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To Study the Plastic Habits and Perceptions: A Household Survey on Consumption, Reuse, and Environmental Awareness in Dakshina Kannada

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ABSTRACT

In today's world, almost every household uses plastic in one or other form like bags, bottles, containers and packaging. Even though people are aware of its harmful effect, the usage of plastic is increasing day by day. Many of them understand that reducing plastic usage is important but its convenience and cost make it difficult to change their routine of using plastic bags. This study mainly focuses on how households in Dakshina Kannada use and think about the harmful effect of plastic. This study primarily focuses on how much plastic people use at home, how often they reuse it and whether they are trying to reduce plastic waste. The survey also evaluates the awareness level among people about the environmental impact of plastic. The research compares plastic habits among different groups based on age, gender, education, and income to see how these factor effecting the plastic habits. It also focuses whether people willing to use eco-friendly alternatives. The finding of this study will provide the insights into the behaviour and attitude of the residents in Dakshina Kannada toward plastic consumption and highlight the scope for adopting more environmentally sustainable practices.

Keywords: *Plastic Consumption, Reuse Practices, Environmental Awareness, Waste Management.*

Introduction

In today's generation plastic has become a part of our daily lives. Many people use plastic because it is cheap and convenient, but they may not think how it affects the environment after they throw it away or burn it. Plastic waste often ends up in landfills, rivers and oceans, where it remains for many years without breaking down. This creates pollution and affects our environment. Toxic chemicals released from burning plastic can cause serious health issues, while plastic waste in water bodies harms fish, birds, and marine life.

In recent years, plastic pollution has gained global attention, with different countries and organization calling for better waste management and reduce the dependency of plastic usage. India also faces growing plastic waste problem, especially in rapidly developing areas where consumers habits are changing quickly. As cities expand and lifestyle modernize, plastic consumption naturally increases, but awareness and responsible disposal do not always grow at the same pace.

In Dakshina Kannada district, known for its educational institutions, growing urban centers, and coastal economy, reflects this trend. Plastic use has grown along with development, urbanization and changing lifestyle. Many people use plastic every day, but their habits and awareness may differ. In some

household they may reuse plastic items, while others may throw outside after the use. Similarly, some may know the harmful effect of plastic, and some may not be aware of it.

This study aims to explore these differences in plastic usage and awareness across households in Dakshina Kannada. Also, it mainly focuses on how households in Dakshina Kanada use plastic, how often they reuse it and whether they are aware of how plastic is affecting the environment. By learning these the study helps to identify the main reason behind plastic use and about the awareness of people on environment issues caused by plastic.

By understanding these patterns it will help in planning better awareness programs, improving waste-management practices, and encouraging more sustainable choices at the household level. The results of the study can also support policymakers, community groups, and educational institutions in taking effective steps to reduce plastic pollution in the district. By examining these behaviours and perceptions, the study attempts to identify the root causes behind plastic dependence and the gaps in environmental awareness.

Understanding these patterns is crucial because it can help in designing effective awareness programs and improving waste management systems. This study helps local authorities to introduce better segregation practices, promote recycle habits and encourage alternative to plastic. Community organization and educational institutions can conduct targeted campaign that inspire household to adopt more sustainable choices

Statement of the Problem

In Dakshina Kannada, plastic is widely used in household for their daily needs but increase in the use of plastic has created environmental concerns. Usage of plastic differs based on age, gender, occupation and where they live and these differs are not clearly understood. And also, there is unclear understanding of how often household reuse plastic items like bags, bottles, and containers, and awareness of harmful effects of plastic on the environment.

Even though awareness and plastic ban policies exists but their effectiveness in reducing plastic is still uncertain. Due to this there is a need to study plastic usage patterns, environmental awareness, and impact of current policies in the household. This will help identify the challenge and help for better strategies to reduce plastic pollution.

Review of Literature

Bhanu Juneja, Shashikant Deepak, et al. (2025) found that although people are aware of the risks from pharmaceutical waste, many still dispose of it improperly. The study highlights the importance of better disposal methods, stricter regulations, and improved public education to protect the environment. Swati Tyagi, Anita Gajraj, et al. (2024) found that policies like sudden plastic bag bans during the pandemic changed how plastic was used and recycled. The study concludes that waste management needs to be more resilient. Rajendran Geetha, Chandrasekaran Padmavathy (2024) aimed to understand how external and internal factors influence people's intentions to avoid single-use plastic bags. They concluded that improving both personal environmental values and support from external influences can increase the avoidance of single-use plastic bag usage. Nur Syafiqah Khalisah Jallaludin, Nor Shafieqa Sukarno, et al. (2024) aimed to review patterns of consumer plastic use, waste management, and environmental impacts in Asia. Using systematic review synthesis and thematic statistical comparison, they concluded that increasing consumer awareness and aligning policies with consumer capabilities are essential for reducing plastic consumption. Yunus Emre Arslan, Hande Cavus Arslan (2024) aimed to understand recycling practices, economic efficiency, and sustainability perceptions within plastic recycling companies. The study found gaps in employee awareness and stressed the importance of improving sustainability-oriented management practices.

Scope of the Study

This study focuses on analysing household plastic consumption, reuse practices, environmental awareness, and perceptions of plastic ban policies in Dakshina Kannada. It covers various demographic groups to examine variations in behaviour and attitudes toward plastic usage.

Objectives

- To analyse the differences in plastic usage patterns across demographic factors.
- To know the types of plastic used and the extent of reuse of plastic items.

- To evaluate people's awareness of the environmental effects of plastic usage and willingness to adopt eco-friendly alternatives.
- To examine the effectiveness of plastic ban policies, enforcement, and awareness programs in reducing plastic usage.

