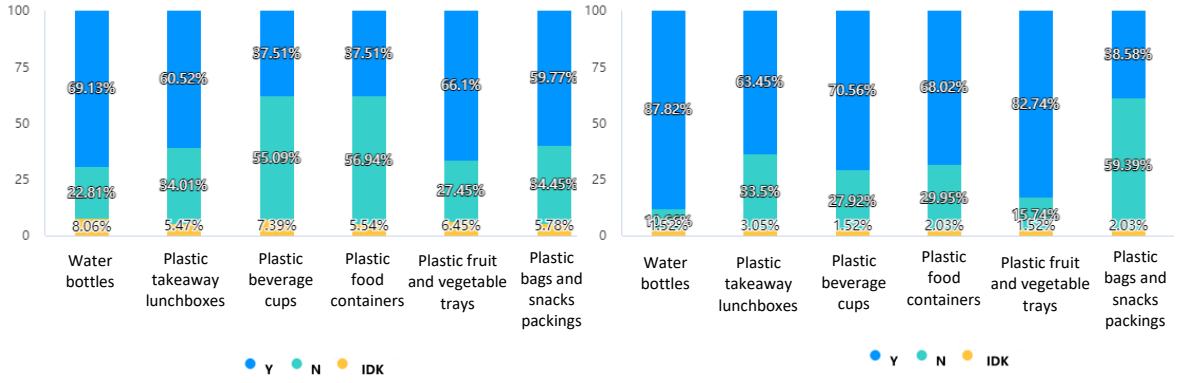


Table 9. Perception for recyclable plastic waste in High-tech District (left) and Industrial District (right)

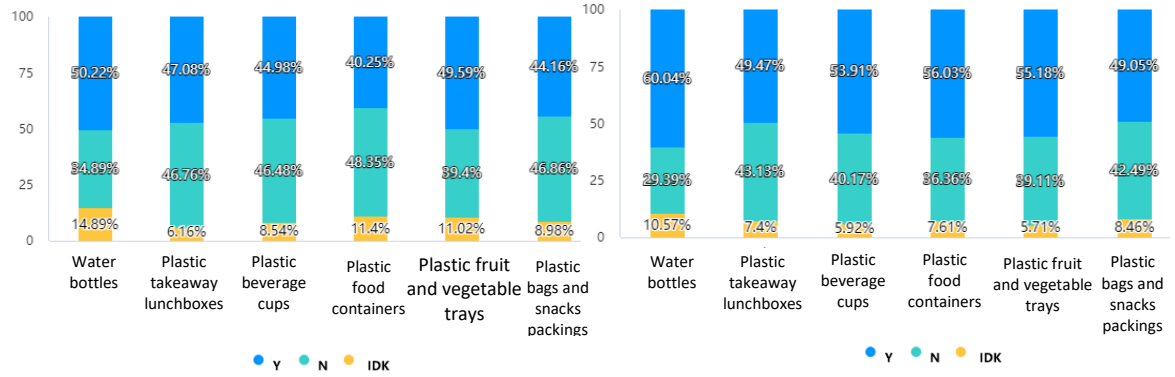


Table 10. Perception for recyclable plastic waste in Wuzhong District (left) and Xiangcheng District (right)

AWARENESS AND COGNITIONS FOR PLASTIC WASTE RECYCLING

In general, almost all respondents (over 99.3%) have the awareness to mitigate plastic waste via practicing pro-environmental behaviors, among which over 70% have practiced plastic waste reducing in their daily life, like taking own shopping bags, buying refilling products etc. As for segregation at source, less awareness is found for low-value plastic segregation compared with awareness for "four-type segregation" for household waste (i.e. segregation between kitchen waste, residual waste, recyclables and hazardous waste). It can be illustrated by the figure that approx. 68% of respondents can recognize water bottles as *'recyclables'*.

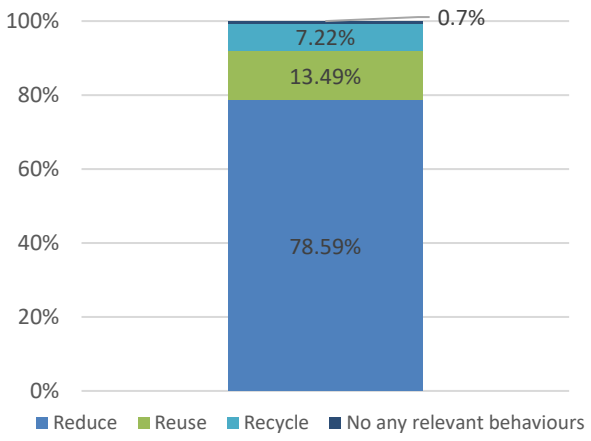


Table 11. 3R-related environmental behaviours in daily life by residents

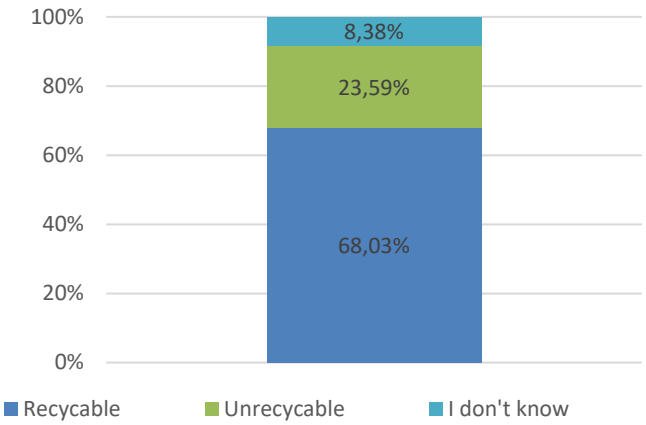


Table 12. The cognization for plastic water bottles as recyclable waste

As for the awareness for plastic waste sorting for recycling, at least 80% of respondents in overall Suzhou have the awareness to do segregating and rinsing for recycling low-value plastic with or without certain incentive/regulatory measures. Where without any supports, the awareness for sorting (53.74%) is higher than rinsing (36.16%). Less than 13% of respondents don't have the awareness due to the insufficient perception of plastic waste's impact or the plastic waste management process.

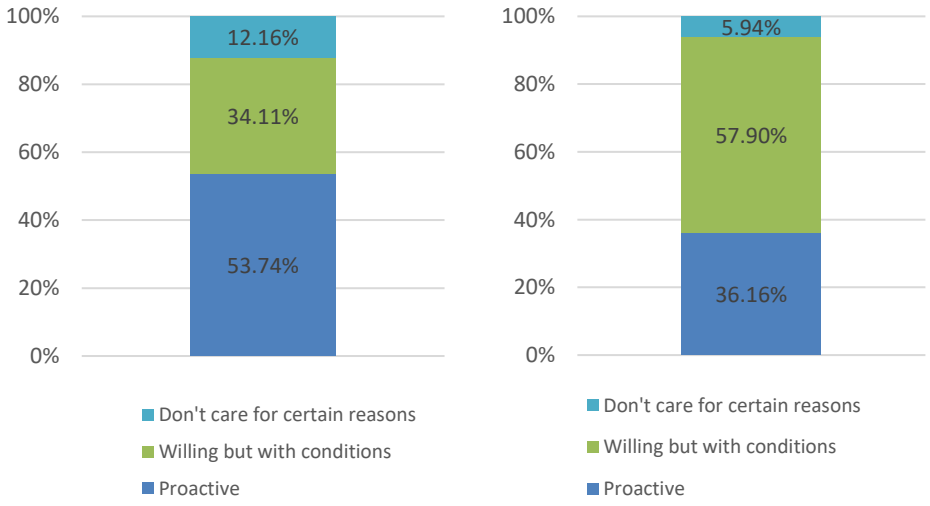
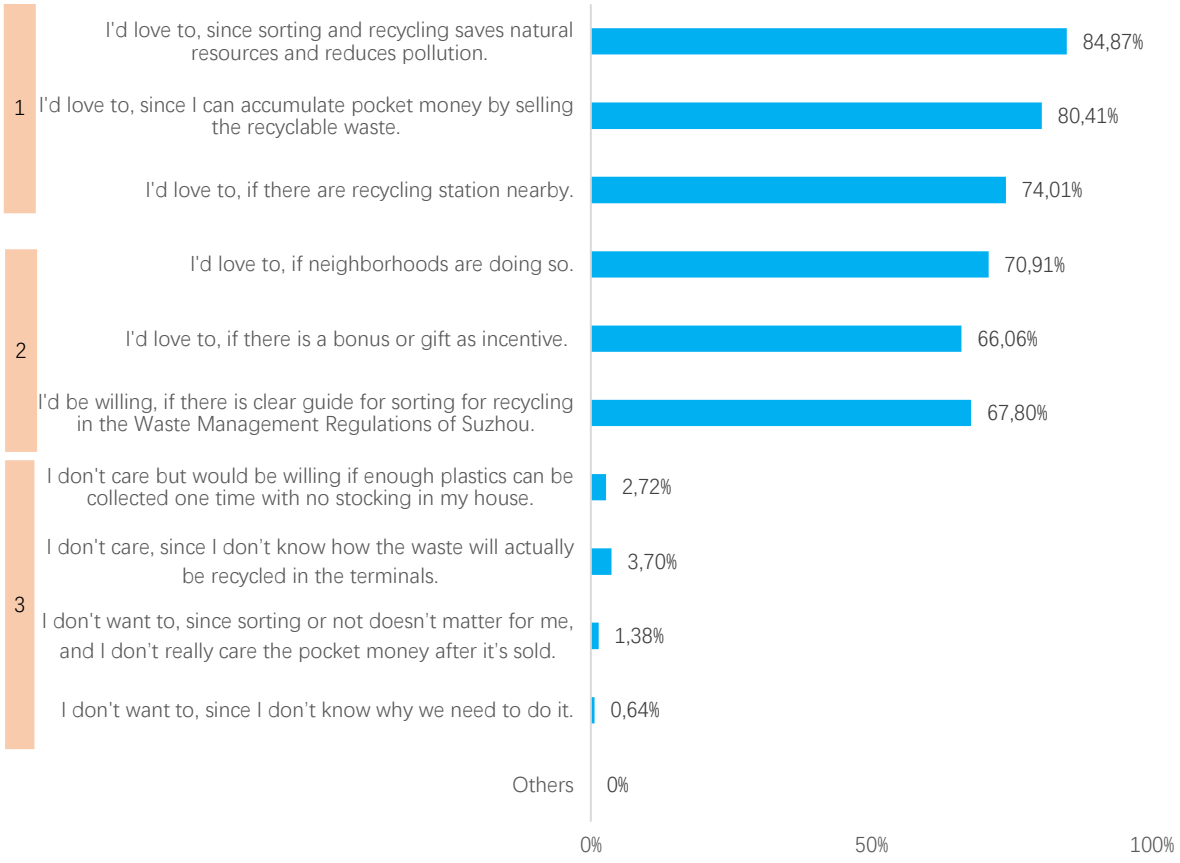


Table 13. Awareness for plastic waste sorting (left) and rinsing (right) for recycling

The communities in Gusu District with low-value plastic waste recycling awareness raising activities have the highest sorting at source and rinsing perception level among all the districts, followed by

Suzhou Industrial Park District, then are High-tech District, Wuzhong District and Xiangcheng District, where the perception in Xiangcheng District is lower the average status of Suzhou.



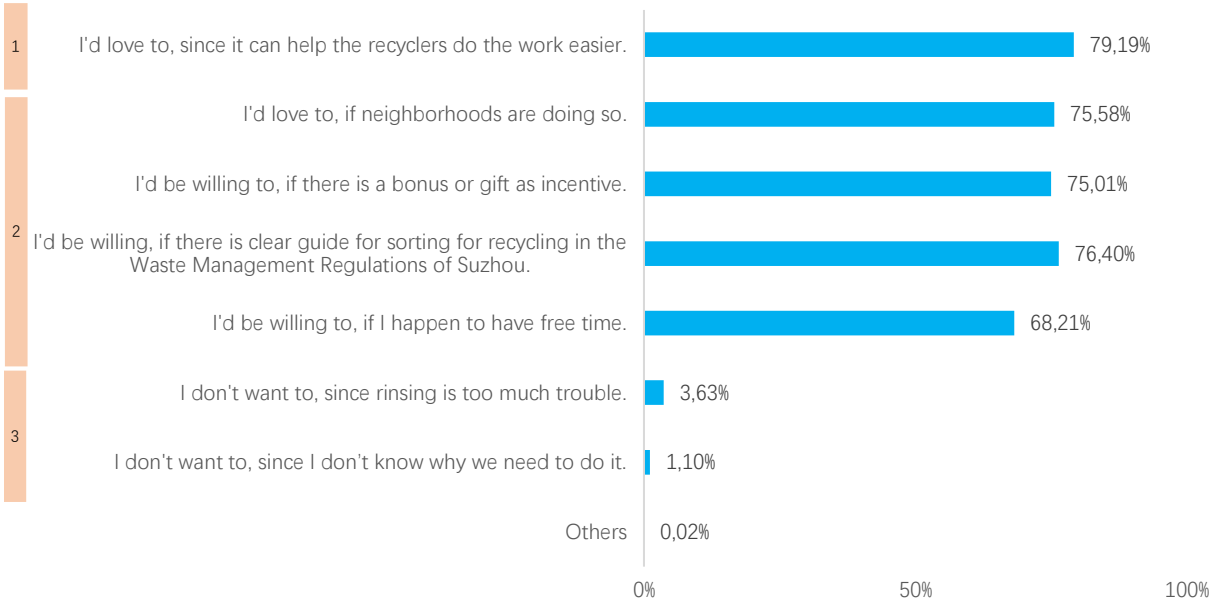
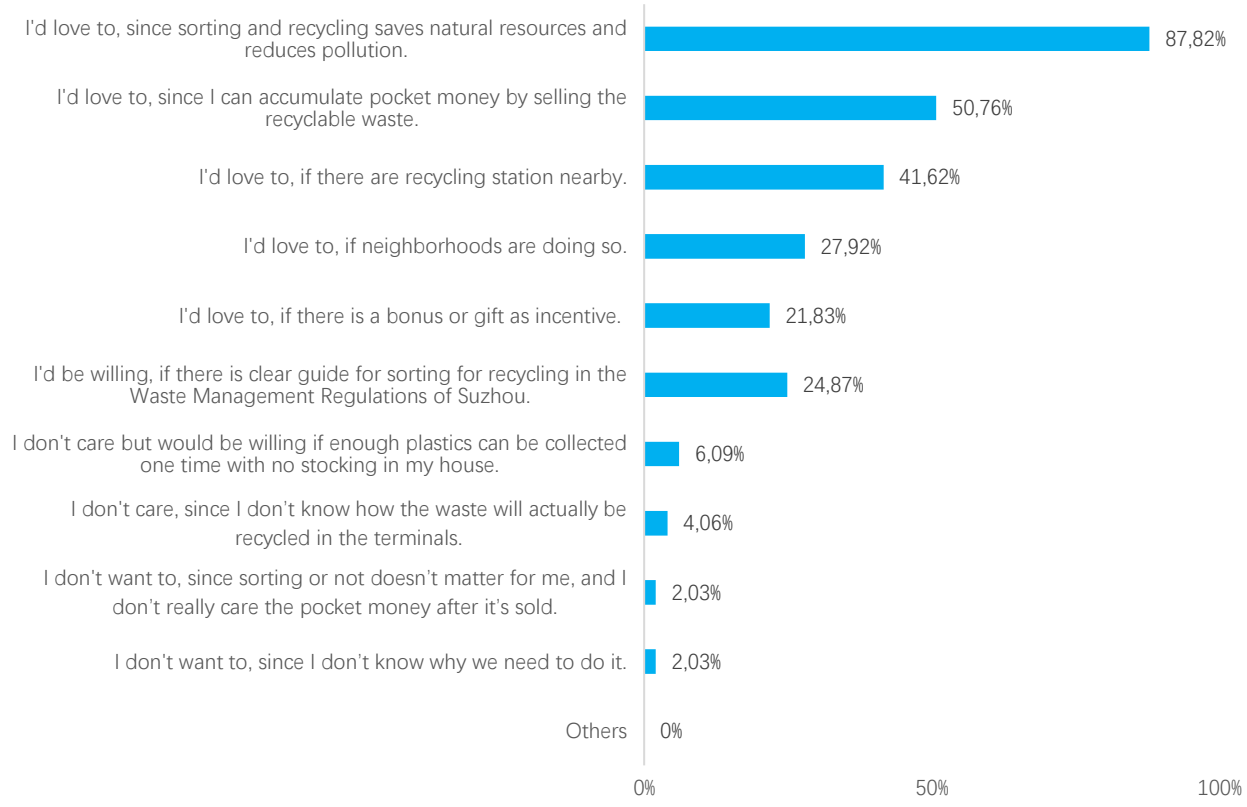


Table 14. The residents' willingness towards sorting and segregating at source for recycling of plastic FaBCs waste (above) and rinsing for plastic takeaway lunchboxes waste (under) in Gusu District



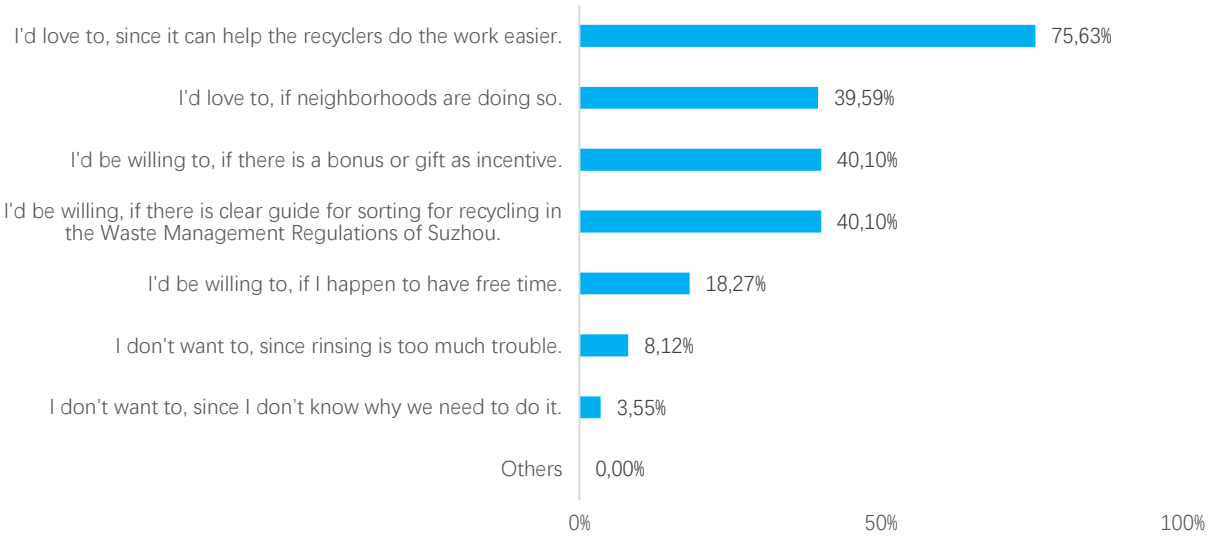


Table 15. The residents' willingness towards sorting and segregating at source for recycling of plastic FaBCs waste (above) and rinsing for plastic takeaway lunchboxes waste (under) in Suzhou Industrial Park District

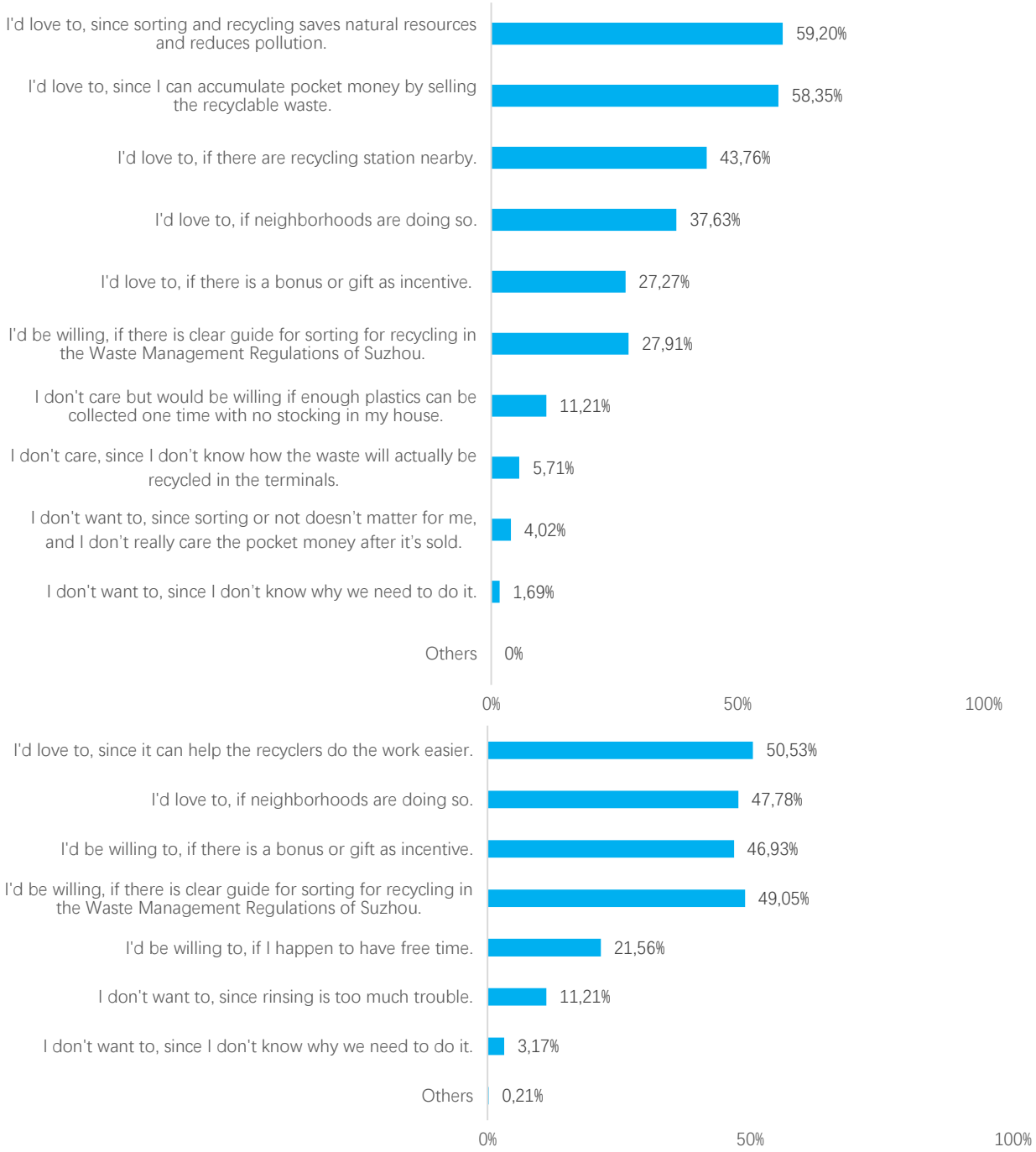


Table 16. The residents' willingness towards sorting and segregating at source for recycling of plastic FaBCs waste (above) and rinsing for plastic takeaway lunchboxes waste (under) in Xiangcheng District

