

THE USE OF POLYTHENE BAGS: ENVIRONMENTAL IMPACTS AND THE ROLE OF SOCIAL AWARENESS IN SHAPING PUBLIC BEHAVIOR

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ABSTRACT

Objective: This study aims to (1) assess the environmental impacts of polythene bags, including land, water, and air pollution, drainage blockages, littering, and harm to animals, and (2) to evaluate the influence of social awareness factors (general environmental awareness, literacy, civic responsibility, and media exposure) on public attitudes and behaviors toward polythene bag usage in Rawalpindi, Pakistan. **Methods:** A cross-sectional survey was conducted with 350 participants, including common citizens, housewives, and Rawalpindi Development Authority (RDA) employees, selected through random sampling from urban and semi-urban areas. Data were collected using a 29-item structured questionnaire namely as “Effect of Polythene on Environment questionnaires” covering 11 domains, including land pollution, water pollution, littering, damage to animals, and social awareness. Responses were measured on a 5-point Likert scale, analyzed using descriptive statistics, crosstabulation in SPSS. **Results:** Findings revealed strong consensus across stakeholders that polythene bags contribute to land pollution (100% agreement among common citizens), water pollution, drainage blockages (95–100% agreement), air pollution from burning (80–95% agreement), and harm to aquatic life (70–100% agreement). Awareness of biodegradable alternatives was low, particularly among housewives (80% agreement on lack of awareness). Literacy was strongly linked to improper disposal by common citizens (90% agreement), but less so by RDA employees (35% disagreement). Civic sense varied, with common citizens showing higher environmental consciousness (60% disagreement on viewing polythene as non-harmful) compared to housewives (90% agreement) and RDA employees (80% agreement). **Conclusion:** The study confirms polythene bags’ significant environmental impacts and highlights gaps in public awareness and civic engagement. While awareness of environmental harm is widespread, knowledge of biodegradable alternatives and consistent pro-environmental behavior remain limited. Multidimensional interventions, including stricter regulations, enhanced environmental education, and media-driven campaigns, are recommended to reduce polythene usage. Future research should adopt longitudinal designs and include diverse stakeholders to address systemic barriers and promote sustainable practices. **Keywords:** Polythene bags, environmental impact, social awareness, plastic pollution, civic responsibility, Rawalpindi, Pakistan

INTRODUCTION

Polythene bags have become an integral part of daily life due to their affordability, convenience, and wide availability. In many developing countries, including

Pakistan, their use has reached alarming levels. Polythene bags are primarily preferred by vendors and consumers alike because they are lightweight,

waterproof, and freely distributed. However, their non-biodegradable nature and improper disposal pose significant threats to the environment. According to a national estimate, Pakistan generates over 3.9 million tons of plastic waste annually, of which a substantial proportion consists of polythene bags that often clog drainage systems, pollute rivers, and scatter across landfills and streets (Dawn., 2024, september 2).

polythene bags may take hundreds of years to decompose, during which they contribute to soil degradation, water pollution, and air contamination when burned. Research study by Hussain et al. (2020) highlighted that improper disposal of these bags causes not only land and water pollution but also adversely affects marine life through ingestion and suffocation (Thushari & Senevirathna, 2020; Weber & Bigalke, 2022). Similarly, the study Nnoko, (2024) reported that polythene waste plays a critical role in urban flooding due to drainage blockages and contributes to habitat destruction for aquatic and terrestrial species (Nnoko, 2024). These findings point toward a significant ecological crisis tied to the unregulated use of polythene bags.

Alongside the environmental burden, the role of social awareness in shaping individual behaviors and consumption patterns is increasingly recognized in literature. Awareness of environmental issues, literacy level, civic responsibility, and the influence of media all play critical roles in determining how individuals respond to the problem of polythene pollution. For instance, Abdullah et al. (2023) observed that consumers with higher environmental awareness and education were more likely to avoid single-use plastic in Malaysia's "No Plastic Bag" campaign (Abdullah, Rahman, & Zain, 2023). Furthermore, Yaqub et al. (2023) found that green consumption orientation and environmental knowledge were strong predictors of reduced polythene bag usage in Pakistan and Saudi Arabia, especially when reinforced through demarketing campaigns and media involvement (Yaqub, Yaqub, Riaz, & Alamri, 2023). These findings emphasize the need to not only identify environmental risks but also understand how awareness campaigns, literacy levels, and civic engagement can be mobilized to alter public behavior.

