PHASE OUT SINGLE USE PLASTIC SURVEY

2023

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1. INTRODUCTION

In our ongoing commitment to advancing sustainable practices and reducing the environmental impact of single-use plastics, below are the findings of the Single-Use Plastic Survey. This report summarizes the result and insights gathered from a comprehensive survey conducted among a diverse group of participants. The data collection for this survey took place from June to September 2023 with GREW Educators as the enumerators to collect the survey. In brief, for the consumer survey, this study has successfully recruited 659 respondents, with 85.9% answered English version survey and 14.1% answered the Malay version survey. From total respondents, 84.5% were Penang residence, with majority staying at Timur Laut district (47.0%). As for business survey, a total of 303 retails has joined in this survey. Food outlet represents the majority with 74.3% and plastic bags were the most single-use plastic items offered to the customers with 51.8%.

The survey aimed to explore the impact of education and awareness campaign and the introduction of new charges for plastic usage in our effort in reducing single-use plastic among Penang populations. By engaging in this research, our goal was to gain a deeper understanding of public sentiments and actions in the context of single-use plastic reduction. These will provide valuable information for individuals, organizations, and policymakers seeking to promote responsible recycling practices and minimize the ecological consequences of single-use plastics.

The survey participants, whose responses form the basis of this report, shared their thoughts, experiences, and opinions on various aspects of single-use plastic reduction. Their input has helped us shed light on the challenges, opportunities, and best practices in their current practice to handle these materials.

The findings presented in this report are a testament to the significance of public engagement and awareness in addressing the environmental concerns associated with single-use plastic items. The data collected from the survey reflects the diversity of perspectives and behaviours within our society, highlighting both the progress made and the areas where further action is needed.

We believe that by presenting these survey results, we can contribute to the ongoing discourse on the handling of single-use plastic items and promote informed decision at individual, organizational, and governmental levels. The insights shared here are not only a reflection of the current state of single-use plastic items but also a call to action for collective efforts toward a more sustainable and eco-friendly future. The report is organized into sections that cover various aspects of the survey findings, allowing for a comprehensive exploration of the data. We encourage readers to delve into the details and reflect on the implications of the results for their specific interests and responsibilities.

2. SURVEY 1: CONSUMER

2.1. Consumer Details

This sub-section will highlight the details of respondents that take part in this study. The demographic details will be highlighted and discussed in this chapter in order to provide a better understanding and to correlate to the findings that will be discussed further in this study.

2.1.1. Status Penang residence and Working place

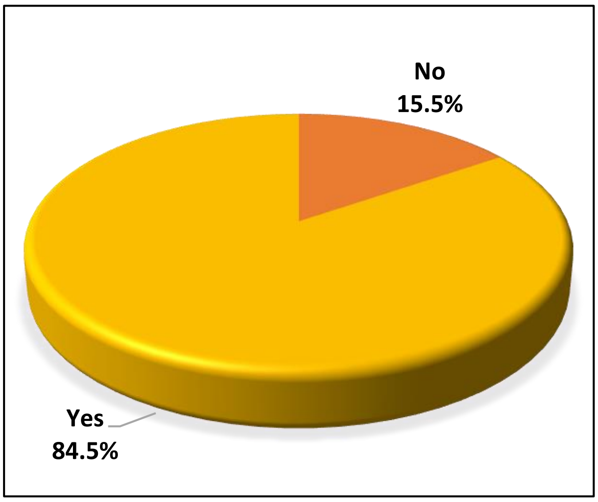

Figure 1: Status of Penang residence.

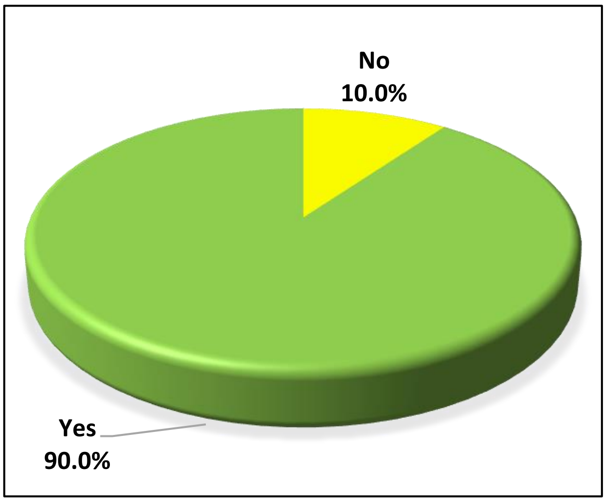

Figure 2: Status of working place.

Based on the Phase-Out Plastic in Penang survey, 84.5% of the respondents were residents of Penang, while the remaining 15.5% were not. Meanwhile, 90% from 659 respondents reported being employed in Penang.

2.1.2. District

In terms of district distribution in Penang, the Timur Laut region had the highest percentage of residents (47%), followed by 20.2% in the Barat Daya, 15.2% in Seberang Perai Utara, 9.6% in Seberang Perai Selatan, and 8.0% in Seberang Perai Tengah.

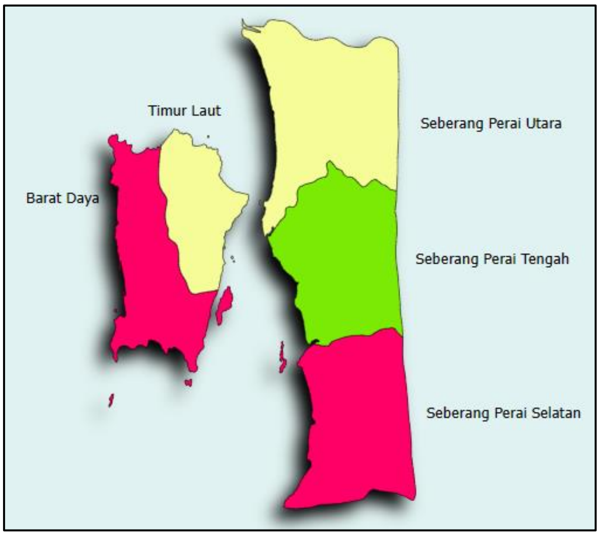

Figure 3: District of Penang.

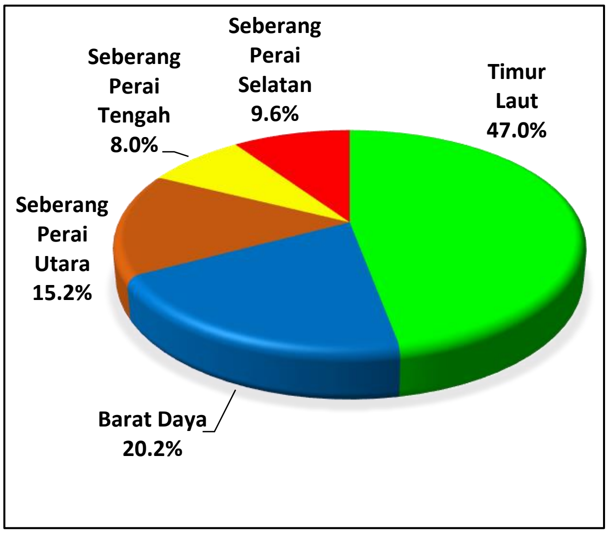

Figure 4: Percentage of residency in Penang district.

2.1.3. Gender and employment status of respondents

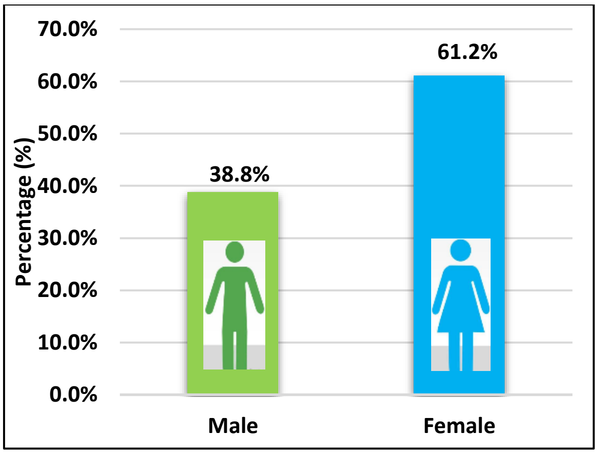

Figure 5: Gender respondents.

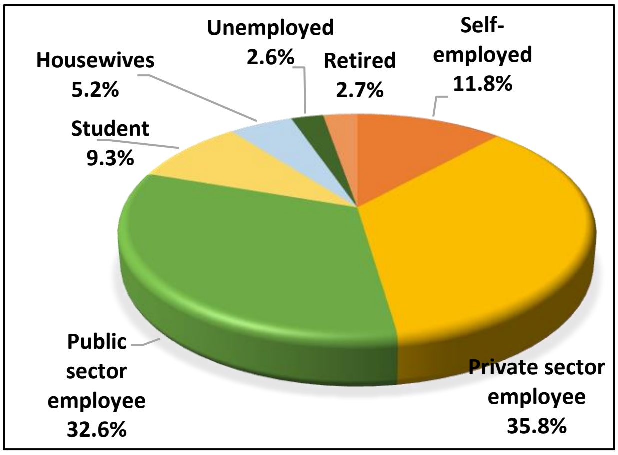

Figure 6: Respondents employement status.

Women constitute the majority with 61.2% from overall respondents and 38.8% were men. In term of employment status, private sector employees represent the largest group of respondents at 35.8%, closely followed by public sector employees at 32.6%, and self-employed individuals at 11.8%. Unemployed and retired respondents revealed the minority of the respondents with 2.6% and 2.7 % respectively.

2.1.4. Age Group

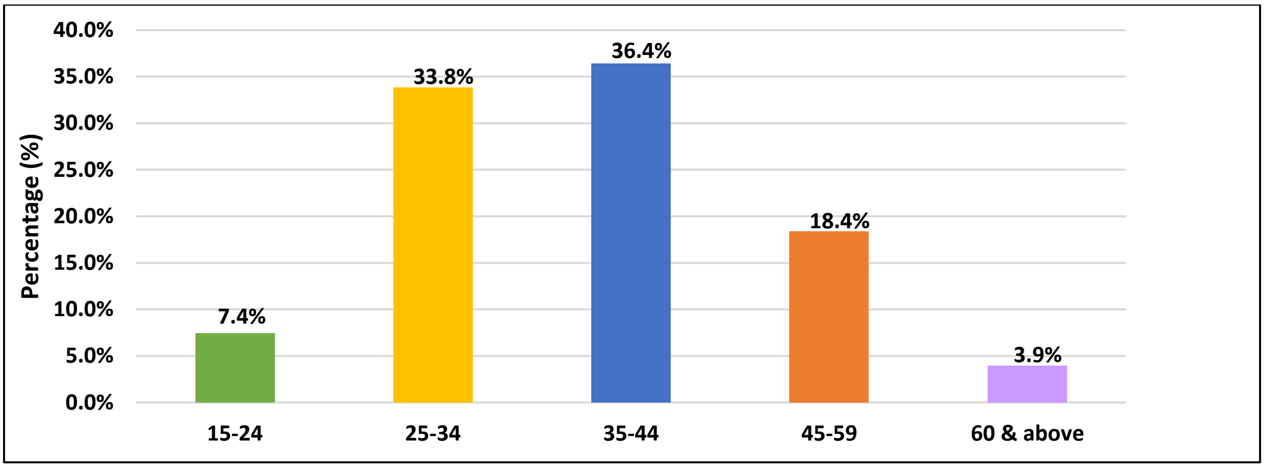

Figure 7: Respondents' age group.