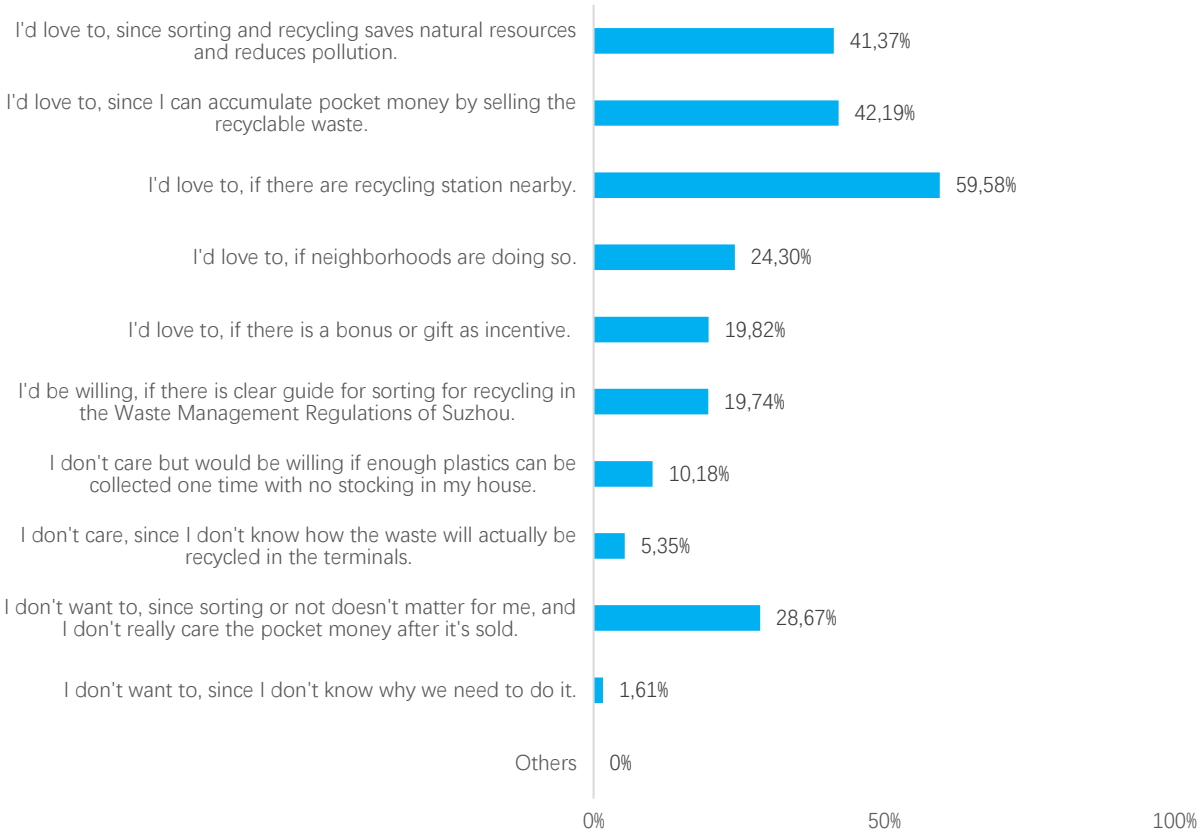


Table 17. The residents' willingness towards sorting and segregating at source for recycling of plastic FaBCs waste (above) and rinsing for plastic takeaway lunchboxes waste (under) in Wuzhong District

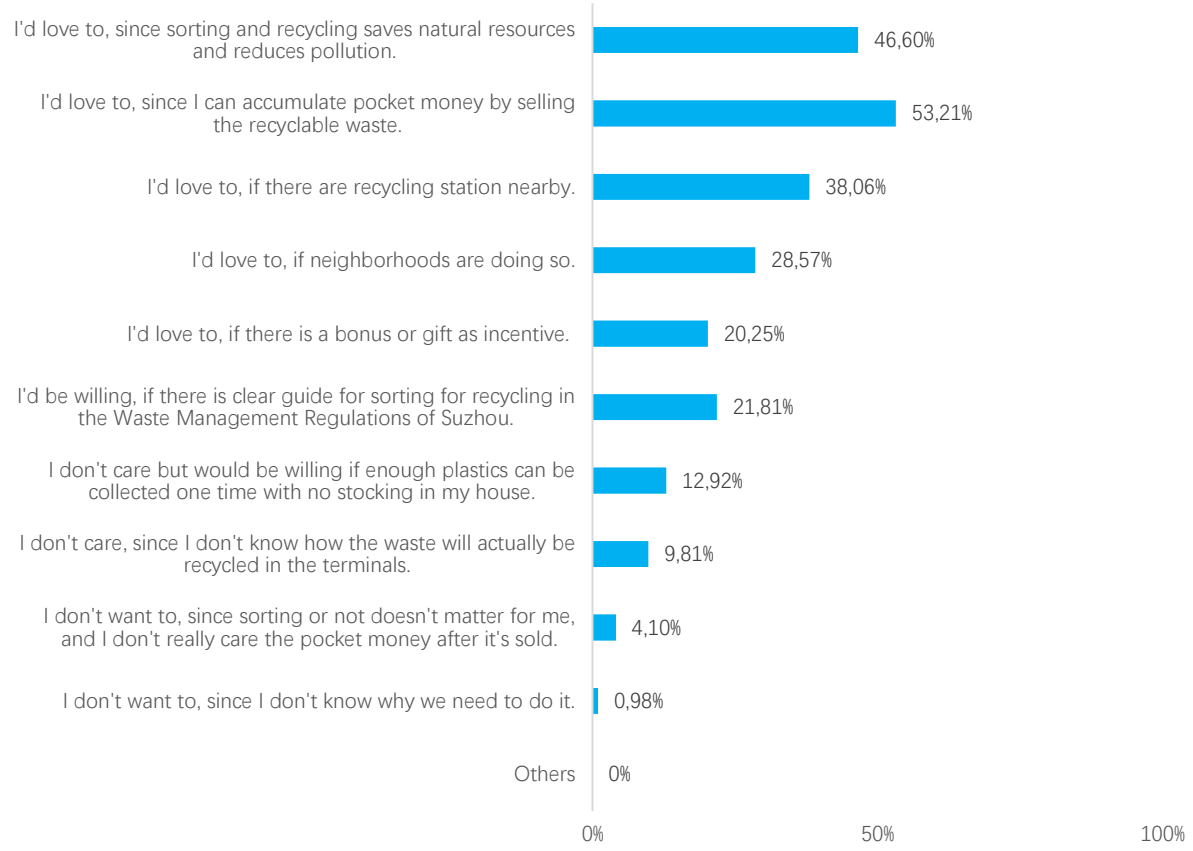


Table 18. The residents' willingness towards sorting and segregating at source for recycling of plastic FaBCs waste (above) and rinsing for plastic takeaway lunchboxes waste (under) in High-tech District

2.1.2 WILLINGNESS TO PARTICATE PLASTIC WASTE COLLECTION AND SEGREGATION

Overall, a relatively high proportion of respondents are willing willingness to do plastic waste collection and segregation. People have less willingness, however, to rinse plastic waste than to sort and segregate. The questionnaire results indicate:

- More than 57% of residents are willing to actively participate in the plastic waste collection and segregation, and more than 56% rinse the plastic takeaway lunchboxes. Overall, results show that residents have strong environmental awareness and are willing to participate in plastic collection and segregation.

- Over 40% of residents are proactive to collect, segregate and rinse plastic waste if there are some incentives, government regulations or if everyone obeys the related norm. With supporting measures, the willingness for recycling is expected to increase substantially, especially for rinsing behaviors.

SORTING BEHAVIORS

Over 57% of respondents are proactive to sort their waste on grounds of environmental protection (63.23%), pocket-money accumulation (61.29%), or if there are recycling facilities for plastic waste nearby (57.17%); and approx. 40% of respondents are willing if there are some incentives (38.09%), government regulations (39.92%) or everyone obeys the sorting norm (44.2%). However, 12.16% of respondents are not concerned about sorting behaviors because they don't know how the waste is treated finally (6.17%) or they just don't care (8.68%) nor want to sort for recycling (8.17%).

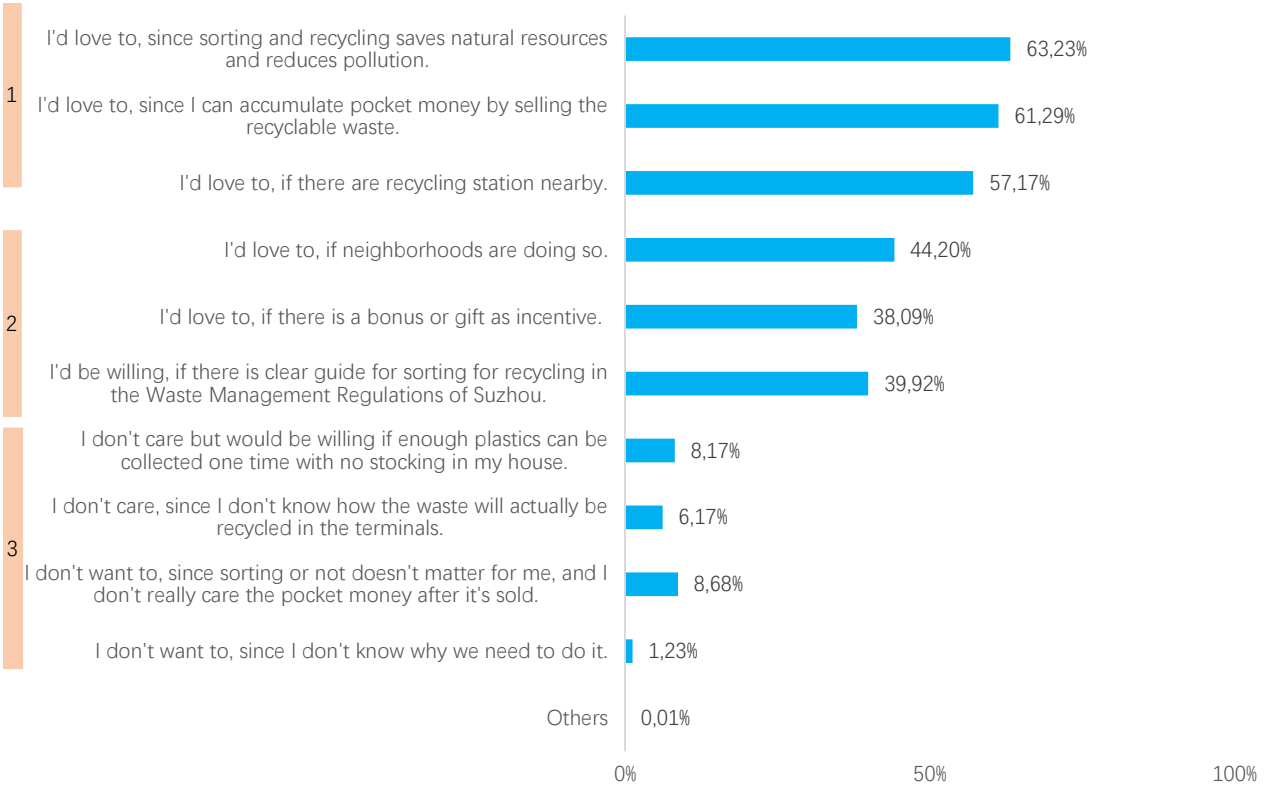


Table 19. Question: Would you like to sort the waste out that shown above and put them away or sell them to local collection and recycling station?

RINSING BEHAVIOURS

For rinsing behaviors, 56.17% of respondents are proactive to rinse the plastic takeaway lunchboxes to subsequently ease the collectors' or sorters' work, and approx. 40-60% of respondents are willing if there are some incentives (51.23%), government regulations (60.29%), everyone obeys the rinsing norm (52.79%) or the respondents have free time to do so (40.16%). The ones who are not willing to rinse do so because they don't understand the motivation (2.07%) or think it is time-consuming (7.87%).

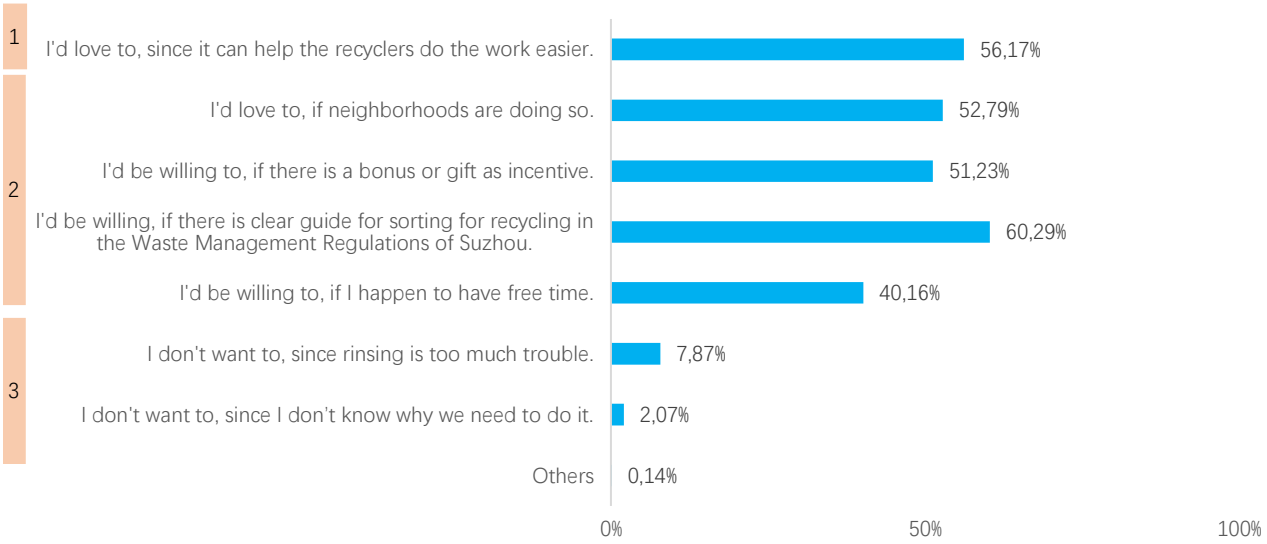


Table 20. Question: Would you like to simply rinse the plastic takeaway lunchboxes before disposing them?

2.1.3 BEHAVIOURS TOWARDS PLASTIC WASTE RECYCLING

Almost all residents apply some of the 3R principles in their daily life. Over half of the population has adopted plastic reducing practices. Out of the 3R (Reduce, Reuse, Recycle), most of the respondents care primordially about the reducing principle, reflected by the analysis of respondents' daily pro-environmental behaviors related with plastic waste recycling.

- For the plastic waste recycling-related behaviors, over half of the respondents would choose 'no cutlery' while ordering takeaway, take own shopping bags or tend to buy refilling products while shopping, where choose 'no cutlery' is the most common behaviors.

- The reducing-related activities make up the majority (20-55%) of resident's activities, as they are likely easier to be carried-out in daily life, including take own shopping bags (51.41%), tend to buy refills or replacement while shopping (51.14%), taking own reusable water bottle, coffee mug (46.88%), or tend to cook at home or dine-in, choosing 'no cutlery' while ordering takeaway (55.08%), and etc. (45.29%).

- For reusing-related practices, 10% of respondents have relevant daily behaviours, such as participating in workshops on plastic waste (9.53%) or reusing the unused plastic bags or takeaway

lunchboxes and etc. (9.76%). For recycling-related practices, it takes similar proportion of reusing-related practices, 9% of respondents have purchased or used recycled plastic products in their daily life.

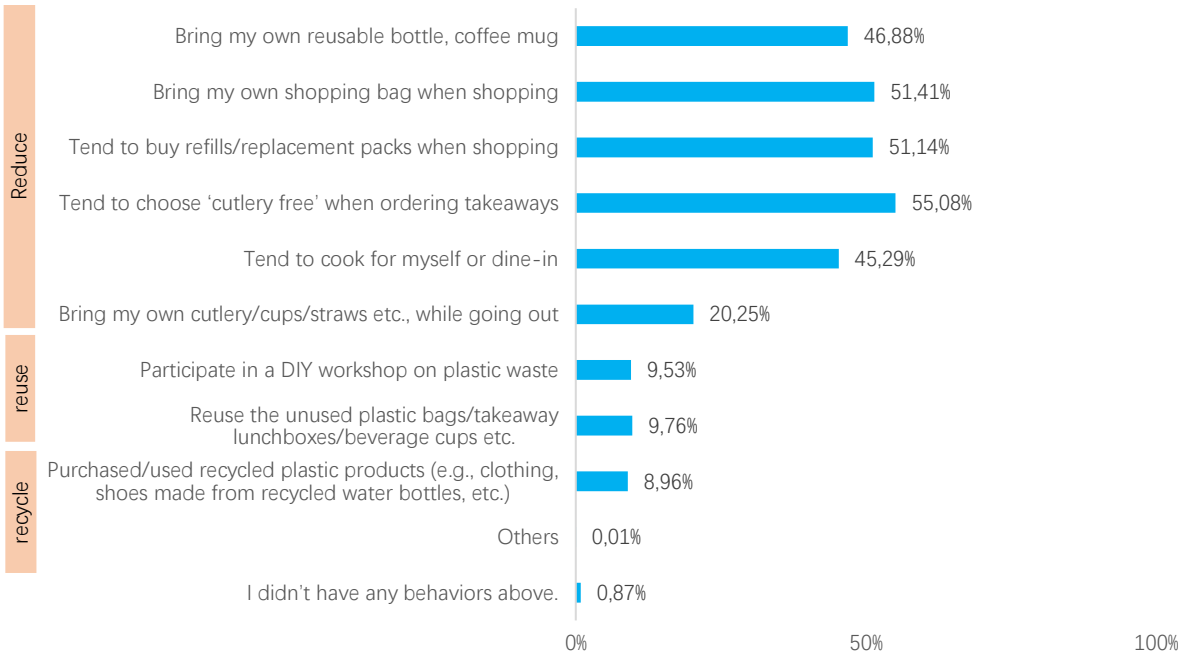


Table 21. Question: What kinds of pro-environmental behaviours did you have in your daily life?

2.1.4 MOTIVATIONS AND CONCERNS FOR PLASTIC WASTE RECYCLING

MOTIVATIONS

According to the analysis of respondents' willingness to do sorting or rinsing under different situations, there are five motivations that drive residents to adopt sorting and rinsing behaviors:

- Environmental protection
- Monetary incentive
- Social consensus
- Government regulation
- Easy-to-practice

Among the motivations, monetary incentives are the main reason to adopt sorting behaviors, while governmental regulation is main driven forces for rinsing behaviors. Environmental protection has a relatively high impact on people's recycling behavior, but it is not the main driver for residents.

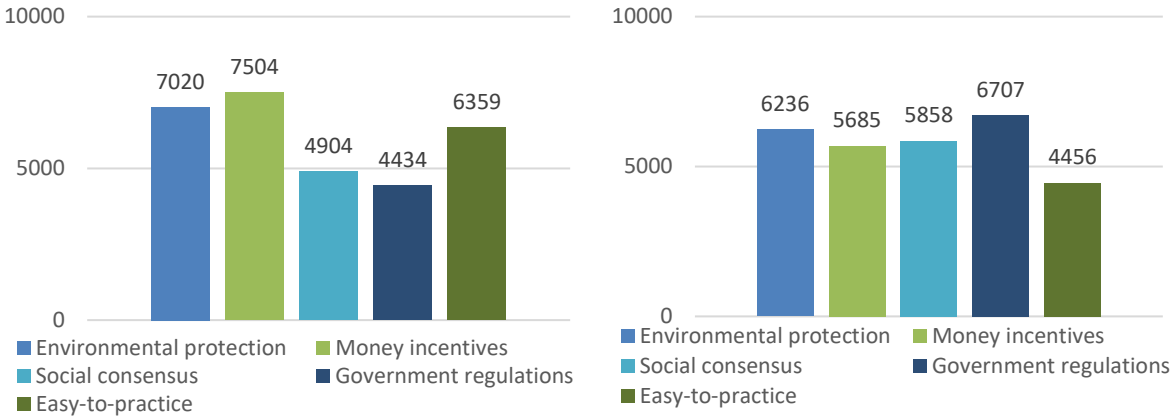


Table 22. Motivations for sorting (left) and rinsing (right) for recycling behaviors of low-value plastic waste

CONCERNS

However, the concerns for the plastic waste recycling are identified as:

1. Inconvenience for low-value plastic waste collection or rinsing,
2. Insufficient perception for the plastic waste,
3. No transparent info for the whole recycling process,
4. Considering rinsing a waste of water.

Among the concerns, the 'not enough perception for plastic waste' is the main player that why people don't recycle plastic waste, while inconvenience is the main bottleneck for not rinsing.

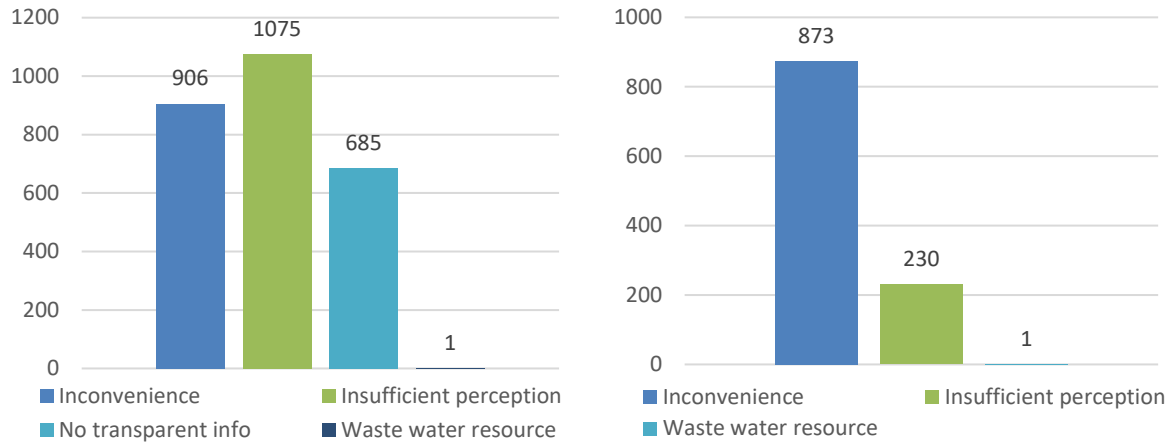


Table 23. Concerns for sorting (left) and rinsing (right) for recycling behaviors of low-value plastic waste

2.2 STUDENTS

Considering the limited reading comprehension ability of primary and middle school students, the term 'classification and recycling of low-value plastic waste' was replaced by 'waste sorting' in the questionnaire for better understanding. As the level of awareness regarding plastic waste varies between grades 1-3 and grades 4-9, the questionnaire has been designed for these two age groups with some differences. Specifically for grades 4-9, the questionnaire includes additional in-depth questions on the classification and recycling habits of low-value plastic waste. It covers aspects such as the reasons for classification and recycling, differentiation of recyclable plastic types, the willingness to acquire relevant knowledge, and the actual classification practices.

