

Use of Plastic Bags Among Adults Over 30 in Sri Lanka: Patterns, Impacts, and Alternatives

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Abstract— Despite regulatory bans and widespread awareness campaigns, plastic bags remain in heavy use across Sri Lanka. This study investigated the usage patterns, environmental awareness and adoption of alternatives among adults over 30 in the districts of Kandy, Kegalle, Kalutara and Hambantota. A structured questionnaire survey was conducted among 100 respondents, complemented by expert inputs and analyzed using descriptive statistics. Results revealed that 26% of participants use plastic bags daily and 36% use them 1–2 times per week, with the highest dependence among the 40–59 age group. Further, the 60–69 age group reported lower dependency and higher eco-consciousness. While 88% of respondents acknowledged marine and wildlife risks and 83.8% recognized microplastic-related health hazards, yet this awareness did not consistently translate into reduced use. Encouragingly, 85% supported investing in reusable alternatives and over 70% favored policy measures such as discounts and bans. By addressing this gap, the study highlights the mismatch between awareness and practice among older Sri Lankan consumers, pointing that awareness alone is insufficient for behavioral change; instead, a combined strategy of accessible alternatives, incentive-driven interventions and policy enforcement are needed to reduce plastic bag dependency and encourage sustainable consumer practices in Sri Lanka.

Keywords — Plastic bags, Adults, Patterns, Impacts, Alternatives

I. INTRODUCTION

Plastic bags have long been favored for their affordability, light weight and convenience, making them an essential part in consumer life. However, their environmental consequences, ranging from persistent marine pollution, ecosystem disruption to microplastic accumulation, are well documented [1] [2]. Despite regulatory measures such as the 2021 ban on single-use plastics, plastic bags continue to be widely used in household shopping and packaging practices [3]. This continuous reliance highlights a mismatch between the awareness level of impacts and the actual behavioral change.

Although global and local studies have examined plastic bag consumption and policy effectiveness, still there is limited research on the behavior of adults over 30 years old. This demographic is significant because they are primary household decision-makers and have long-established consumption habits that are less influenced by digital awareness campaigns. Understanding their usage patterns, attitudes and barriers is crucial for designing effective, age-targeted interventions in Sri Lanka.

Existing studies in Sri Lanka largely focus on youth, metropolitan populations, or general awareness levels [3] [4]. Only few studies explicitly analyze the patterns of use, perceived impacts and openness to alternatives among adults over 30, despite their central role in household purchasing. Moreover, research to date often highlights awareness but stops short of applying behavioral theories, which limits both the evidence available and the conceptual framework for understanding consumer actions.

The objective of this study is to investigate the usage of plastic bags among adults over 30 in Sri Lanka, with a particular focus on their behavioral patterns, awareness on environmental impacts and willingness to sustainable alternatives. Specifically, the study examines the frequency and patterns of plastic bag use, evaluates the extent of awareness regarding environmental and health impacts, and assesses the willingness of individuals to shift toward alternatives such as cloth, paper, or reusable bags.

By addressing these objectives, the study contributes to filling the empirical and theoretical gap on age-specific consumer behavior in Sri Lanka, while offering evidence-based insights to guide both policy interventions and community-level awareness programs.

II. LITERATURE REVIEW

Plastic bag pollution has been rising as a critical global issue due its widespread usage and severe environmental consequences it causes [5]. Governments, local authorities, researchers and environmental organizations have examined the underlying causes and the consequences of the plastic bag consumption. Their focus has encompassed on the public awareness levels and the adoption of sustainable alternatives. This section focuses on the current academic and policy-oriented knowledge, with specific emphasis on the community over 30 in Sri Lanka which is a demographic characterized with long-established consumption habits formed prior to the rise of plastic regulatory controls.