Research Methodology

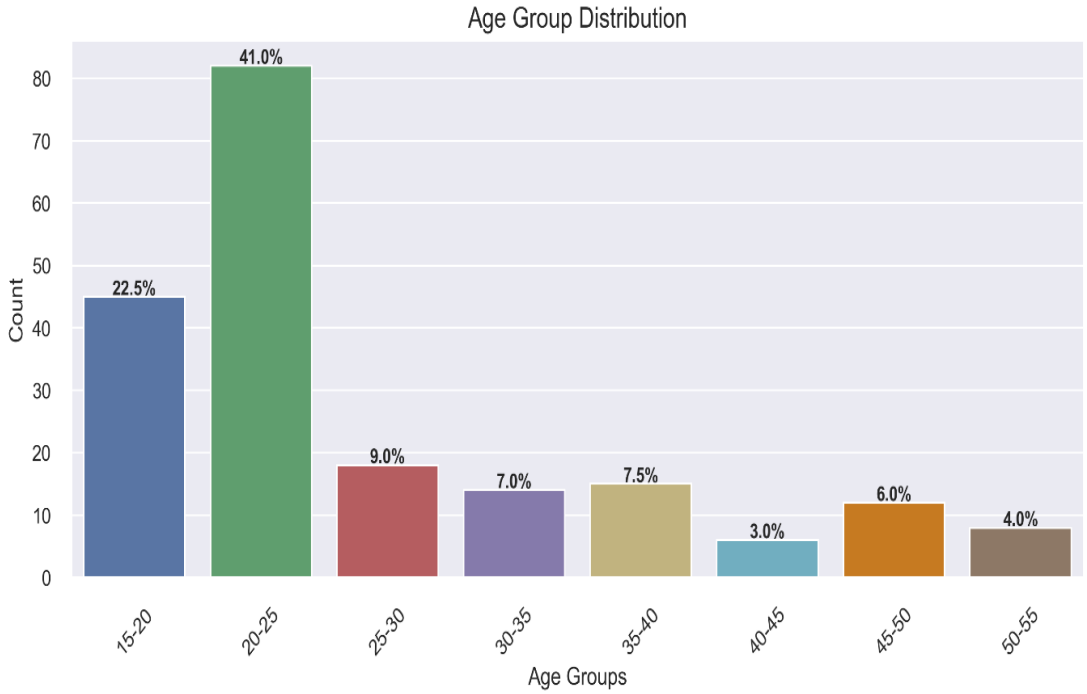
In this study, the primary data has been collected through a structured questionnaire to examine the plastic usage pattern, reuse percentage, environmental awareness, adoption of eco-friendly alternatives and the effectiveness of the plastic bag policies. The respondents are from the different localities of Dakshina Kannada district. The questionnaire contained both close ended and scaled questions. There were 200 respondents participated in the survey. By considering the ease of access and willingness to participate, the convenience sampling technique is adopted. The key variables considered in the study are level of plastic consumption, reuse pattern, environmental awareness, perception of plastic ban policies. The collected data were analysed using descriptive statistics, chi-square tests, Mann–Whitney U Test, Kruskal–Wallis Test, Spearman Rank Correlation, Friedman Test, Wilcoxon Signed-Rank test, Mc Nemmar's test. And built an ordinal logistic regression model to find out the demographic factors influences the usage of plastic bags and to predict the number of plastic bags a person is likely to use per week. And Binary Logistic Regression is used to identify the factors that influencing paying extra for eco-friendly products.

Data Analysis and Interpretation

The data has been analysed by using R and Python software. Graphical and tabular forms are used to present the results.

Demographic Profile of the Respondents

Figure 1: Distribution of Respondents according to their age group



Conclusion

The figure-1 shows most respondents are aged 20-25 (41%), this is followed by 15-20 age group (22.5%). This shows majority of the respondent fall under 15-25 age group.

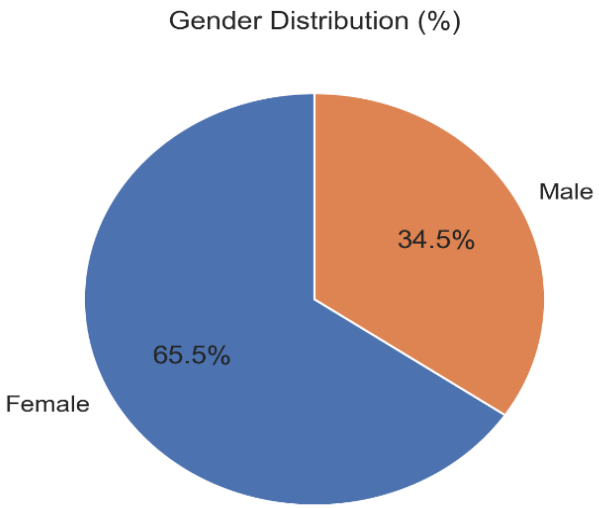


Figure 2: Distribution of Respondents according to their Gender

Conclusion

The Figure-2 shows that, female respondents (65.5%) form the majority of the sample, while male respondents account for 34.5%. This indicates that the survey responses are predominantly contributed by females, suggesting a higher level of participation or representation of women in the study.

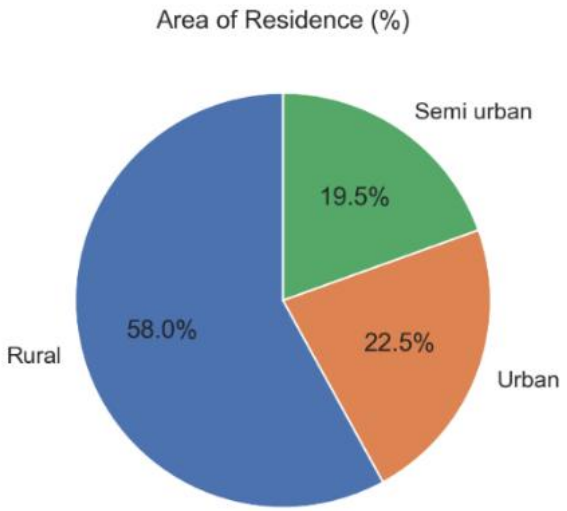


Figure 3: Distribution of Respondents Based on Area of Residence

Conclusion

The Figure 3 shows that majority of the respondents come from rural areas (58%), indicating that more than half of the sample population resides in rural area. A smaller part comes from urban areas (22.5%), while smallest group resides in semi urban areas (19.5%).