2.2.1 CURRENT SITUATION OF PLASTIC CONSUMPTION, AWARENESS AND COGNITIONS FOR LOW-VALUE PLASTIC WASTE AND PLASTIC WASTE RECYCLING

In general, middle school students (aged 13 to16) demonstrate a high level of basic awareness regarding waste sorting and plastic recycling. However, their ability to classify specific categories of plastic waste correctly and recognize recyclable waste remains relatively weak. The questionnaire results indicate:

- Over 90% of the respondents are aware of the reasons for engaging in waste sorting and possess a basic understanding of it. Among these, the primary motivation for waste sorting is the desire to protect the environment and conserve resources.

- 76% of the sampled students in grades 4-9 reported that they frequently generate plastic waste such as snack packings at home and school. However, only 39.89% of the respondents were able to correctly identify low-value plastics, such as plastic bags, as recyclable, indicating the need to strengthen the students' awareness and knowledge regarding the recycling of plastic waste.

ACTIVITIES AND COURSES CONDUCTED BY SCHOOLS

The survey results reveal that over 78% of respondents have participated in courses or activities related to plastic waste recycling organized by their schools. This demonstrates the significant commitment and far-reaching potential impact of Suzhou's primary and middle schools in promoting environmental knowledge and education.

Among students in grades 1 to 3, 78.97% of the respondents stated that their schools had organized relevant courses or activities. 19.46% of the respondents mentioned that their schools had never conducted such plastic reduction activities, while an additional 1.57% were unsure. In contrast, among students in grades 4 to 9, a higher percentage of respondents (89.09%) confirmed that their schools conducted educational programs and activities on plastic waste recycling. The proportion of respondents indicating that there were no previous activities by their schools was lower compared to lower the lower grades (9.66%). Only a small percentage of respondents, merely 1.25%, were unsure.

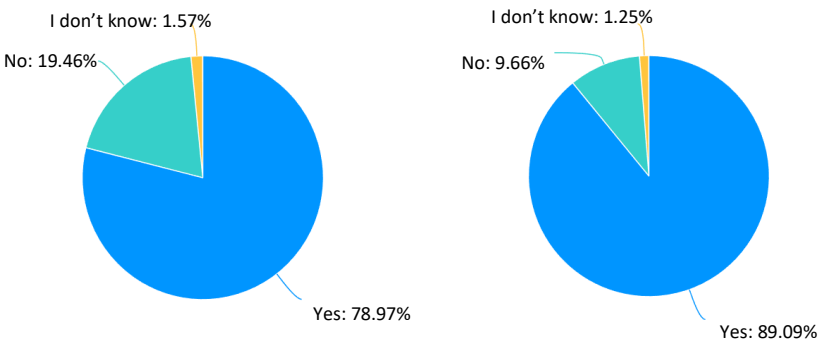


Table 24. Question: Has the school organized any courses or activities for plastic waste recycling?

From grades 1-3 (left), grades 4-9 (right)

AWARENESS FOR WASTE SEGREGATION

In general, over 90% of respondents are aware of the reasons for waste sorting, with higher overall awareness among students in grades 4-9 (97.32%) compared to those in grades 1-3 (93.06%).

The survey results indicate that among students in grades 1-3, 4.7% of the respondents are unaware of the reasons for waste sorting, while an additional 2.24% expressed some uncertainty. However, among students in grades 4-9, the proportion of respondents who claimed to be 'unaware' was significantly lower at only 2.68%, and there were no respondents who expressed 'uncertainty'.

It could be concluded that the increasing number of educational activities (among other factors) conducted in higher grades are effective in developing an understanding and awareness of plastic waste and recycling among students.

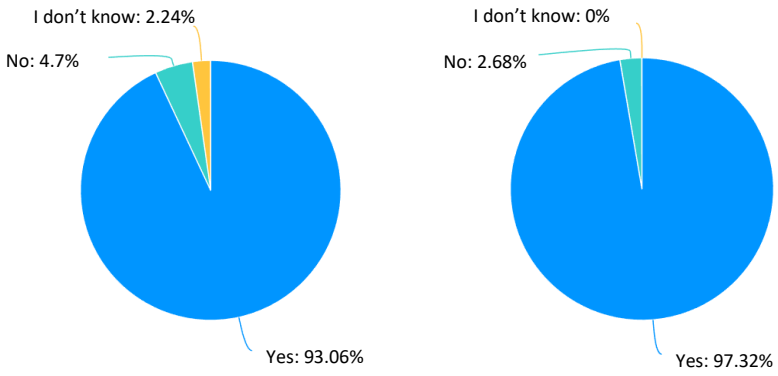


Table 25. Question: Do you know why it is important to practice waste sorting?

From grades 1-3 (left), grades 4-9 (right)

Among students in grades 4-9, over 50% of the students believe that the main reasons for waste sorting are environmental protection and resource conservation. Only a small portion of students consider waste sorting to be motivated by personal interest or the influence of others.

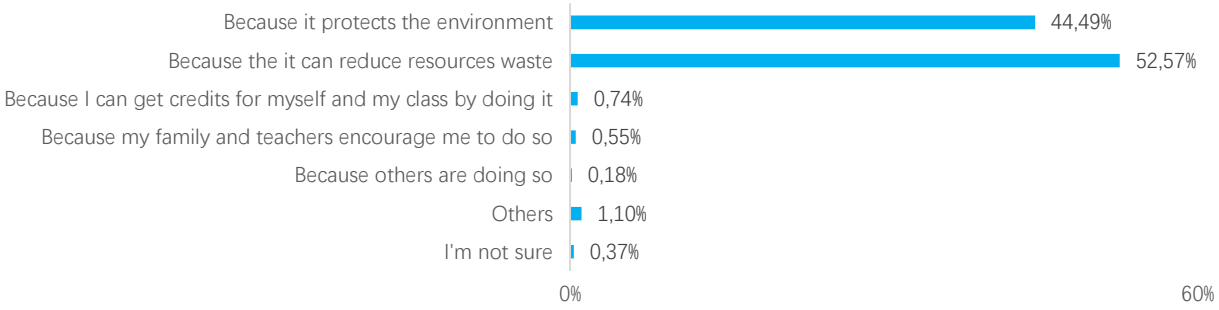


Table 26. Question: What is your reason for engaging in waste segregation?

From grades 4-9

COGNIZATION FOR PLASTIC WASTE AND RECYCALE PLASTIC WASTE

According to the research findings, snack packaging is the most encountered plastic waste by respondents at home and in school (94.85% for grades 1-3, 76.21% for grades 4-9), followed by yogurt cups (80.75% for grades 1-3, 72.45% for grades 4-9) and food packaging boxes (80.31% for grades 1-3, 71.91% for grades 4-9). The least encountered plastic waste is plastic fruit and vegetable trays (68.01% for grades 1-3, 52.95% for grades 4-9).

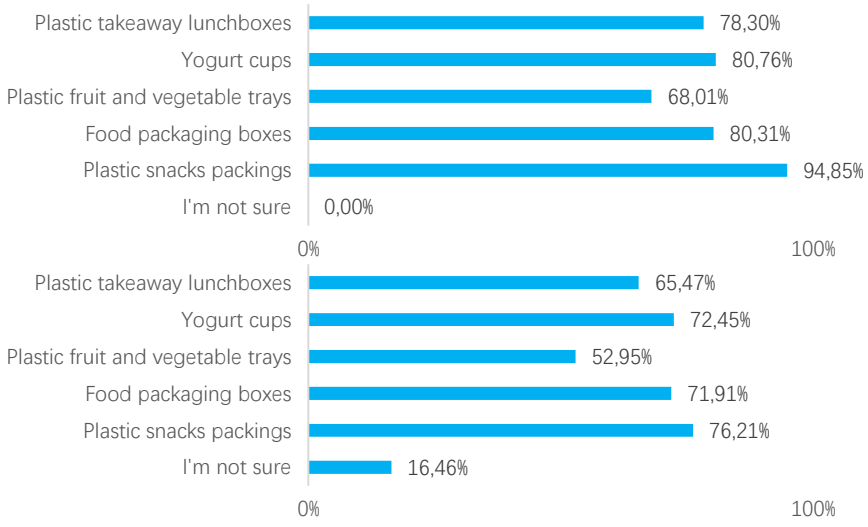


Table 27. Question: What types of plastic waste have you encountered at school and at home?

From grades 1-3 (above), grades 4-9 (under)

The survey results indicate that among students in grades 4 to 9, 96.78% of the respondents believe that plastic water bottles are recyclable, reflecting the highest level of awareness regarding the recycling of this type of plastic waste. Following that, plastic takeaway lunchboxes (79.07%), plastic fruit and vegetable trays (78.71%), yogurt cups (75.85%), and food packaging boxes (57.07%) are also considered recyclable by the majority of students. However, the awareness level regarding snack packaging is relatively low, with only 39.89% of the respondents aware that these types of plastic waste can be recycled. Merely 3.22% of the respondents believe that none of these plastic wastes are recyclable.

Therefore, it can be observed that most students in grades 4 to 9 possess the ability to identify and recognize common plastic waste items such as plastic water bottles and plastic takeaway lunchboxes. However, their understanding of the recyclability of snack packaging is not yet accurate enough.

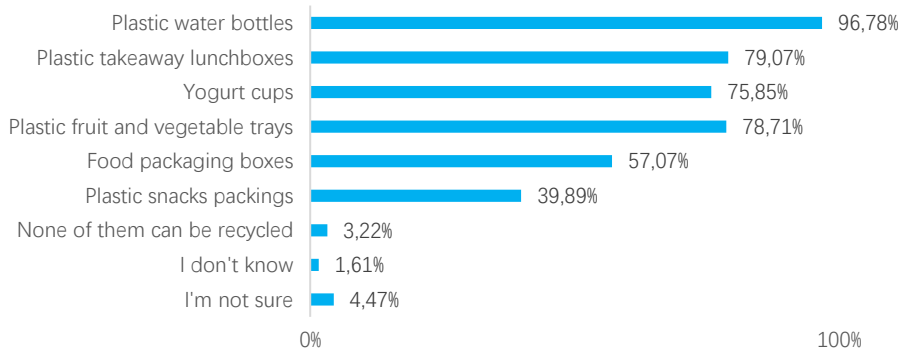


Table 28. Question: Which of the following plastic waste do you think are recyclable?

From grades 4-9

2.2.2 WILLINGNESS TO PARTICIPATE IN PLASTIC WASTE COLLECTION AND SEGREGATION

In general, the primary and middle school students have a high willingness to participate in plastic recycling and waste sorting. Among students aged 13-16, the inclination to deepen relevant knowledge is widespread. The questionnaire results indicate:

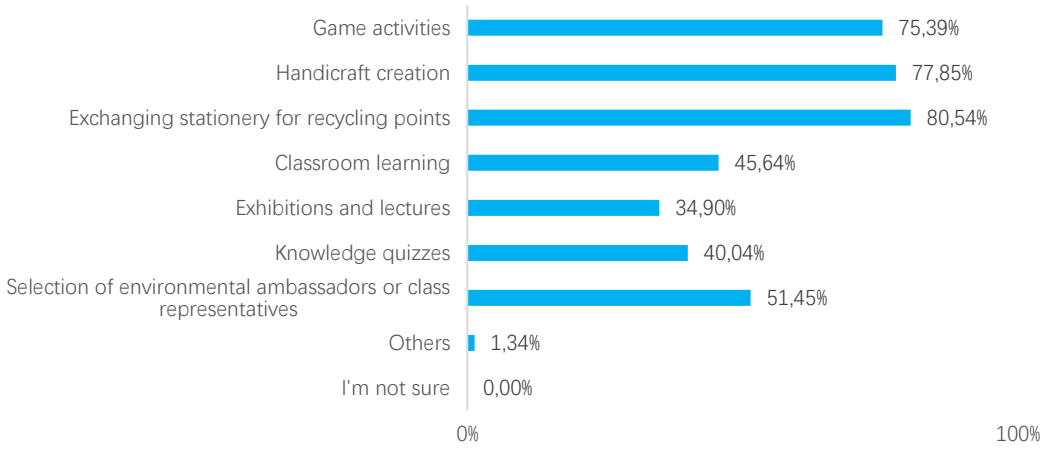
- Approximately 75% of respondents are willing to engage in educational activities related to plastic waste recycling such as exchanging stationery against “collection credit”, making crafts, and gamification activities.

- Over 70% of respondents from grades 4 to 9 show a strong desire to deepen their understanding of waste sorting and plastic waste, actively contemplating how to implement related actions.

WILLINGNESS TO PARTICIPATE IN ACTIVITIES

The options provided in the questionnaire for activities can be divided into practical activities (such as exchanging stationery against collection credit, handcraft creation, and gamification activities) and course-based activities (classroom learning, knowledge quizzes, exhibitions and lectures). Overall, practical activities are generally more popular than course-based activities. Over 77% of respondents prefer the activity of exchanging stationery for recycling points (80.54% for grades 1-3, 77.64% for grades 4-9). Furthermore, a significant number of respondents also selected handicraft creation (77.85% for grades 1-3, 71.02% for grades 4-9) and game activities (75.39% for grades 1-3, 75.49% for grades 4-9). Therefore, it is recommended to prioritize practical activities as the main educational activities for plastic waste recycling in schools.

Compared to students in grades 4-9, those in grades 1-3 place more emphasis on the selection of environmental ambassadors or class representatives (51.45% for grades 1-3, 30.77% for grades 4-9) and show less interest in exhibitions and lectures (34.9% for grades 1-3, 47.23% for grades 4-9).



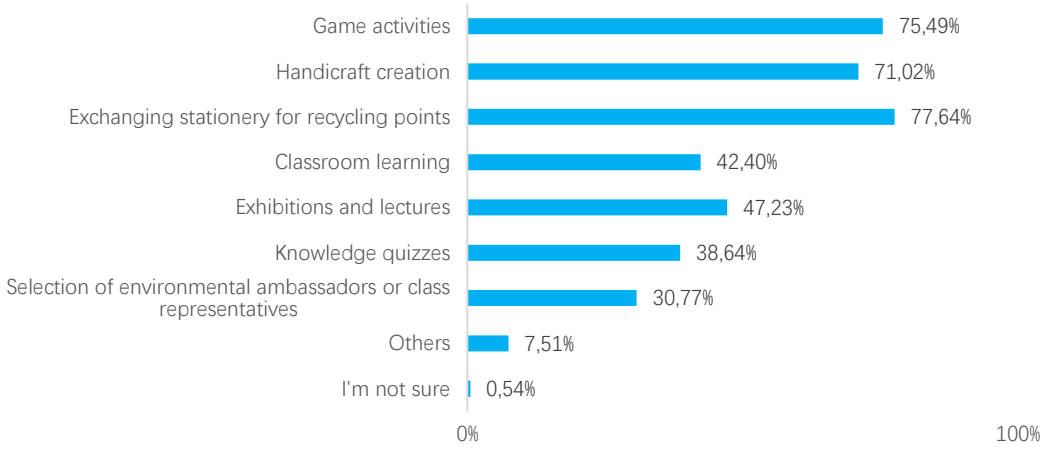


Table 29. Question: What form of environmental activities do you enjoy participating in?

From grades 1-3 (above), grades 4-9 (under)

PREFERENCE ON PLASTIC-RELATED KNOWLEDGE (WASTE SORTING AND PLASTIC RECYCLING KNOWLEDGE)

The analysis of the questionnaires indicates that respondents in grades 4-9 generally wish to have a deeper understanding of waste sorting and plastic recycling. Most students not only aspire to grasp the fundamental concepts, but also desire to delve into the environmental impacts and practical behaviors, and gain insights into successful practices adopted by other countries.

Regarding waste sorting knowledge, the results reveal that the question of 'What is the purpose of recycling waste?' (79.96%) is the most significant concern among the respondents. This indicates that a majority of the respondents is eager to acquire a more detailed understanding of the specific benefits of waste recycling. The options 'How do other countries classify and recycle waste?' (73.35%) and 'How does our country classify and recycle waste?' (72.09%) were also frequently selected, showing that many respondents wish to comprehend waste sorting and recycling from a broader perspective. Additionally, 51.34% of the respondents chose 'Where does the recycled waste go?', while 40.25% expressed their desire to further comprehend 'Why do I need to take action in waste sorting and recycling?'. These responses highlight that some respondents require a deeper understanding of their contribution to the entire waste management process.

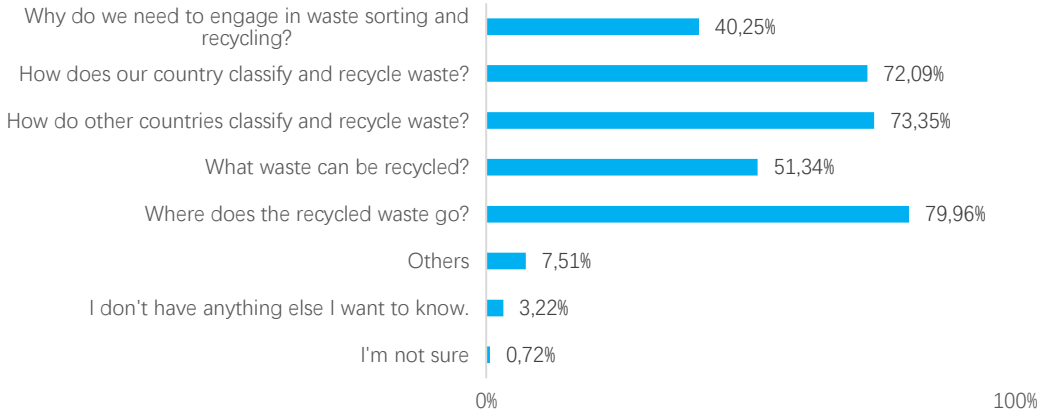


Table 30. Question: What specific information would you like to know about waste sorting and recycling?

From grades 4-9

Regarding information gaps identified by the students themselves, the survey results indicate that 'How do we and other countries recycle plastic waste?' (72.81%) is the most concerning issue for respondents. Additionally, the questions 'Where do recyclable and non-recyclable plastic waste end up?' (70.13%) and 'What can I do to reduce plastic waste for Mother Earth?' (62.79%) also received significant attention from the respondents. These findings demonstrate that the majority of respondents are eager to gain a deeper understanding of national and international waste management practices, the final destination of plastic waste and actions to support plastic reduction. Moreover, many respondents expressed a desire to know the 'hazards of plastic waste' (58.32%), the 'types of plastics and their respective uses' (53.31%), and 'which plastic waste can be recycled' (52.59%).

Table 31. Question: What specific information would you like to know about waste sorting and recycling?

From grades 4-9

2.2.3 BEHAVIOURS TOWARDS PLASTIC WASTE RECYCLING

Generally, the habit of waste sorting has been widely adopted among primary and middle school students. By reducing plastic usage, sorting, and reusing plastic waste, students already have a strong awareness of environmental protection, and they strive to translate this awareness into further practical actions. The questionnaire results indicate:

- More than 60% of respondents participate in the waste sorting at home and assume primary responsibility for it.

- Most students in grades 4-6 already know how to take specific actions for plastic waste recycling. More than 78% of respondents expressed that they will properly sort the plastic waste, reduce and reuse plastic, or work with other people to do so.

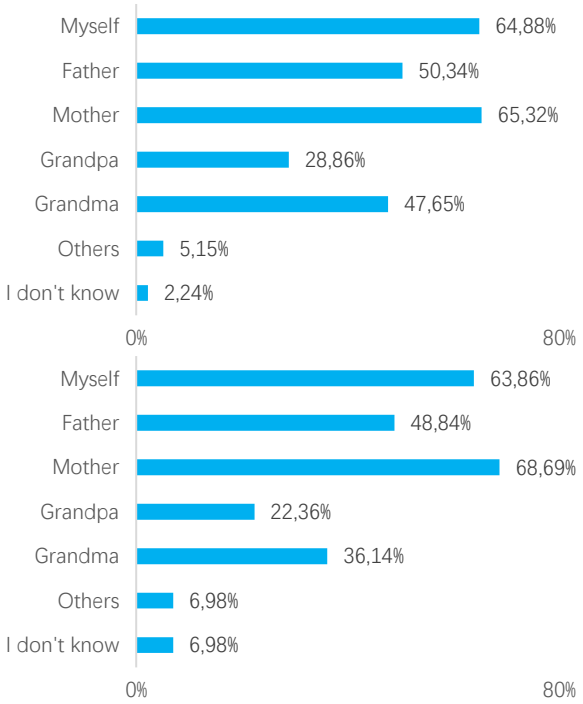


Table 32. Question: Who is doing waste sorting in your home in daily life?

From grades 1-3 (above), grades 4-9 (below)

The findings indicate that students in grades 4-9 in Suzhou have demonstrated a strong environmental awareness and engagement in reducing and recycling plastic waste. At the practical level, averagely, most of the respondents would like to participate in proper waste sorting (93.02%) and plastic waste reducing (92.31%). 84.97% of the respondents expressed their willingness to encourage others around them to take action, while 78.53% believed in the potential for reusing plastic waste.

In conclusion, the majority of the respondents possess a clear understanding of reducing plastic waste. They emphasize both upstream measures, such as reducing plastic consumption and waste, and the following actions, like waste sorting and recycling.