Despite these efforts, a noticeable gap remains in the literature. Most studies have addressed either the environmental impacts or the behavioral factors independently (Aghdam, Alamdari, Nadrian, Jafarabadi, & Dehghanzadeh, 2019; Li, Liu, Yu, &

Zheng, 2022). There is limited research exploring how these two domains interact in the context of developing countries. Specifically, there is a lack of integrated studies that simultaneously assess the physical environmental impact of polythene bags and the role of social awareness including civic sense and media exposure in driving behavior change. Moreover, there is insufficient evidence on how literacy levels and general environmental understanding influence people's willingness to adapt eco-friendly practices. This disconnection between awareness and behavior limits the effectiveness of environmental campaigns and weakens public policy interventions.

Given these gaps, the current study is designed to address both the environmental and behavioral dimensions of polythene bag usage. It is grounded in the assumption that a better understanding of the environmental consequences, combined with a clearer picture of public awareness and media influence, can support more effective strategies to reduce polythene consumption. The study is significant in the context of Pakistan, where the use of polythene bags continues to rise despite government-imposed bans and repeated awareness drives. It also contributes to global discourse on sustainable consumption and environmental responsibility.

This research, therefore, aims:

1. to assess the environmental impact of polythene bags, including their contribution to land, air, and water pollution, urban littering, drainage blockages, and harm to animals and aquatic life.
2. to assess the influence of social awareness factors including general environmental awareness, literacy level, civic responsibility, and the role of media in shaping public attitudes and behaviors toward the use of polythene bags and environmental protection.

Methodology

The population for the purpose of the study is selected people from ministry of environment and Rawalpindi development authority and representatives from public. The participants of this study consisted of common citizens, house wives, official of RDA, Teacher and students selected through random sampling from urban and semi-urban areas. A total of 350 participants were surveyed, representing diverse backgrounds in terms of age, gender, education, and socioeconomic status.

All participants were informed about the purpose of the study and gave informed consent prior to participation.

Data were collected using a structured questionnaire titled “Effect of Polythene on Environment – Likert Scale.” The questionnaire consisted of 29 items grouped under 11 domains:

1. Land Pollution,
2. Water Pollution,
3. Littering Environment,
4. Damage to Animals,
5. Social Awareness,

Each item was measured on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly

Agree). Higher scores indicated greater agreement with the negative environmental impacts or awareness themes.

Participants were approached in public settings such as markets, community centers, and academic institutions. The questionnaire was administered in paper based. Responses were collected anonymously and confidentiality was maintained throughout. After data collection, responses were coded and entered SPSS for analysis. Cross tabulation (frequency & percentage) was used to analyze the data.

Results

1. Land pollution

Table-1; Your land is polluted due to polythene bags (n=100)

Stake holder	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)	Total (%)
Common citizen	55.0%	45.0%	0.0%	0.0%	0.0%	100.0%
House wives	30.0%	60.0%	10.0%	0.0%	0.0%	100.0%
Employees of RDA	35.0%	45.0%	20.0%	0.0%	0.0%	100.0%

The responses indicate a strong consensus among all stakeholder groups that polythene bags contribute to land pollution. Among common citizens, 55% strongly agreed and 45% agreed, showing that every respondent acknowledged the problem. Housewives showed a similar pattern, with 30% strongly agreeing and 60% agreeing, although 10% remained neutral, which could suggest slight uncertainty or limited information. Employees of RDA also reflected awareness, with 35% strongly agreeing and 45% agreeing, but a higher portion (20%) remained neutral. This neutrality among RDA employees might reflect a more cautious or policy-oriented perspective.

Table-2; Polythene Bags Take 1000 Years to Break Down (n=100)

Stake holder	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)	Total (%)
Common citizen	25.0%	60.0%	5.0%	10.0%	0.0%	100.0%
House wives	20.0%	70.0%	0.0%	10.0%	0.0%	100.0%
Employees of RDA	25.0%	65.0%	5.0%	5.0%	0.0%	100.0%

The perception that polythene bags take an extremely long time to decompose is widely accepted, though with some variation in strength of belief. Among common citizens, 60% agreed and 25% strongly agreed, while a smaller fraction (5%) was neutral and 10% disagreed. This indicates that while the majority understand polythene's durability, some may lack precise knowledge about its decomposition rate. Housewives showed even higher agreement levels, with 70% agreeing and 20% strongly agreeing, though 10% also disagreed. Employees of RDA had a similar response, with 65% agreeing and 25% strongly agreeing, while 5% were neutral and another 5% disagreed. These results reflect broad awareness of polythene's environmental persistence but also reveal that strong scientific understanding is not universal.