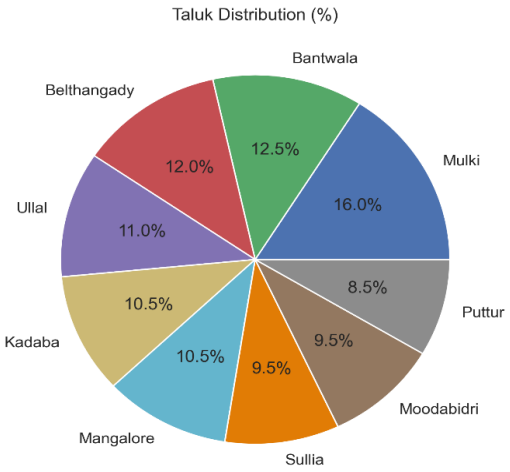


Figure 4: Taluk Distribution of Respondents

Conclusion

The Figure-4 shows that the respondents are distributed across all taluks, with Mulki 16% having the highest share, followed by Bantwala (12.5%), Belthangady (12%), Ullala (11%), Kadaba (10.5%), Mangalore (10.5%), Sullia(9.5%), Moodabidri (9.5%), and Puttur (8.5%), showing a well spread representation across the region.

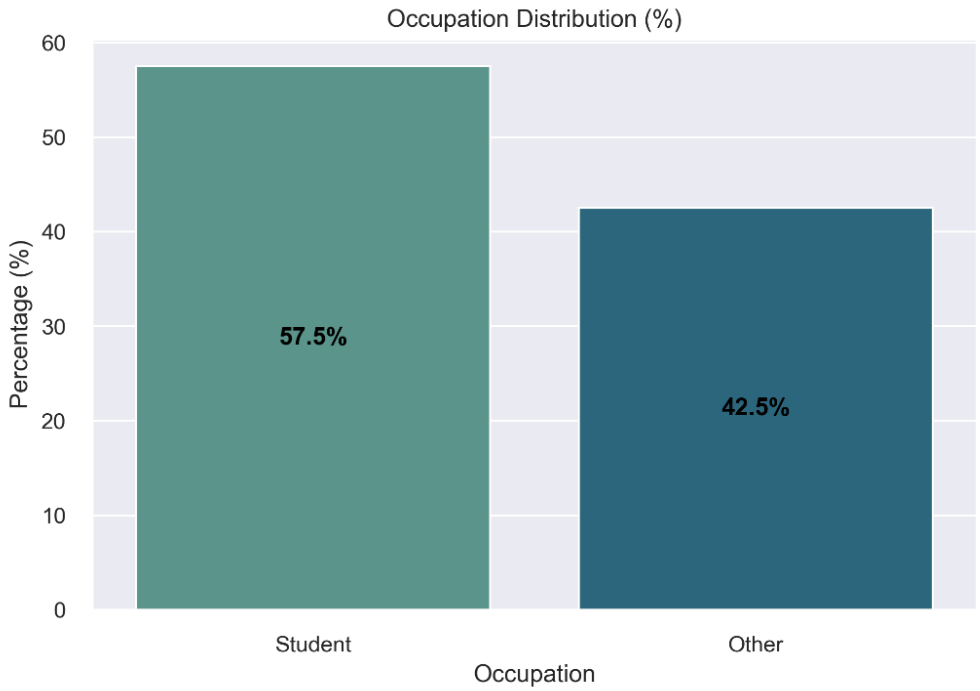


Figure 5: Occupation of Respondents

Conclusion

The Figure-5 shows that most (57.5%) respondents are students. The remaining 42.5% fall under other occupations, which include, private sector employees, self employed, government employees, home maker, farmers, teachers and few respondents in other minor job roles.

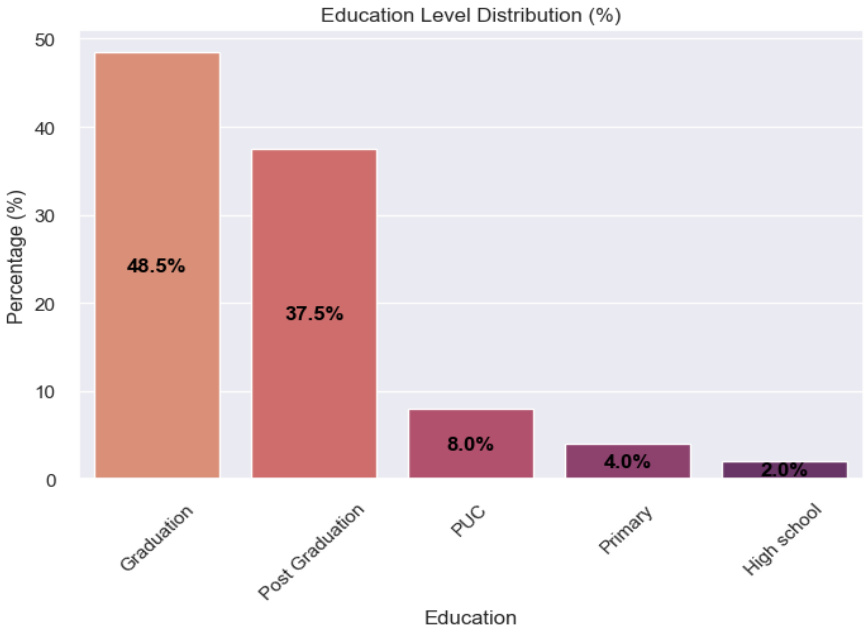


Figure 6: Education level of Respondents

Conclusion

The Figure-6 shows that most respondents are well educated, with Graduation (48.5%) and Post Graduation (33.5%) making up the large majority. A smaller portion have completed PUC (8%), Primary (4%) and High School (2%).

Studying the Behaviour of People towards the Usage of Plastic through Graphical Representation

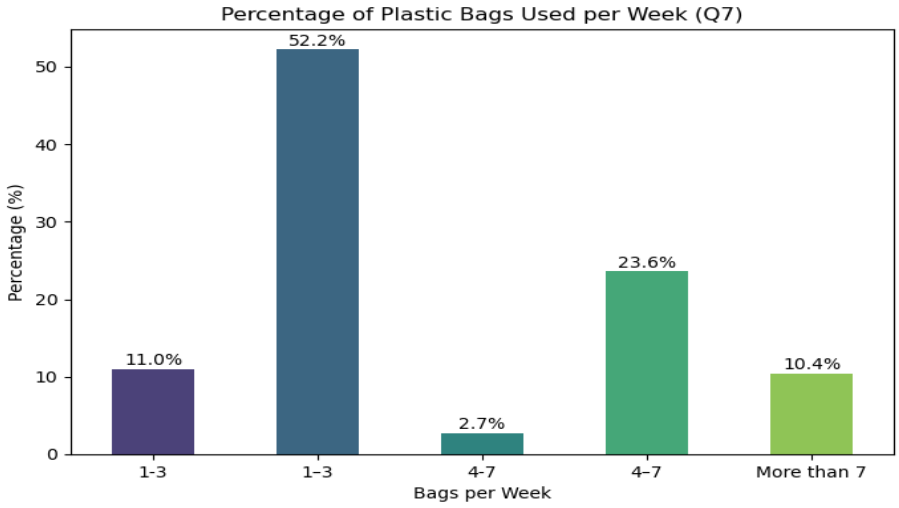


Figure 7: Percentage of Plastic Bags Used per Week

Conclusion

The Figure-7 indicates that a majority of respondents (63.2%) use between 1 and 3 plastic bags per week. Roughly 26.3% people fall into 4-7 plastic bags per week and a small minority (10.4%) uses more than 7 bags per week.