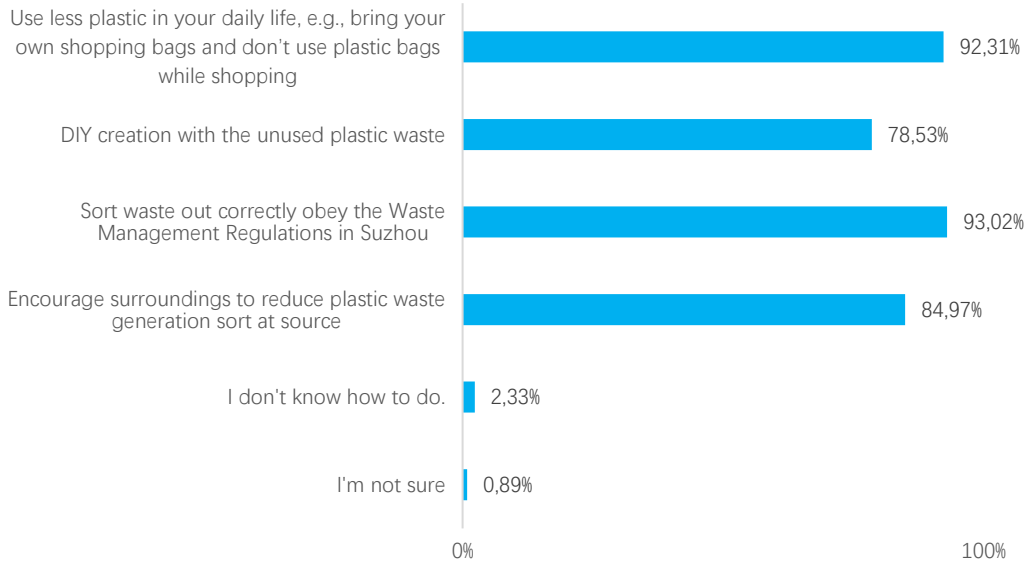


Table 33. Question: What do you think we should do to reduce the pollution caused by plastic waste?

From grades 4-9

3. IN-DEPTH ANALYSIS OF RESIDENT PROFILES AND RECYCLING BEHAVIOR

Based on the results in Chapter 2, Chapter 3 sketches different persona profiles of residents with different awareness level and waste segregation habits. Besides, the key message needed and motivations for residents to engaging in plastic collection and recycling are elaborated in this Chapter as well.

As the portrait for the student groups (with different ages and different awareness level) has been illustrated in Chapter 2, there will be no detailed analysis in this chapter.

3.1 PORTRAIT OF ‘PIONEERS’ AND ‘FOLLOWERS’

3.1.1 PROFILES TO DIFFERNT PERSONA PROFILE

Based on this analysis, the residents are categorically divided into:

- **Plastic Waste Pioneers:** Members of this group have a high level of awareness and willingness to sort and recycle low-value plastics, and already have adopted behaviors to reduce plastic consumption and waste.

- **Potential Followers:** Members of this group have medium awareness regarding sorting and recycling of low-value plastics, but a strong willingness to take action.

- **Spectators:** Members of this group have low awareness of sorting and recycling low-value plastics and have no ideas on how and why to participate low-value plastic recycling.

We then further investigate pioneers, who have high awareness and positive actions towards recycling, and compare them with followers, and analyze the reasons that affect the willingness and behavior of potential followers.

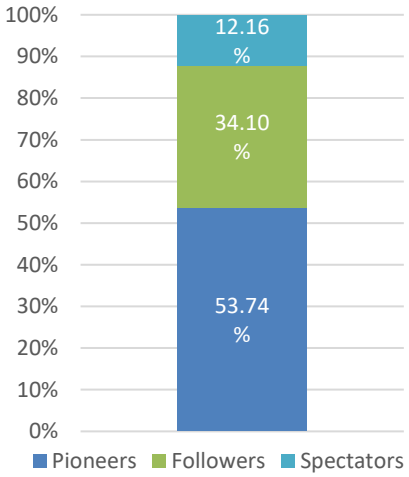


Table 34. Three residents' profiles for plastic waste recycling

The pioneers make up 53.74% of respondents. They are proactive to sort or sell waste for recycling due to environmental protection if there are plastic-FaBCs-waste-recycling facilities nearby. 34.1% of respondents are followers who have the willingness to do sorting at source for plastic waste if certain conditions are met, e.g., if there are some incentives or government regulation/ guides in place, or if everyone obeys the sorting rules. 12.16% of respondents are spectators who don't want to or don't know why they should recycle plastics. More time may be needed to increase their sorting awareness.

COMPARISON OF PIONEERS AND FOLLOWERS

In general, the pioneers outnumbered followers in almost all age groups and educational levels, which shows that the awareness of plastic waste recycling is relatively good in Suzhou. According to Table 37, 26-40-year-old age group taking the largest share of both pioneers and followers, who are suggested as the target group for further awareness-rising activities for low-value plastic waste recycling. Moreover, there are more male than female respondents among pioneers, while the situation is reversed among supporters.

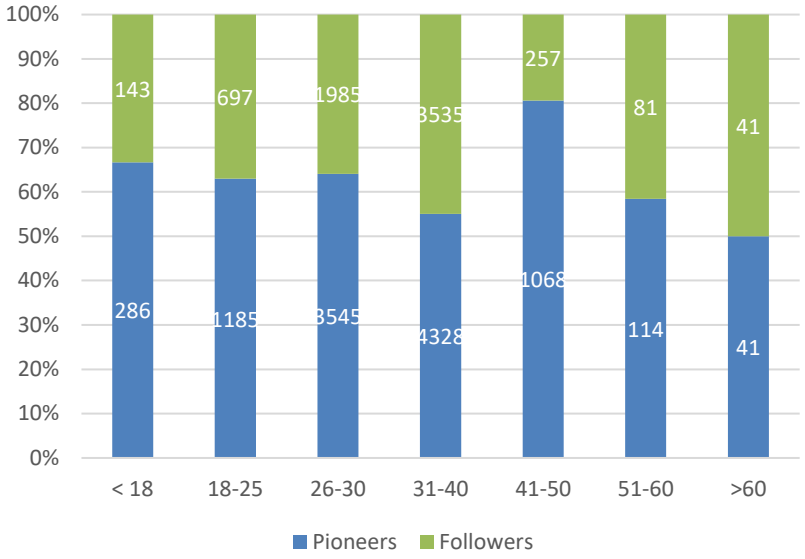


Table 35. The pioneers and followers' distribution among age groups

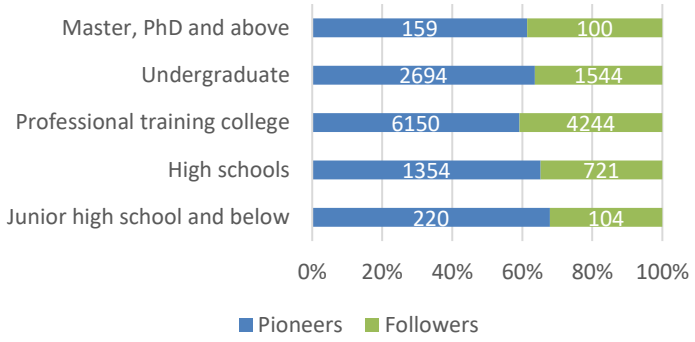


Table 36. The pioneers and followers' distribution among educational levels

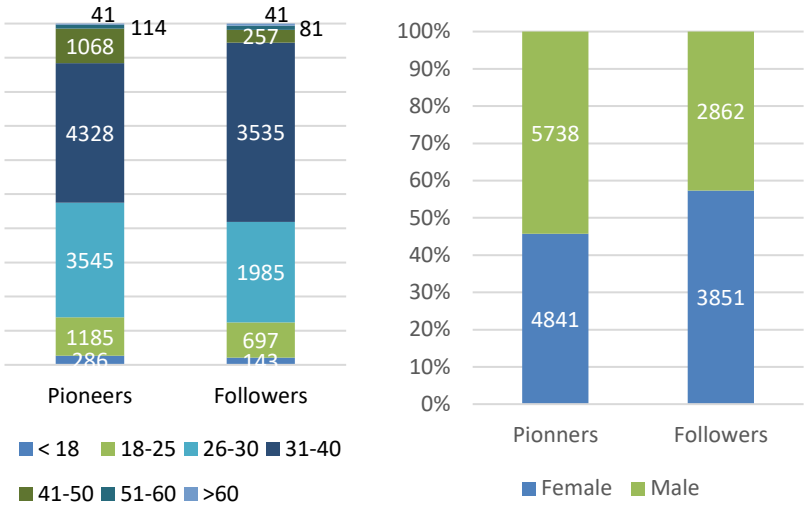


Table 37. The age (left) and gender groups (right) distribution among pioneers and followers

3.1.2 INFORMATIONAL GAPS AND KEY MESSAGES FOR FUTURE ACTIVTIES

OVERALL STATUS

Regarding the information gap in sorting and recycling plastic waste among residents, most respondents (over 60%) are interested in practical information, such as where to find the nearest recycling facilities and clear guidance for citizens on how to support plastic waste's sorting and recycling. Compared to getting to know *The Waste Regulation* (15%), more respondents want to have transparent information on recycling and treatment processes for plastic waste in the terminal treatment plant (65.92%).

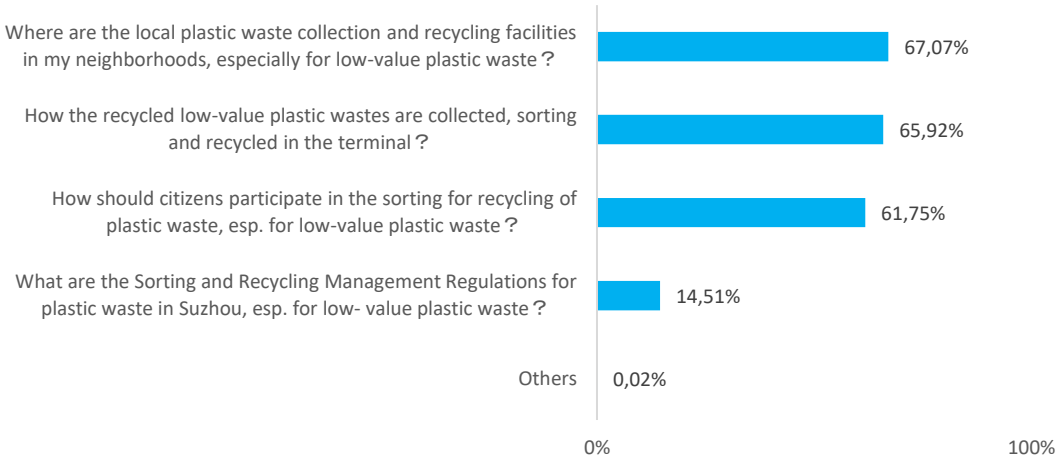


Table 38. Question: What else do you want to know about plastic waste?

For pioneers, being informed of the recycling facilities' location is relatively more important for almost all age groups, especially for the 41-50 and over-60-year-old groups, but not for 18-30-year-old age group. The 18-to 30-year-old age groups, care more about how the plastic waste is treated in the end.

For followers, the information of terminal treatment for plastic waste is relatively more important. Education on waste regulation is less important than other information for most age groups.

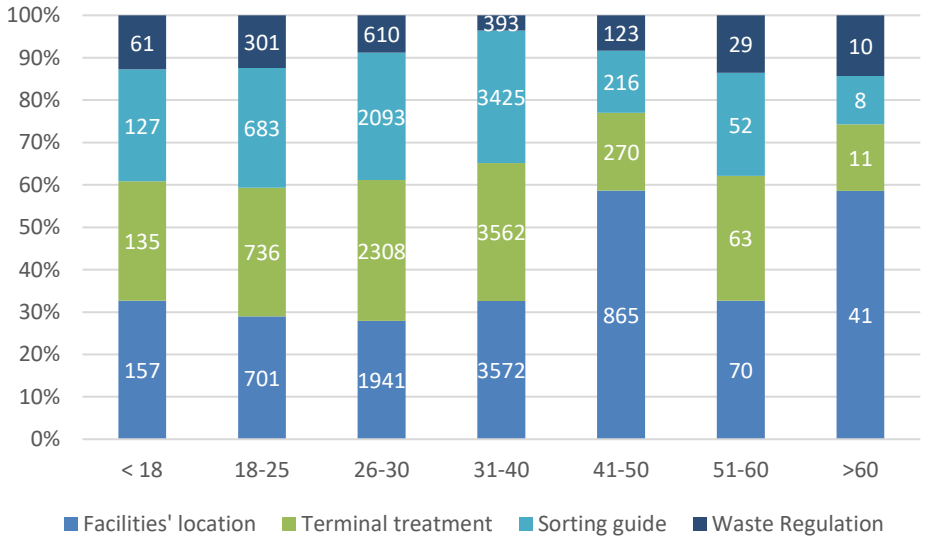


Table 39. The plastic waste-related info cared for pioneers by age groups

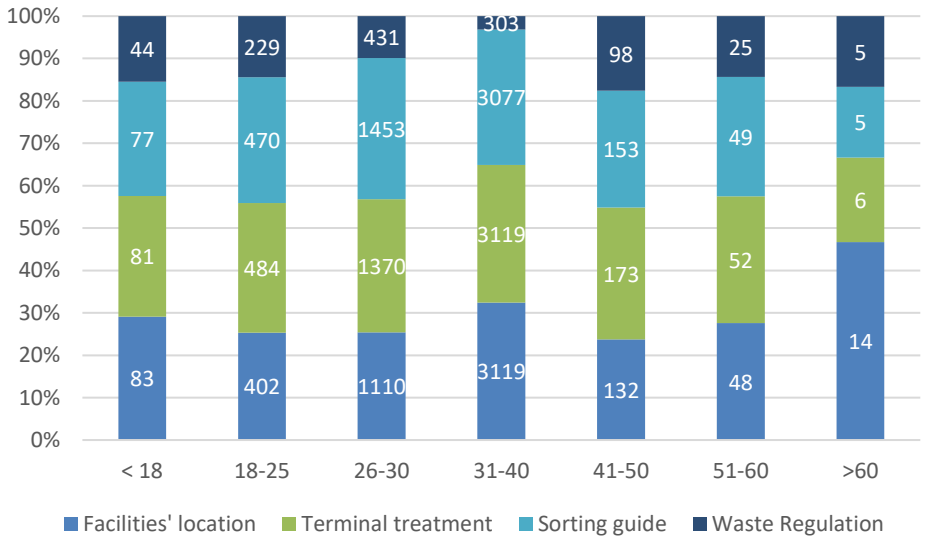


Table 40. The plastic waste-related info cared for followers by age groups

3.1.3 PERFERENCE TO AWARENESS RAISING ACTIVTIES

OVERALL STATUS

The TOP three most popular awareness-rising activities that residents would like to participate in are practical activities, including clean-up activities (64.07%), visiting a terminal treatment plant (56%) and offline workshops on plastic waste DIY (49.23%). This shows that respondents generally prefer to take practical actions to mitigate plastic waste instead of receiving the theoretical information through knowledge-sharing events or channels. For the latter, watching short educational videos on new media platforms takes the biggest share of 48.05% compared to other information channels.

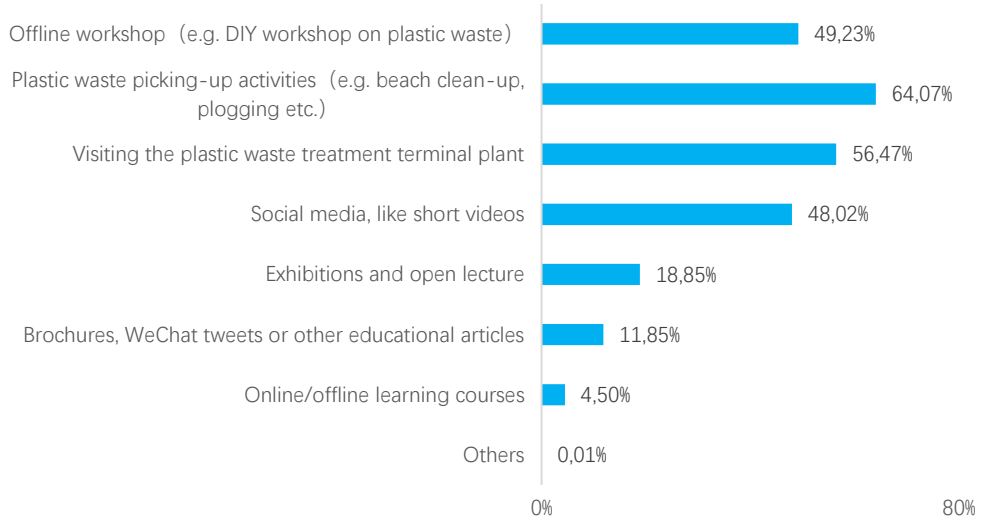


Table 41. Question: From which channel you would like to receive the info?

PIONEERS

For pioneers, offline workshops are more attractive for the age groups below 18 and over-60-year-old, but for 18-40 and 51-60-year-old groups, clean-up activities are preferred compared to other awareness-rising activities. For the 41-50-year-old group, the terminal facility visit is more attractive.

As indicated in Table 45, the activities above the red curve are informative activities (e.g., lectures, articles, exhibitions, etc.), while those under the curve are more practical and interactive activities (e.g., offline handcraft workshop, clean-up activities and termination visit, etc.). The preference for practical activities increases with age. However, those above 50 years old, seem to be indifferent about the mode of delivery.

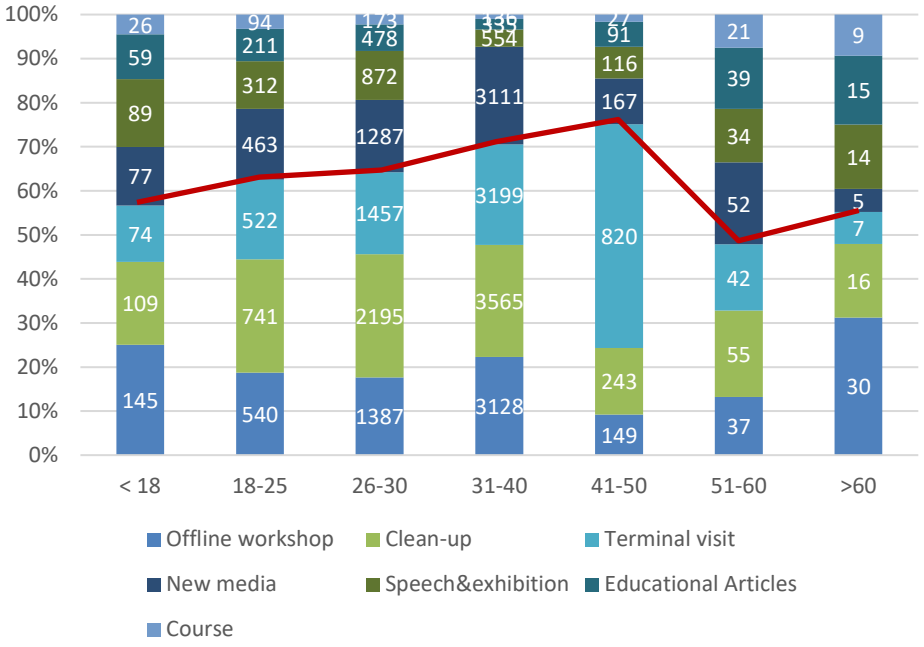


Table 42. The awareness-rising activities pioneers preferred by age groups

FOLLOWERS

Followers have similar preferences for the most preferred activities as pioneers, where the clean-ups are more attractive for the 18-60-year-old group, and offline workshops are more welcomed for under-18 and over-60-year-old group.

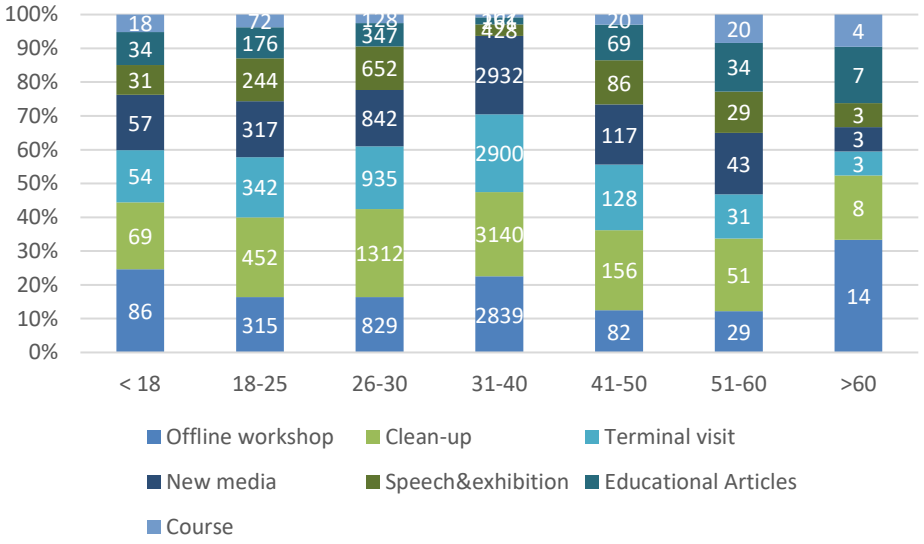


Table 43. The awareness-rising activities followers preferred by age groups

3.1.4 MOTIVATIONS

PIONEERS

There are mainly three kinds of motivation driving sorting behavior for recycling among pioneers: **Environmental protection**, **monetary incentive,** and **easy-to-practice**. Environmental protection is the main reason to adopt sorting behaviors for most age groups, including under-30-year-old and over 50-year-old groups, who would do sorting for recycling behaviors for low-value plastic waste. The 41-50 age group cares most for convenience, while for 31-40 and 51-60-year-old groups, each motivation factor occupies a relatively similar share. Monetary incentive only takes a slightly higher share than other two factors in 31-40-year-old age group.

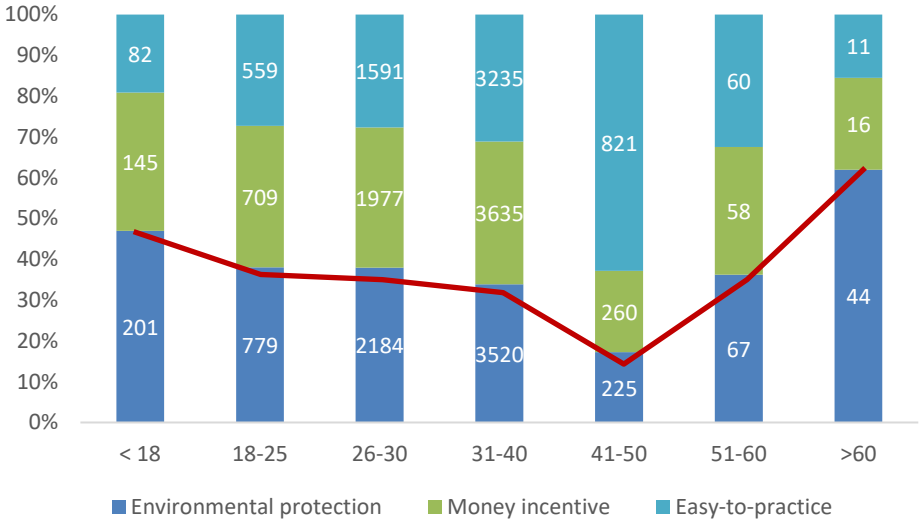


Table 44. The motivations for sorting behaviours among pioneers by age groups

FOLLOWERS

There are three motivations identified for followers, who are willing to do sorting for recycling if certain conditions are met: **Monetary incentive**, **social consensus,** and **government regulation**. The social consensus is most important for almost all age groups but for the over-60-year-old group; The latter seem to be affected most by government regulation. Monetary incentives have a considerable impact for followers to adopt sorting behaviors, but it they are not the main motivation.