A. Global Trends in Plastic Bag Usage and Environmental Impact

The global increase in plastic bag usage is largely attributed to their functional advantages, such as lightweight design, widespread availability and low production cost. Despite these advantages, plastic bags are well recognized as major contributors to both land and marine environmental degradation [6]. Due to the non-biodegradable nature, plastic bags fragment into microplastics that persist in ecosystems [7], disrupt ecosystems and infiltrate food chains, posing risks to both biodiversity and human health.

Many countries have enacted legislative measures such as taxes and bans addressing this issue. Notably, Rwanda, Kenya and several European Union countries have implemented comprehensive restrictions on plastic bags [5] [8]. These actions have resulted some positive influence reducing the consumption. These regulatory actions suggest that policy enforcements can significantly influence community level behavioral change.

B. Plastic Bag Use and Policies in Sri Lanka

Sri Lanka has taken significant range of policy measures to mitigate plastic pollution by recognizing the detrimental environmental and health impacts. The Central Environmental Authority and the Ministry of Environment has implemented bans on single-use plastics, including lunch sheets and shopping bags, effective from March 2021 [9]. These regulations aim to curtail the usage of non-biodegradable materials while promote biodegradable alternatives.

In addition to the above-mentioned regulations, complementary strategies including nationwide awareness campaigns conducted through schools, civil society partnerships and local government bodies aimed on fostering plastic free zones and reinforcing the use of reusable alternatives. Collaborations with commercial entities such as supermarkets, further support this transition by promoting consumer behavioral change.

However, policy enforcements still remain as a challenge. In rural areas, continues using plastic bags as they have limited access to affordable alternatives. Moreover, weak regulatory oversight and insufficient penalties have allowed the banned products to circulate in the community. While several studies have assessed the general public awareness, limited empirical data exists on how specific demographic groups, particularly adults over 30 responds to plastic reduction policies [3]. This cohort plays a crucial role as household decision makers and is often less exposed to digital awareness initiatives. Enhanced research efforts to understand their behaviors and attitudes is essential to designing more efficient waste management strategies.

C. Public Perceptions: Balancing Convenience and Environmental Harm

Consumer preferences for plastic bags continue, because of their accessibility, durability and perceived cost effectiveness. Even environmental conscious individuals revert to plastic bag usage in scenarios where alternatives are unavailable or deemed inconvenient. Existing literature suggests that the heightened awareness of the impacts does not consistently lead to meaningful behavioral modification in the community.

Insights from behavioral psychology indicate that habitual actions, convenience and immediate gratifications outweighs the long-term environmental concerns [10]. This behavioral inertia is evident in the case of plastic bags, where minor inconvenience like carrying a reusable bag require deliberate effort. Individuals are more likely to reconsider their consumption patterns when they confronted with direct, tangible consequences, such as urban floods caused by clogged drainage systems.

D. Awareness Levels and Behavioral Barriers

Public outreach initiatives have improved general knowledge about plastic pollution, especially its ecological effects including wildlife and marine life pollution [1] [2]. However, still the misconceptions persisted regarding complex issues such as microplastic contamination, biodegradable and recyclability. When awareness campaigns are not supported by educational reinforcements and behavioral support, they fail to yield sustained impact.

In the Sri Lankan context, the traditional information channels such as television, school-based programs and local awareness programs remain pivotal in sharing this knowledge. Nonetheless, translating this awareness into action remains to be challenge, particularly among adults who has limited knowledge to contemporary environmental education. To bridge this gap, culturally relevant and practical guidance is required.

E. Adoption of Sustainable Alternatives: Challenges and Motivation

Eco-friendly alternatives for plastic bags such as cloth bags, polypropylene (PP) reusable bags and biodegradable and traditional carriers are gaining modest traction, especially among the urban community influenced by the implementation of policy incentives. However, these are several barriers that impede the adoption:

- Forgetting reusable bags when shopping
- Perceptions of inconvenience (e.g., bulkiness, cleaning requirements)
- Higher upfront cost despite long-term savings
- Hygiene and durability concerns

Interventions like discount programs and branded awareness campaigns have shown potential in encouraging adoption within the community [5]. Nonetheless, deeply ingrained cultural and established practices and the availability of inexpensive plastic bags remain dominant influence in consumer behavior.