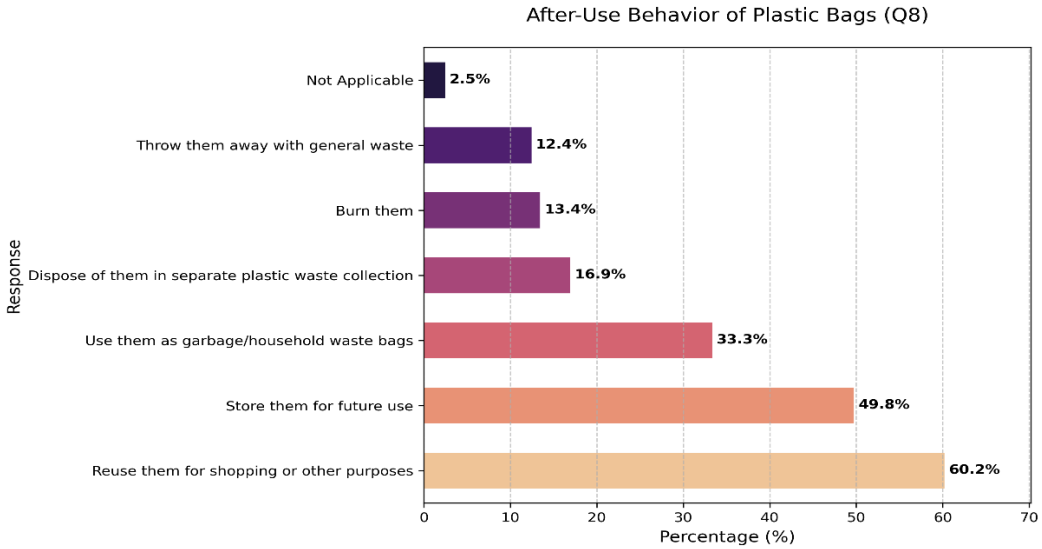


Figure 8: After-Use Behaviour of Plastic Bags

Conclusion

The Figure-8 shows that a majority of respondents (60.2%) reuse the plastic bags for shopping or other purpose once they use it, while 49.8% store used plastic for future use, and 33.3% use plastic bags as garbage or household waste bags. Coming to the disposal, 16.9% of respondent dispose plastic bags in separate waste collection, while13.4% burn them and 12.4% throw them away with general waste.

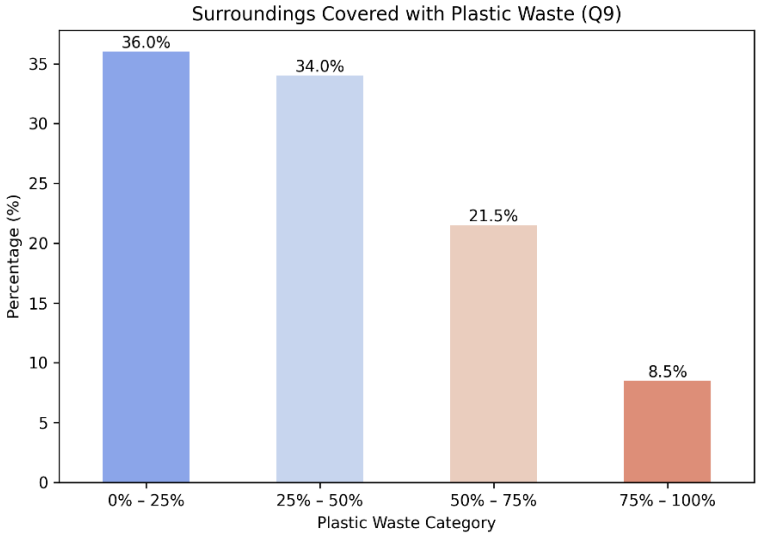


Figure 9: Surroundings Covered with Plastic Waste

Conclusion

The Figure-9 shows that 36% of respondents observe the lowest (0%-25%) level of plastic waste in their surroundings, while 34% of the respondent's report moderate (25%-50%) waste in their surroundings. Around 21.5% of people see lot of plastic (50%-75%) covering their surroundings and only a small group 8.5% of people reported that their surroundings is covered with highest (75%-100%) plastic waste.

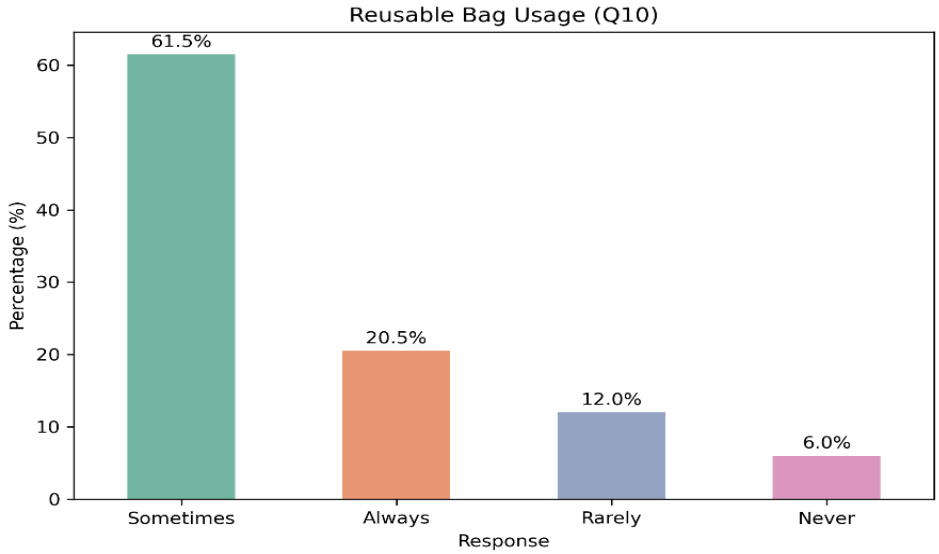


Figure 10: Reusable Bag Usage

Conclusion

The Figure 10 shows that 61.5% of respondents sometimes uses reusable bag, while 20.5% uses always. Small group of respondents that is 12% uses rarely and 6% of the respondent never uses reusable bags.