The average age of respondents ranged from 35 to 44 years old (36.4%), followed by those between 25 and 34 years old (33.8%), and those between 45 and 59 years old (18.4%). Only 3.9% recorded for elderly (age more than 60 years).

2.1.5. Education level

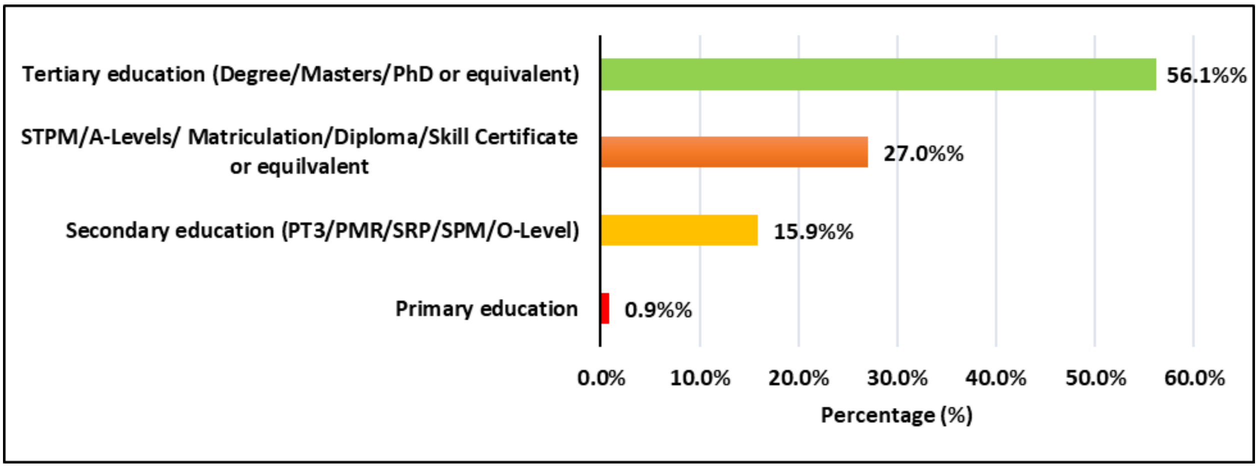

Figure 8: Respondents' education level.

In regards to the educational background, the majority, constituting 56.1% of all educational categories, which represent the tertiary education of Degree/Masters/PhD or equivalent. Following closely were those with STPM/A-Levels/Matriculation/Diploma/Skill Certificate or equivalent, accounting for 27.0%. Secondary education (PT3/PMR/SRP/SPM/O-Level) made up 15.9%, while primary education represented a smaller fraction at 0.9%.

2.1.6. Household income per month

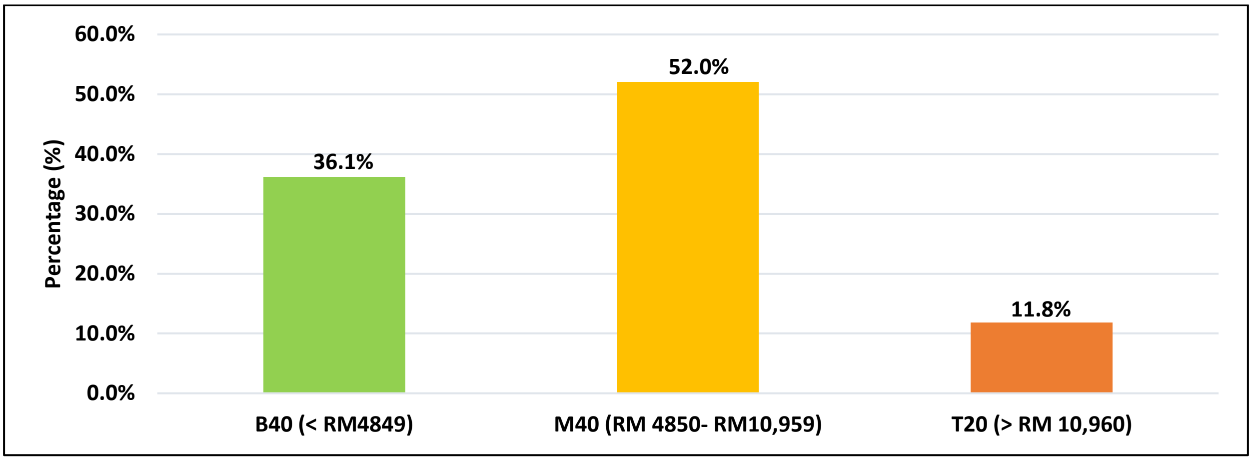

Figure 9: Respondents' total income per month

The study also assesses monthly household income of respondents and mostly belong to the M40 income group (RM4,850-RM10,959) comprising 52.0% of the total. Following this group were the B40 category (less than RM4,849) with 36.1% and the T20 category (greater than RM10,969) with 11.8%.

2.2. Single-Use Plastic Items

This sub-section brings forth the assessment related to single use plastic items from the perception of the consumers and indirectly showing the impact of awareness and education done by the government agencies though out the years of campaign. This section will include current thought and suggestions from respondent for future decision-making process.

2.2.1. Impact of education and awareness campaign

This section represents the impact of education and awareness campaign on reducing single-use plastic at hotels, restaurants, cafe, and food outlets in Penang.

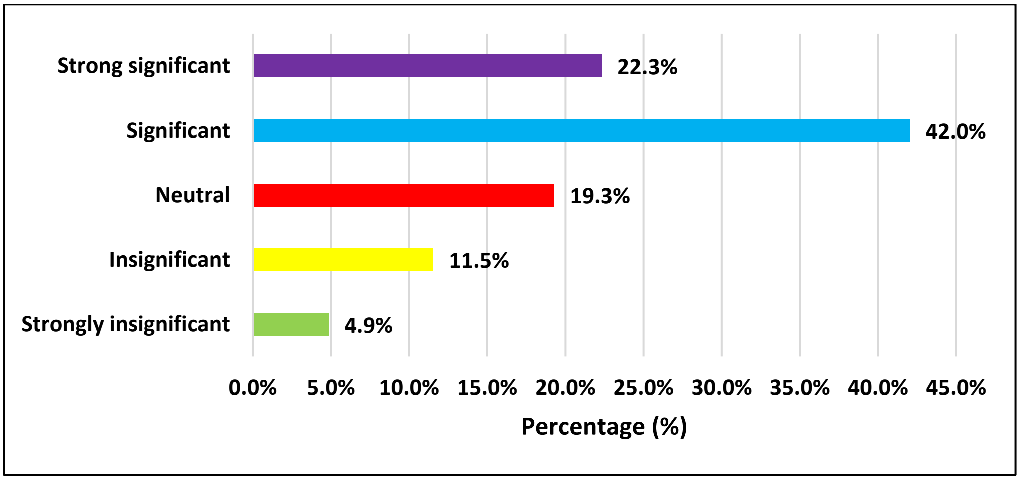

Figure 10: Respondents' opinion on impact of education and awareness campaign on reducing single-use plastic

From total respondents involved, a significant portion, 42.0%, felt that the education and awareness campaign had a "Significant" impact. Additionally, 22.3% considered it "Strongly significant." Combine positive outtake total up to 64.3% In contrast, 11.5% believed the campaign's impact was "Insignificant," while 4.9% thought it was "Strongly insignificant." A further 19.3% expressed a "Neutral" opinion.

2.2.2. Reason to use single-use plastic items

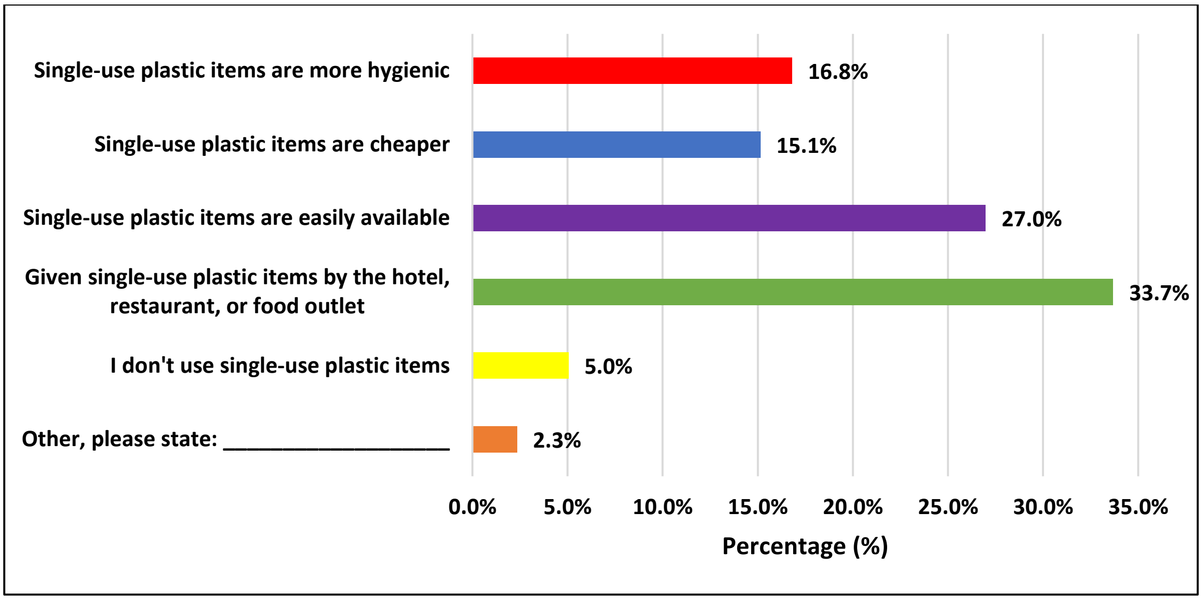

Figure 11: The reasons why respondents use single-use plastic items.

Meanwhile, the cause of using single-use plastic usually because of they were provided by hotels, restaurants, or food outlets (33.7%). Some respondents indicated that single-use plastic items were easily available (27.0%), while a smaller group mentioned the perception that these items are more hygienic (16.8%). Additionally, a few respondents (5.0%) stated that they do not use single-use plastic items, and some cited in term of affordability (15.1%) as a factor in their use. However, the others stated that they used single-use plastic due to convenience, particularly when purchasing raw materials at food hawkers and markets, some respondent mentioned that they forget to bring reusable containers, and also due to the fact that single use plastic items require no cleaning and are durable, although efforts are made to reduce their usage which contribute of total 2.3% overall.