F. Gaps in Existing Research and the Need for This Study

The existing studies are emphasized on the youth engagement, urban consumption patterns and policy effectiveness in plastic waste reduction [3]. However, they do not deeply examine the habits and the attitudes of the adults over 30 who play key roles in household purchasing decisions. Moreover, most of the prior studies do not capture the specific socioeconomic and cultural context of Sri Lanka [8].

To better understand the behaviors observed in previous studies and in the Sri Lankan context, this study adopts the Theory of Planned Behavior (TPB) [10]. TPB posits that behavior is influenced by attitudes, subjective norms and perceived behavioral control, which together shape intentions and actions. In the context of plastic bag usage, attitudes reflect adults' perceptions of environmental benefits of reducing plastic bags, subjective norms represent social expectations from family, peers or community regarding sustainable practices and perceived behavioral control reflects the ease or difficulty of using alternatives, influenced by availability, convenience and policy enforcement. This framework helps explain the persistent awareness and behavior gap. Although many adults recognize the environmental and health impacts of plastic bags, habitual use and convenience often outweigh intentions to adopt sustainable alternatives. Operationally, this study measures plastic bag usage as weekly frequency and policy awareness as knowledge of charges or bans. By applying TPB, this research links observed behaviors to theoretical constructs, providing a conceptual basis for analyzing usage patterns, barriers and openness to alternatives among adults over 30 in Sri Lanka.

III. METHODOLOGY

This section delineates the research approach, data collection procedures and the analytical strategies employed to explore the plastic bag usage among Sri Lankan individuals aged over 30. The primary aim is to examine the consumer behavior, awareness of the environmental impacts and the degree of adoption to alternatives.

A. Study Design and Target Group

Descriptive research was conducted utilizing a structured questionnaire as the primary data collection instrument. The study specifically targeted individuals aged 30 years and above, as this demographic characterized with entrenched consumption habits that significantly influence household purchasing decisions and reflect broader behavioral patterns in relation to plastic bag usage.

B. Sample Population

The research was conducted across four districts in Sri Lanka which are Kandy, Kalutara, Hambantota, and Kegalle. As it will capture a representative mix of urban and semi-urban contexts. A convenience sampling technique was conducted, allowing researchers to collect data from individuals who were easily accessible and willing to participate. A total of 100 responds constituted the data for this study. While this non-probability sampling method is practical and efficient, it introduces biases and limits the generalizability of the findings to the other districts and national population.

Although the sample size of 100 may appear modest, it aligns with the scope of Sri Lanka's population compared to larger international studies. For instance, Nishijima and Nakatani (2024) [11] conducted a survey on the use and disposal of plastic shopping bags in Japan with a sample size that, when proportionally adjusted, is comparable to the current study [11]. Therefore, within the context of Sri Lanka's population, this study's sample is considered sufficiently reliable for an exploratory analysis of plastic bag usage among adults over 30.

C. Data Collection Methods

Data was collected over a one-week period using a **self-administered** questionnaire, made available in both Sinhala and English to enhance inclusivity and comprehension. The instrument was disseminated via two main channels:

- Digital distribution through google forms shared via social media and messaging apps
- Face-to-face interviews targeting individuals with limited or no internet access

Participants were briefed about on the study's objectives and only those who provided informed consent were included in the process.

D. Questionnaire Structure

The questionnaire was meticulously crafted to align with the research objectives and was segmented into the following four thematic sections:

- Demographic Information - Age, gender, and district
- Plastic Bag Usage Patterns - Frequency of use, reliance on plastic bags
- Perceptions and Awareness - Agreement with statements about environmental, health, and social impacts
- Sustainable Alternatives - Use of reusable bags and perceived barriers (cost, availability, convenience)

Questionnaire utilized a combination of Likert scale and multiple-choice items to gather both quantitative and subjective perspectives.

