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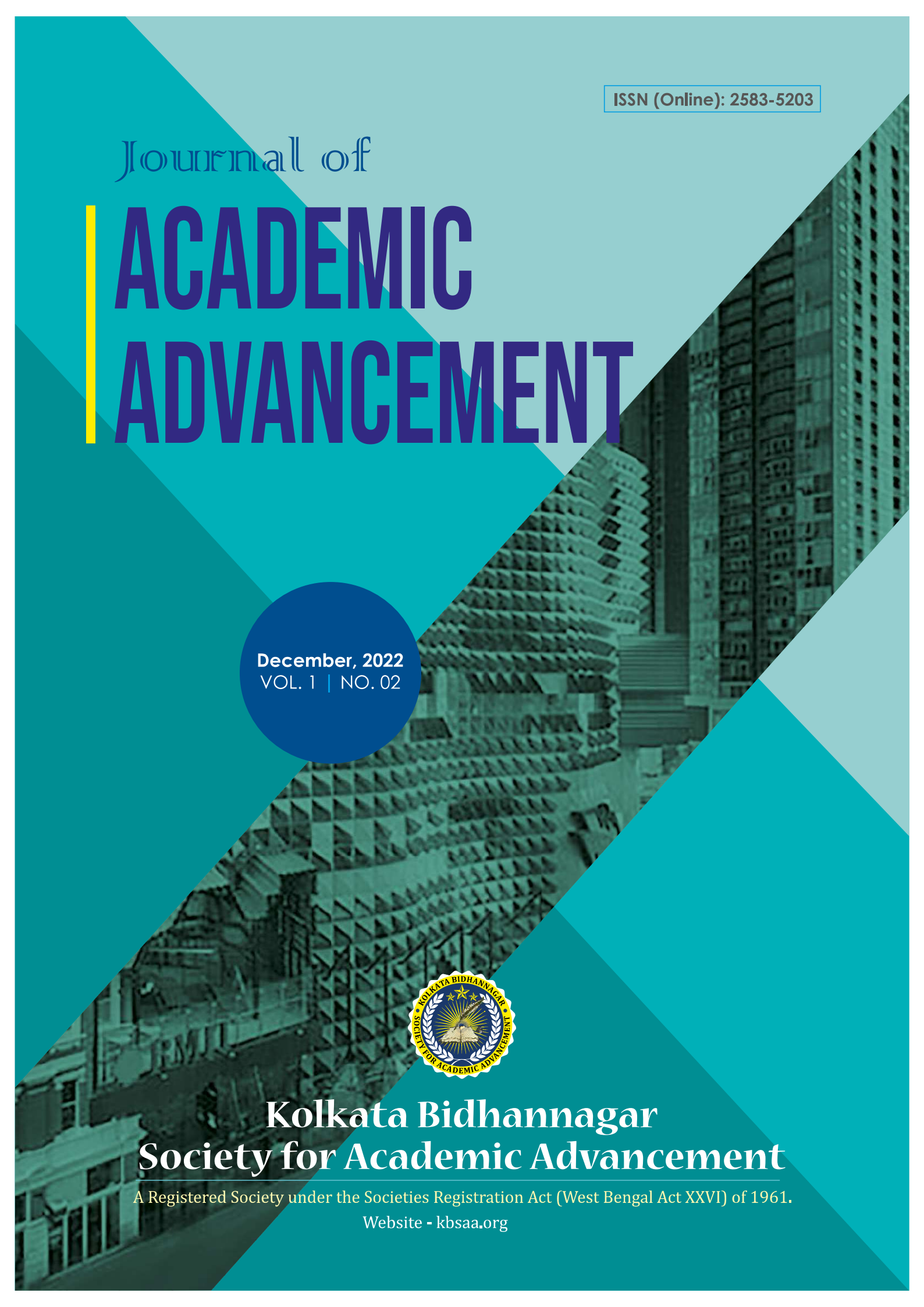

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Zero-Waste Lifestyle in India: A Study on Consumer's Standpoint

ABSTRACT

In recent years, the global waste problem has taken a massive toll on the ecology of the earth. The philosophy of zero waste treats it as a misallocated resource that can be circled back into the production or consumption process.

This paper aims to study consumers' perception in metropolitan cities in India toward a zero-waste lifestyle and management. The study investigates the change in consumer perspective from the conventional way of waste disposal to the newer and more sustainable way of life. Data from 314 consumers residing in metropolitan cities in India were collected to study their attitude towards zero-waste.