2.2.3. Action performed after using single-use plastic items

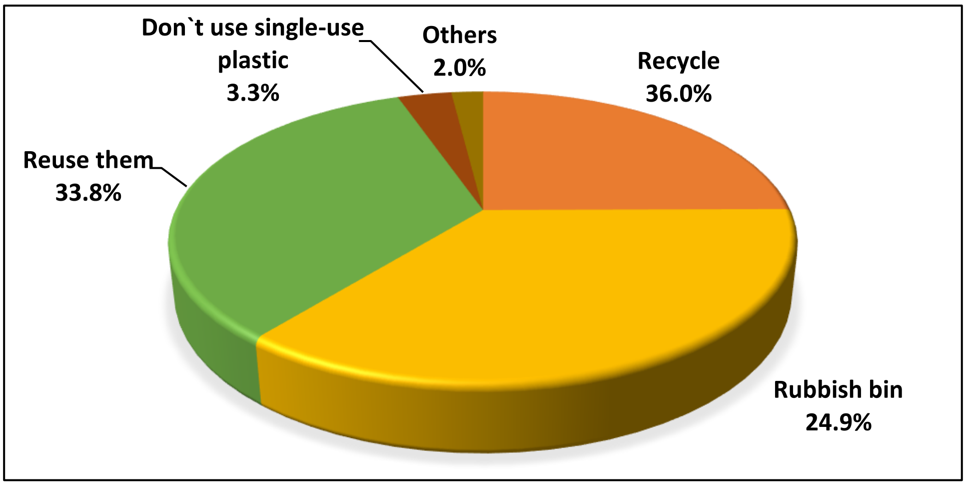

Figure 12: Respondents' action after using single-use plastic items

Regarding the disposal of single-use plastic items after usage, the majority of respondents (36.0%) indicated recycling, either through available recycling bins or taking items home for recycling. A significant portion (33.8%) reported opting to reuse these items, while 24.9% disposed of them in rubbish bins. A minority (3.3%) abstained from using single-use plastic items altogether. Additionally, within the "Other" category, a small segment (2.0%) of respondents expressed diverse practices, with some recycling water bottles but often not recycling soft plastics like plastic bags, wrappers; decisions depend on item condition, with some reusing or opting for paper materials, and recycling choices are influenced by bin availability, while cleanliness affect repurposing or reusing of the items.

2.2.4. Rinsing and drying single-use plastic items before recycling

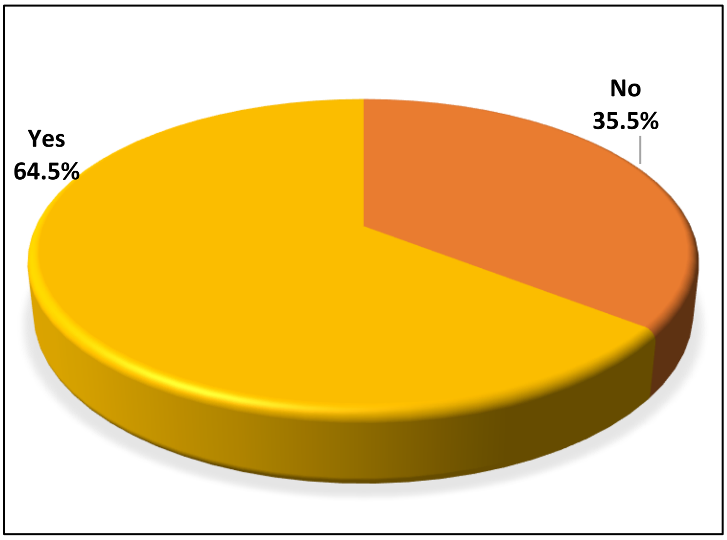

Figure 13: Respondents' practices on rinsing and drying before recycling.

The data shown insights into respondents' practices regarding rinsing and drying their single-use plastic items before recycling. The majority (64.5%) reported that they do rinse and dry these items before recycling, while a substantial portion (35.5%) indicated that they do not follow this practice. Cleaning and rinsing the material increase its probability of getting recycled.

***Initiative taken**: Beginning January 2021, no plastic bag will be given on every Monday, Tuesday and Wednesday and RM 1 will be charged for every plastic bag requested on Thursday, Friday, Saturday and Sunday.*

2.3. Single-Use Plastic Bags

This sub-section focused on the single use plastic bag only in particular. As the Penang State Government have conducted several campaign and effort in order to phase out the plastic bag usage in daily life, a focused was given in this study in order to understand further on current usage and public readiness in mitigating out the plastic bag usage.

2.3.1. Initiative on reducing plastic bag usage while shopping

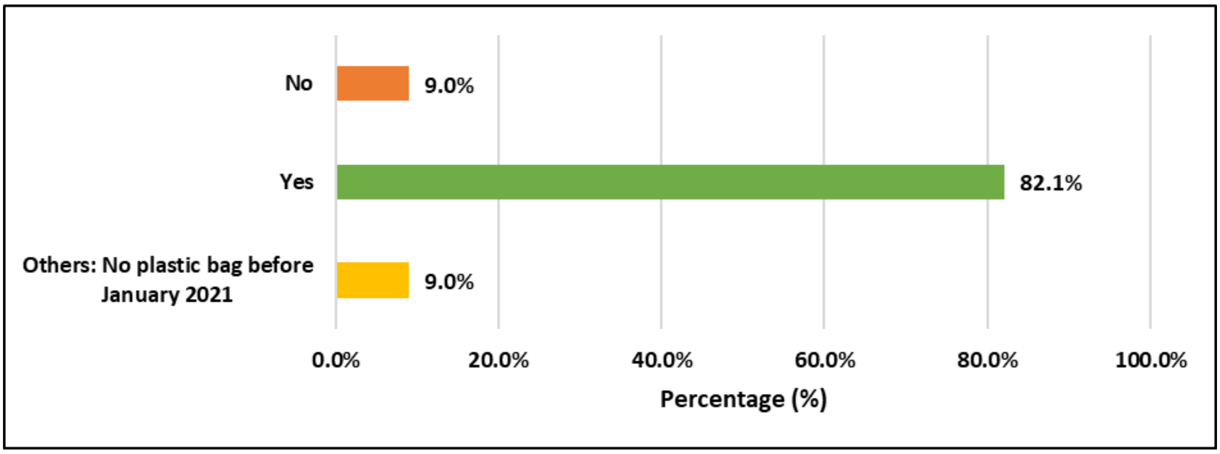

Figure 14: Respondents opinion about the impact of initiative on reduce the usage of plastic bag while shopping

The data demonstrates that the majority of respondents, accounting for 82.1%, perceive initiative aimed at reducing plastic bag usage during shopping as effective in curbing their reliance on plastic bags. In contrast, 9.0% reported not using plastic bags even before the initiative's implementation in January 2021, while an equivalent 9.0% believe the initiative had no impact on their plastic bag usage.

2.3.2. Options for fee collected

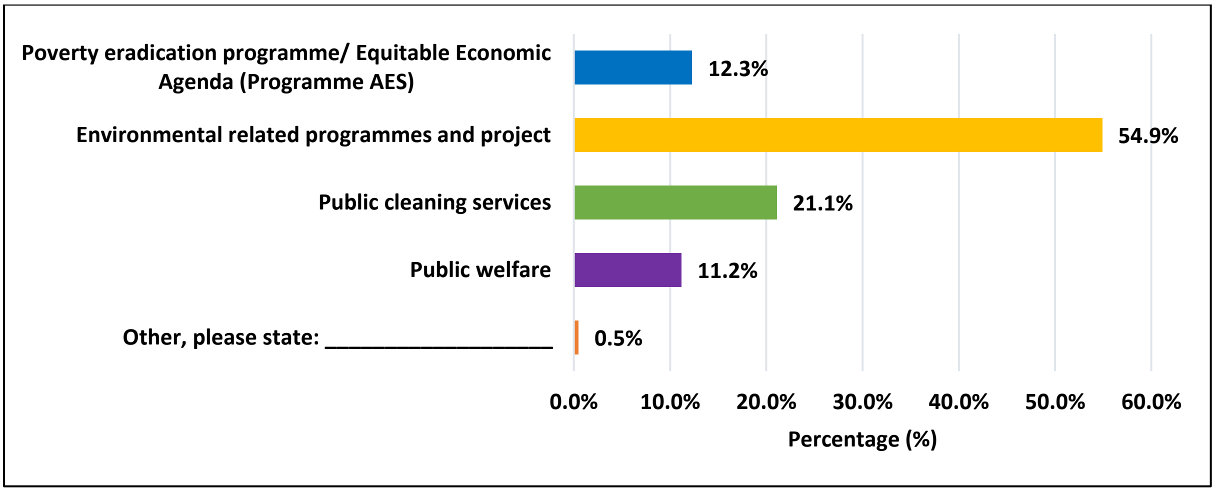

Figure 15: Respondents opinion about the collected charges

The data reveals respondent preferences for government fund allocation in various programs. A majority (54.9%) expressed a strong inclination toward directing funds to environmental initiatives, highlighting their heightened concern for environmental issues. Additionally, 21.1% favored allocating resources to public cleaning services, indicating a significant interest in maintaining cleanliness in public spaces. A smaller portion (12.3%) prioritized funds for poverty eradication programs and equitable economic agendas, reflecting their commitment to addressing socio-economic disparities. Public welfare programs received support from 11.2% of respondents, indicating their concern for societal well-being. A minimal 0.5% fell into the "Other" category, expressing diverse preferences, such as animal welfare, environmental education, and research on reducing single-use plastic, within this subgroup of respondents.