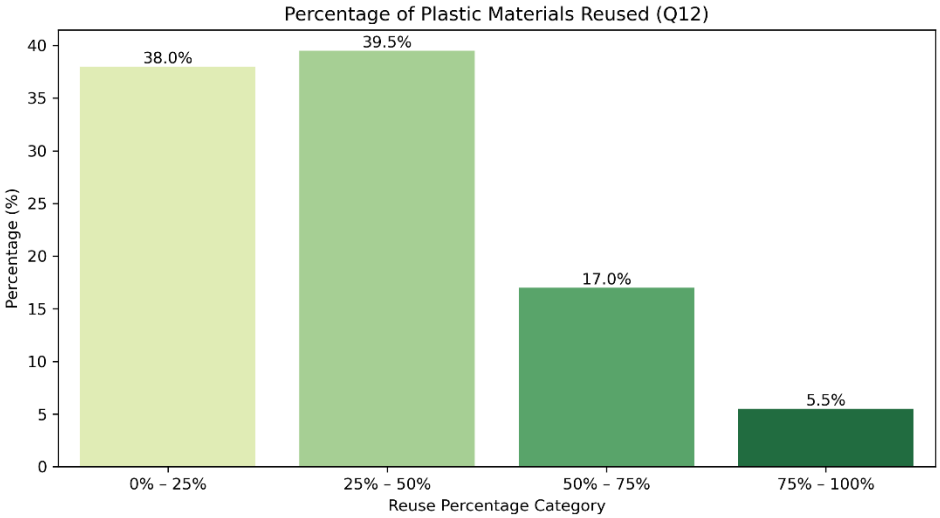


Figure 11: Percentage of Plastic Materials Reused

Conclusion

The Figure-11 shows that 39.5% of respondents reuse 25-50% of plastic materials, while 38% of the respondents reuse 0-25% of plastic materials and small group of people like 17% and 5.5% reuse 50-75% and 75-100% of plastic materials respectively.

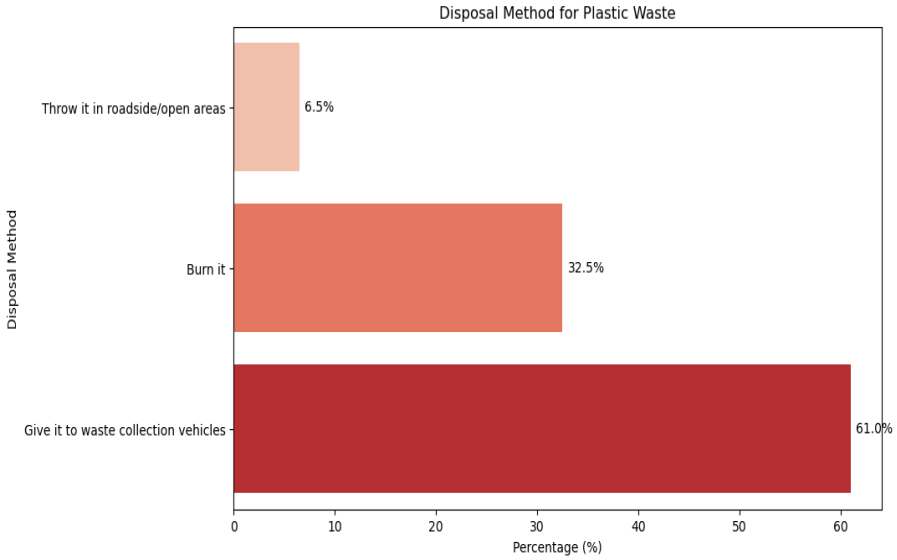


Figure 12: Disposal Method for Plastic Waste

Conclusion

The Figure-12 shows that 61% of respondents give plastic waste to waste collection vehicles, while 32.5% burn plastic waste and few respondents (6.5%) throw plastic waste in roadside or open areas.

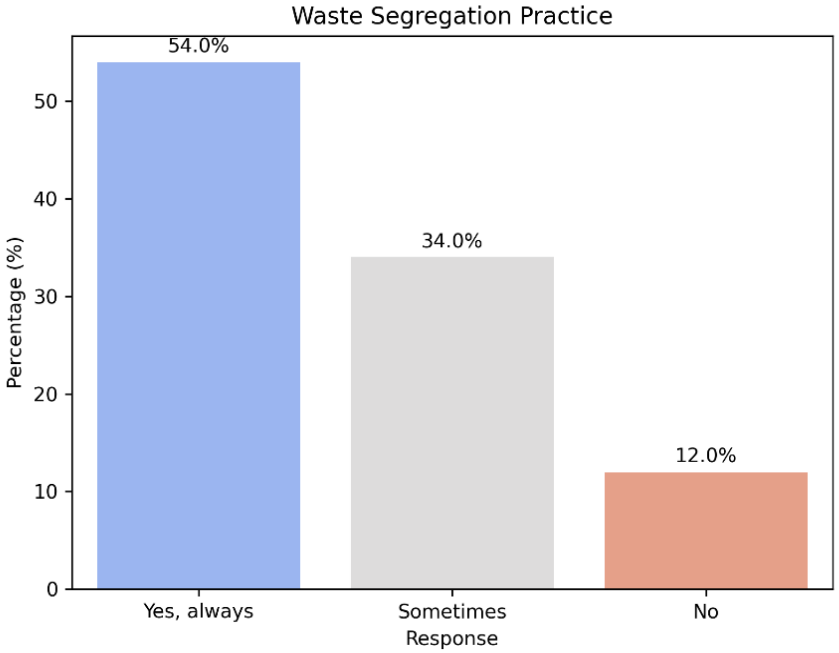


Figure 13: Waste Segregation Practice

Conclusion

The Figure-13 shows that 45% of respondents segregate their household waste into plastic and wet/organic and 34% of people sometime segregate the plastic waste and wet waste. Whereas 12% of respondents never segregate their household waste into plastic and wet/organic.