Keywords: *Zero-waste, Waste Management, Circular Economy, Consumer Perspective on zero-waste living.*

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1. INTRODUCTION

Waste is the darker side of an economy. Growing economies and globalization have led to the production of massive waste. One of the biggest menaces to the human race on this planet is the unaccounted disposal of 'stuff.' On average India is a contributor of 1.5 lakh metric tons of waste per day, a majority of which ends up in an unmanaged landfill or is burned, pyrolyzed, or disposed of in landfills, which has various adverse effects on the environment. In his report on a more sustainable single market, David Cormand, a French member of the Greens / EFA group stated that in 2019, the European Union's ecological footprint has surpassed the capacity of the planet's ecosystem. As per his calculation, if everyone in the world consumed as much as the residents of the European Union, we would need an ecosystem equivalent to 2.8 times planet Earth. Climate change and improper waste disposal are the greatest global problems faced by every nation. Taking a step forward to incrementally reduce the effects, at this point, is quite the challenge. Thus, in an effort to achieve sustainability and combat climate change, zero-waste movements have become increasingly trendy in recent years. As opposed to the 3 'R's of recycling (Reduce, Reuse, Recycle), the concept of sustainability provides the 7 'R's ("Refuse, Rethink, Reduce, Reuse/ Repurpose, Repair, Rot, Recycle"). Regardless of the concept we choose, recycling is always a last resort. Zero-waste management aims at waste prevention by maximizing reusability. Hence, Zero-waste management is encouraged at all levels, consumer, industry, organization, and government.

2. LITERATURE REVIEW

This literature review has been done by studying the available literature, gaining insight from a range of experts, drawing conclusions from the research conducted, and looking at the findings of recent studies on the topic. **Murray (1999)** holds a primary view of waste as a valuable 'resource' that can be converted and put into a wide range of reusable products. Waste can be viewed as generated wealth when it is turned into a product that can be used directly. This is what he means when he uses the phrase 'wealth from waste.' **Sharma (2018)** studied the standing of green buildings, their hurdles, and boots and tried to develop a unified strategy that would help in the development of green buildings in India. **Pries *et al* (2019)** developed a metric that is used to measure how circular economy is implemented in the waste hierarchy and analysed multiple European countries' waste hierarchy index (WHI). **Pangarkar *et al* (2021)** provides a conceptual overview of a minimalism approach and the classification of

minimalism like Voluntary simplicity, Anti-consumerism, Reduced consumption and inconspicuous minimalism. **Laksmidewi (2022)** focused on 312 millennial respondents residing in Jakarta, Indonesia and found out that millennials have a moderate level of materialism in them. It has been observed that millennials have a desire to buy eco-friendly products as their moderate level of materialism motivates them to care for and value the environment. The study draws the inference that green products hold the ability to help consumers to portray themselves as knowledgeable and showcase their success.

3. RESEARCH GAP

The concept of zero-waste is to turn the waste into a valuable material input into the process of production. India's solid waste management in recent years has tried to make a strategy that would lead to material recovery and reuse. It is safe to say that due to India's relative newness to this concept, the assessment of zero-waste management in the country is rather vague. Not much has been examined about the adoption of the concept in the country and the relative adaptiveness of the entire process remains unexcavated. No such comprehensive study has been conducted on the effects of mass adoption of a zero-waste lifestyle. There is little to no evidence available on the perspective that consumers in India hold on this lifestyle and the possibility that it can be adopted on a larger scale in India. This paper aims to solve this research gap and provide a multidisciplinary approach toward sustainability using the zero-waste concept.

4. OBJECTIVES OF THE STUDY

The Objectives of the Study are as follows -

- To check the awareness, attitude of consumers toward the Zero-Waste Lifestyle in metropolitan cities in India.
- To evaluate the consumer's perspective on the feasibility of adopting zero waste as a mass-market goal in India.

5. RESEARCH METHODOLOGY

- **Data Collected:** Raw data was collected first-hand through the circulation of a questionnaire, from various consumers residing in India. Data collected solely for research purposes from various research papers, journals, interviews.
- **Questionnaire Design**: Data has been collected from the consumer perspective of Zero-Waste using a Questionnaire through Google forms and circulated on various social media platforms. The questionnaire contains 16 close-ended questions, with multiple 5-point Likert-scale type questions and multiple choices.
- **Sampling Method**: "Non-Probability Sampling Technique (convenience and snowball sampling)" is used.