2.3.3. Consideration for alternatives to replace plastic bags

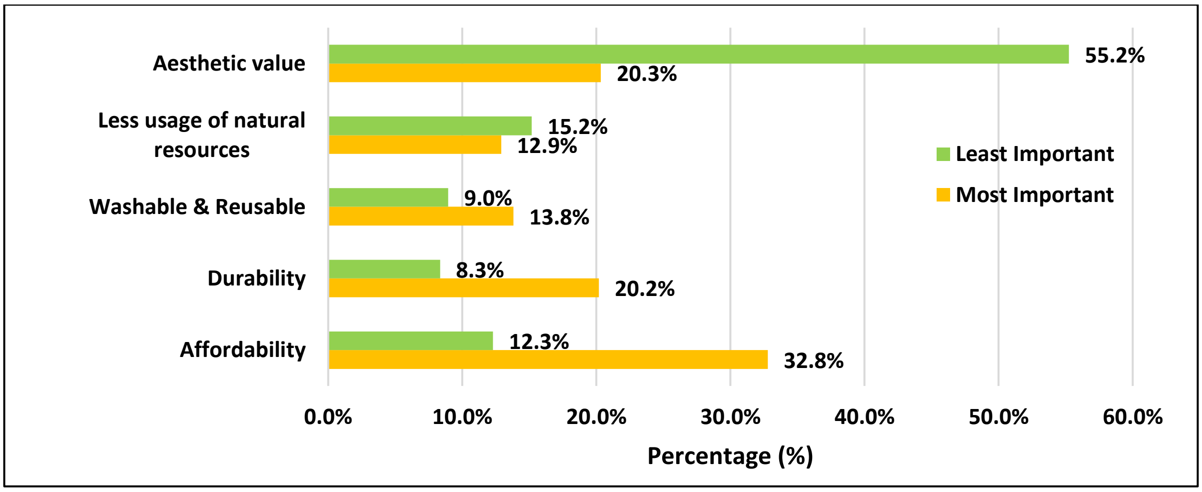

Figure 16: Respondents' consideration for alternatives to replace plastic bags

The results revealed the respondents' preferences for important criteria while looking for alternatives to plastic bags. The percentage were taken from the `Most Important` (Rank 1) among the alternatives option. Affordability appears as the most crucial factor, with 32.8% deeming it the most important. While 20.3% emphasize on aesthetic value, it is significantly slightly more important than durability (20.2%). Furthermore, 13.8% choose washable and reusable alternatives on the basis of quality, indicating environmental concerns. Less use of natural resources is also important, with 12.9% prioritizing the preservation of natural resources.

On the other hand, aesthetic value is rated as least important by 55.2% of respondents. In summary, respondents tend to prioritize price, durability, and eco-friendliness when considering alternatives to plastic bags which highlight their focus on its application instead of the look of the product. Aside from that, reduced use of natural resources and cost were among least important factors to consider while selecting features after replacing the plastic bag.

2.3.4. Incentives to cease plastic bags

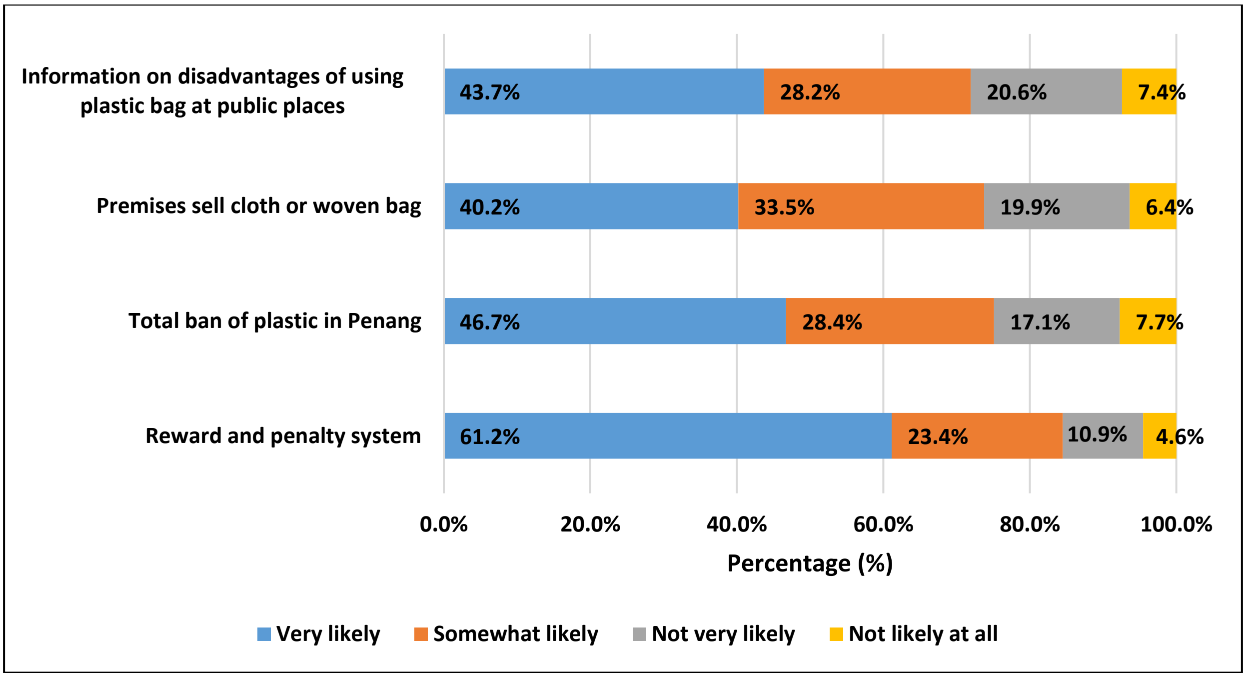

Figure 17: Factors that encourage respondents to stop using plastic bag

According to the data, a majority of respondents (61.2%) show a strong inclination to cease using plastic bags if a reward and penalty system is put into effect. Additionally, 46.7% of respondents express a high level of motivation to discontinue the use of plastic bags in Penang if a total ban on plastic is enacted. On the other hand, 43.7% of respondents emphasize that receiving information about the disadvantages of plastic bag use at public places strongly influences their decision to discontinue their use. Furthermore, 40.2% of respondents, consider the availability of cloth or woven bags for purchase at establishments a significant factor in encouraging them to abandon plastic bags.

2.4. Future Consideration

This sub-section aims to capture public perceptions and preference in term of current single use items in the market. This section will also guide policy-makers in making plan and establishing new efforts to curb the issue in the future.

2.4.1. In future market planning, the following items were selected to be focused on or removed from the market.

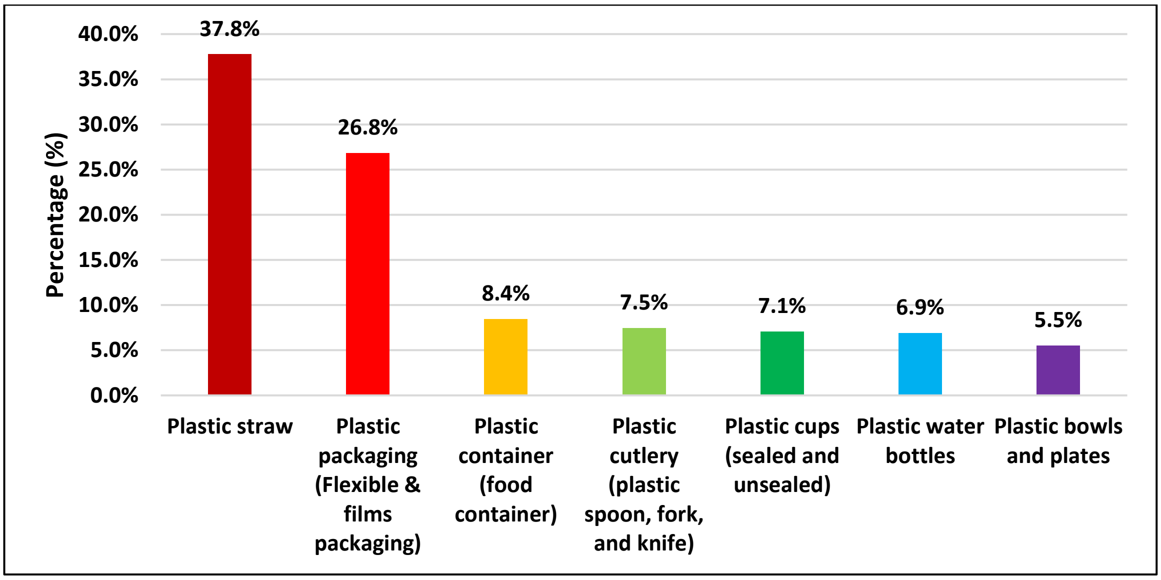

Figure 18: Respondents' opinion on important items needs to be prioritized/removed from market

According to respondents' opinions on the relative importance of addressing and perhaps eliminating other plastic items from the market, plastic straws have the highest priority, at 37.8%. Plastic packing comes in second place with 26.8%, followed by plastic containers (8.4%). Plastic cutlery and plastic cups were the fourth and fifth items to be removed from the list. Meanwhile, the final two options to be taken out of the market were plastic water bottles and plastic bowls with 6.9% and 5.5%, respectively.

These top three responses demonstrated that the key items that needed to be eliminated were plastic straws, plastic packaging, and plastic containers from the perception of Penangites.

2.4.2. Actively engaged in recycling and promoting reduction of single-use plastic items

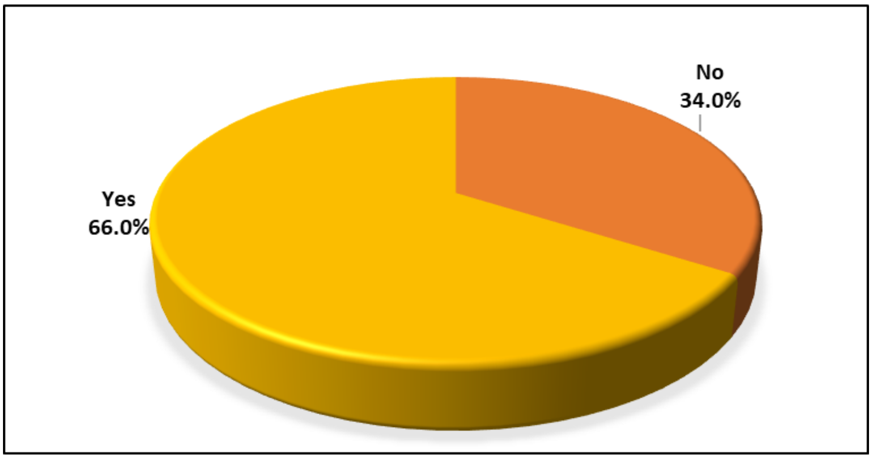

Figure 19: Respondents' involvement in recycling and promoting the reduction of single-use plastic items.

Of the respondents, 66.0% actively engage in recycling and advocate for reducing single-use plastic items, demonstrating a significant commitment to sustainability. Conversely, 34.0% do not actively participate in these efforts, indicating potential for increased involvement in recycling and plastic reduction initiatives.

2.5. Comparison 2018 – 2023 survey on Consumers

Penang Green Council have conducted a survey in 2018 to asses the usage of Single Use Plastic in Penang from the perspective of consumers and business operators. The current study aims to compare and assess the perception after continues effort from 2018 to 2023. However, this also considering the COVID-19 pandemic that undoubtedly have affect the effort. Comparison of outcome from both years will be asses in this sub-chapter and analysed for future reference and guidance.