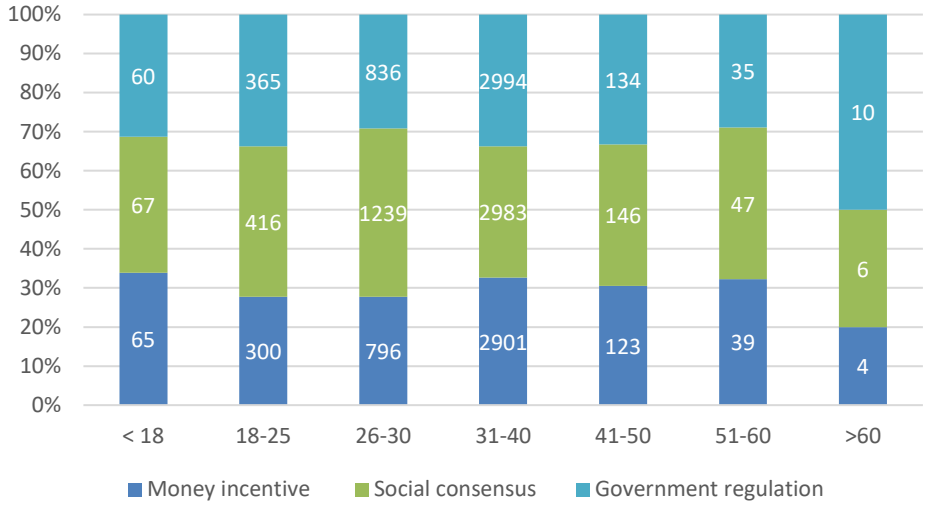


Table 45. The motivations for sorting behaviors among followers by age groups

Besides the three motivations identified for sorting behaviors, easy-to-practice is also a factor that will motivate followers to adopt rinsing behaviors. Nevertheless, the results show that easy-to-practice has the least impact relative to the other factors in all age groups. Among all the factors, the government regulation takes a larger share than others for most age groups, but for followers below-18-years-old and over-60-years-old. For the under-18-year-old and over-60-year-old age groups, social consensus has a relatively higher impact on rinsing behaviors.

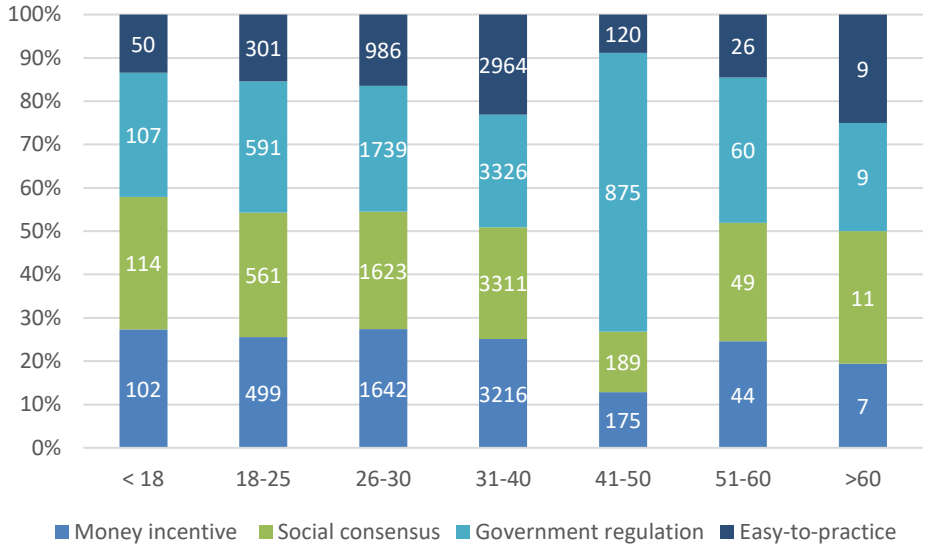


Table 46. The motivations for rinsing behaviours among followers by age groups

4. INSIGHTS FROM INTERVIEWS

The interviews aim to compensate for the limitations of the questionnaire in terms of different survey/respondent types and depth of question content in order to gather more insightful views and suggestions for improvement in the management of low value plastic waste. The interviews are mainly conducted in the form of one-to-one, open-ended interviews.

4.1 RESIDENTS

Based on the interviews with residents, community staff and the local recyclers from SZT, several insights in the motivations and preferred channels to gather information related to plastic waste recycling are concluded below:

OVER 60-YEAR-OLD AGE GROUP, THE ELDERY

For the motivations of the over 60-year-old group, the money or bonus points incentive has a positive effect on them, reflected by the fact that they tend to sell their recyclables in fixed recycling stations with higher prices for recyclables and bonus points accumulation.

As for the channels that they prefer to receive information, it is found that community-related channels are more trusted by them, like the offline activities hold or information shared by community committees, community workers or neighborhoods.

UNDER 60-YEAR-OLD AGE GROUP, THE YOUNGER GROUP

For the younger group, they care more about the convenience than the monetary incentives. This is reflected in the phenomenon that the younger group tend to use smart recycling facilities for sorting, where the recycling price is slightly lower than that from the fixed recycling stations, but the time and process required are less. Moreover, the supervisory mechanism for sorting behaviors also has an impact on residents but is relatively lower than the impact from money incentives and sorting convenience. However, for the families with young kids, the motivation is different. To foster their kids' awareness for sorting and recycling is a big motivation for them.

The younger group prefers to receive information through livestreaming media platforms, and their behavior are influenced by commercial marketing, social trends, and other activities that reflect their values or is more interesting and interactive, like clean-ups, or plastic waste DIY workshops, or gamification workshops.

4.2 STUDENTS

Based on the interviews with schoolteachers from Canglang Primay School, insights of pro-environmental education for students of different age groups are concluded below:

6-10 YEARS OLD, YEAR 1-3 STUDENTS

For students between 6-10 years old, who are still in the stage of learning to read, they prefer school activities in more interactive way, like group games.

11-15 YEARS OLD, YEAR 4-9 STUDENTS

For students between 11-12 years old, who have gradually developed logical thinking abilities, activities with more scientific and systematic information have been organized, like speeches or reading. In addition, they mentioned that selecting students for 'Environmental Protection Star' and assign credits or bonus incentives for stationery products can motivate the students to do sorting for recycling.

PROMOTION BY STUDENTS

Besides the education from schools, the family education for environmental protection and waste segregation is also important to increase students' awareness. In turn, the students can also be the promotors to increase their family members' awareness for low-value plastic waste recycling.

5. RECOMMENDATIONS FOR EFFECTIVE AWARENESS RAISING

Based on the assessment results, Chapter 5 provides recommendations for an effective awareness raising strategy to promote responsible plastic waste management practices among Suzhou citizens, including specific event formats and activities and communication channels, each tailored to their respective target groups.

5.1 RESIDENTS

5.1.1 AWARENESS-RAISING ACTIVITIES

Among residents, those aged 26 to 50 should be targeted for further awareness-raising activities. Not only do they constitute a majority of the population in Suzhou, but they also have a good knowledge base in terms of sorting and recycling, combined with a high willingness to acquire additional knowledge and take further action. Therefore, they are likely to be encouraged to participate in awareness-raising activities. Moreover, possessing prior knowledge and motivation enables effective and efficient awareness raising. As this age group is often the main actor in families and workplaces, their engagement would help spread the messages to a larger number of residents and homes.

Results from the assessment suggest a preference for practical and engaging awareness raising activities among residents. Three formats stand out in particular and are recommended for future implementation to raise awareness of low-value plastic waste recycling, namely clean-up campaigns, visits to final treatment facilities and participation in offline DIY workshops on plastic waste. Participants should engage with each other personally and creatively, develop an understanding of the recycling process and recycled products beyond their immediate actions at home, and actively come into contact with the waste materials.

5.1.2 ADVOCACY INFORMATION

According to the assessment results, people require practical information to adopt responsible waste management habits, specifically the location of nearby collection and recycling facilities or waste collectors. Participants in awareness-raising events should also receive action-oriented advice on how they can become more actively involved in the plastic waste recycling process, e.g., whether their current practices are adequate and what more can be done. Lastly, information on the recycling and

treatment processes further down in the waste management process can create an understanding and purpose to drive sorting and rinsing at home.

5.1.3 ADVOCACY CHANNELS

A combination of online and offline channels for advocacy and practical information is proposed to ensure that people get the information they need about plastic waste recycling. Favored online channels such as new media (e.g., short videos), WeChat articles or the mini programs from the government should effectively complement offline channels like practical activities (e.g., informative workshops and clean-up campaigns) and educational activities (e.g., exhibition, open speeches or learning courses).

5.1.4 ACTIVITIES AND INFO BY AGE GROUPS

As the receptivity to and preference for certain forms of events/activities and information is found to vary across age groups, specific approaches to awareness raising should be pursued (as showed in Table 49). To convince 18–40-year-olds to adopt sorting and recycling behaviors clean-up campaigns should be employed and information (and site visits) related to terminal treatment seems best suited to create purpose for their environmental action. Young people under 18 and older people over 60 can be reached through (educational) workshops and need information about nearby recycling facilities and collection points. The latter information is also of great practical importance to Suzhou citizens aged 41 to 51, but they also derive purpose from visits to terminal treatment facilities.

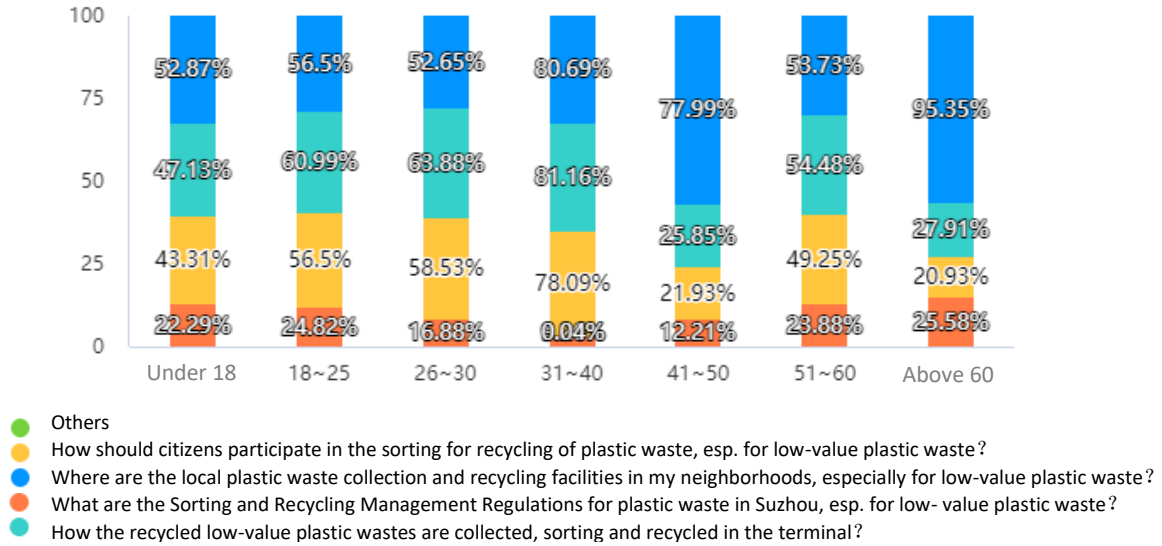


Table 47. The interested plastic-waste related info by residents of different age groups

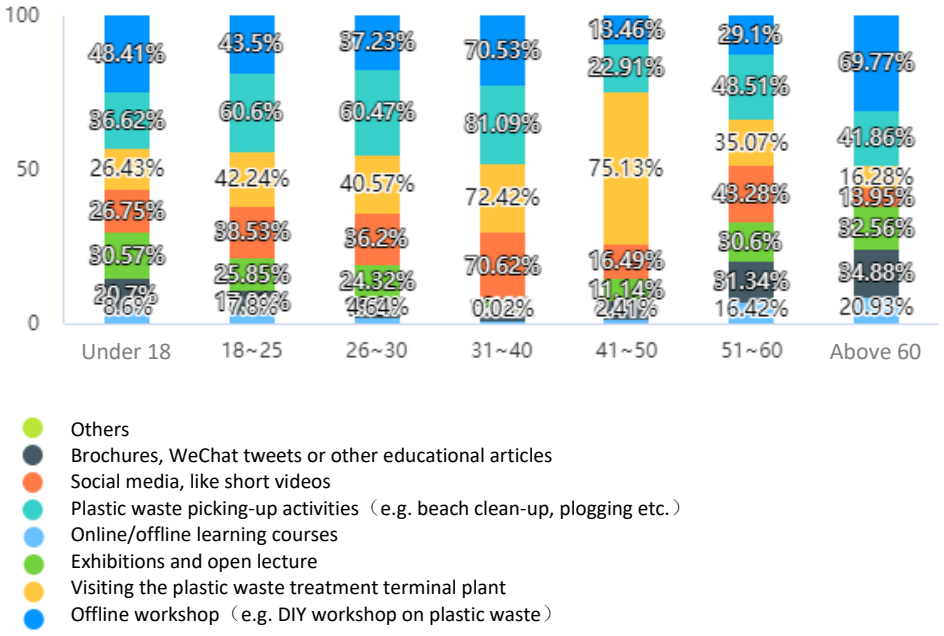


Table 48. The interested plastic-waste related activities by residents of different age groups

Age group	Information/key messages to convey	Activities
<18	Recycling facilities and collection point location	Workshop activities
18-25	Terminal treatment of recyclable plastic waste	Clean-ups
26-30	Terminal treatment of recyclable plastic waste	Clean-ups
31-40	Terminal treatment of recyclable plastic waste	Clean-ups
41-50	Collection and recycling facilities' location	Vising terminal treatment plant
51-60	Terminal treatment of recyclable plastic waste	Clean-ups
>60	Collection and recycling facilities' location	Workshop activities

Table 49. The most interested plastic-waste related info and activities by residents of different age groups

5.2 STUDENTS

5.2.1 KNOWLEDGE ACQUISITION

Ovwe, primary and middle school students demonstrate a high level of basic awareness of waste sorting and plastic recycling. However, their ability to classify specific categories of plastic waste and recognize its recyclability remains relatively weak. It is recommended to implement different knowledge dissemination activities targeting students of different grade levels.

Compared to respondents in grades 4-9, those of grades 1-3 have a lower level of awareness regarding waste sorting and plastic recycling. Schools are advised to use informative posters to give further basic knowledge of waste sorting and plastic recycling to students in grades 1-3.

Respondents in grades 4-9 generally expressed a desire for a deeper understanding of waste sorting and plastic recycling. Most respondents not only hope to master fundamental knowledge but also wish to learn more about the environmental impact and practical behaviors related to these issues. It is recommended to conduct systematic courses about plastic waste reduction specifically tailored to this age group. The course can focus on topics such as 'How plastic waste is recycled domestically and internationally', 'The trace of recyclable and non-recyclable plastic waste', 'How to reduce plastic waste', 'The potential risks caused by plastic waste', 'Types and uses of plastics' and 'Which plastics can be recycled'.

5.2.2 AWARENESS-RISING ACTIVITIES

Overall, practical activities (such as exchanging stationery for recycling points, handicraft creation, and game activities) are generally more popular than course-based activities (such as classroom learning,

knowledge quizzes, and exhibition lectures). It is recommended for schools to regularly organize practical activities (e.g. gamification events, school days, etc.) to help students better understand plastic waste-related knowledge in an enjoyable way.

Students in grades 1-3 place more emphasis on the selection of environmental ambassadors or class representatives. Schools can organize such activities to cultivate a sense of collective honour and personal responsibility, guiding students to develop awareness of waste sorting and plastic recycling.

Students in grades 4-9 have a greater interest in exhibitions and lectures. Organizing such activities can promote them to deeper understand the waste sorting and plastic recycling. Additionally, knowledge quizzes can be held within the school to reinforce the fundamental knowledge of waste sorting and plastic recycling.

6 ANNEX

6.1 QUESTIONNAIRE QUESTIONS

6.1.1 RESIDENTS

QUESTIONNAIRE MANUSCRIPT

The Awareness Baseline Assessment on Plastic Waste Generation and Recycling for Community Residents in Suzhou

Since the implementation of the Separation Management of Domestic Waste Regulation in Suzhou Municipality in 2020, the city's waste separation work has been progressively effective and is entering a new era with more refined management to achieve the goal as being a 'waste-free city' by 2025. The survey is aimed to know the general situation and perception of plastic waste generation and recycling among community residents in Suzhou. Your responses will be kept confidential and combined with other responses when reporting the results.

The questionnaire consists of 12 questions and is expected to take 3 minutes to complete.

1. Age [Single option] *

○Under 18 ○18~25 ○26~30 ○31~40

○41~50 ○51~60 ○Above 60

2. Gender [Single option] *

○Male ○Female

3. Education level [Single option] *

○Up to junior high school

○High School

○Tertiary

○Bachelor

○Master, PhD and above

4. District or county [Fill in the blank] *

_____

5. Community name [Fill in the blank]

_____

6. For the following plastic waste, do you think they are recyclable or not? [Matrix single-choice] *

	Yes	No	I DON'T KNOW
Plastic water bottles	○	○	○
Plastic takeaway lunch boxes	○	○	○

Plastic food packaging boxes	○	○	○
Plastic beverage cups	○	○	○
Plastic fruit and vegetable trays	○	○	○
Plastic bags, snack packs	○	○	○

7. How many pieces of low-value plastic waste do you produce on average each week？[Matrix single-choice] *

Low value plastics* in this questionnaire refers to plastic waste that can be recycled but is difficult to recycle and currently lacks a complete recycling chain, such as plastic takeaway lunch boxes, plastic fruit and vegetable trays and plastic beverage cups.

	0	1-3	4-6	7-10	>10
Plastic takeaway lunch boxes	○	○	○	○	○
Plastic beverage cups	○	○	○	○	○
Plastic food packaging boxes	○	○	○	○	○

Plastic fruit and vegetable trays	○	○	○	○	○
Plastic bags, snack packs	○	○	○	○	○

8. Would you like to sort the waste out that shown above and put them away or sell them to local collection and recycling station? [Multiple choices] *

☐I'd love to, since sorting and recycling saves natural resources and reduces pollution.

☐I'd love to, since I can accumulate pocket money by selling the recyclable waste.

☐I'd love to, if there are recycling station nearby.

☐I'd love to, if neighborhoods are doing so.

☐I'd love to, if there is a bonus or gift as incentive.

☐I'd be willing, if there is clear guide for sorting for recycling in the Waste Management Regulations of Suzhou.

☐I don't care but would be willing if enough plastics can be collected one time with no stocking in my house.

☐I don't care, since I don't know how the waste will actually be recycled in the terminals.

☐I don't want to, since sorting or not doesn't matter for me, and I don't really care the pocket money after it's sold.

☐I don't want to, since I don't know why we need to do it.

☐Others _____*

9. Would you like to simply rinse the plastic takeaway lunchboxes before disposing them？ [Multiple choices] *

☐I'd love to, since it can help the recyclers do the work easier.

☐I'd love to, if neighborhoods are doing so.

☐I'd be willing to, if there is a bonus or gift as incentive.

☐I'd be willing, if there is clear guide for sorting for recycling in the Waste Management Regulations of Suzhou.

☐I'd be willing to, if I happen to have free time.

☐I don't want to, since rinsing is too much trouble.

☐I don't want to, since I don't know why we need to do it.

☐Others _____*

10. What kinds of following pro-environmental behaviors did you have in your daily life？ [Multiple choices] *

☐Bring my own reusable bottle, coffee mug

☐Bring my own shopping bag when shopping

☐Tend to buy refills/replacement packs when shopping

☐Tend to choose ‘cutlery free’ when ordering takeaways

☐Tend to cook for myself or dine-in

☐Bring my own cutlery/cups/straws etc., while going out

☐Participate in a DIY workshop on plastic waste

☐Reuse the unused plastic bags/takeaway lunchboxes/beverage cups etc.

☐Purchased/used recycled plastic* products (e.g., clothing, shoes made from recycled water bottles, etc.)

'Recycled Plastics' are post-consumer plastic materials recycled through the physical or chemical processing from waste plastics.

☐Others _____*

☐I didn't have any behaviors above

11. What else do you want to know about plastic waste [Multiple choices] *

☐Where are the local plastic waste collection and recycling facilities in my neighborhoods, especially for low-value plastic waste？

☐ How the recycled low-value plastic wastes are collected, sorting and recycled in the terminal？

☐How should citizens participate in the sorting for recycling of plastic waste, esp. for low-value plastic waste？

☐What are the Sorting and Recycling Management Regulations for plastic waste in Suzhou, esp. for low- value plastic waste？

☐Others _____*

12. From which channel you would like to receive the info？[Multiple choice] *

☐Offline workshop（e.g. DIY workshop on plastic waste）

☐Plastic waste picking-up activities（e.g. beach clean-up, plogging etc.）

☐Visiting the plastic waste treatment terminal plant

☐Social media, like short videos

☐Exhibitions and open lecture

☐Brochures, WeChat tweets or other educational articles

☐Online/offline learning courses

☐Others _____*

ONLINE QUESTIONNAIRE (INCL. POST AND PARTIAL CONTENT)

6.1.2 STUDENTS

QUESTIONNAIRE MANUSCRIPT FOR YEARS 1-3 STUDENT

The Awareness Baseline Assessment on Plastic Waste Generation and Recycling for Year 1-3 Students in Suzhou

The questionnaire consists of 5 questions and is expected to take 3 minutes to complete.

1. Who always do the waste sorting work in your family？ [Multiple options] *

☐Myself

☐Dad

☐Mom

☐Grandpa/Grandma

☐Others

☐I don’t know

2. Do you know why we need to sorting waste [Single option] *

◯Yes

◯No

3. What plastic waste have you seen in school and home [Multiple options] *

☐Plastic takeaway lunchboxes

☐Yoghurt cup

☐Plastic fruit and vegetables trays

☐Plastic food packaging boxes

☐Plastic bags, snack packaging bags

4. Did the school have any plastic waste recycling related courses or activities？ [Single option] *

○Yes

○No

5. Which kind of pro-environmental activities do you prefer to join？ [Multiple options] *

☐Desk game

☐DIY workshop

☐Redeem points for stationery

☐Course learning

☐Exhibition or open lecture

☐Knowledge competition

☐Eco star selection for class

☐Others _____

QUESTIONNAIRE MANUSCRIPT FOR YEARS 4-9 STUDENTS

The Awareness Baseline Assessment on Plastic Waste Generation and Recycling for Year 4-9 Students in Suzhou

The questionnaire consists of 11 questions and is expected to take 5 minutes to complete.