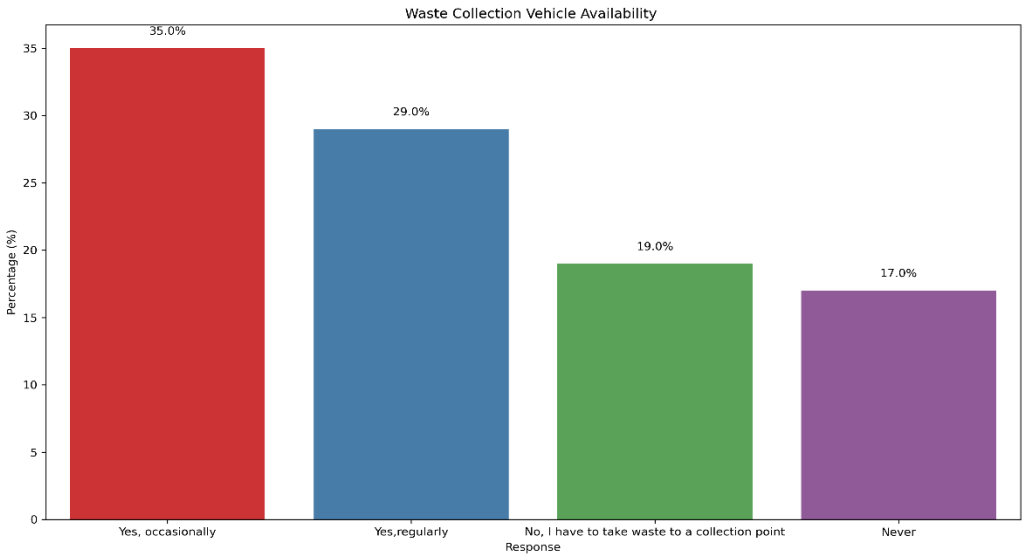


Figure 14: Waste Collection Vehicle Availability

Conclusion

The Figure-14 shows that highest percentage of respondents (35%) report that waste collection vehicles are only available occasionally. 29% of respondents have regular access to waste collection vehicles. Roughly 19% of people are forced to take their waste to specific collection point and 17% people report never having waste collection vehicle.

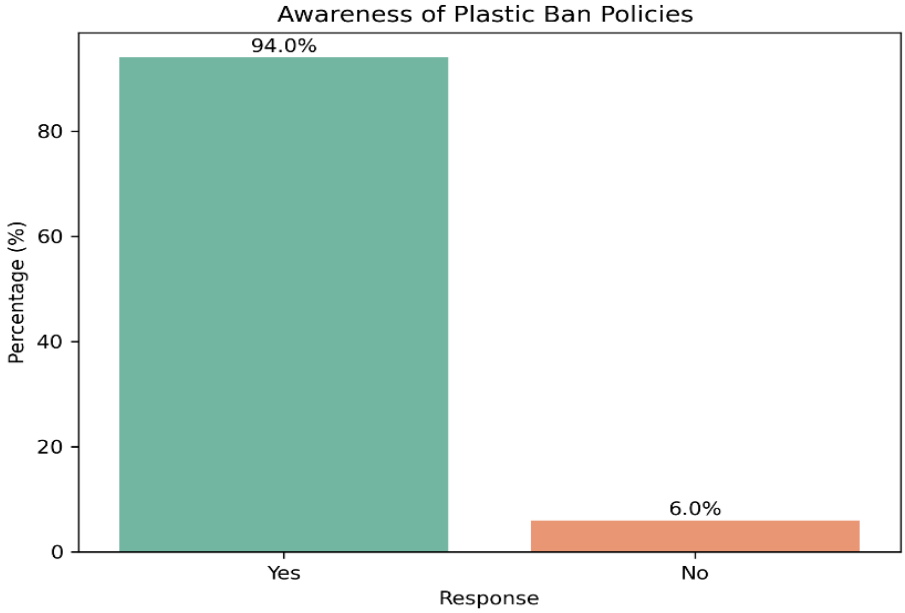


Figure 15: Awareness of Plastic Ban Policies

Conclusion

The Figure-15 shows that majority (94%) of the respondents are aware of plastic ban policy whereas only 6% of respondents are not aware of this policy.

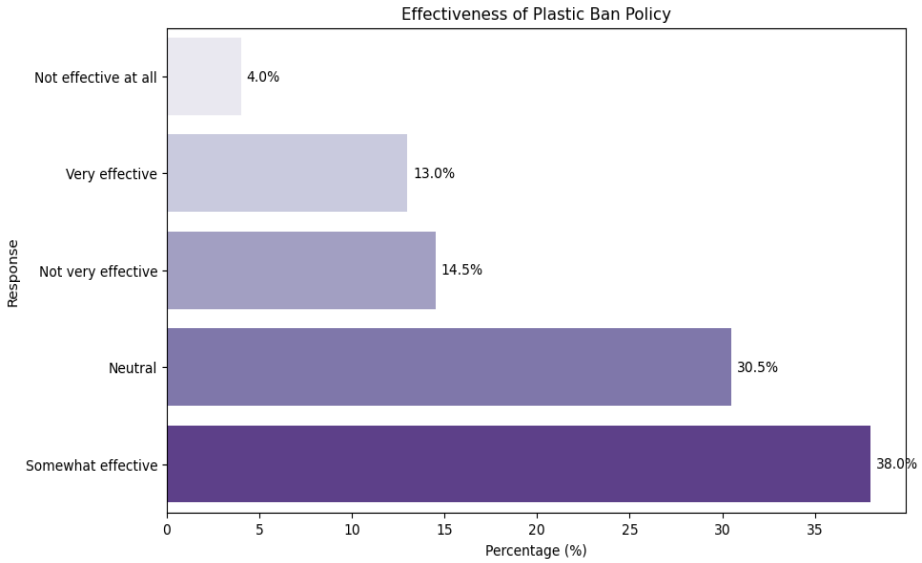


Figure 16: Effectiveness of Plastic Ban Policy

Conclusion

The Figure-16 shows that the largest group of respondents (38%) believes the policy is somewhat effective, while 30.5% of people feel neutral about the ban policy. Whereas 14.5% of respondents report that plastic ban policy is not much effective and 13% of people are telling it is very much effective. Some small group of people (4%) feel it is not at all effective.