2.5.1. Comparison single-use plastic item between 2018 (Phase 1) and 2023 (current)

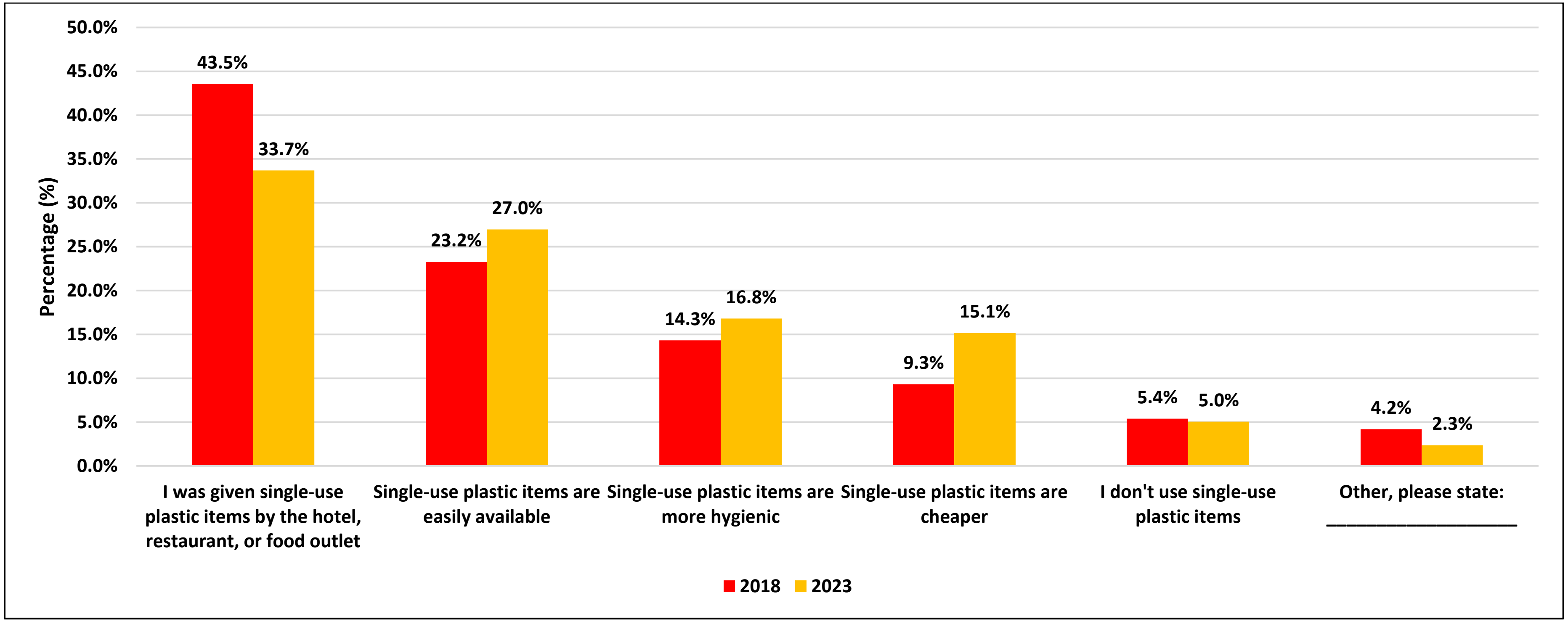

Figure 20: Comparison single-use plastic item between 2018 (Phase 1) and 2023 (current).

A comparison of single-use plastics from 2018 to 2023, as shown in Figure 20, demonstrates a tremendous shift in consumer behavior. The number of respondents who said they used single-use plastic items because they were given to them by hotels, restaurants, or grocery shops declined dramatically from 43.5% in 2018 to 33.7% in 2023. Between 2018 and 2023, there was a minor rise in the percentage of respondents who chose single-use plastics because they were more convenient and sanitary, ranging from 2.5% to 3.8% increment. This could be attributed to hygiene considerations, as people have become more selective about cleanliness, particularly in the post-COVID-19 era (de Sousa, 2021; Patrício et al., 2020). Cheaper prices were the third choice that consumers preferred, with an increase in 2023 of 15.1% from 9.3% in 2018. Furthermore, the number of people who said they did not use single-use plastic items decreased from 5.4% in 2018 to 5.0% in 2023. These data demonstrate a significant shift in consumer attitudes toward single-use plastics, possibly due to increased environmental awareness and a reduced impact of plastic waste over the years.

2.5.2. Comparison of action taken on single-use plastic item after using it between 2018 (Phase 1) and 2023 (current)

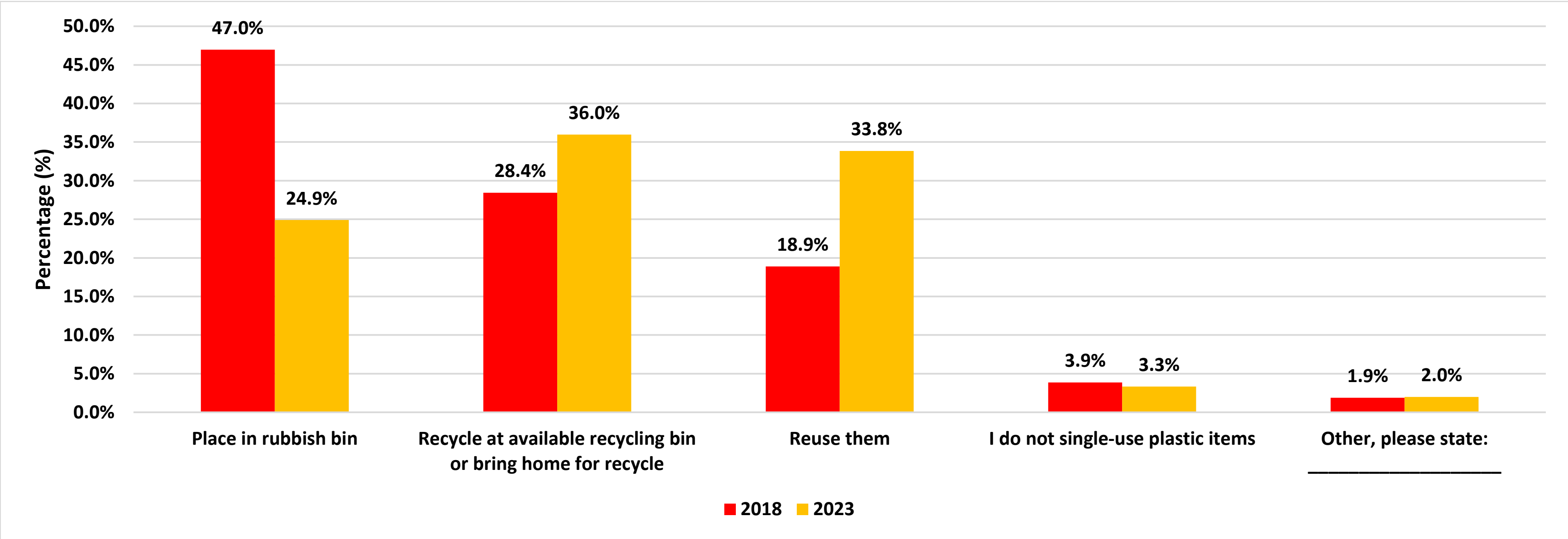

Figure 21: Comparison of action taken on single-use plastic item after using it between 2018 (Phase 1) and 2023 (current).

Based on Figure 21, a comparison of action taken on single-use plastic item after using it between 2018 (Phase 1) and 2023 reveals significant changes in respondents' action. In 2018, 47.0% of respondents indicated that they would place single-use plastic items in the rubbish bin after using them, which decreased to 24.9% in 2023, representing a substantial 22.1% difference between the two years. The percentage of respondents who expressed a desire to recycle these items by placing them in existing recycling bins or bringing them home for recycling slightly increased from 28.4% in 2018 to 36% in 2023. Additionally, in 2018, 18.9% of respondents stated their intention to recycle single-use plastic products, which rose to 33.8% in 2023. The percentage of people not using single-use plastic products decreased slightly from 3.9% in 2018 to 3.3% in 2023. These findings indicate a positive shift towards more sustainable action regarding single-use plastics by 2023, likely influenced by increased access to environmental information and a growing awareness of the need for recycling to reduce plastic waste.

2.5.3. Comparison between year 2018 (Phase 1) and 2023 (current) on collected charges should be use for.

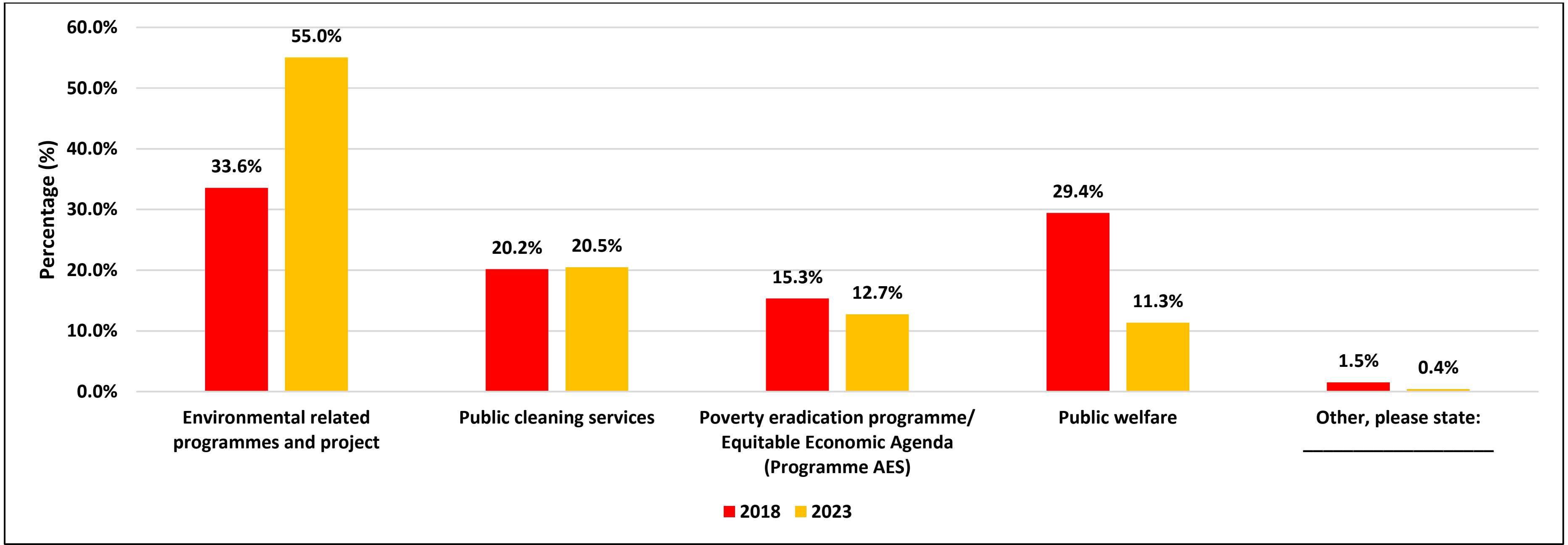

Figure 22: Comparison between year 2018 (Phase 1) and 2023 (current) on collected charges should be use for.