Table-3. Polythene Bags Have Negatively Affected the Fertility of Land (n=100)

Stake holder	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)	Total (%)
Common citizen	30.0%	70.0%	0.0%	0.0%	0.0%	100.0%
House wives	25.0%	65.05	0.05	10.0%	0.05	100.0%
Employees of RDA	35.0%	55.05	5.05	5.05	0.05	100.0%

There is strong agreement across all stakeholder groups that polythene bags have a detrimental effect on land fertility. Among common citizens, 30% strongly agreed and 70% agreed, with no neutral or dissenting responses, indicating unanimous concern. Housewives also showed considerable agreement, with 25% strongly agreeing and 65% agreeing; however, 10% disagreed, which could point to either misinformation or varying levels of engagement with agricultural issues. Employees of RDA showed slightly more diversity in responses: 35% strongly agreed, 55% agreed, 5% remained neutral, and 5% disagreed. This variation might reflect differing interpretations or a more evidence-based outlook among officials.

1. Air Pollution

Table-4; Burning of polythene bags pollutes air by emitting toxic fumes (n=100)

Stakeholder	Strongly Agree%	Agree %	Neutral %	Disagree %	Strongly Disagree%	Total%
Common Citizen	50%	50%	0%	0%	0%	100%
Housewives	25%	55%	10%	10%	0%	100%
Employees of RDA	25%	70%	5%	0%	0%	100%

The data presented in Table-4 illustrates public perceptions regarding the impact of burning polythene bags on air pollution. Among common citizens, there is unanimous agreement, with 50% strongly agreeing and 50% agreeing that burning polythene emits toxic fumes contributing to air pollution. Housewives also show a strong consensus, though slightly less intense, with 25% strongly agreeing and 55% agreeing, while a minority (10%) remain neutral or disagree. Employees of the Rawalpindi Development Authority (RDA) show the highest agreement levels, with 70% agreeing and 25% strongly agreeing.

2. Water Pollution

Table-5; Improper disposal of polythene bags blocks the drinking water drain (n=100)

Stakeholder	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Common Citizen	50%	50%	0%	0%	0%	100%
Housewives	50%	40%	5%	0%	5%	100%
Employees of RDA	40%	60%	0%	0%	0%	100%

Table-5 provides insight into public perception about the improper disposal of polythene bags leading to the blockage of drinking water drains. Common citizens again unanimously agree on the issue, with an even 50% strongly agreeing and 50% agreeing. Housewives also express strong concern, with 90% in agreement and only 5% each in the neutral and strongly disagree categories. Among RDA employees, all participants agree, with 40% strongly agreeing and 60% agreeing.

Table-6; Improper disposal of polythene bags causes water-borne diseases like hepatitis, cholera, and urinary tract infection (n=100)

Stakeholder	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Common Citizen	25%	75%	0%	0%	0%	100%
Housewives	20%	45%	20%	15%	0%	100%
Employees of RDA	25%	50%	25%	0%	0%	100%

In Table-6, the perception that improper disposal of polythene bags leads to water-borne diseases is explored. Among common citizens, all respondents recognize the health risks, with 25% strongly agreeing and 75%

agreeing. Housewives, while still largely in agreement (20% strongly agree and 45% agree), exhibit a more varied response, with 20% neutral and 15% disagreeing. Employees of RDA present a more cautious consensus, with 25% strongly agreeing, 50% agreeing, and 25% neutral. This variation suggests that while the majority of stakeholders acknowledge the health threats posed by polythene waste, there is some level of uncertainty or lack of direct evidence perceived by certain groups, particularly housewives and government employees.