1. Who always do the waste sorting work in your family？ [Multiple options] *

☐Myself

☐Dad

☐Mom

☐Grandpa/Grandma

☐Others

☐I don’t know

2. Do you know why we need to sort waste out [Single option] *

○Yes (select this item, follow question 3)

○No (select this item, follow question 4)

JingSu
Creating Value from Plastic Waste along the Yangtze

3. Why you choose to sort for recycling the waste? [Single option] *

○Because it protects the environment

○Because the it can reduce resources waste

○Because I can get credits for myself and my class by doing it

○Because my family and teachers encourage me to do so

○Because others are doing so

○Others _____ *

4. What plastic waste have you ever seen in school and home？ [Multiple options] *

☐ Plastic takeaway lunch boxes

☐Yoghurt cups

☐Plastic fruit and vegetable trays

☐Plastic food packaging boxes

☐Plastic bags, snack packaging bags

5.Which of the following plastic waste do you think can be recycled？[Multiple options] *

☐Plastic water bottles

☐ Plastic takeaway lunch boxes

☐Yoghurt cups

☐Plastic fruit and vegetable trays

☐Plastic food packaging boxes

☐Plastic bags, snack packaging bags

☐None can be recycled

☐I don’t know

6. Did the school have any plastic waste recycling related courses or activities？ [Single option] *

○Yes

○No

7. Which kind of plastic waste below is collected for recycling in school？ [Multiple options] *

☐ Plastic takeaway lunch boxes

☐Yoghurt cups

☐Plastic fruit and vegetable trays

☐Plastic food packaging boxes

☐None can be recycled

☐I don't know

8. What do you think we should do to reduce the plastic waste pollution？ [Multiple options] *

☐Use less plastic in your daily life, e.g., bring your own shopping bags and don't use plastic bags while shopping

☐DIY creation with the unused plastic waste

☐Sort waste out correctly obey the Waste Management Regulations in Suzhou

☐Encourage surroundings to reduce plastic waste generation sort at source

☐I don't know what to do

9. What else do you want to know about waste separation and recycling？ [Multiple options] *

☐Why we need to do waste sorting and recycling？

☐How waste is sorted and recycled in our country？

☐How waste is sorted and recycled in other country？

☐What kind of waste can be recycled?

☐Where does the recycled waste end up？

☐Others _____*

☐There is nothing else I want to know

10. What else do you want to know about plastic and plastic waste？ [Multiple options] *

☐What is plastic？

☐What are the different types of plastics and what are they used for?

☐What dangers that plastic waste can bring？

☐What types of plastic waste can be recycled？

☐How our countries and other countries do the recycling for plastic waste？

☐Where does recyclable and non-recyclable plastic waste end up？

☐What can I do for the Earth to reduce the plastic waste pollution?

☐Others _____*

☐There is nothing else I want to know

11. Which kind of pro-environmental activities do you prefer to join？ [Multiple options] *

☐Desk game

☐DIY workshop

☐Redeem points for stationery

☐Course learning

☐Exhibition or open lecture

☐Knowledge competition

☐Eco star selection for class

☐Others _____

6.2 INTERVIEW QUESTIONS

6.2.1 RESIDENTS AND COMMUNITY STAFF

DOMESTIC WASTE SORTING AND RECYCLING

- What kind of mainly plastic waste does your household generate?
- Do you know the plastic waste pollution, and how do you think of it?
- Do you know the regulations for waste separation in Suzhou? Have you fully followed the regulations to behave?
- Do you know the 3Rs principle of solid waste management (Reduce - Reuse - Recycle)? Which of the 3R's do you think is more important?

LOW-VALUE PLASTIC WASTE RECYCLING

- What category of waste do you think plastic takeaway lunchboxes belongs to? Do you clean up the residues before throw them away?

- Do you think that low-value plastic waste such as plastic takeaway lunchboxes, plastic beverage cups and plastic fruit and vegetable trays are valuable for recycling?

- Do you know if there are recycling facilities in your neighborhoods where you can sell for recycling the low-value plastic waste? If there is a recycle station in your community, would you like to sort for recycling the low-value plastic waste there? If no, what are the reasons?

- Would you be willing to simply rinse it before throwing away your plastic takeaway lunchboxes? If no, what are the reasons?

PROMOTION ACTIVITIES

- What other information would you like to know about plastic waste separation and recycling?

- Through which channel do you prefer to obtain green information?

- What green activities would you like to participate in in your neighborhoods?

6.2.2 LOCAL RECYCLERS FROM SZT

LOW-VALUE PLASTIC WASTE RECYCLING

- What are the characteristics of the residents who always do the selling for recycling? (e.g., age, gender, etc.)

- What are the main types of low-value plastic waste collected at the collection point, and what are their prices per kg? What is the average amount of collected recyclable plastic waste for each week?

- What difficulties have you encountered in the implementation process of low-value plastic waste recycling project?

PROMOTION ACTIVITIES

- Have you been involved in community awareness-raising activities on low-value plastic waste collection? (If have) What are the main challenges in the promotion process?

- Do you have any suggestions on the forms of awareness-raising activities for sorting and recycling of low-value plastic waste in the communities?

6.2.3 COMMUNITY STAFF

DOMESTIC WASTE SORTING AND RECYCLING

- How are the young and middle and elderly aged residents' sort behaviours? Which group is more likely to sort wrongly according to the Waste Management Regulation in Suzhou? Please give examples.

LOW-VALUE PLASTIC WASTE RECYCLING

- Do you know that low-value plastic waste such as plastic takeaway lunch boxes and plastic beverage cups are recyclable and can be sold for recycling?

- Have you ever participated in any awareness-raising activities on low-value plastic waste recycling in communities? If yes, what are the main challenges you identify in the promotion process?

- Do you have any suggestions on the forms of awareness-raising activities for sorting and recycling of low-value plastic waste in the communities?

PROMOTION ACTIVITIES

- Since the implementation of the Separation Management of Domestic Waste Regulation in Suzhou Municipality in 2020, have you organized or join any of the waste sorting and recycling advocacy

activities in your community? What the feedbacks from residents and what were the main challenges you meet?

- Did the community staff organize any promotion activities to encourage residents to sell for recycling to the local recyclers, such as SZT recycling station? What are they and how was the residents' participation?

6.2.4 SCHOOLS TEACHERS

LOW-VALUE PLASTIC WASTE RECYCLING

- What kinds of plastic waste do the students and school staff always generate in schools?
- How are the students' behaviours for sorting the low-value plastic waste?
- How are the students' families' attitudes towards the '*Plastic-free Childhood*' project?

PROMOTION ACTIVITIES

- How the school's teachers response to the '*Plastic-free Childhood*' project in school? What kinds of activities have you organized for it? And how was the students' participation?
- Do you have different strategies or activities for different age-grouped students to foster their low-value plastic waste recycling behaviours? Why and what are they?

6.3 TABLE OF RECYCLING CLASSIFICATIONS

材质/ polymer	名称及 logo/ sub-category	实物图示 **Picture of examples**	颜色/color	来源/source
硬质塑料 **rigid plastics**				

PP	餐盒/ food container		有色/ dark	外卖/ food-delivery
			杂色/ mixed	外卖/ food-delivery
			透明/ transparent	外卖/ food-delivery
	饮料杯/ beverage container-hot		透明/ transparent	奶茶/ beverage -hot
	食品包装/ food packaging	 	有色/ dark	冰淇淋盒、黄油盒、酸奶杯、饼干盒、奶酪盒等/ Container for yogurt/butter/cookies/ice creams
PET	饮料杯/ beverage container-cold		透明/ transparent	冷饮/ beverage-cold

PET	生鲜托盘/ Fresh tray		有色/ dark	蔬菜、肉类托盘/ Vegetable/meat container
			透明/ transparent	水果、蔬菜托盘/ Fruit/vegetables container
	食品包装/ food packaging		透明/ transparent	零食盒/ cookies containers
PS	食品包装 /food packaging		有色/ dark	冰淇淋盒、黄油盒、酸奶杯、饼干盒、奶酪盒等/ Container for yogurt/butter/cookies/ice creams and so on
				
			透明/ transparent	

Table 50. List of recyclable plastic FaBCs waste in Suzhou

Awareness Baseline Assessment in Suzhou – Commercial Areas

Status quo and recommendations for promoting awareness and behaviours in recycling low-value plastics in commercial areas in Suzhou.

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CONTENT

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Creating Value from Plastic Waste along the Yangtze

EXECUTIVE SUMMARY – COMMERCIAL AREA ASSESSMENT

This baseline focuses on promoting awareness and behaviors in recycling low-value plastics in business areas in Suzhou. It examines the target area, which includes business and commercial areas. Based on the assessment results, the report provides recommendations for an effective awareness-raising strategy, including specific event formats, activities, and communication channels tailored to the respective target groups in Suzhou.

The baseline indicates that consumers in Suzhou already have a good basic awareness of some plastic waste materials and recycling practices. The group shows a strong willingness and distinct motivations to participate in waste separation and would like to take further actions to collect and recycle low-value plastics. Some of them are already adopting aspects of the 3R (Reduce, Reuse, Recycle) principle in their daily life. Further awereness raising and educational activities are required to deepen citizens' knowledge (e.g. on recyclable items) and to adopt appropriate recycling practices (e.g. for rinsing plastic waste).

1. ABOUT THE ASSESSMENT

Until now, Suzhou has piloted several initiatives of awareness promotion or sorting for recycling activities aimed at improving 'low-value plastic' recycling in Business Areas, and there is a list of common low-value plastic waste that are focused to be collected and recycled (see Annex 4.2.), especially FaBCs[1], which will also be the target waste for the awareness baseline survey and subsequent awareness-rising activities implementation.

1.1. COMMERCIAL AREA ASSESSMENT OBJECTIVE

To improve the current waste management system with a focus on better collection and recycling for low-value plastics, the Awareness Baseline Assessment on Plastic Waste Generation and Recycling

[1] They are the plastic Food and Beverage Containers defined as rigid single-used plastics composed of PP, PS, and PET.

for Suzhou Citizens ('The Assessment') is conducted. It forms the basis for the design and implementation of subsequent awareness-rising activities in Suzhou by project JingSu. The objectives for this specific part of the assessment, i.e. the commercial area assessment, are:

1. assess the level of awareness of the CONSUMERS of Suzhou's COMMERCIAL AREAS on plastic waste generation and recycling.

2. inform tailored awareness-raising strategies promoting FaBC waste reduction, collection and recycling, focusing specifically on business areas.

The assessment methodology follows the same logic and set up of the residential and school assessments (p. 8).

1.2. TARGET GROUP AND SAMPLE

The key stakeholders in the whole plastic waste management process were identified based on the info from preliminary site visit and desk research, where for different objectives, the key stakeholders are marked as dark brown in the 'Figure 3.

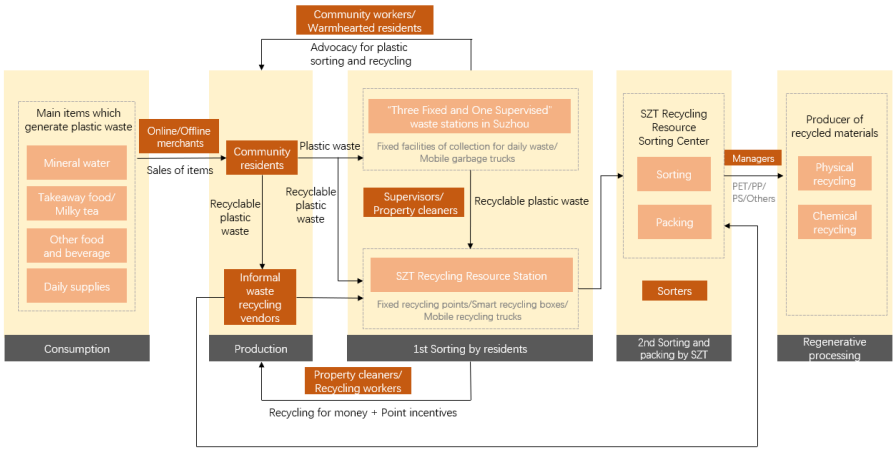

Figure 3. Plastic Waste Management Process and Identified Stakeholders of Business Areas in Suzhou

KEY STAKEHOLDERS IN BUSINESS AREAS

- **Area:** Business Areas

- **Related sessions within management process:** distribution, consumption, waste generation, source separation and collection, sorting and packaging, regeneration treatment.

- **Key stakeholders:** business, merchants, consumers, nearby residents, informal waste recycling vendors, supervisors/ district operators, sanitation workers, recyclers of fixed waste collection points, sorters and managers of renewable resource recycling institutions

- **Main categories of plastic waste:** plastic water bottles, plastic beverage cups, straws, plastic packaging bags and other food and beverage packaging

TARGET GROUP AND SAMPLING SIZE

Given the plastic waste generation differs concerning the generator groups, generated waste type and amount in various scenarios, a separate scenario is identified for the baseline assessment: shopping zones/business areas. Shopping malls, merchants and consumers are the main target and supporters for the implementation of this assessment.

Waste generation place	Key stakeholders	Assessment methodology	Sample size
Business Areas	Consumers	Questionnaires	**308**

Table 1. Overall situation for target groups and sampling in business areas

Overall Sample	
Total sample number	308
Age	{Under 18} 15.26% {18~25} 17.21% {26~30} 19.16% {31~40} 20.78% {41~50} 14.29% {51~60} 8.44% {Over 60} 4.87%
Gender	Male to female ratio 46.43%:53.57%
Educational Background	Junior high school and below 17.21%

	Middle school 27.27% Professional training college 14.94% Undergraduate 23.7% Master, PhD and above 16.88%
Address (District)	Huqiu District 10.71% Wuzhong District 6.82% Xiangcheng District 9.74% Gusu District 15.26% Wujiang District 15.26% Zhangjiagang 13.31% Changshu District 11.04% Taicag District 7.79 Kunshan District 10.06%

Table 2. Distribution features of samplings

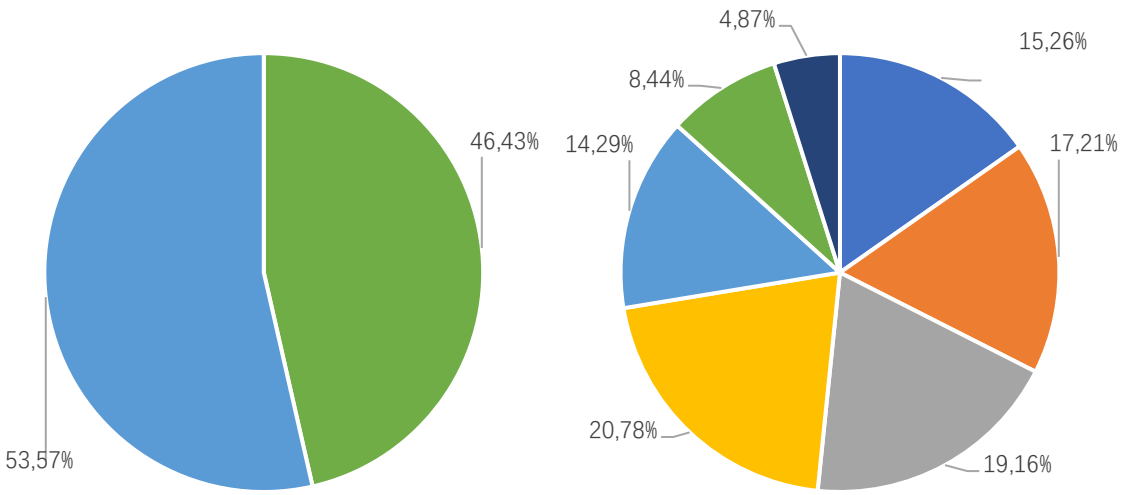

Table 3.1 Respondents' gender (left) and age group (right)

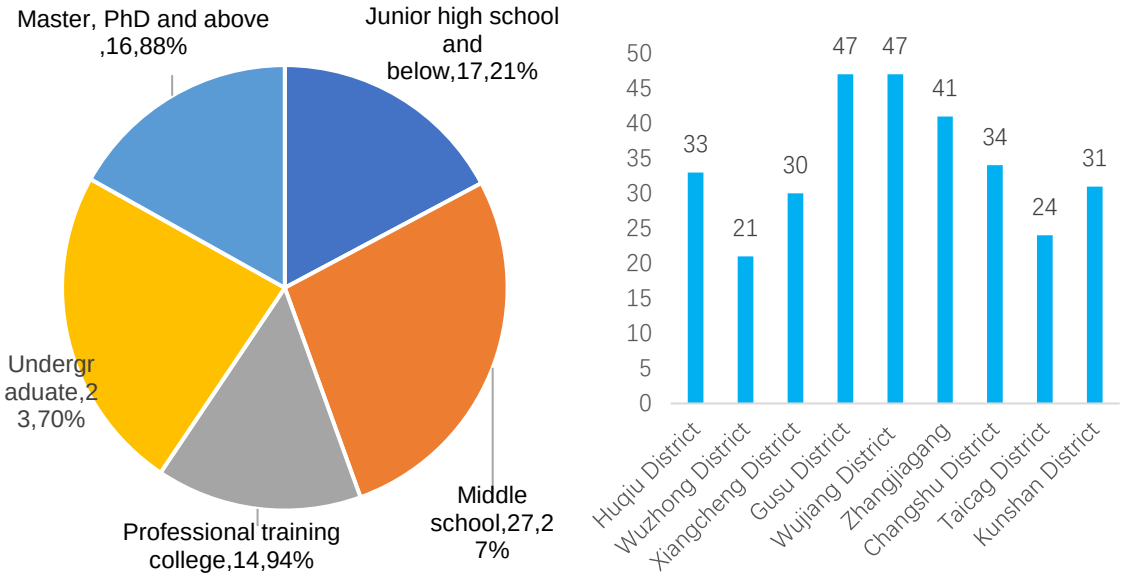

Table 3.2 Respondents' educational level (left) and locations (right)

Table 3. Respondents' geographical information

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2. ASSESSMENT RESULTS

This chapter evaluates the Suzhou consumer's awareness and willingness to participate and current behavior toward plastic waste management and low-value plastics segregation and recycling.

2.1. CURRENT SITUATION OF PLASTIC CONSUMPTION, AWARENESS AND COGNITIONS FOR LOW-VALUE PLASTIC WASTE AND PLASTIC WASTE RECYCLING

Consumers in Suzhou generate a lot low-value plastic in business areas. Overall, Suzhou consumers have a good perception of plastic waste recycling. Around 45% of consumers have an awareness of recyclable low-value plastic waste, which is generally good, but lower than for recyclable household waste. This is reflected by the fact that there are fewer respondents who can cognise the recyclable plastic waste among low-value plastic waste than the water bottles, which are categorised as *recyclables* according to *The Waste Standard*.

CURRENT SITUATION OF PLASTIC CONSUMPTION

The survey inquired about the quantity of plastic waste generated during visits to business areas. Respondents were specifically instructed to report their usage patterns for the top four types of plastic waste commonly encountered in these areas: plastic cups, straws, plastic food box packaging, and plastic bag packaging.

The baseline provides a clear depiction of the findings, revealing that plastic bag packaging exhibits the highest generation rate per trip out of the 4 categories, ranging from 3 to 5 or more pieces. Following closely are plastic straws and cups, with an average of 2 pieces per trip (to the business area).

Specifically, 41.23% of respondents typically produced 1 to 2 plastic cups per trip, and 47.4% used 1 to 2 straws, reflecting relatively low generation rates compared to other waste types. Plastic food box packaging and plastic bag packaging, however, displayed a different pattern. Notably, 29.55%

generated a minimum of 5 plastic food box packaging items per trip, and a remarkable 32.14% produced at least 5 pieces of plastic bag packaging during their business areas visits.

In summary, this finding underscores a noteworthy observation. Approximately half of the respondents was responsible for the production of plastic cup and straw wastes, yet the output per person remains relatively low, typically ranging between 1 to 2 items probably due to a limitation in consumption habit. In stark contrast, a smaller segment of respondents partakes in the generation of packaging products. However, within this group, each individual makes a substantial higher contribution to the total production quantity. Unlike cups and straws, the production of packaging products is not subject to limitations imposed by consumption volume. This phenomenon may well be influenced by the purchasing power and consumer behaviors of individuals.

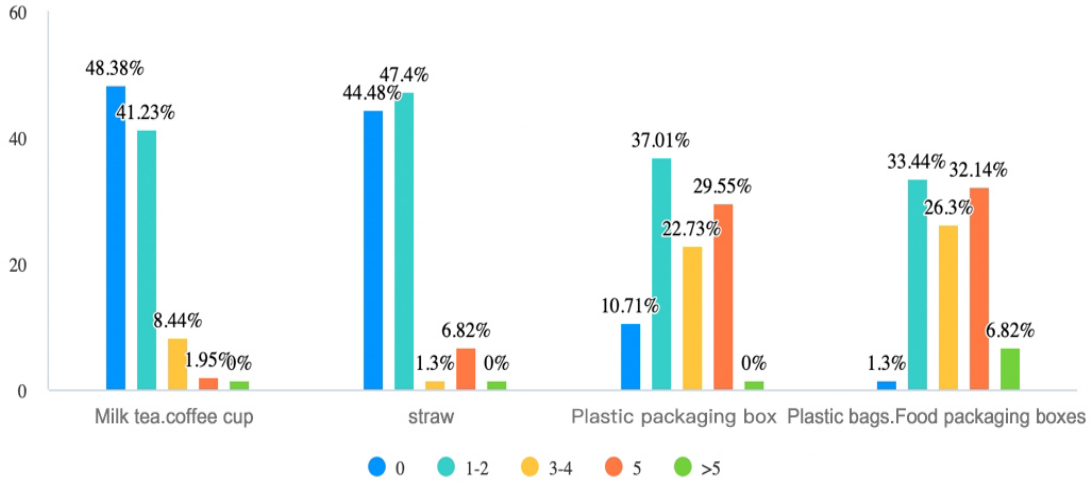


Table 4. Question: How many pieces of low-value plastic waste do you produce on average per trip in business areas?

AWARENESS AND COGNITION FOR LOW-VALUED PLASTIC WASTE

Participants were specifically asked about their level of awareness concerning the recyclability of different plastic items, which encompassed plastic water bottles, plastic cups, straws, plastic food box packaging, and plastic bag packaging.

Plastic water bottles were the most recognized item, with 68.51% of participants aware of their recyclability. Plastic food box packaging also had a high recognition rate at 58.44%, showing that a

majority of respondents knew these waste items could be recycled. In contrast, plastic cups and plastic food packaging exhibited a slightly lower recognition rate at 45.45%, suggesting that while a significant portion of participants understood their recyclability, there was room for improvement in awareness. Finally, plastic straws were found to have the lowest level of recognition among the surveyed population, with 44.16% of respondents acknowledging their recycling value, underscoring the need for greater efforts in raising awareness about the recyclability of this particular plastic item.