Based on Figure 22, when comparing the perspectives on the use of collected charges between 2018 (Phase 1) and 2023, significant shifts in preferences for allocation become evident. In 2018, a larger percentage of respondents, 33.6%, expressed the view that collected charges should be directed toward environmental-related programs and projects, whereas in 2023, this percentage is increasing to 55.0%. In 2018, 20.2% of respondents suggested using the collected charges for public cleaning services, slightly lower than the percentage in 2023, 20.5%. There was a notable decrease in the percentage of individuals who believed that the collected charges should be utilized for poverty eradication programs or an Equitable Economic Agenda (Programme AES), with 12.7% in 2023 compared to 15.3% in 2018. Conversely, a smaller proportion of respondents, 11.3%, in 2023 indicated that these charges should be directed toward public welfare, while this number was notably lower than 29.4% in 2018. These findings illustrate changing attitudes toward the allocation of collected charges, with a stronger emphasis on environmental programs and a reduced focus on public welfare in 2023 compared to 2018.

2.5.4. The impact on education and awareness of plastic usage between gender and age categories of the respondents

When looking especially at male respondents, 23.7% said the impact of education and awareness campaigns on reducing single-use plastic was considerable, while 6.7% said it was minor. Meanwhile, a bigger number of female respondents, 40.7%, ranked the impact as considerable. Similarly, just 9.7% of respondents rated the campaign's impact as substantial. In reality, there was **NO SIGNIFICANT RELATIONSHIP** between respondents' genders and the outcome of an education and awareness campaign on eliminating single-use plastic. Following a study of age categories, 64.3% of respondents picked education and awareness efforts as having a substantial influence on reducing single-use plastic, with the majority (24.3%) being between the ages of 25 and 34. The age group 35-44 years old has the second highest meaningful response rate among respondents. Age group and respondents' responses on the impact of education and awareness initiatives on decreasing single-use plastic have shown a **SIGNIFICANT CORRELATION** with a p-value less than 0.05.

The data analysis reveals disparities in perceptions of the campaign's performance among socioeconomic levels. The impact of education and awareness programs on reducing single-use plastic was deemed successful by 32.5% of the M40 group. The B40 group ranks second, while the T20 group ranks third, in terms of the impact of education and awareness campaigns on reducing single-use plastic. However, there is **NO SUBSTANTIAL RELATIONSHIP** between income level and reaction to education and awareness activities aimed at reducing single-use plastic.

3. SURVEY 2: BUSINESS

3.1. Business Information

This chapter will highlight business operator's perspective in phasing out Single Use plastic from their business. It is vital to understand their concerns and preference in ensuring that the decision makers will come out with policy and solution that is holistic.

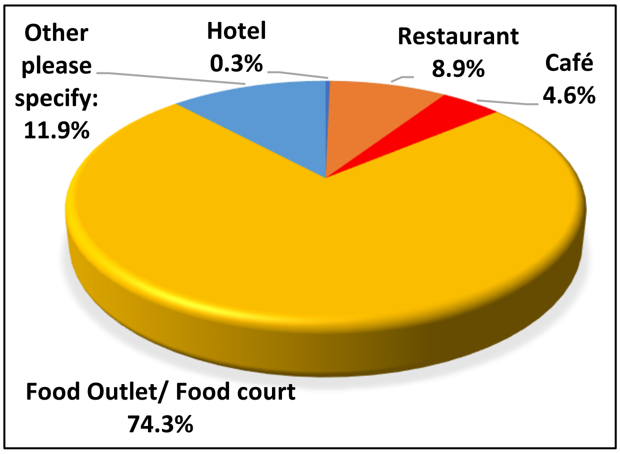

Figure 1: Type of respondents' business

3.1.1. Type of respondents' business

The survey findings indicate that 74.3% of respondents stated that their primary business type is food outlet/ food courts, with 8.9% in restaurant, 4.6% in café and 0.3% in hotels. Additionally, 11.9% of respondents were associated with a diverse range of shops and stores.

3.2. Single Use Plastic Items

This sub-section brings forth the assessment related to single use plastic items from the perception of the business operators and indirectly showing the impact of awareness and education done throughout the years of campaign. This section will include current thought and suggestions from respondent for future decision-making process.

3.2.1. Type of single-use plastic items offered to the customers

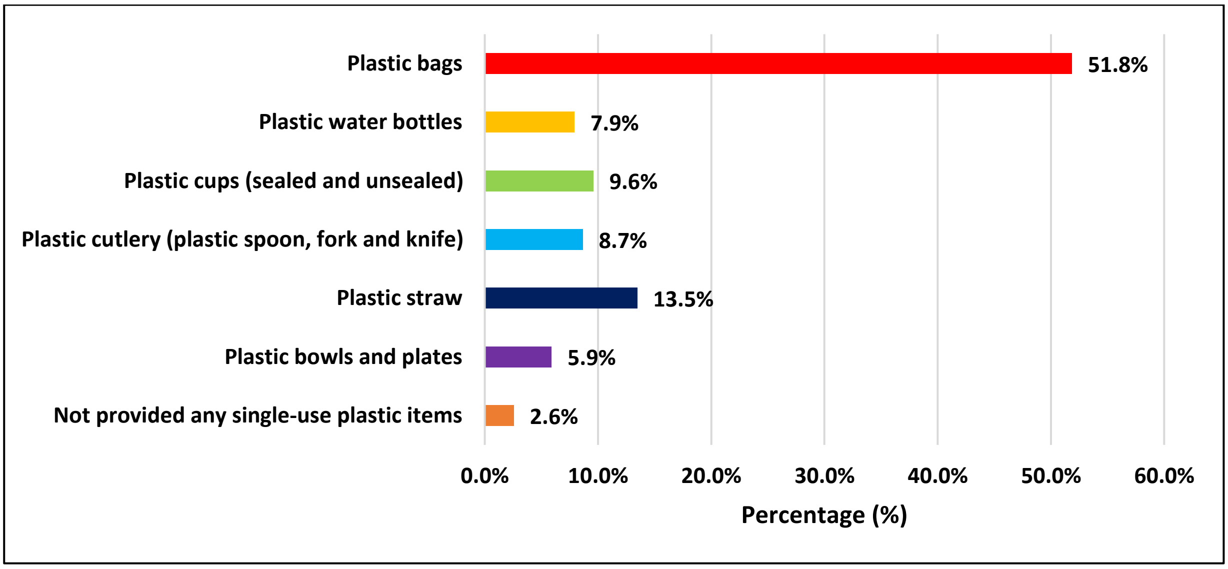

Figure 2: Type of single-use plastic items

The survey results also indicate that the majority of respondents' (51.8%) state that they provided their customer with plastic bags, followed by 13.5% of respondents who provided plastic straw. Plastic cups, both sealed and unsealed, were provided by 9.6% of respondents, while 8.7% offered plastic cutlery (plastic spoon, forks, and knives) and 7.9% provided plastic water bottles. In additions, 5.9% of respondents' mention providing plastic bowls and plates. A minority of respondents, stated that they do not provide any single-use plastic items, instead opt for alternative or eco-friendly choices.

3.2.2. Reasons to use single-use plastic items at their premises

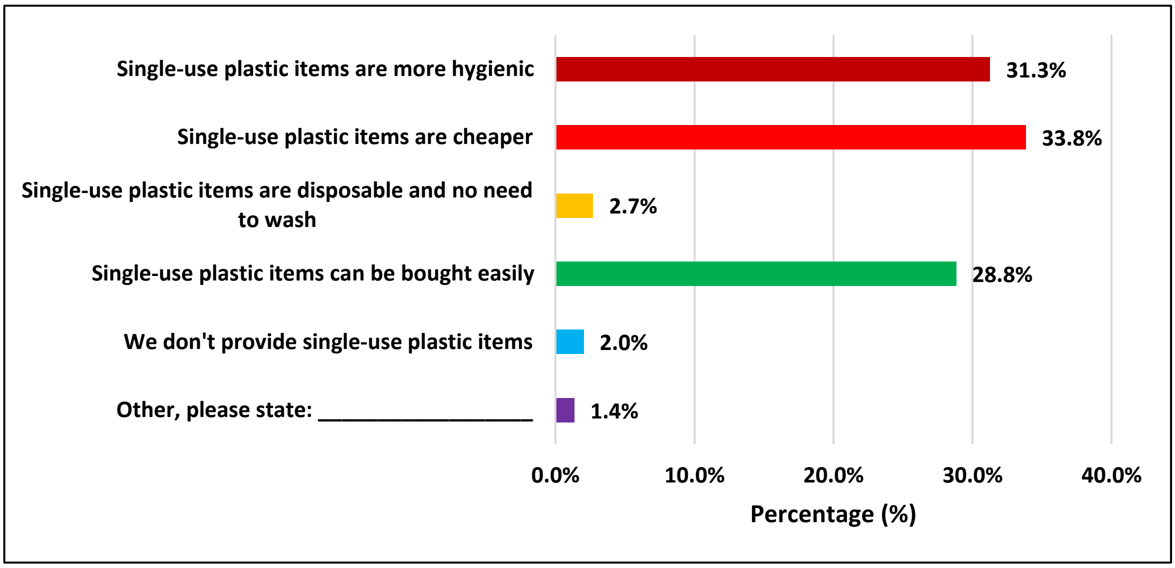

Figure 3: Reason of provide single-use plastic at their premises

Among the respondents, 33.8% mentioned that single-use plastic items were chosen due to its cheaper price compare to its other alternatives, which was considered one of factors driving the provision single-use plastic items at their premises. Additionally, 31.3% of respondents reported that single-use plastic items were perceived as more hygienic, while 28.8% found them can be bought easily. A small percentage, 2.7% preferred providing single-use items because they were disposable and do not require washing. Only 2.0% of respondents mentioned that their business did not provide single-use plastic on their premises. Furthermore, 1.4% cited various additional reasons, such as allowing customers to bring in their own items in bulk, offering convenience, providing free plastic bags, adhering to employer instructions, offering specific types of cups (paper for hot drinks and plastic for cold drinks) based on employer and HQ directives, anticipating customer dissatisfaction if not provided, and avoiding customer complaints.