- **Sample Size and Area covered:** A total of 314 respondents were a part of this research. The sample area of the research work is confined to the metropolitan cities of India namely- Kolkata, Delhi, Mumbai, and Chennai but with a special emphasis on Kolkata.
- **Statistical Tools Used:** Various descriptive statistics like mean, median, standard deviation has been used, and computation is done through MS Excel. Inferential statistics like chi-square tests and t-tests have been conducted to test the hypothesis of the study through SPSS software.
- **Hypothesis:** The following hypotheses have been developed and tested in this research to satisfy the objectives of the study.

  $H0_1$: Gender does not affect consumers' willingness to adopt a zero-waste lifestyle.

  $H1_1$: Gender affects the willingness to adopt a zero-waste lifestyle of consumers.

  $H0_2$: Age does not affect awareness of zero-waste in metropolitan cities in India.

  $H1_2$: Age affects the awareness of zero-waste in metropolitan cities in India.

  $H0_3$: Age does not affect the response of consumers to government-imposed taxes imposed to minimize waste generation in India.

  $H1_3$: Age affects the response to government-imposed taxes imposed to minimize waste generation in India.

6. ANALYSIS

- **Demographic Analysis**

Age: Out of the total 314 respondents, 75% of the sample (234 participants) fall under the age range of 19-25, 11% (35 participants) fall under the range of 26-35, 6% (19 participants) fall under the range of 15-18, 5% (15 participants) in the range 36 - 50 and remaining 3% (11 participants) fall in range 51-65. It can be seen that the majority of participants are the youth of the country that is they are 35 or less than 35.

Gender: Out of the sample size of 314, 67% (211) respondents were female and 32% (99) respondents were male. 1% (4) of the sample size did not fall under the spectrum of male or female gender identities.

Area: 237 (75%) people reside in Kolkata, 33 (11%) respondents reside in Mumbai, 26 (8%) respondents reside in Delhi and 18 (6%) respondents reside in Chennai. Since our research aim was to give special emphasis to Kolkata, 75% of the sample data has been collected from the participants who reside in Kolkata.

- **Descriptive Analysis**

It can be observed that contrary to the assumptions of the research, the awareness variable shows that 256 out of 314 respondents

lie on the positive side of the awareness spectrum. The mean being '3.54' shows that on average the respondents are somewhat aware of the idea of zero waste.

Table 1: Awareness of Zero-Waste Statistics

Particulars	Awareness
N	314
Mean	3.5
Median	4
Mode	5
Standard Deviation	1.48
Minimum	0
Maximum	5
Skewness	-0.907

Source: *Data collected through online questionnaire*

The majority of respondents have selected '5' thereby stating that they are extremely aware of the concept of sustainability through 'zero-waste'. There is a relation between Question 1 and Question 2 so as to judge that if consumers are aware of the concept of zero waste, do they in correct manner know what the entirety of this theory stands for? Given how the previous analysis demonstrated that 256 respondents out of 314 lay on the positive side of the awareness spectrum and the mode of the sample size were '5' stating that they are 'Extremely aware' of the concept of zero-waste, the current bar graph gives us the real scenario where only 29 out of 314 respondents knew what it actually was.

Impulse purchase behavior is condoned by zero-waste as it leads to a lot of waste generation. It is always advisable to make or carry a list so that they do not end up buying something unnecessary. While judging if consumers carry a shopping list, it can be seen that 33% of respondents of the survey strongly agreed with the statement, 27% agreed with it, 20% chose the scale 3 showing the might or might not do it, 13% respondents disagreed and 7% strongly disagreed with the statement.

199 participants out of 314 participants (63.4%) wish they could have compost but for some reason, it is not possible. 83 participants (26.5%) do have compost at home and they use it. Practices of composting existed in India since ancient times as vegetable scraps, brewed tea leaves, and food waste is fermented and composted and used as fertilizers in gardens. 19 participants (6.1%) are indifferent about composting and 13 people (4.1%) participants do not see the requirement for composting and find them unnecessary.

A direct question to consumers about their readiness in adopting a zero-waste lifestyle in India shows that 51% of the respondents have

said 'Yes' while the other 49% cannot properly make a decision yet. 1% of people went with a solid 'No.'