E. Data Analysis

All responses were compiled and processed using **Microsoft Excel**. Paper-based data was manually transcribed to ensure consistency. The analysis focused on **descriptive statistics** such as frequency counts and percentage distribution to identify usage trends, levels of environmental awareness and attitudes to sustainable practices. Data were analyzed by using 5 points Likert scale.

Responses were analyzed using a weighted Likert scale, assigning values from 5 (“Strongly Agree”) to 1 (“Strongly Disagree”). The weighted score for each age group was calculated using the formula:

$$\text{Weighted Score} = (nSA \times 5) + (nA \times 4) + (nN \times 3) + (nD \times 2) + (nSD \times 1)$$

where nSA, nA, nN, nD, nSD are the frequencies of responses in each Likert category.

The maximum possible score for a group was calculated as:

$$\text{Max Score} = \text{Total Respondents in group} \times 5$$

The Positive Response Rate (%) was then derived as:

$$\text{Positive Response Rate (\%)} = \frac{\text{Weighted Score}}{\text{Max Score}} \times 100$$

F. Ethical Considerations

The research was conducted in accordance with ethical research principles:

- Voluntary Participation - All participants took part willingly without coercion
- Informed Consent - Consent was obtained by participants reading a short introduction before completing the form

- Anonymity and Confidentiality - No personal identifiers were collected, and all responses remained confidential and were used solely for research purposes

G. Limitations

There are several limitations that must be acknowledged in this research:

- The sample size more than 100 may provide the statistical generalizability of the findings
- People’s answers might be affected by the desire of the respondents to give socially acceptable responses.
- The geographic scope was limited to four districts and findings may not fully represent regional or national trends

IV. RESULTS

A. Perception and Behavior

The research was conducted among 100 individuals, representing a mix of elderly and middle-aged community.

Figure 2 shows the usage pattern of the plastic bags among the study sample. It can be seen that the usage of plastic bags is high among the sample population. Nearly 26% of the respondents reported using plastic bags daily, while 36% used them 1-2 times per week. Only 6% of the sample reported using plastic bags rarely, which is most likely within the 60-69 age group.

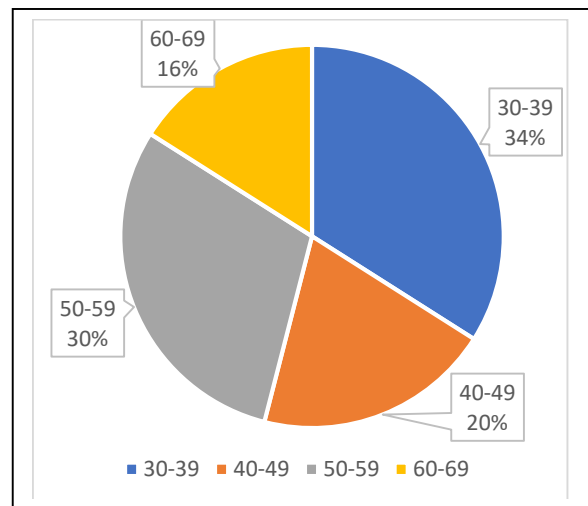


Figure 1 Age groups of the respondents

These results show the high and continued reliance on the plastic bags among the adults, particularly from those who are aged between 40 to 59. In contrast, the elderly participants (60-69) showed relatively lower dependency on plastic bags, possibly because of their maturity and the lifestyle changes.