3.2.3. Respondents' support for banning single-use plastic

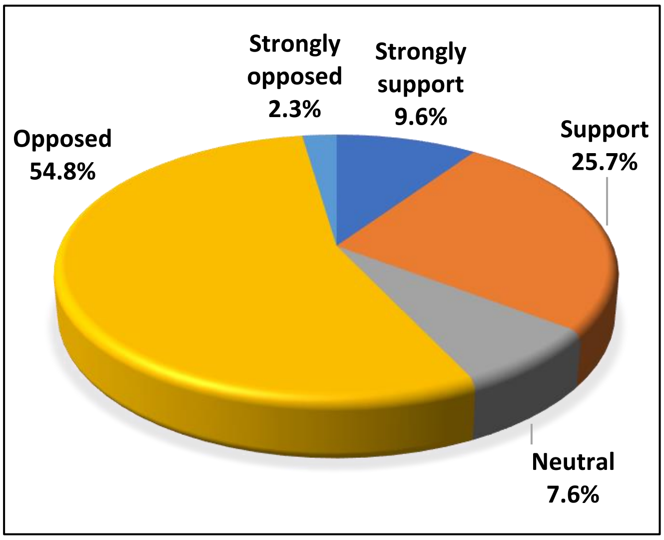

Figure 4: Respondents' support for banning single-use plastic

Out of the total respondents, 57.1% opposed (including 2.3% strongly opposed) the ban on single-use plastic items at food eateries in Penang. Contradict to that, 35.3% supported the ban (with 9.6% was strongly support). Only 7.6% remained neutral in their opinion. However, from the perspective of business operators, there are no affordable option yet to replace plastic and without it, they have to resort to the available option in the market which is the plastic.

3.3. Single Use Plastic Bag

This sub-section focused on the single use plastic bag only in particular from the perspective of business operators.

3.3.1. Response regarding initiative that might had an impact on reducing customers' usage of plastic bag.

Majority of respondents (88.4%) agree that the initiative had an impact on reducing customers' usage of plastic bag from their shop while only 11.6% disagreeing.

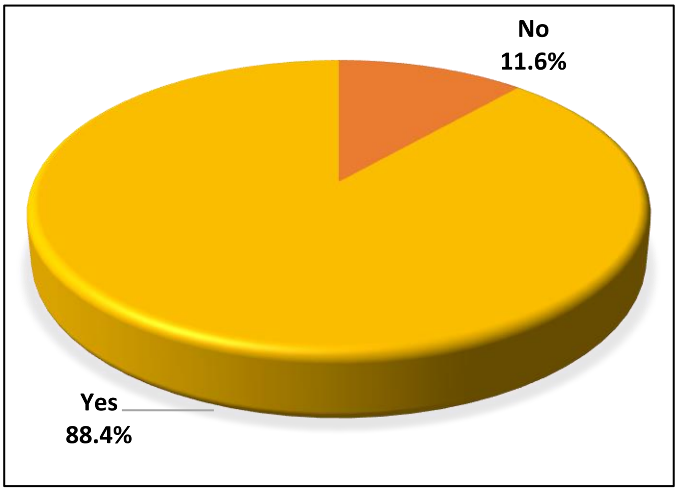

Figure 5: Respondents' perspective on reducing plastic usage of plastic

3.3.2. Choice for fee collection

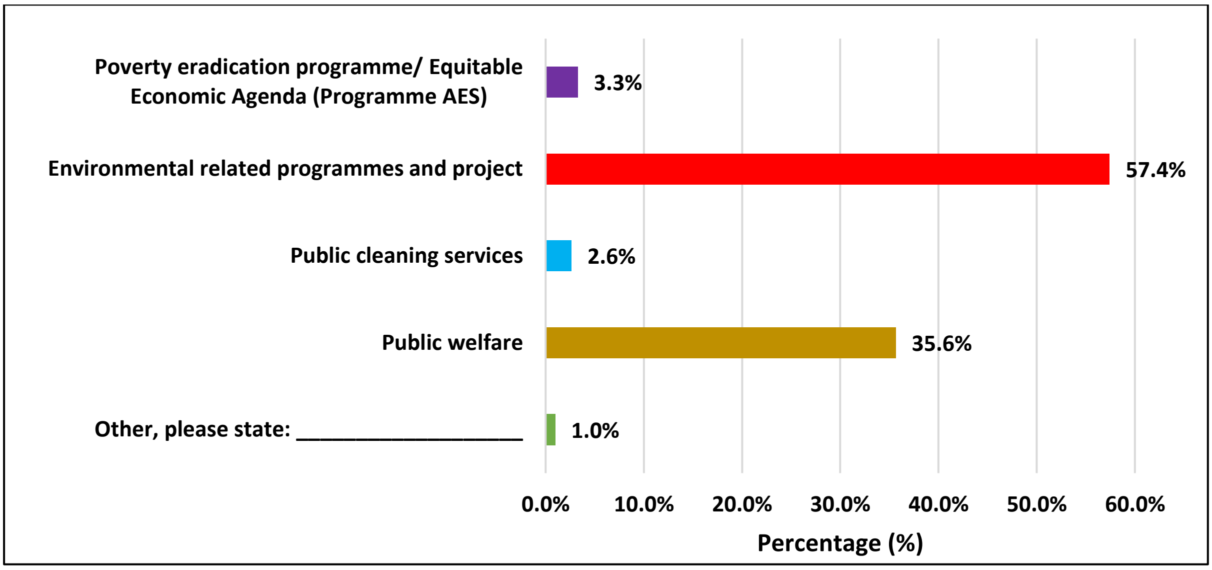

Figure 6: Respondents opinion about the collected charges

Most of respondents (57.4%) advocate for the funds to be directed towards environmental-related programs and project, reflecting a strong emphasis on environmental conservation. Additionally, 35.6% prefer the collected charges should be used for public welfare. In contrast, 3.3% believe that the collected charges should be allocated towards Poverty Eradication program and an Equitable Economic Agenda (Programme AES). Meanwhile, a small portion, 2.6% suggest utilizing the charges for public cleaning services and minority (1.0%) expressed the preference for self-management, running an independent business, and not imposition of charges.

3.3.3. Consideration for alternatives to replace plastic bags

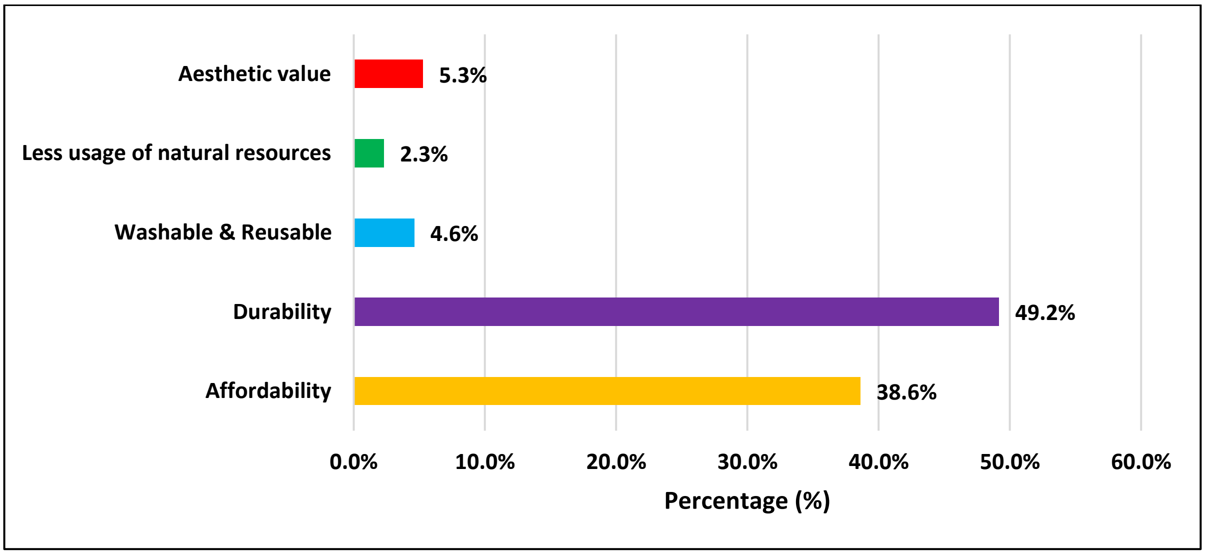

Figure 7: Respondents' consideration for alternatives to replace plastic bags

The findings highlighted respondents' preferences for key characteristics while searching for alternatives to plastic bags. Durability is the most significant factor, according to 49.2% of respondents. While 38.6% place a premium on pricing, durability is far more essential. Aesthetic value rank third with 5.3%, followed by washable and reusable, which ranks fourth with 4.6%. Less use of natural resources is the least important, accounting for just 2.3%.

3.3.4. Frequency of respondents' customers refused on single-use plastic items

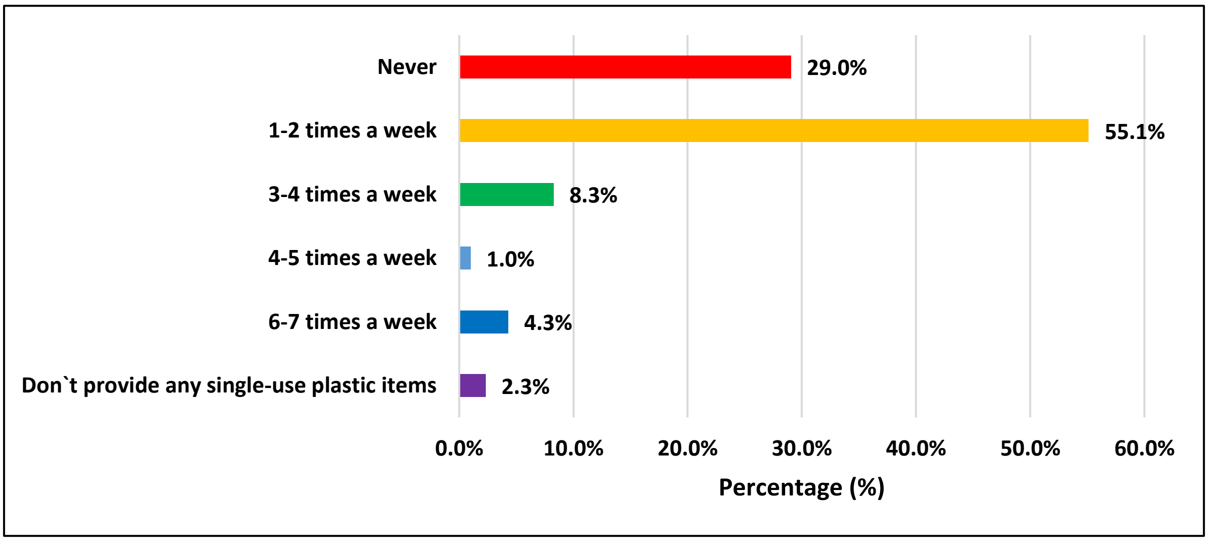

Figure 8: Frequency of respondents' customers refused on single-use plastic items

The majority of respondents (55.1%) mentioned that their customers refuse these single-use plastic items 2 times a week. Approximately 29.0% of respondents reported that their customers never decline single-use plastic items. A smaller proportion, 8.3%, noted that their customers reject single-use plastic items 3-4 times a week. Another 4.3% of respondents shared that their customer usually refuses single-use plastic items 6-7 times a week. A minority, 2.3% stated that they do not provide any single-use plastic items to their customers. Only 1.0% of respondents indicated their customers refuse to use this items 4-5 times a week.

3.4. Future Consideration

This sub-section aims to capture the business operator's perceptions and preferences in term of current single use items in the market. This section will provide insight for policy-makers in making plan and establishing new efforts to curb the issue.