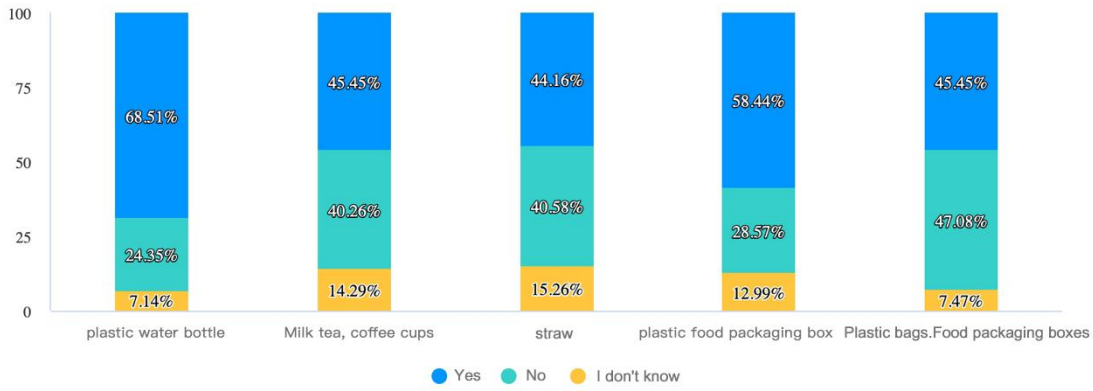


Table 5. Respondents' awareness on the recycling value of plastic waste

2.2. WILLINGNESS TO PARTICATE IN PLASTIC WASTE COLLECTION AND SEGREGATION

In our analysis of recycling willingness, an overwhelming majority (92.21%) of respondents expressed eagerness to participate, with motivations ranging from social influence to incentives. Among those willing to engage, 84.72% were ready to rinse items before disposal, with 56.82% influenced by observing others and 47.4% motivated by facilitating recycling for others. Interestingly, respondents showed a higher preference and inclination to follow suit in rinsing behaviors compared to recycling, driven by social norms and immediate rewards. This underscores the impact of social influence in normalizing and promoting responsible waste management practices, suggesting that emphasizing the benefits and fostering collective responsibility can further encourage these positive behaviors.

PARTICIPATION IN THE RECYCLING PROCESS

It's important to note that 24 individuals within our respondent pool were not inclined toward recycling.

One respondent did not specify a reason, while the rest cited a perceived lack of responsibility as their main rationale.

Looking deeper into the motivations of those willing to participate, we found that 29.87% stated they would be more inclined to recycle if they saw others doing so, and an additional 21.43% mentioned that incentives would motivate them.

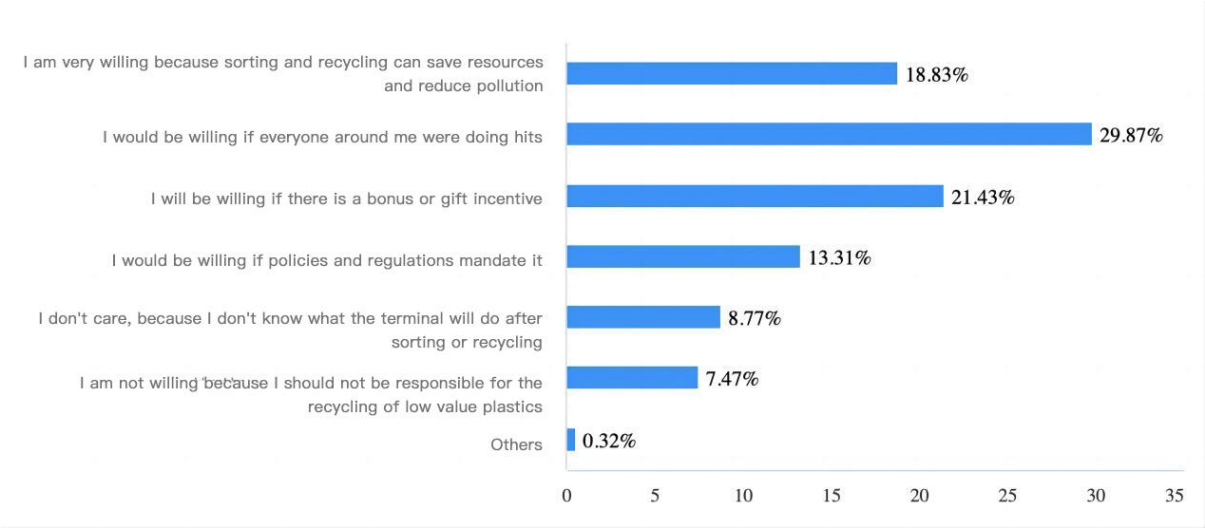


Table 6. Respondents' motivations towards plastic waste sorting

Table 7. Respondents' motivation towards plastic waste sorting separated by district

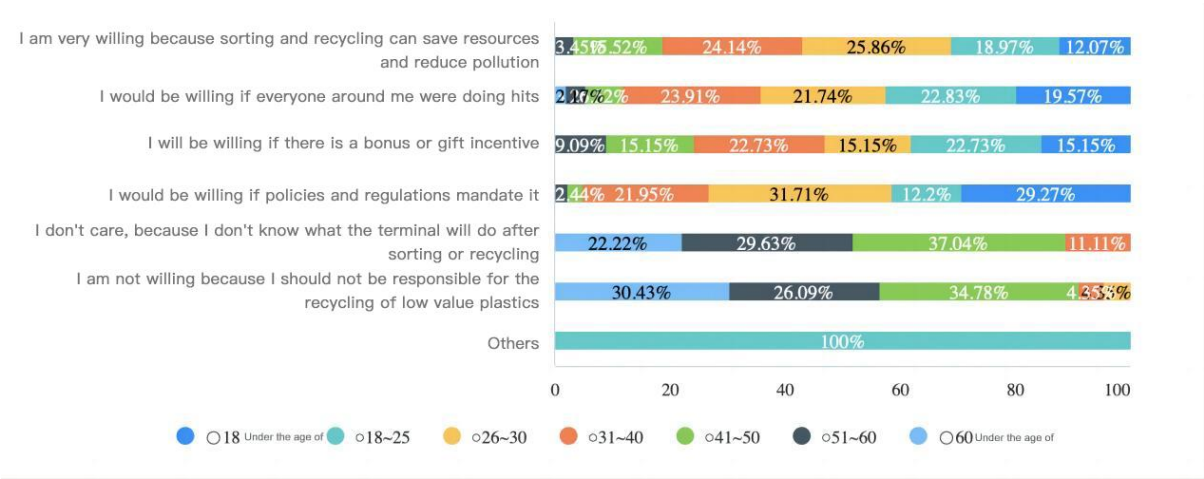


Table 8. Respondents' motivation towards plastic waste sorting separated by age

When queried about their willingness to rinse items before disposal, a substantial 84.72% of respondents indicated their readiness to do so. Among this group, 5.84% expressed concerns that the rinsing process might be too labor-intensive, while 7.14% felt that it should not be their responsibility.

Among those who affirmed their willingness to rinse, 56.82% cited the motivation that if they observed others engaging in rinsing, they would be inclined to follow suit. Additionally, 47.4% mentioned that they would be more likely to rinse if it facilitated the recycling process for others, and 42.21% stated that they would do so if they happened to have the time available.

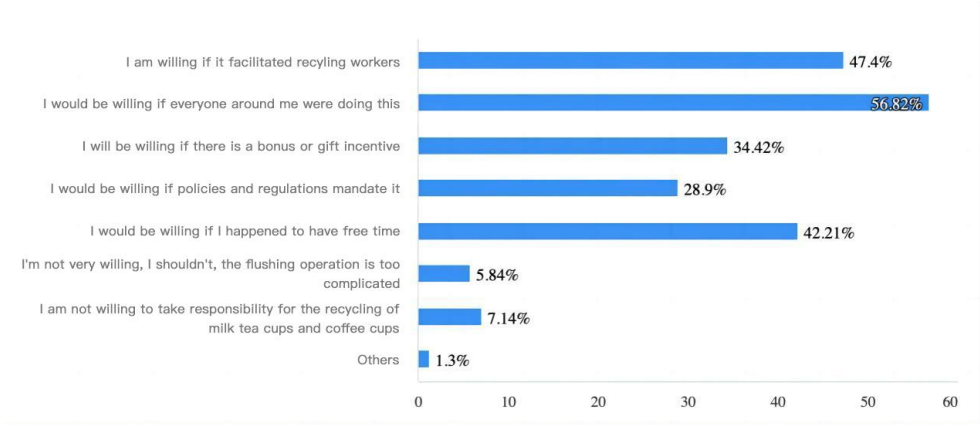


Table 9. Respondents' motivation towards rinsing the plastic waste

Comparing the results between rinsing and recycling, a noteworthy trend emerges, indicating a higher preference and willingness to engage in rinsing behaviors. Additionally, a substantial number of respondents expressed a strong inclination to follow the behavior of others, with both rinsing and recycling receiving the highest percentage of respondents stating that they would participate if they saw others doing it.

The social aspect of observing others engaging in these behaviors plays a significant role. People tend to be influenced by the actions of their peers. When they witness others participating in recycling or rinsing, it not only normalizes these behaviors but also creates a sense of collective responsibility, making individuals more inclined to follow suit. Moreover, respondents expressed that they would be more likely to rinse if it facilitated recycling for others. The higher preference for rinsing and the resonance with the act of following others can be attributed to the immediate rewards, social influence, and the sense of communal responsibility associated with these actions. To promote the act further, efforts can focus on emphasizing its immediate and long-term benefits.

2.3. BEHAVIOURS TOWARDS PLASTIC WASTE RECYCLING

Almost all consumers apply some of the 3R principles when they go to the business area. Over half of the population has adopted plastic reducing practices. Out of the 3R (Reduce, Reuse, Recycle), most of the respondents care primordially about the recycle principle, reflected by the analysis of respondents' pro-environmental behaviours related with plastic waste recycling when visiting business areas.

Overall, the situation is quite promising, primarily driven by the fact that a significant 52.25% of respondents not only contemplate waste separation but also actively ensure its proper disposal in recycling bins. Additionally, an encouraging 62.34% of participants demonstrate an awareness of waste separation, even though they may occasionally falter by not consistently separating their waste. On the flip side, only a small fraction, specifically 9.42%, have yet to consider waste separation as a practice. Furthermore, a mere 8.77% of respondents acknowledged leaving waste near the establishments where they conducted their transactions, be it restaurants, supermarkets, or bubble tea shops(table 9).

Table 10. Respondents' behavior of plastic waste disposal

When disposing, a 73.38% said yes in terms of willingness If plastic waste recycling collection points were set up in commercial areas, they would take a photo as proof when you categorize your waste for disposal, share it in the mall or business's fan groups, and receive platform points, cashback, or coupons.

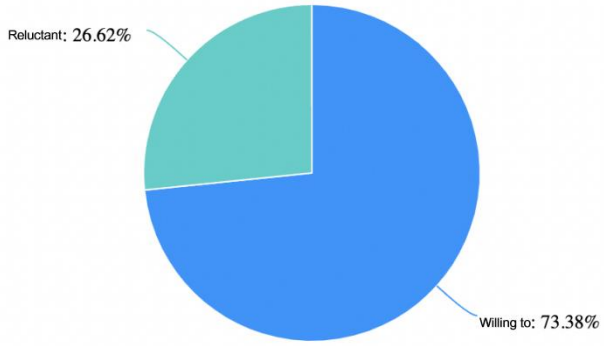


Table 11. Respondents' behavior towards taking photo while disposing

The baseline reveals several positive insights regarding waste management practices. A significant 52.25% of respondents actively engage in waste separation and recycling, indicating a strong commitment to responsible disposal. Furthermore, an encouraging 73.38% express a willingness to

participate in a photo-based waste categorization system if provided with plastic waste recycling collection points in commercial areas. This willingness demonstrates the potential for convenient infrastructure and incentives to motivate individuals to adopt sustainable waste management practices.

As of past eco conscious behaviors (Table 11), 97% of respondents reported that they have engaged in any such behaviors, indicating a commendable level of awareness among the vast majority. A substantial 62% of participants disclosed that they had proactively taken the initiative to bring their own reusable cups, showcasing a strong commitment to reducing single-use waste. Additionally, an impressive 50% of those surveyed expressed a conscious intention to purchase refillable products, demonstrating a growing trend toward sustainable consumption practices. Moreover, 42% of respondents proudly mentioned that they consistently tote their own reusable bags, contributing significantly to the reduction of plastic bag usage.

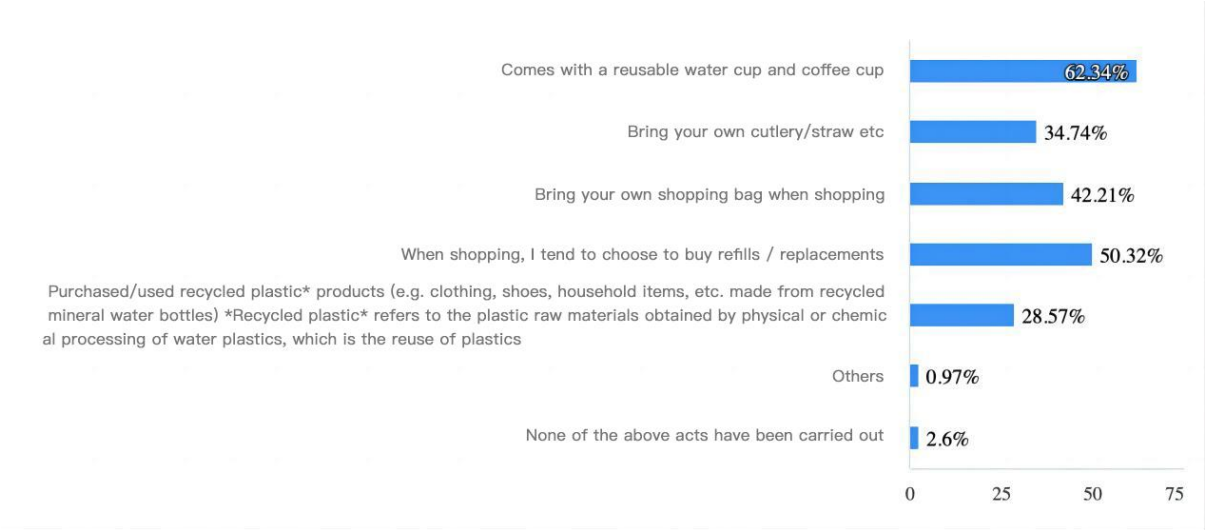


Table 12. Question: What environmentally friendly behaviors do you usually do when visiting shopping malls/commercial streets?

2.4. PARTICIPATION FOR PLASTIC WASTE RECYCLING ACTIVITIES

The top four activities consumer interested in are: Plastic Recycling Knowledge Exhibition, which intrigued 63.96% of participants; a DIY Workshop Lab, favored by approximately 56.82% of respondents; Empty Plastic Bottle Recycling Programs in exchange for store credits, appealing to 51.3% of those surveyed; and Pop-Up Shops, which drew the attention of 49.03% of participants.

A significant 77.27% expressed a preference for accessing information and initiatives through online resources. Influencer or Key Opinion Leader (KOL) recommended initiatives on social platforms like Little Red Book, Weibo, or Douyin (TikTok) intrigued 77.27% of respondents. Approximately 65.58% indicated a desire to engage with recycling initiatives through city-announced events, such as those organized via WeChat Official Accounts, WeChat groups, and Douyin. Furthermore, 57.14% of participants favored promotions related to stores in the Business Areas, including in-store distributional promotion and engagement through the stores' official accounts. Lastly, 47.73% expressed a preference for being informed about recycling initiatives by their families or friends, emphasizing the significance of word-of-mouth recommendations in spreading awareness.

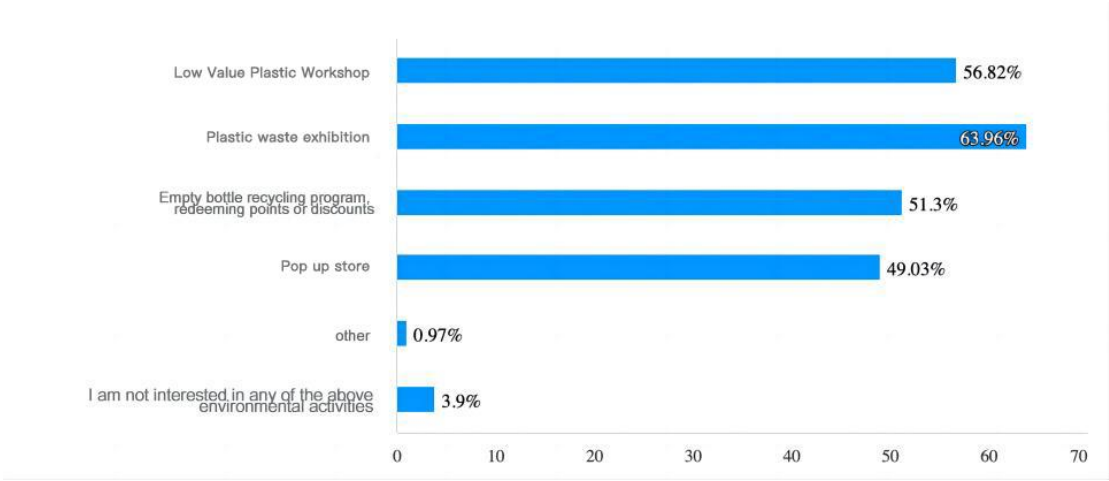


Table 13. Respondents' favored activities

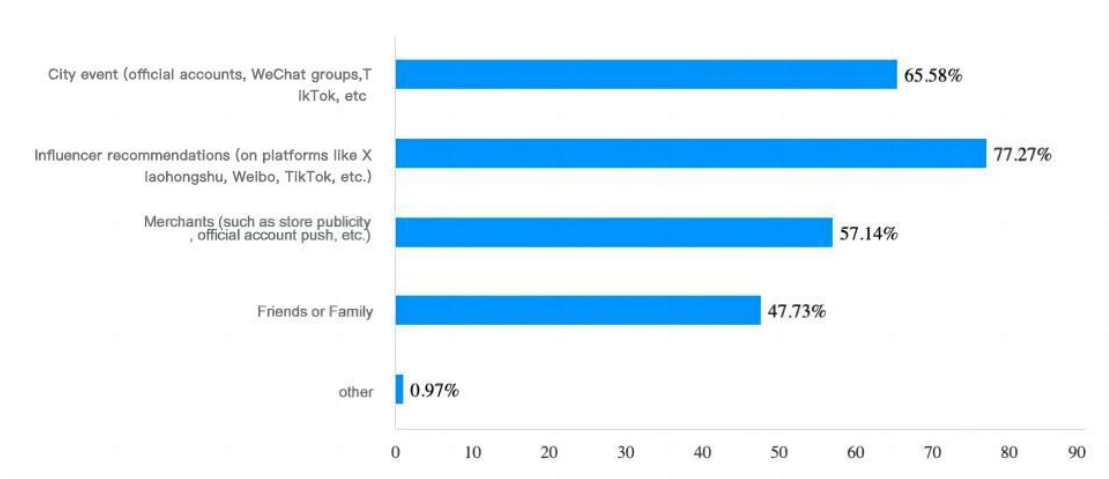


Table 14. Respondents' favored promotional channels

The survey explored participants' awareness and willingness to engage in plastic recycling activities through two critical aspects. Initially, when assessing their current level of participation awareness, a mere 7.14% stated that they never engage in recycling-related activities. On the flip side, a substantial majority demonstrated a strong enthusiasm for remaining informed and actively participating in plastic recycling endeavors, with 55.52% indicating they would do so "always" and "often," and an additional 37.43% expressing their willingness to engage "sometimes" and "occasionally."

Furthermore, the survey extended its investigation to participants' future participation awareness regarding activities promoted by shops. In this context, only 6.49% stated that they never pay attention to such initiatives. A significant 60.39% expressed a commitment to engage "always" and "often," with an additional 33.11% indicating they would do so "sometimes" and "occasionally." These findings collectively highlight a prevalent eagerness among participants to remain actively involved and informed about plastic recycling activities, both presently and in the future.

This data serves as a source of great encouragement and promise for future planning initiatives. It clearly illustrates the authentic interest and enthusiasm among individuals when it comes to participating in plastic recycling activities, both presently and in the future. Such a positive response bodes well for the success and effectiveness of upcoming plastic recycling programs and initiatives.

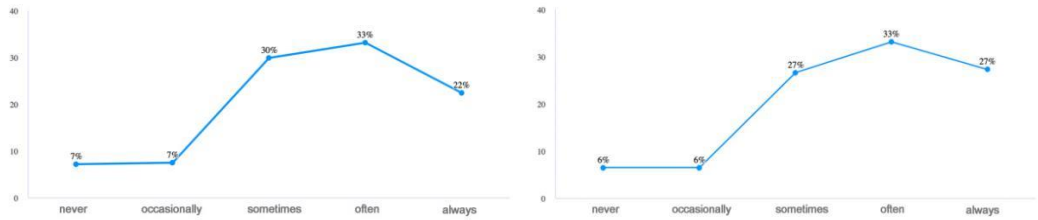


Table 15. Current participation (right) future participation (left)

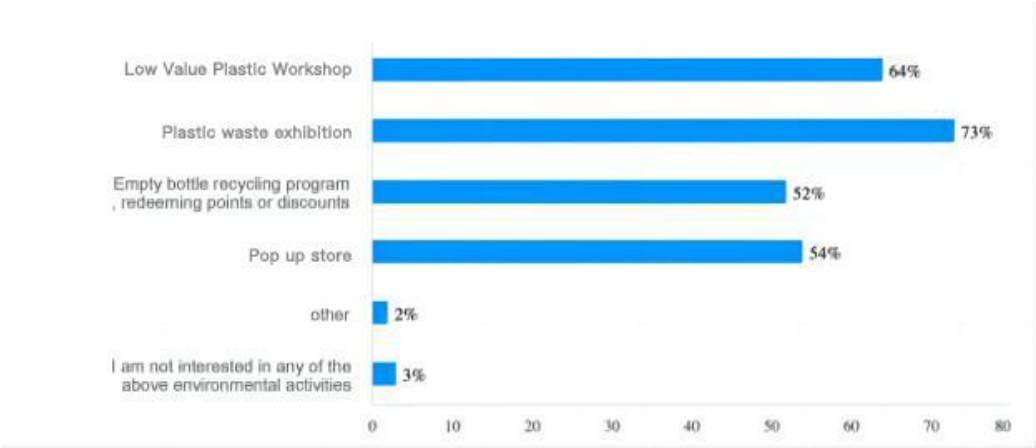
3. RECOMMENDATIONS FOR EFFECTIVE AWARENESS RAISING

Based on the assessment results, Chapter 3 provides recommendations for an effective awareness raising strategy to promote responsible plastic waste management practices among Suzhou consumers, including specific event formats and activities and communication channels, each tailored to their respective target groups.