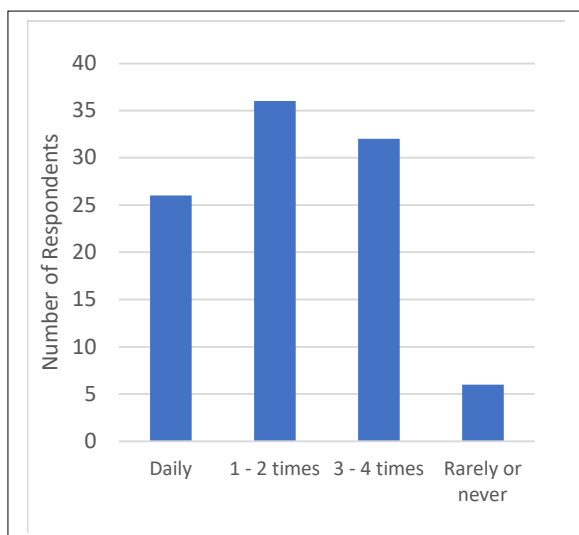


Figure 2 Usage Frequency

B. Awareness of environmental impacts and personal responsibility

According to the survey results, respondents have shown a high awareness level on the negative impacts of plastic bags. As the results, 88% acknowledged the harmful effects on marine and wildlife, 83.8% recognized the health risks from microplastics and 62.6% agreed that the plastic bags significantly contribute towards urban litter. It is reported that no respondents disagreed to these statements. This shows a high level of awareness on the negative impacts within the sample.

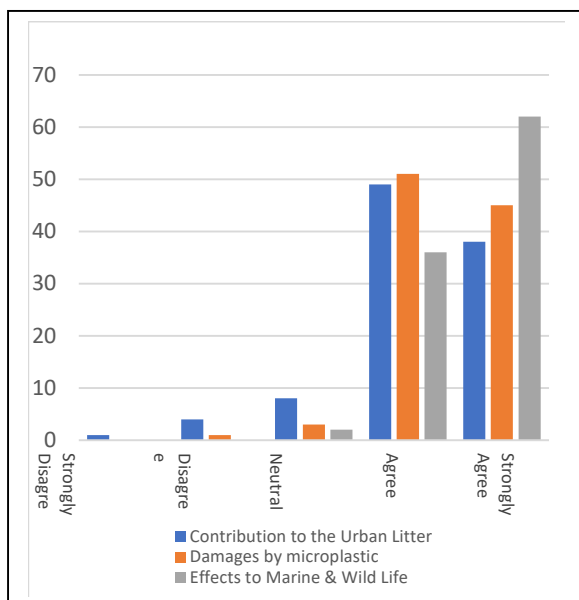


Figure 3 Awareness levels of the negative impacts

However, even the awareness level is high, respondents continue to prioritize convenience over the harmful effects. Specially the 30-59 age group, continues to use plastic bags because of their convenience, long-term usage practices and availability. In contrast, the 60-69 age group was less likely to prioritize convenience of using plastic bags,

reflecting a strong environmentally conscious behavior (Figure 4).

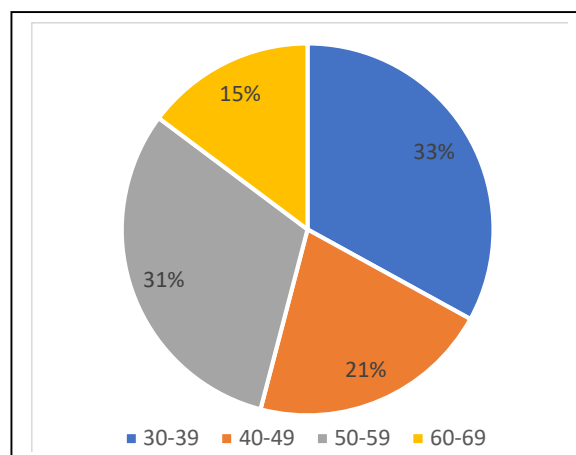


Figure 4 Positive Response Rate for Convenience Vs. Environmental Concerns

This was then divided by the maximum possible score (Total Respondents×5) to obtain the Positive Response Rate (%). For example, in the 30–39 age group, the weighted score was 105 out of a maximum of 170, yielding a positive response rate of 61.8%.