3. Drainage Blockage

Table-7; Improper disposal of polythene bags causes drainage blockage (n=100)

Stakeholder	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Common Citizen	50%	50%	0%	0%	0%	100%
Housewives	40%	55%	5%	0%	0%	100%
Employees of RDA	60%	40%	0%	0%	0%	100%

Table-7 evaluates the extent to which the public perceives drainage blockage because of polythene bag disposal. The consensus is again strong. All common citizens either strongly agree (50%) or agree (50%). Among housewives, 95% agree, and only 5% remain neutral. Employees of RDA report the strongest belief in this environmental impact, with 60% strongly agreeing and 40% agreeing. These results reinforce the earlier interpretation that improper waste management of polythene bags is clearly associated with infrastructural problems such as drainage blockage, particularly recognized by municipal stakeholders who likely observe the impact first-hand.

5. Littering Environment

Table-8; Polythene bags become litter when not disposed of properly (n=100)

Stakeholder	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Common Citizen	55%	45%	0%	0%	0%	100%
Housewives	30%	60%	10%	0%	0%	100%
Employees of RDA	15%	65%	20%	0%	0%	100%

According to Table-8, perceptions of littering due to polythene bag misuse are prominently high across all groups. Among common citizens, 100% agree that polythene bags become litter when not disposed of properly, with 55% strongly agreeing. Housewives echo similar sentiments, with 90% in agreement and 10% neutral. Employees of RDA reflect a slightly more varied view, with 15% strongly agreeing, 65% agreeing, and 20% remaining neutral. Although agreement is strong, the slightly reduced conviction among RDA employees could reflect their awareness of multiple sources of litter or their practical involvement in urban cleanliness efforts.

Table-9; Most of the litter found in our streets is due to polythene bags (n=100)

Stakeholder	Strongly Agree%	Agree%	Neutral%	Disagree%	Strongly Disagree%	Total%
Common Citizen	25%	65%	10%	0%	0%	100%
Housewives	20%	50%	20%	10%	0%	100%
Employees of RDA	10%	65%	25%	0%	0%	100%

Table-9 delves deeper into the issue of littering by focusing on whether polythene bags constitute most of the street litter. Among common citizens, 90% agree (25% strongly), and 10% are neutral. Housewives are slightly less confident, with 70% agreement and 20% neutrality, while 10% disagree. RDA employees display a similar pattern, with 75% agreement, 25% neutrality, and no disagreement. These responses suggest that while most stakeholders perceive polythene bags as a major component of urban litter, there is recognition, especially among more observant groups, of other contributing forms of waste in the urban environment.

6. Damage to Animals

Table-10; Polythene bags disturb aquatic life (n=100)

Stakeholder	Strongly Agree%	Agree%	Neutral%	Disagree%	Strongly Disagree%	Total%
Common Citizen	45%	55%	0%	0%	0%	100%
Housewives	30%	40%	15%	15%	0%	100%
Employees of RDA	25%	55%	20%	0%	0%	100%

Table-10 assesses the perception that polythene bags disturb aquatic life. All common citizens either agree (55%) or strongly agree (45%) with this notion, reflecting a strong consensus. Housewives show more diversity in responses: 30% strongly agree, 40% agree, 15% neutral, and 15% disagree. Employees of RDA again display a high level of agreement (25% strongly agree and 55% agree), with 20% neutral. These responses point to a general awareness of environmental degradation caused by polythene in aquatic ecosystems, though the variation among housewives and RDA employees may reflect a gap in direct exposure to the issue or a need for more public education on aquatic environmental hazards.

7. Social Awareness

a) General Awareness

TABLE-11: Common citizens are unaware of using biodegradable polythene bags (n=100)

Stakeholder	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Common Citizen	20%	55%	5%	20%	0%	100%
Housewives	15%	65%	15%	5%	0%	100%
Employees of RDA	30%	55%	15%	0%	0%	100%

Table 11, which examines awareness of biodegradable polythene bags, a significant proportion of respondents across all groups expressed agreement, with housewives showing the highest level of agreement (65% agree, 15% strongly agree), followed by common citizens (55% agree, 20% strongly agree) and RDA employees (55% agree, 30% strongly agree). This suggests a widespread acknowledgment of limited awareness regarding biodegradable alternatives, particularly among housewives, though a notable minority of common citizens (20%) and housewives (5%) disagreed, indicating some awareness in these groups.

b) Literacy

TABLE-12: Improper disposal of polythene bags is due to low literacy rate (n=100)