Analysing the Plastic Usage Pattern across Demographic Factors

- The differences in plastic usage pattern across demographic factors are examined
- Using statistical tests and are displayed in table-1.

Table 1: Statistical Test Outcomes on Plastic Usage Patterns

Hypothesis	Test Used	p-value	Result
H_0: There is no significant association between gender and plastic usage.	Chi-Square	p=0.1774	Not significant
H_0: There is no difference in the rank distribution of plastic usage between men and women.	Mann–Whitney U	p=0.0242	Significant
H_0: There is no significant association between reusable bags and residence area.	Chi-Square	p=0.00001	Significant
H_0: There is no significant difference in the plastic usage index across residence area.	Kruskal Wallis test	p=0.0148	Significant
H_0: There is no significant difference in the plastic usage index across occupation.	Kruskal Wallis test	p=0.0298	Significant
H_0: There is no significant difference in the usage of plastic bags per week across occupation.	Kruskal Wallis test	p=0.00119	Significant
H_0: There is no monotonic relationship between age and the plastic usage index in the population.	Spearman Rank Correlation	p=0.00001	Significant
H_0: There is no significant association between usage of plastic per week and age group.	Chi-Square	p=0.0004	Significant

Conclusion

The statistical analysis reveals gender does not affect overall plastic use. However, the way men and women use plastic is a bit different. The residential area, occupation and age are the factors showing a significant influence on reuse of plastic. This means that efforts to reduce plastic use should focus more on age groups, types of jobs, and the place of residence, rather than gender.

- **Ordinal Logistic Regression**

Table 2: Ordinal Logistic Regression Results of Predictors

Predictors	p-value
Age	0.004
Gender	0.299
Area of residence	0.918
taluk	0.485
Occupation	0.943
Education Level	0.141

Conclusion

This model is used to find out which demographic factors influence the usage of plastic bags and to predict how many plastic bags a person is likely to use per week. The model results reveal that age is only significant factor of plastic usage. Gender, area of residence, taluk, occupation and education were not statistically significant. The model was evaluated based on the predictive accuracy for classifying respondents into the respective category of plastic bag usage. The accuracy of the model is 61.5% and it remained same even after removing the non-significant variables.

- **Studying the Types of Plastic Used and the Extent of Reuse of Plastic Items.**
  - To analyze the differences in plastic usage across product categories and to examine the relationship between usage frequency and reuse behavior, statistical tests are used and displayed in table 3.

Table 3: Statistical Test Outcomes on Plastic Usage Across Product Categories and Reuse Behaviours.

Hypothesis	Test Used	p-value	Result
H_0: There is no significant difference in the median plastic usage between the Water category and the Snacks category.	Wilcoxon Signed-Rank	p=0.00001	Significant
H_0: There is no significant difference in the median plastic usage between the Water category and the Groceries category.	Wilcoxon Signed-Rank	p=0.00001	Significant
H_0: There is no significant difference in the median plastic usage between the Snacks category and the Groceries category.	Wilcoxon Signed-Rank	p=0.1821	Not significant
H_0: There is no significant difference in the median plastic usage between the Groceries category and the House hold category.	Wilcoxon Signed-Rank	p=0.0121	Significant
H_0: There is no significant association between plastic Bag usage per week and reuse of plastic bags.	Chi-Square	p=0.0411	Significant
H_0: There is no relation between the number of bags used per week and the percentage of bags reused.	Spearman Rank Correlation	p=0.0396	Significant

Conclusion

The result shows that the usage of plastic items is not same across the considered categories. However, the snacks and grocery category have no significant difference in usage. There is a significant association between plastic Bag usage per week and reuse of plastic bags. Also, there is significant relationship between usage and percent of reuse.

- **Binary Logistic Regression**

Table 4: Binary Logistic Regression Results of Predictors

Predictors	p-Value
Age	0.801
Gender	0.807
Residence	0.380
Awareness score	0.0001
Plastic index	0.942

Conclusion

The model was used to identify the factors influencing paying extra for eco-friendly products. The result reveals that the awareness score is only the factor showing significant influence on willingness to pay extra for eco-friendly products. Indicating that people with higher awareness like to pay extra. It's also observed that age, gender, residence and plastic index are not significant in this model. The accuracy of the model is 85.50% and it remained same even after removing the non-significant variables.

- **Evaluating People's Awareness on the Effect of Plastic Usage on the Environment and Winningness to Adopt Eco-Friendly Alternatives.**
  - To examine whether environmental awareness varies across demographic factors and to analyze its relationship with eco-friendly behavior and willingness to pay extra, used statistical tests. The results are displayed in table 5.

Table 5: Table of Statistical Test Outcomes on Awareness Level and Its Associated Factors

Hypothesis	**Test Used**	**p-value**	**Result**
H_0: Awareness scale is not reliable	Cronbach's Alpha	$\alpha = 0.9371$	Reliable
H_0: There is no significant difference in the median awareness level between males and females regarding plastic usage.	Mann Whitney U	p=0.1701	Not significant
H_0: There is no significant difference in the median awareness level across different residence areas.	Kruskal Wallis	p= 0.0701	Not significant
H_0: There is no significant difference in the median awareness level across different occupation groups.	Kruskal Wallis	p= 0.0487	Significant
H_0: There is no significant correlation between awareness level and the percentage of eco-friendly product usage.	Spearman Rank Correlation	p= 0.2424	Not significant
H_0: There is no significant association between awareness level and the adoption of reusable bags.	Chi-Square	p= 0.0001	Significant

Conclusion

The awareness scale was found to be highly reliable. Area of residence and gender had no significant effect on awareness level. But occupation statistically influenced. Although awareness did not correlate with ecofriendly product usage, it showed a strong relation with adoption of reusable bags. This suggesting that future changes should focus not just on giving awareness but on motivating behavioural change.