C. Challenges in adopting reusable alternatives

Challenges in adopting reusable alternatives were studied using focusing two facts: Factors Influencing Plastic Bag Usage and Perception of Reusable Alternative.

When asked about the factors that influence the usage of plastic bags, majority showed a neutral response. Affordability was not highlighted as a major factor that influenced the community. However, the features such as lightweight, waterproof and hygienic were seen as attractive features compared to others. These practical traits continue to motivate the community to use plastic bags, despite the environmental concerns.

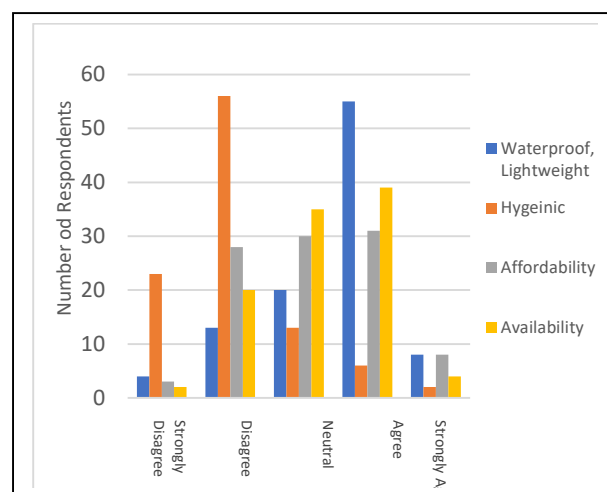


Figure 5 Factors influencing plastic bag usage

The results showed a very positive perception of reusable alternatives among the sample population. More than a half of the respondents agreed (27% strongly agreed and 58% agreed) (Figure 7) that the reusable bags are more convenient than the plastic bags and none of the respondents have strongly disagreed with this statement. An 85% of respondents also have positively responded as investing on a reusable bag is worth (Figure 6), possibly because their durability and the concern about the environmental impacts among the community.

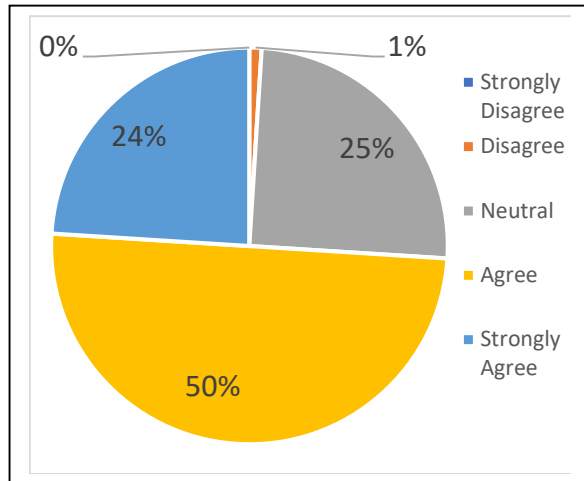


Figure 6 Percentage of agreement on investing on a reusable bag

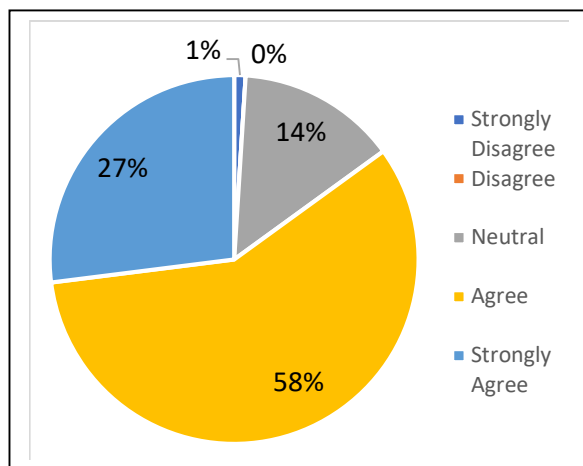


Figure 7 Percentage of agreement on convenience of reusable bags

When considering about the types of reusable bags, 79% of the sample support using paper bags for bakery items and 63% of the respondents support using cane bags for carrying grocery such as fruits and vegetables (Figure 8). However, one third of the respondents remained neutral or disagreed with using cane bags. This may be possibly because the inconvenience, less availability and the belief among the community that the cane bags are outdated and unsuitable for modern lifestyle.