There were 4 myths about zero-waste as a mass-market goal that were endowed to the respondents with a scale ranging from "Strongly Disagree (1) to Strongly Agree (5)". It can be seen how the respondents do not believe in the myths. When asked to give views on 'Products made from recycled materials are inferior' majority (129/119) of the participants strongly disagreed or disagreed. 45 participants were neutral about it and 21 participants lay on the agreeing side of the spectrum. On asking views on if 'going zero waste is impossible for companies' only 40 participants strongly disagreed with it. 126 of them disagreed with the myth and 79 of them were neutral. 62 participants agreed with the myth and 7 of them strongly agreed. The myth 'zero waste costs too much for companies' was strongly disagreed with by only 34 participants while 99 of them disagreed with it and 117 of them had a neutral standpoint. 54 and 10 participants agreed and strongly agreed respectively. 85 participants strongly disagreed with the fact that zero waste cannot be successful in India, 120 people disagreed with it while 66 of them were neutral about it. Only 32 and 11 people disagreed and strongly disagreed with it.

Table 2: Consumer Score for Green Building

Category	No. of Respondents for each score					Mean Score	S.D.
	1	2	3	4	5		
Cost	13	60	101	94	46	3.32	1.07
Sustainability	10	56	98	76	74	3.47	1.13
Building Aesthetic	6	37	103	59	109	3.73	1.12
Achievability	21	85	90	69	49	3.13	1.17

Source: *Data collected through online questionnaire*

Participants were asked to give their opinion on green buildings on 4 factors - the cost of buildings, sustainability of the buildings, building aesthetic value, and achievability of green buildings in India. The scale is 1-5, where 1 is the lowest and 5 is the highest. It can be observed that most respondents chose '3' for all factors giving showing that they are quite midway in their opinion, owing to not having enough knowledge about the eco-building scenario. From the mean score, it can be seen they all lay between scores 3 and 4.

When asked respondents if zero-waste would facilitate anti-consumerism, 149 out of 314 respondents could not draw a conclusion that tells us the amount of unawareness that exists among consumers. Coming to the principles of capitalist ideologies, consumers should be able to buy whatever they want at any point with their money. This agenda is condoned by zero waste. 51 out of 314 have agreed with this notion.114 participants have agreed that less is

always more, which is a driving force for zero-waste.

- **Inferential Analysis**

i) Chi-Square: Here, we are going to see if the gender of participants has any role to play in the attitude that facilitates zero-waste. For this purpose, an indirect question is used "Someone in your friend circle wants to cry no scrap cooking for a week and encourages everyone to join in. What do you do?". We are using a Chi-square test to judge if there is any relationship between gender and the interest of consumers in adopting a zero-waste way of life in India.

$H0_1$: "Gender does not affect consumers' willingness to adopt a zero-waste lifestyle".

$H1_1$: "Gender affects the willingness to adopt a zero-waste lifestyle of consumers".

Table 3: Chi-Square Analysis between Gender and Willingness to adopt Zero-Waste

Variable	Chi-square value	N	p-Value
Gender/Adaptiveness	22.8	314	0.004

Source: *Data collected through online questionnaire*

It can be seen that at a 5% level of significance level the p-value is **0.004** i.e., $p<0.05$, hence we accept the alternate hypothesis ($H0_1$) and reject the null hypothesis ($H1_1$) and draw the conclusion that **there is a significant association between gender and the willingness to adopt a zero-waste lifestyle.**

ii) Chi-square: Participants have been divided into two groups. Group 1 includes participants of ages 15-35 and Group 2 includes participants of ages 36-65. We want to judge if there is a relationship that exists between age and awareness of zero waste in the metropolitan cities of India.

$H0_2$: "Age does not affect awareness of zero-waste in metropolitan cities in India".

$H1_2$: "Age affects the awareness of zero-waste in metropolitan cities in India".

Table 4: Chi-Square Analysis between Age and Awareness of Zero-Waste

Variable	Chi-square value	N	p-Value
Age/Awareness	11.1	314	0.049

Source: *Data collected through online questionnaire*

It can be seen that at a 5% level of significance level the p-value is **0.049** i.e., $p<0.05$, hence we accept the alternate hypothesis ($H1_2$) and reject the null hypothesis ($H0_2$) and draw the conclusion that **there is a significant association between age of consumers and awareness in the metropolitan cities in India.**

iii) Independent Sample t-test: Participants have been divided into two groups. Group 1 includes participants ages 15-35 and Group 2 includes participants 36-65. We want to judge

if these two groups react differently if the government starts taxing households per bag of waste generated per day.

$H0_3$: Age does not affect the response of consumers to government-imposed taxes imposed to minimize waste generation in India.

$H1_3$: Age affects the response to government-imposed taxes imposed to minimize waste generation in India.