- **Examining the Effectiveness of Plastic Ban Policies, Enforcement, and Awareness Programs in Reducing Plastic Usage.**
  - To evaluate the effectiveness of plastic ban policies and related programs, several statistical tests were used. The results of the tests are displayed in table 6.

Table 6: Table of Statistical Test Outcomes on the Impact and Perceived Effectiveness of the Plastic Ban

Hypothesis	Test Used	p-value	Result
H_0: There is no significant difference in the median plastic usage of households before and after the plastic ban.	Wilcoxon Signed-Rank	p= 0.00001 Mean Before Ban: 2.515 Mean After Ban: 1.875 Direction: ↓Reduced	Reliable
H_0: There is no significant difference in the proportion of high plastic users before and after the ban.	McNemar's Test	p=0.00001	Significant
H_0: There is no significant association between awareness of the plastic ban and the perceived effectiveness of the ban among respondents.	Chi-Square	p=0.0383	Significant
H_0: There is no significant difference in the median perceived effectiveness of the plastic ban across different residential areas.	Kruskal–Wallis	p=0.4949	Not significant
H_0: There is no significant difference in the median perceived effectiveness of the plastic ban based on the level of waste collection access among respondents.	Kruskal–Wallis	p=0.4453	Not significant
H_0: There is no significant difference in the median perceived effectiveness of the plastic ban among respondents who practice different levels of waste segregation.	Kruskal–Wallis	p=0.1171	Not significant

Conclusion

The results indicating that the usage of plastic significantly reduced after the ban (Wilcoxon test). There is a statsicaly difference in the proportion of plastic users before and after ban. The awareness of plastic ban asscoiated with the perceived efeectiveness. There is no differences of perceived effectiveness was observed across residential areas, waste collection access, or waste segregation practices.

- **Ordinal Logistic Regression**

Table 7: Ordinal Logistic Regression Results of Predictor

Predictors	p-value
Ban awareness	0.143
Residence	0.146
Waste vehicle	0.209
Awareness score	0.371
Segregate waste	0.663

Conclusion

The ordinal logistic regression model was used to find the factors influencing a person's perception towards the effectiveness of the plastic bag ban. All the predictors showing a non-significant effect at 5% level.

Findings

- The demographic analysis indicates that the majority of respondents fall within the 15–25 age group, with females comprising a larger proportion of the sample. Most respondents reside in rural areas, and the distribution across all taluks reflects a well-represented geographic spread. Furthermore, all participants possess a high level of educational attainment (Figure-1, Figure-2, Figure-3, Figure-4, Figure-5, Figure-6).
- 63.2% of households are moderate plastic bag users, with heavy consumption being relatively uncommon across the sample (Figure-7).
- Reuse is the most common behavior after using a plastic bag, though final disposal through proper channels remains weak among a significant portion of respondents (Figure-8).
- While most respondents observe low plastic pollution in their surroundings, a notable share reports moderate to heavy contamination, making environmental concern a real issue in the district (Figure-9).
- Consistent use of reusable bags is not yet a daily habit, as most respondents use them only occasionally and some avoid them altogether (Figure-10), (Table-1).
- Groceries and snacks are the most plastic-intensive product categories, confirming that food-related purchasing is the primary driver of household plastic waste (Figure-11), (Table-3).
- Overall plastic reuse is moderate to low, with most households reusing less than half of the plastic they consume, suggesting reuse habits are limited and selective (Figure-12), (Table-3)
- While the majority responsibly hand over plastic to collection vehicles, a substantial portion still burns or dumps it openly, reflecting that harmful disposal practices remain a significant challenge (Figure-13).
- Awareness of the plastic ban policy is near-universal across the sample, indicating that policy communication has reached households effectively throughout the district (Figure-16).
- A serious infrastructure gap exists, as the majority of respondents lack consistent access to waste collection vehicles, making responsible plastic disposal difficult even for those willing to do it (Figure-15).
- Public confidence in the plastic ban remains lukewarm, with most respondents viewing it as only somewhat effective and very few considering it a strong or highly impactful policy (Figure-17), (Table-6).
- Attitudes toward plastic reduction are strongly positive, with most respondents agreeing that the ban should be stricter and more awareness is needed, but personal commitment to avoiding

plastic disposal reveals a clear gap between what people believe and what they actually practice (Figure-19).

- The plastic ban has produced a measurable downward shift in consumption behavior, with the share of high plastic users declining considerably and low-usage households growing substantially after the ban came into effect (Figure-18), (Table-6).
- Age is the only strong independent predictor of plastic-use behavior, meaning awareness efforts should be tailored by age group rather than applied uniformly (Table-1), (Table-2).
- Households moderately use plastic and often reuse it, but poor final disposal habits (burning/dumping) persist, showing that reuse alone does not solve the waste problem (Figure-8), (Figure-13).
- Environmental awareness is high but does not reduce actual plastic use; however, it strongly increases willingness to pay for eco-friendly alternatives (Table-4), (Table-5).
- The plastic ban has reduced real usage, but people do not strongly perceive its effectiveness, indicating the need for better enforcement visibility and clearer communication of results (Table-7&Table-8).

Conclusion

This study titled "A study on Plastic Use and Perceptions: A Household Survey on Consumption, Reuse, and Environmental Awareness in Dakshina Kannada" was conducted across households in the Dakshina Kannada district to understand plastic consumption behavior, reuse habits, environmental awareness, and the impact of plastic ban policies.

The study found that although most households practice basic reuse of plastic and are widely aware of both the harmful effects of plastic and the existing ban policy, their actual sustainable behavior remains inconsistent and limited in depth.

A clear gap exists between what people know and what they consistently practice in daily life, particularly in areas of proper disposal, reusable bag adoption, and reduction of plastic-intensive purchases. The plastic ban has successfully brought down consumption levels in practice, yet public confidence in its effectiveness remains low due to weak enforcement visibility and poor waste collection infrastructure.

Overall, the study concludes that while environmental awareness encourages positive attitudes toward plastic reduction, practical barriers such as inadequate infrastructure, irregular waste collection access, and limited availability of affordable alternatives play a key role in preventing consistent sustainable behavior at the household level. Strengthening enforcement, improving waste management systems, and making eco-friendly alternatives more accessible and affordable are essential steps toward effectively reducing plastic pollution in Dakshina Kannada.

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