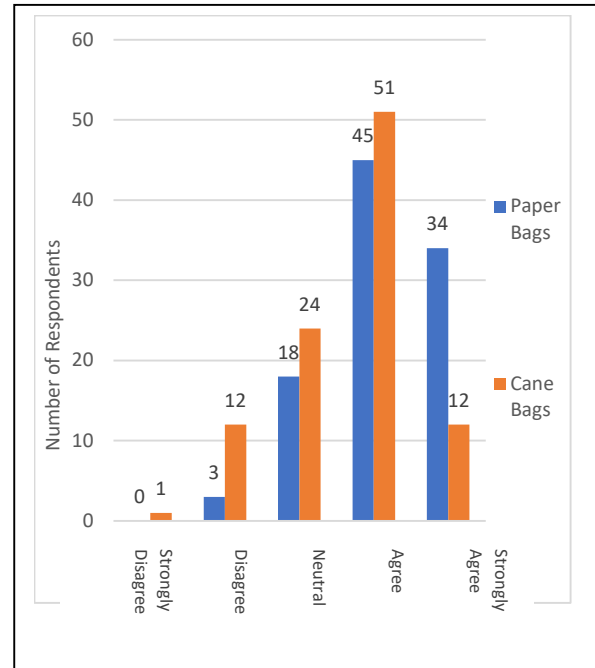


Figure 8 Paper Bags Vs. Cane Bags

D. Recommendations for targeted awareness and policy efforts

Although as reported, many respondents are very much aware of the negative effects caused by the plastic bags and support the reusable alternatives, the actual usage and the adoption towards them remains very low and limited. These results suggest that behavioral change needs more than awareness, which is practical support. More than half of the respondents agreed that government-imposed policies such as bans and incentive programs such as discounts can encourage the community to reduce the plastic bag usage (Figure 9). According to the results, discounts were reported more effective and accepted by most of the respondents, reflecting that community prefers for positive incentives over strict policy enforcements.

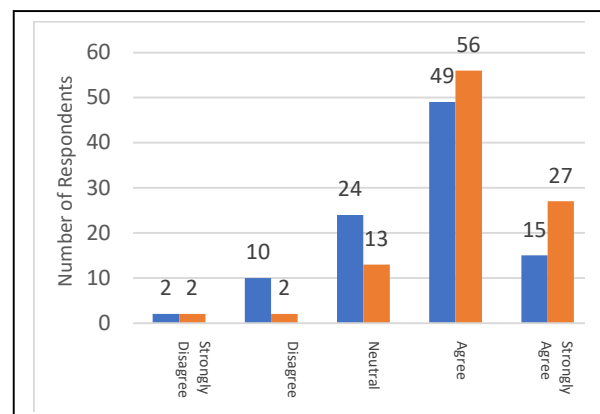


Figure 9 Inspirations to use alternatives

V. DISCUSSION

This research explored the usage of plastic bags among the individuals over 30 in four districts of Sri Lanka, which focused on their usage frequency, awareness level about the consequences and the willingness towards the alternatives. The findings of this research depict the gap between the awareness and the actions, as respondents have widely recognized the harmful effects of plastic bags, but continue to use them regularly because of their positive characteristics.