3.1. AWARENESS-RAISING ACTIVITIES

When it comes to raising awareness among consumers regarding sustainable practices and responsible consumption, it's essential to consider the diverse demographics and preferences. Consumer age groups play a significant role in shaping their attitudes and behaviors towards sustainability.

Youth aged 25 and under exhibit a strong enthusiasm for eco-conscious practices, with 73% showing interest in Exhibitions and 64% in workshops. Effective awareness activities should focus on interactive events and online platforms. Adults aged 26-40 display a balanced approach to sustainability, with 67% interested Exhibitions. Mid-50s adults (41-60) prioritize efficiency and value influencer endorsements, making exhibitions and online platforms suitable. Elderly individuals (60+) engage less but prefer traditional communication channels like community events, emphasizing the need for offline approaches.



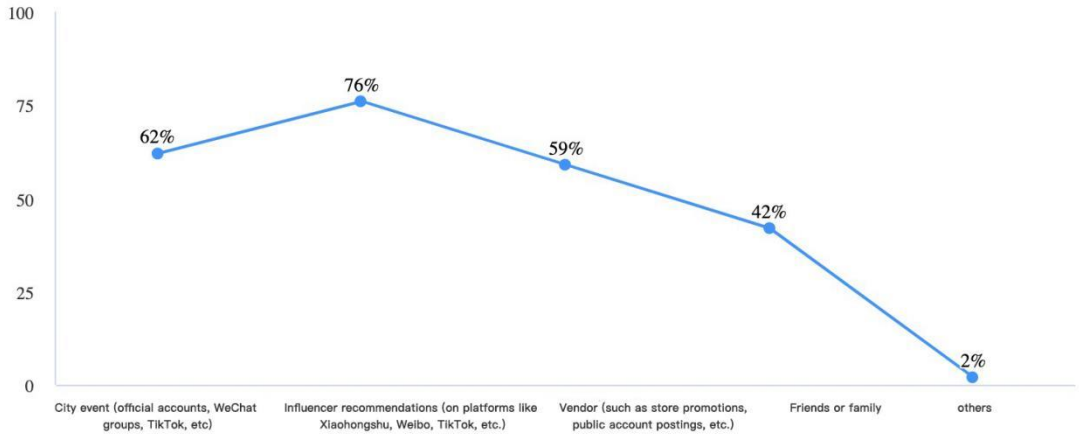
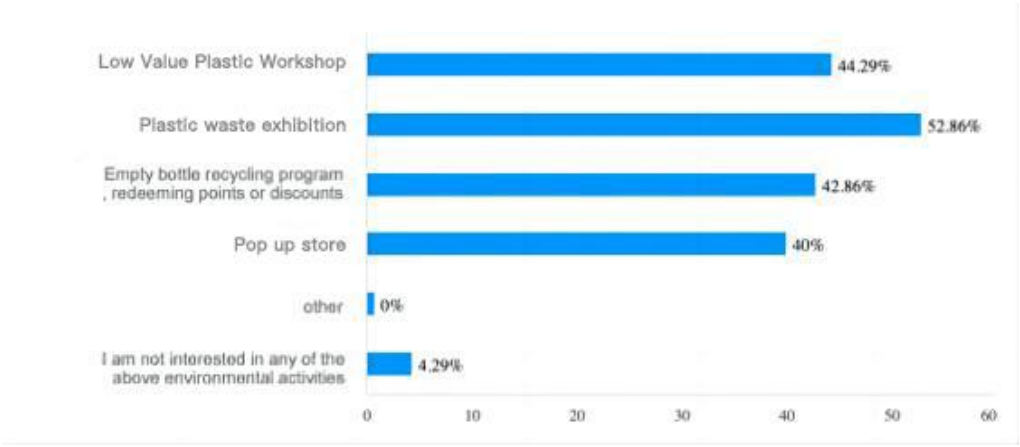


Table 16. Youth awareness on recycling activities



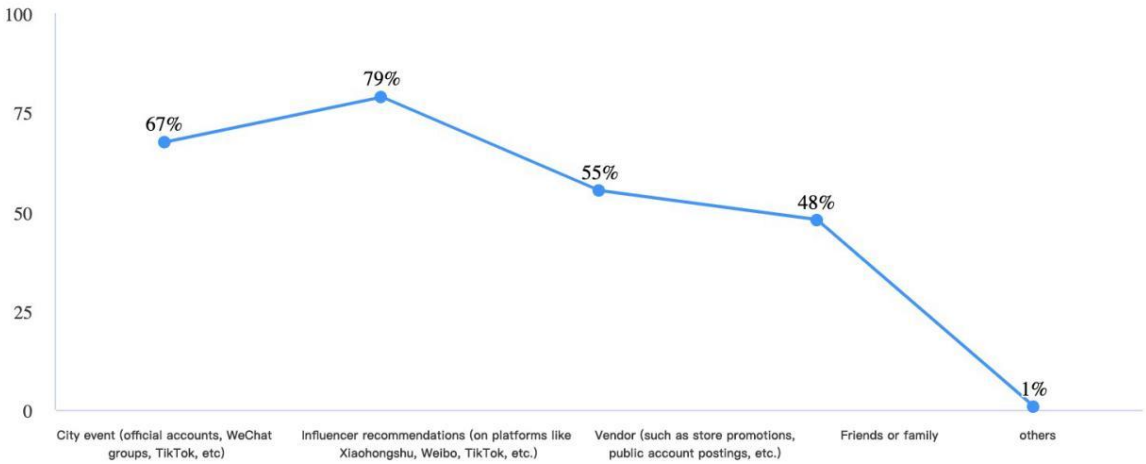
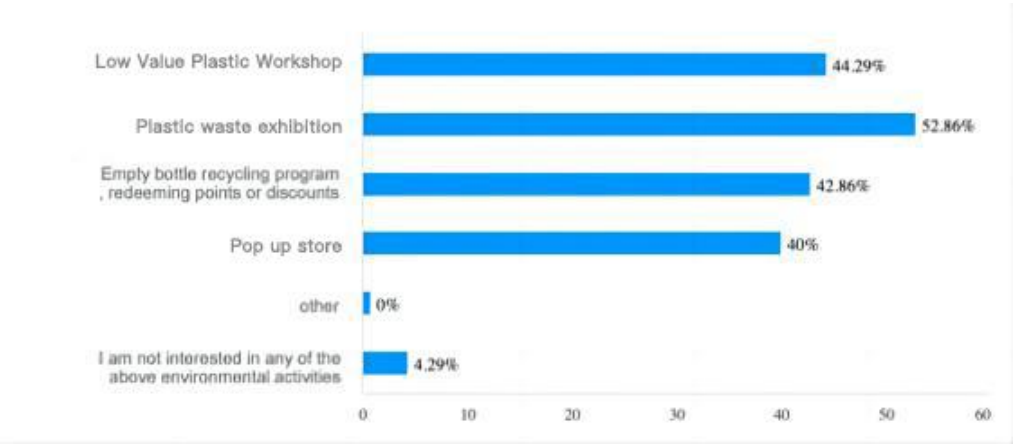


Table 17. Adult awareness on recycling activities



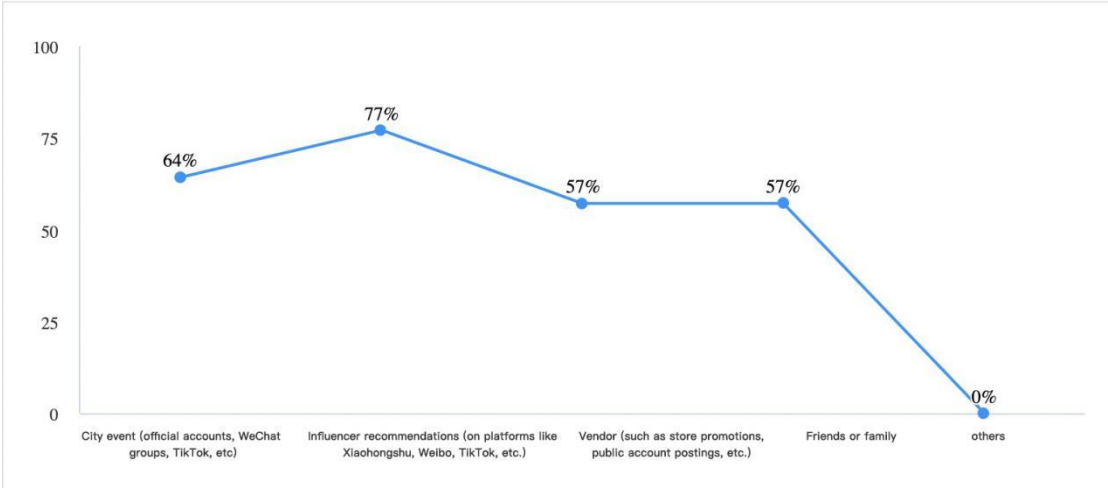
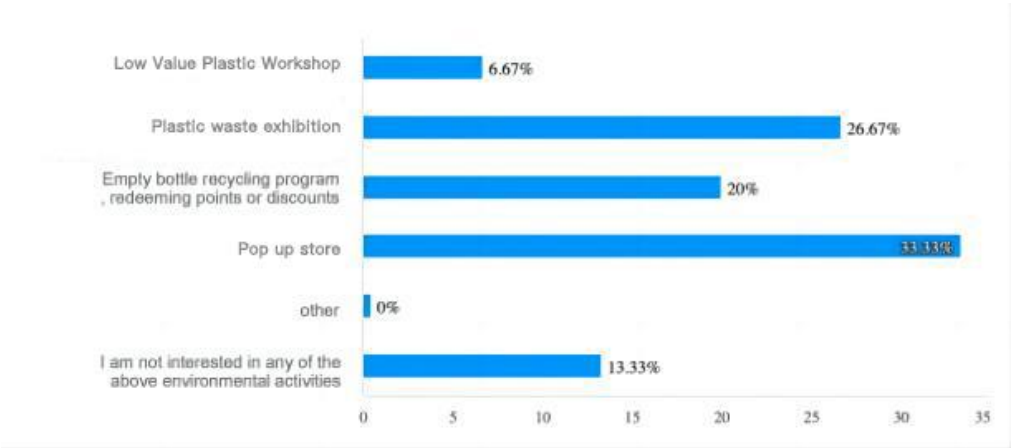


Table 18. Mid 50s awareness on recycling activities



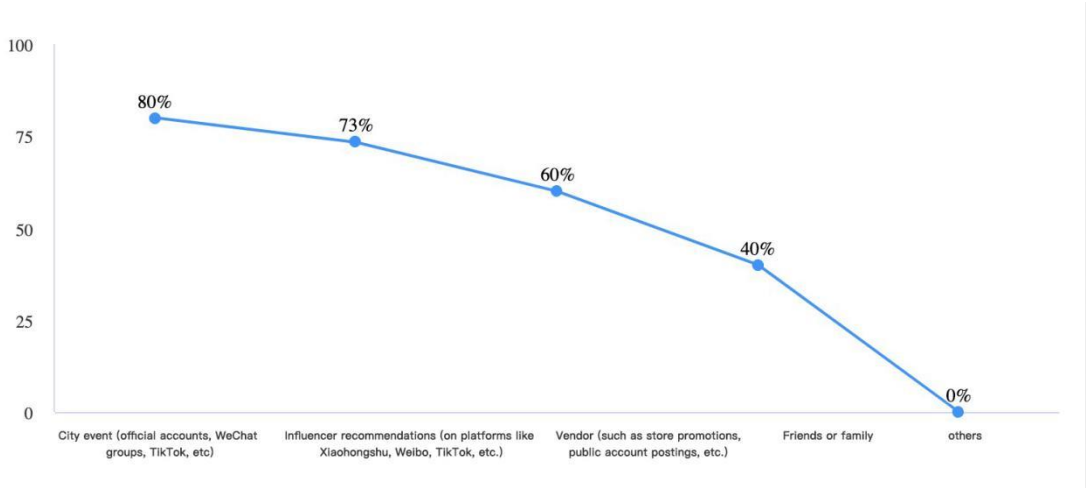


Table 19. Elderly awareness on recycling activities

3.2. ADVOCACY INFOMATION

In order to improve public awareness of properly disposal of their plastic waste, it is important to provide practical information (e.g., informing people about the location of nearby collection and recycling facilities or waste collectors) to individuals. In addition to practical information, action-oriented advice to individuals can be done through awareness-raising events where participants are given guidance on how they can become more actively involved in the plastic waste recycling process. This may include evaluating their current practices and determining if they are adequate or if more can be done. By providing this advice, individuals will feel empowered to make a difference in plastic waste collection and recycling.

A balanced approach to advocacy information is crucial. The survey results indicate that people are open to a diverse range of initiatives, such as Plastic Recycling Knowledge Exhibitions, DIY workshop labs, and bottle recycling programs. By offering a variety of initiatives, individuals are more likely to find something that resonates with them and encourages their active involvement in raising awareness about waste plastic collection and recycling.

Furthermore, providing information on the recycling and treatment processes further down in the waste management process can create an understanding and purpose for individuals to engage in sorting and rinsing at home. By explaining the importance and impact of these processes, individuals will be more motivated to properly prepare their plastic waste for recycling.

3.3. ADVOCACY CHANNELS

Efforts in advocacy channels should place a strong emphasis on the adaptability of promotional strategies, encompassing both online and in-person approaches, to effectively engage this particular demographic. Furthermore, advocacy information should underscore the efficiency and knowledge acquisition aspects of recycling initiatives, with a specific focus on influencer-driven promotional strategies and informative experiences.

The survey findings reveal that people in this group are most actively inclined to participate when they receive recommendations from various sources. These recommendations can stem from influencers on online platforms, guidance provided by city-sponsored events, local shop owners, or even personal recommendations from friends and family members. The top two approaches in this regard are references from personal channels on social media platforms such as Xiaohongshu, Weibo, and Tiktok, as well as official account posts from cities on platforms like WeChat public accounts and groups. These channels have proven to be effective in reaching and engaging the general public. Therefore, in order to improve public awareness of plastic waste collection, it is important to prioritize these advocacy channels on popular social media platforms. By leveraging the reach and influence of personal channels and official city accounts, we can effectively disseminate information and encourage individuals to participate in plastic waste collection efforts.

3.4. ACTIVITIES AND INFO BY AGE GROUPS

To engage with the youth (25 and under), who are often well-informed but need more opportunities for action, make effective use of popular social media platforms such as WeChat, Weibo, and TikTok. Collaborate with eco-conscious influencers and bloggers on these platforms to not only inspire but also encourage youth to actively participate in recycling initiatives such as exhibition and workshops.

For individuals between the ages of 26 and 60, who have a balanced approach to sustainability, a multi-channel strategy is key. This strategy should seamlessly combine both online and offline methods. Collaborate with local stores to create offline engagement opportunities, and partner with influential lifestyle content creators to craft informative and motivating content. Additionally, utilize social media advertising on various platforms to reach this diverse age group effectively.

Efforts to engage adults in their mid-50s, who prioritize efficiency, should underscore the versatility of promotional strategies. Employ both online and in-person approaches to ensure a comprehensive outreach strategy, tailoring your efforts to their desire for efficient recycling practices.

Engaging the elderly demographic, characterized by lower participation and awareness, requires a tailored approach. Focus on traditional communication channels and WeChat-based communication since this age group prefers these methods. Given their limited inclination to participate, prioritize educational campaigns that highlight the inherent recycling value of products. Augment these efforts with offline community events to foster understanding and support for recycling initiatives.

4. ANNEX

4.1. QUESTIONNAIRE QUESTIONS

QUESTIONNAIRE MANUSCRIPT

Baseline Survey on Consumer Awareness of Plastic Waste Recycling in Suzhou City

Since the implementation of the "Suzhou Municipal Household Waste Classification Management Regulations" in 2020, Suzhou City has gradually achieved success in waste classification work. To achieve the goal of making Suzhou a "zero-waste city" by 2025, Suzhou's waste classification will also gradually enter the more refined era of 2.0 for household waste classification and recycling. This survey is initiated by the Suzhou Municipal Environmental Sanitation Bureau in collaboration with international organizations such as the Alliance to End Plastic Waste (AEPW) and the German International Cooperation Agency (GIZ). The questionnaire design was entrusted to Impact Hub Shanghai, and it aims to conduct a baseline survey on consumer awareness of plastic waste recycling in Suzhou. This questionnaire is for statistical analysis purposes only, so please feel free to fill it out

Module 1：background

1. Age[single option] *

○Under 18 ○18~25 ○26~30 ○31~40

○41~50 ○51~60 ○Above 60

2. Gender [single option] *

○male ○female

3. education level [single option] *

○up to junior high school

○Highschool

○Tertiary

○Bachelor

○Master, PhD and above

4. District or County*

District_____ Business Areas_____

Module 2 Basic Knowledge on plastic waste

5. Regarding the following common plastic waste items, do you believe they have recycling value? [Matrix Single Choice Question] *(with illustrations)

	Yes	No	I Don't Know
Mineral water and various types of beverage bottles 	○	○	○
Bubble tea and coffee cups 			

Straw 			
Food packaging boxes 			
Everyday items, gift packaging boxes 			
Plastic bags, food packaging bags 			

Module 3：Generation of plastic waste

6. How many low-value plastic waste items do you generate each time in a shopping area consumption scenario? [Matrix Single Choice Question] *

In this questionnaire, 'low-value plastic' refers to plastic waste that is recyclable but has a higher recycling difficulty and currently lacks a complete recycling chain, such as beverage cups, straws, plastic bags, etc

	0	1-2	3-4	5	>5
Bubble tea and coffee cups 	○	○	○	○	○
Straw 					
Food packaging boxes 					
Plastic bags, food					

packaging bags  					

Module 4：Personal plastic waste disposal habits

7. How do you handle low-value plastic waste generated when consuming in shopping areas? [Multiple-choice question] *

☐ Dispose of it inside the establishment you visited, such as a restaurant, supermarket, cinema, bubble tea shop, etc.

☐ Not sure/Did not consider waste sorting, dispose of it in the mall's trash bin. ☐ After considering waste sorting, dispose of it in other trash bins.

☐ After considering waste sorting, dispose of it in recyclable trash bins.

☐ Dispose of clean plastic in recyclable trash bins, and plastic with food residue in other trash bins.

☐ Wash plastic waste and then dispose of it in recyclable trash bins."

8. Are you willing to separately classify and dispose of the waste shown in the illustrations above to support the recycling of low-value plastics? [Multiple-choice question] *

☐ I am very willing, because separating and recycling can save resources and reduce pollution.

☐ I would be willing if people around me are doing the same.

☐ I would be willing if there are bonuses or incentives.

☐ I would be willing if it is mandated by policies and regulations.

☐ I don't care because I don't know how the end processing will be done after sorting and recycling.

☐ I am not willing because I should not be responsible for the recycling of low-value plastics."

□Others _____*

9. Are you willing to rinse bubble tea cups and coffee cups before disposing of them? [Multiple-choice question] *

☐ I am very willing because it makes it easier for recycling personnel to collect bubble tea and coffee cups.
☐ I would be willing if people around me are doing the same.
☐ I would be willing if there are bonuses or incentives.
☐ I would be willing if it is mandated by policies and regulations.
☐ I would be willing if I happen to have free time.
☐ Rinsing is too troublesome, so I am not very willing.
☐ I should not be responsible for the recycling of bubble tea cups and coffee cups, so I am not willing.
☐ Other: _____*"

10. If there were plastic waste recycling collection points in shopping areas, would you be willing to take photos and share them in the mall or store's fan group as proof of your waste sorting, in exchange for platform points or discounts?
☐ Willing
☐ Not willing"

Module 5：Public Awareness and Actions

11. When you visit a shopping mall/commercial street, what environmental-friendly actions have you generally taken? [Multiple-choice question] *
☐ Bring your own reusable water bottle or coffee cup.
☐ Bring your own utensils/straws, etc.
☐ Bring your own shopping bag when shopping.
☐ Tend to choose to buy refill/replacement products while shopping.
☐ Have purchased/used products made from recycled plastic* (such as clothing, shoes, household items made from recycled mineral water bottles)."Recycled plastic" refers to plastic materials obtained by processing waste plastic through physical or chemical methods, which is a way to reuse plastic.
☐ Other: _____*
☐ I haven't taken any of the above actions."

12. Which environmental activities are you willing to participate in? [Multiple-choice question] *
☐ DIY workshops for plastic waste creativity.
☐ Public education and exhibition events on plastic waste held in shopping malls and commercial streets.

☐ Bottle recycling programs with point redemption or discounts.
☐ Exploring environmentally themed shops/pop-up stores.
☐ Other: _____
☐ I'm not interested in any of the above environmental activities

13. Which method of recommendations do you prefer for checking in at offline environmental activities? [Multiple-choice question] *
☐ City-wide event promotions (such as public accounts, WeChat groups, TikTok, etc.).
☐ Influencer recommendations (such as Xiaohongshu, Weibo, TikTok, etc.).
☐ Businesses (such as in-store promotions, public account promotions, etc.).
☐ Friends or family.
☐ Other: _____"

14. How often do you participate in the above environmental activities?
☐ Never ☐ Occasionally ☐ Sometimes ☐ Frequently ☐ Always

15. Do you pay attention to businesses' initiatives or actions related to environmental protection and plastic reduction?
☐ Never ☐ Occasionally ☐ Sometimes ☐ Frequently ☐ Always"

4.2. TABLE

材质/ polymer	名称及logo/ sub-category	实物图示 Picture of examples	颜色/color	来源/source
硬质塑料 rigid plastics				
PP	餐盒/ food container		有色/ dark	外卖/ food-delivery

			杂色/ mixed	外卖/ food-delivery
			透明/ transparent	外卖/ food-delivery
	饮料杯/ beverage container-hot		透明/ transparent	奶茶/ beverage -hot
	食品包装/ food packaging	  	有色/ dark	冰淇淋盒、黄油盒、酸奶杯、饼干盒、奶酪盒等/ Container for yogurt/butter/cookies/ice creams
PET	饮料杯/ beverage container-cold		透明/ transparent	冷饮/ beverage- cold

PET	生鲜托盘/ Fresh tray		有色/ dark	蔬菜、肉类托盘/ Vegetable/meat container
			透明/ transparent	水果、蔬菜托盘/ Fruit/vegetables container
	食品包装/ food packaging		透明/ transparent	零食盒/ cookies containers
PS	食品包装 /food packaging		有色/ dark	冰淇淋盒、黄油盒、酸奶杯、饼干盒、奶酪盒等/ Container for yogurt/butter/cookies/ice creams and so on
				
		 	透明/ transparent	

Table 20. List of recyclable plastic FaBCs waste in Suzhou