3.4.1. In future market planning, the following items were prioritized to be focused on/removed from the market

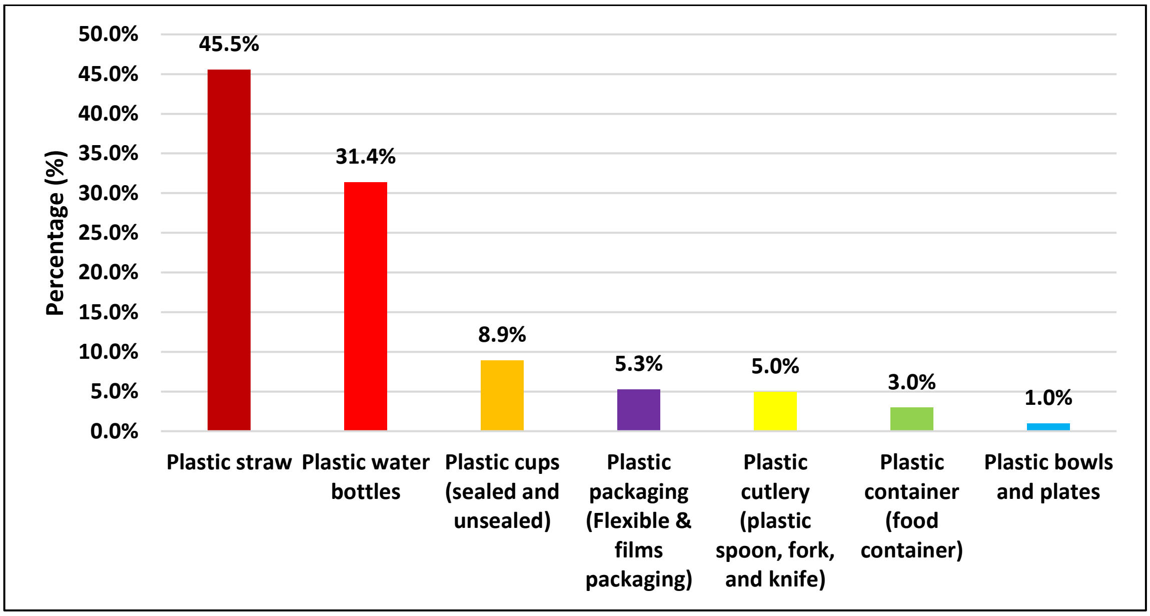

Figure 9: Respondents' opinion on important items needs to be prioritized/removed from market

Plastic straws have the greatest priority, with 45.5%, according to respondents' thoughts on the relative significance of addressing and perhaps eradicating other plastic goods from the market. Plastic water bottles were the next to go, with 31.4% being abolished. Plastic cups, both sealed and unsealed, come in third place with 8.9%. Meanwhile, plastic packaging and plastic cutlery fell within the 5.0% to 5.3% range. Plastic containers and plastic bowls were the final two alternatives to be phased out of the market.

3.5. Comparison 2018 – 2023 survey on Business

Penang Green Council have conducted a survey in 2018 to assess the usage of Single Use Plastic in Penang form the perspective of consumers and business operators. The current study aims to compare and assess the perception after continues effort from 2018 to 2023. However, this also considering the COVID-19 pandemic that undoubtedly have affect the effort. Comparison of outcome from both years will be asses in this sub-chapter and analysed for future reference and insight.

3.5.1. Comparison single-use plastic item offered to the customers between 2018 (Phase 1) and 2023 (current)

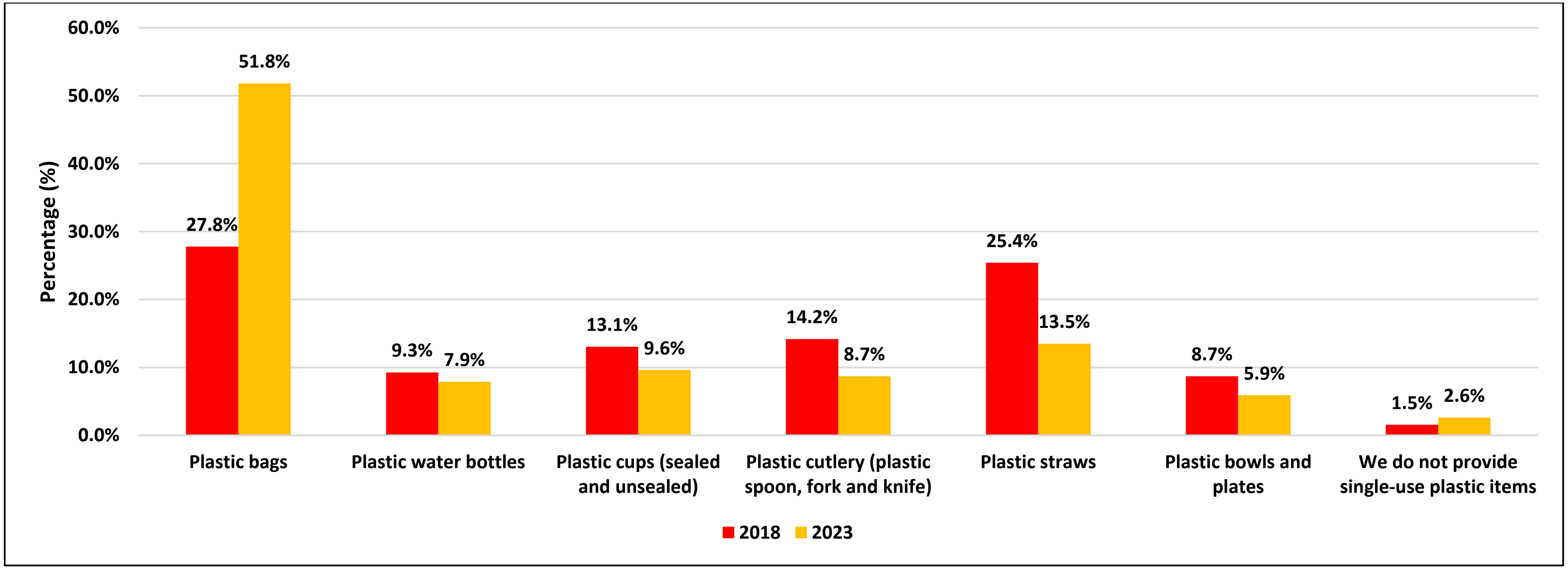

Figure 10: Respondents' opinion towards offering the single-use plastic items to the customers (2018 vs 2023)

A comparison of single-use plastics offered to the customers from 2018 (Stage 1) to 2023, as shown in Figure 10, demonstrates a tremendous shift in consumer behavior. The percentage of respondents who reported that they offered single-use plastic goods such as plastic straws declined dramatically from 78.4% in 2018 to 13.5% in 2023. The percentage of respondents who offered single-use plastic bags, water bottles, cups, cutlery, bowls, and plates also decreased in huge difference by 20.7% to 35.0% in 2023 when compared to 2018. In addition, a slight decreased in term of providing single-use plastic items to the customers with 2.6% recorded as compared to 4.8% in 2018. These findings show a considerable shift in consumer views regarding single-use plastics, which might be attributed to improved environmental knowledge and a reduced effect of plastic waste over time. A more comprehensive study focusing on the detailed single-use plastic usage by business operators is needed on a larger scale in order to evaluate factors that affect and contribute to this reduction.

4. SUMMARY

In summary, the on-going efforts in reducing single use plastic in Penang was a success, with the majority of respondents admitting that the effect and influence of this campaign's information on single-use plastic had beneficial consequences (64.3% agreed). Meanwhile, 33.7% said that they use single-use plastic items because it was provided by the hotel, restaurant and food outlet which is an opening that should addressed in the future in mitigating the single use plastic usage. The consumer also cited hygiene as another factor that cause them to use the single use plastic, which might be related back to the fact that we were now in the post-COVID-19 era and the concern of health and sanitary especially in foods and beverages aspect. As for now, if the plastic bag has to be replaced, the most crucial issue that needs to be addressed is its suitability and the preference of consumers and business operator. Plastic straw, plastic packaging and plastic containers were the top three items need to be focused and removed in future as voted by the consumers in this survey.

As comparison between 2018 and 2023, majority showed a significant decreased in term of plastic usage in hotel, restaurant and food outlet. Public has also shown a positive attitude toward recycling and understanding the needs for it. According to this study, public perceive that the collected charges should be directed back towards the environmental related programs and projects.

As for **business** aspects, a total of 303 retails has joined in this survey. Food outlet represents the majority with 74.3%. Plastic bags were the most single-use plastic items offered to the customers with 51.8%. On top of that, cheaper price, hygienic factors and availability were the top reason why the respondents provide single-use plastic at their premises. Similar to the results of the consumer survey, the fees collected should be spent toward environmental initiatives and projects. In line with the consumers, business operators also choose plastic straws, plastic packaging, and plastic containers as the top three single use plastic items that need to be worked on and eliminated in the future after the single use plastic bag.

Between 2018 and 2023, result showed a dramatically decreased in plastic bags usage, plastic straws usage and plastic cutlery with at least 33.9% to 64.9% difference between years. These findings show a considerable shift in consumer views regarding single-use plastics, which might be attributed to improved environmental knowledge and campaign effect in reducing single use plastic waste over time.

5. RECOMMENDATION

Thorough understanding on local society will provide an efficient campaign in ensuring a smooth process to achieve the goal. This study provide insight from not only the consumers but also the business operators. Sample from various location with diverse background would provide a better insight and opinion on the current situation. However, this would require an extensive number of enumerators which will incur additional cost and longer period of data collection.

In mitigating the usage of single use plastic, an extreme measure such as prohibition of usage and imposing high tax or fee would produce a better outcome in term of usage reduction. However, there would be societal and economical based resistance from public which might hinder a long-term effort and cause societal discomfort in the long run. In term of valuable single use plastic where it can be recycled and have significance value in the market, reward systems would work in increasing its recycling rate, however this does not encourage the reduction of its usage.

In order to curb its usage from the source, Extended Producer Responsibility or EPR is a policy approach that requires producer to be responsible for their product in the post-consumer stage of a product's life cycle. This will shift the responsibility either economically or physically towards the producer instead of the municipalities. It is an upstream approach that will encourage producer to reduce their packaging materials or even shift it into alternative options. This approach compelled producer in injecting environmental aspect in designing their products. It is also important to harmonize the government procurement policies with requisite on product's recyclability, reusability or composability and incorporating transparency on proportion of recycled content in the products. This would mainstream the adoption of circular economy especially in the market.

On the local level, continuous education and awareness effort are always on the forefront especially for issues in environment and sustainability as it is always changing and directly impact the community. Concurrently, a scheduled assessment needed to be done with the purpose of assessing the outreach impact and understanding public perception towards any policy or decision made by the policy-makers.

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