Table 5: Independent Sample t-test between Age and Response to Government Taxation

Variable	Student's t	df	p-Value	Mean Difference
Tax per Garbage Bag	-0.132	314	0.895	-0.0387

Source: *Data collected through online questionnaire*

It can be seen that at a 5% level of significance level the p-value is 0.895 i.e., $p>0.05$, hence we accept the null hypothesis and reject the alternate hypothesis. Hence it can be derived that **age does not affect the response to government-imposed taxes imposed to minimize waste generation in India.**

7. FINDINGS AND OBSERVATIONS

- Consumers have somewhat awareness of zero-waste. It is not as if like they have never heard of the concept on average but it is also not a total and complete awareness. Our analysis suggests that a select few people have a solid understanding of it.
- It is observed that awareness depends on the age of the consumers with youth being more aware which is quite an expected observation as the youth have access to social media platforms that provide them with news from around the world.
- Consumers agree that it is possible for a developing country like India to achieve zero waste. They have collectively disagreed to the myths of zero waste. They believe that products made from reusable materials are not inferior. Their view on organizational zero waste is on a positive side because they think that companies can go zero-waste and it is definitely not impossible.
- It is observed that the consumers in India do practice certain elements of zero-waste.
- Most consumers take their reusable shopping bags to supermarkets and grocery chains instead of getting a plastic or paper bag from the seller. Most of the subjects make a list of things and stick to it rather than ending up buying unnecessary products.
- It is clear from the analysis of the survey that consumers residing in metropolitan cities in India, especially Kolkata, have quite a positive approach towards the entire concept of zero-waste.
- In this study, both male and female consumers have shown significant interest

and positively accepted a change. This study reveals that gender definitely does affect the willingness to adopt zero-waste, suggesting an eco-gender gap, with females bearing the green burden.

- The results of this study show that no matter what age, consumers do not have any problem if the government imposes any tax burden on waste generation by households, which signifies that they care and understand the need for it.
- The study shows that consumers have an idea that the cost of green buildings is very high when in actuality it costs pretty much the same as conventional buildings. The sustainability of these buildings is very high in practice. The building aesthetic is at a maximum but consumers have two chains of thought here. One section believes that they lack visual appeal while the other believes they have high aesthetic features. Consumers do have a questionable opinion on the achievability of green buildings in India.

8. RECOMMENDATIONS

The analysis made in this paper can be used to make certain recommendations to adopt zero waste at the consumer and producer level better:

i) Government intervention is required as the majority of the population in India cannot get themselves aware of the entire waste management and zero waste scenario.

ii) The corporations and companies have to be held responsible. Waste has to be traced back to them, as the originator of waste lies in the production of 'stuff.' A 'pay as you throw' structure would definitely send zero waste to landfills.

iii) Companies should monitor product creation, product use, and product disposal. The waste audit technique of waste management can be used. Yes, it is definitely difficult for diverse companies to follow zero-waste but it is never impossible and any efforts made can be a start of it. Employees of companies can be engaged in waste diversion.

iv) The consumers have to be given data on the country's waste management. They need to be educated on the various alternatives that will help them reduce their carbon footprint and make their lives sustainable.

v) Government can take steps concerning revenue generation like- Taxing per bag of garbage over a certain income level or putting a tax on pollution for industries to minimize carbon emissions.

vi) Local organic stores can be given subsidies. Supermarkets and grocery stores should ban the use of plastics whatsoever and also permit to bringing in jars and containers for filling up products. Cafes should make policies to provide discounts to consumers who carry

their own mugs and reusable straws.

vii) Schools, Colleges, and other educational institutions could conduct seminars so that the younger generation can learn about the reasons, ways and effects of going zero waste which would help them break the generational chain of preposterous consumerism.

viii) Consumers groups shall be formed to raise awareness and conduct activities to socially benefit others in the community to learn the small ways that would help them have a sustainable life.

9. CONCLUSION

Waste management and waste disposal pose a major threat in the present times. The generation of garbage and its nonchalant disposal leads to innumerable environmental issues. "Considering the nature and components of waste generated by households and businesses, the application of waste minimization, reusing, recycling, and composting as management options should be integrated with a sustainable framework".

A holistic zero-waste strategy is needed to be developed, but under our current production, consumption, and waste management system, it is not feasible to divert 100% of waste from landfills. Businesses have a massive role to play here. It involves extended producer responsibility, which would give companies incentives to minimize packaging and make way for products to be more recyclable and durable. Zero-waste is projected to support the local circular economy and create green jobs. On societal grounds, zero waste helps to promote social equity and helps to bring in a sense of community. It has a twin oar that benefits both- the economy and the earth.

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Kolkata Bidhannagar Society for Academic Advancement

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