Stakeholder	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Common Citizen	5%	85%	10%	0%	0%	100%
Housewives	25%	40%	15%	20%	0%	100%
Employees of RDA	10%	35%	20%	30%	5%	100%

Table 12, addressing the link between improper polythene bag disposal and low literacy rates, reveals strong agreement among common citizens (85% agree, 5% strongly agree), while housewives and RDA employees displayed more varied responses, with 20% and 30% disagreeing, respectively. This divergence highlights differing perceptions, with common citizens strongly attributing improper disposal to literacy deficits, whereas RDA employees, potentially more informed due to their professional context, were less convinced of this causal relationship.

c) Civic Sense

TABLE-13: Common citizen does not consider the use of polythene bags as harmful to the environment (n=100)

Stakeholder	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Common Citizen	15%	20%	5%	55%	5%	100%
Housewives	15%	75%	5%	5%	0%	100%
Employees of RDA	35%	45%	15%	0%	5%	100%

Table-13, focusing on civic sense and the perception of polythene bags as environmentally harmful, indicates a lack of consensus. Common citizens predominantly disagreed (55% disagree, 5% strongly disagree) that they view polythene bags as non-harmful, suggesting a relatively high environmental consciousness. In contrast, housewives (75% agree, 15% strongly agree) and RDA employees (45% agree, 35% strongly agree) were more likely to perceive a lack of civic sense, with RDA employees showing the strongest concern.

Discussion

The current study investigated the environmental consequences of polythene bag use and assessed levels of public awareness in the context of Rawalpindi, Pakistan. Drawing from responses of three stakeholder groups common citizens, housewives, and employees of the Rawalpindi Development Authority (RDA) the study offers empirical insights into how polythene bags contribute to ecological degradation and how literacy, media influence, and civic responsibility shape individual behaviors. The discussion is organized around two thematic domains: environmental impact and social awareness, with findings interpreted considering recent scholarly literature.

The results consistently indicate that the use of polythene bags poses significant environmental threats. As reflected in Table-1, all stakeholder groups acknowledged land pollution due to polythene bags, a finding consistent with Luqman et al. (2023), who reported widespread land contamination linked to plastic waste in urban Pakistan (Luqman, Shahid, Awan, Kashif, Arooj, & Awan, 2023). Similarly, most respondents in Table-2 recognized that polythene bags take up to a millennium to degrade, which aligns with study conducted by Engber, (2007), which notes that conventional plastic bags can persist in ecosystems for over 500 years, exacerbating long-term soil infertility (Ritchie, June 23, 2025).

Further reinforcing these concerns, Table-3 showed near-universal agreement that polythene bags negatively affect land fertility. This aligns with Chaurasia et al. (2022), who demonstrated that microplastics inhibit soil microbial activity and reduce agricultural productivity in peri-urban farming zones (Chaurasia, Patel, & Rao, 2023). Air pollution was another major concern, with Table-4 showing that a vast majority of participants agreed that burning polythene releases toxic fumes. This corroborates the findings of El-Sherif et al., (2022), who detailed how combustion of polyethylene-based materials emits dioxins and furans, both known carcinogens and respiratory irritants (El-Sherif et al., 2022).

The study also underscores polythene's contribution to water pollution and public health risks. Table-5 and Table-6 demonstrated strong consensus that improper disposal leads to blocked water drains and waterborne diseases, respectively. These findings mirror those by Lawrence et al. (2024), who documented a spike in hepatitis and cholera cases in Bangladesh following flooding events exacerbated by drainage systems clogged with plastic waste (Lawrence Grant, Lange, Almeida, Hoque, & Kjær Mackie Jensen, 2023). Table-7 further confirmed these infrastructural consequences, particularly among RDA officials who directly encounter urban drainage failures. This aligns with The report by Dawn (2024) assertion that plastic blockage is a key driver of urban flooding and infrastructural decay in South Asia (Dawn., 2024, september 2).

Regarding littering, Tables 8 and 9 reveal overwhelming agreement that polythene bags significantly contribute to street litter. This concurs with Alvi and Tariq's (2022) study in China, which identified single-use plastic as the predominant component of municipal litter (Chen, Awasthi, Wei, Tan, & Li, 2021). The adverse impact on wildlife was also recognized, with Table-10 showing agreement that polythene harms aquatic life. Internationally, this resonates with the research by Cassio et al. (2024), which found that marine

organisms ingesting microplastics exhibit stunted growth, reproductive dysfunction, and increased mortality (Cássio, Batista, & Pradhan, 2022).