Although 88% of the respondents agreed that the plastic bags pose a significant threat to marine and wildlife and 83.8% acknowledged the various risks of microplastics, especially the respondents in the age 40-59 (Figure 1), still have reported using plastic bags daily or several times a week. This represents that while the awareness and the knowledge is high, it does not lead towards a sustainable behavior. The 60-69 age group has shown less dependency on plastic bags, suggesting that the maturity and the experiences may have influenced them towards more eco-conscious decisions.

These patterns have aligned with the previous findings in, that in Sri Lanka, the public awareness does not change into behavioral change. Similarly, there are global studies, which have reflected that the immediate rewards such as convenience, overweight the environmental concerns which would not be sufficient to change the behaviors [1]. These have confirmed that the behavioral habits, affordability and the availability of plastic bags are the major barrier to make a change in the community.

The present study further contributes by showing strong support among Sri Lankan respondents over 30 for adopting reusable bags. Over 75% of participants agreed that investing in reusable bags is worthwhile (Figure 6), and more than half considered them more convenient than plastic (Figure 7). However, consistent with Nishijima and Nakatani (2024) [11], practical barriers such as storage concerns, forgetting to carry reusable bags, and limited availability hinder their regular use. Respondents also accepted the use of paper bags for bakery items, but cane bags received mixed responses (Figure 8), possibly due to perceptions of being outdated and impractical for a modern lifestyle.

However, this was only limited for four districts, which may not represent the full diversity of Sri Lankan community. Future researches should consider more broad geographic coverage and psychological, cultural factors influencing community to use plastics.

Despite high awareness, habitual use and convenience continue to drive plastic bag consumption. Interventions should combine policy measures such as bans or charges with incentives, accessible alternatives, and targeted campaigns for adults over 30, who are key household decision-makers. Retailers can promote reusable bags at the point of purchase, providing lightweight, hygienic and durable alternatives.

Practical measures like reminders or point-of-sale nudges can also help overcome habitual reliance on plastic bags.

This study reinforces the Theory of Planned Behavior (TPB) by showing how attitudes, social expectations and perceived behavioral control shape behavior in environmental contexts. Even with high awareness and social expectations, perceived control and convenience barriers can prevent behavior change. These findings provide empirical evidence of the awareness and behavior gap in developing countries and among older adults, extending the applicability of TPB in environmental behavior research.

VI. CONCLUSION

This study explored plastic bag usage patterns, awareness on environmental impacts and attitudes toward alternatives among adults over 30 in Sri Lanka, focusing on 100 individuals from Kandy, Kegalle, Kalutara and Hambantota districts.

Nearly 26% of the respondents reported using plastic bags daily, while 36% used them 1-2 times per week, indicating high and continued reliance on the plastic bags among the adults, particularly from those who are aged between 40 to 59. Only 6% of the sample reported using plastic bags rarely, which is most likely within the 60-69 age group.

Among the respondents, 88% acknowledged the harmful effects on marine and wildlife, 83.8% recognized the health risks from microplastics and 62.6% agreed that the plastic bags significantly contribute towards urban litter, indicating high awareness on negative environmental impacts.

More than 50% of the respondents agreed that the reusable bags are more convenient than the plastic bags, 85% of respondents also have positively responded as investing on a reusable bag is worth considering their durability and environmental impacts.

Findings revealed that despite high awareness of the negative impacts of plastic bags, especially among adults aged 40-59, habitual use and convenience continue to drive frequent consumption. Encouragingly, there is strong support for reusable alternatives and policy measures such as bans and incentives. This shows that, even when attitudes are positive and social expectations support sustainability, perceived behavioral control and convenience barriers significantly influence actions.

Although this study provides valuable insights, future research with larger, more diverse populations and deeper analysis of cultural, urban-rural and behavioral factors is recommended. Such studies can further inform policy and program design for sustainable plastic use reduction.

Transitioning from plastic bags requires both informed citizens and a supportive system that provides practical alternatives, incentives and policy reinforcement. Combining these strategies can foster sustainable consumer behavior and contribute to long-term environmental protection in Sri Lanka.

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