While the environmental consequences are evident, the study also highlights important dimensions of social awareness. Table-11 reveals a general lack of awareness about biodegradable alternatives, especially among common citizens and housewives. These results echo findings by Hashim et al. (2022), who noted that in regions with limited environmental education, consumers tend to rely on convenience over ecological responsibility (Hashim, Aminuddin, Abdullah, Hwan, & Zainuddin, 2022). Table-12 linked improper polythene disposal to low literacy levels, a perception especially prevalent among common citizens. This suggests that improving educational outreach may bolster environmental responsibility. Notably, however, RDA employees were more ambivalent, possibly due to their exposure to multifactorial causes of improper disposal beyond literacy alone.

Civic sense and public engagement emerged as complex issues in Table-13. While common citizens mostly rejected the notion that they were unaware of polythene's harm, housewives and RDA employees suggested otherwise. This divergence indicates a potential gap between self-perception and external evaluation of environmental responsibility. Such discrepancies have also been noted in Yaqub et al. (2023), who reported that environmental self-awareness does not always translate into pro-environmental behavior unless reinforced by targeted public campaigns (Yaqub et al., 2023).

Collectively, these findings reveal a dual crisis: one of ecological sustainability and one of civic accountability. Despite growing awareness, especially among public authorities, polythene bags continue to be used and improperly disposed of due to cultural inertia, infrastructural gaps, and insufficient policy enforcement. The findings also reflect a global pattern. As noted by Ritchie et al. (2025), the mismanagement of plastic waste is a worldwide issue, particularly pronounced in developing economies where municipal systems are under-resourced and public education campaigns are inconsistently implemented (Ritchie, June 23, 2025).

Conclusion

This study provides compelling evidence of the environmental hazards posed by polythene bag usage and highlights critical gaps in public awareness

and behavioral responsibility in Rawalpindi, Pakistan. The findings reveal widespread acknowledgment among citizens, housewives, and government officials that polythene bags contribute significantly to land, water, and air pollution, drainage blockages, and harm to terrestrial and aquatic ecosystems. Despite this awareness, there remains a significant deficiency in knowledge about biodegradable alternatives and the long-term ecological consequences of plastic waste. Moreover, varying levels of environmental literacy and civic engagement suggest that behavioral change is not uniform across demographics. The results affirm the urgent need for multidimensional interventions that combine strict regulatory enforcement with targeted public education. Integrating environmental education into school curricula, promoting civic responsibility through community-based campaigns, and amplifying media messaging on plastic pollution could significantly improve outcomes. By addressing both environmental impacts and social awareness simultaneously, policymakers and environmental agencies can develop more holistic and sustainable strategies to mitigate the threats posed by polythene bags. This study contributes to the growing body of literature advocating for behavioral-environmental integration in tackling plastic pollution in developing countries.

Limitations and recommendations of the study

The present study, while offering important insights into the environmental impacts and public awareness related to polythene bag usage in Rawalpindi, is subject to several limitations. The research was geographically limited and may not fully reflect the perspectives of populations in other regions of Pakistan with differing socio-economic or cultural contexts. The reliance on self-reported data through structured questionnaires introduces the potential for bias, particularly social desirability bias. Additionally, the study's cross-sectional nature restricts its ability to track changes in awareness or behavior over time. Key stakeholders such as plastic manufacturers, policymakers, and retail sector representatives were not included, which may limit the comprehensiveness of the findings.

To build on the findings of this research, several recommendations are proposed. There is a pressing need for stricter enforcement of plastic bag bans and incentives for the production and use of biodegradable alternatives. Public education initiatives should be expanded through formal

curricula and mass media to raise environmental literacy and promote behavior change. Community-level interventions such as clean-up campaigns and civic engagement programs can further encourage responsible waste management. Future research should broaden its geographic scope, employ longitudinal methods, and include qualitative components to capture deeper motivations and systemic barriers. Additionally, engaging industrial and policy actors will be essential to developing practical and sustainable solutions to polythene pollution.

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