

A study on Food Waste and Consumer Behavior

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Abstract:

Food waste is a growing global concern influenced by various socio-economic and demographic factors. This study explores the relationship between household characteristics, grocery shopping habits, and food waste behaviors. The demographic profile reveals a predominantly female and student-heavy population, with most respondents living in nuclear families and having varied household sizes. A significant portion (55%) reported no monthly expenses, likely due to financial dependence among students. Consumer behavior indicates frequent grocery shopping, with 55% shopping multiple times a week and 65% purchasing fresh produce daily. While 62.5% have engaged in bulk buying, meal planning is inconsistent—only 32.5% always prepare a shopping list. Food waste patterns show that the most common reasons for disposal are leftovers not being consumed (27.5%), food expiration (25%), and food decomposition (20%). Despite high awareness of food waste's environmental impact (77.5%), 17.5% still discard leftovers, and only 5% compost food waste. Findings suggest that socio-economic status, purchasing behavior, and meal planning habits significantly impact food waste levels. Addressing food waste requires tailored interventions, such as consumer education, behavioral nudges, and policy-driven initiatives promoting food redistribution and waste reduction strategies.

Keywords: Food waste, Consumer behaviour, Socio-economic profile and demographic characteristics.

Introduction

Food waste is an increasingly pervasive issue that has garnered global attention due to its far-reaching implications for the environment, economy, and society. It is estimated that one-third of all food produced worldwide is wasted, amounting to roughly 1.3 billion tons annually (FAO, 2019). While food waste occurs throughout the entire food supply chain, from production and processing to distribution, the majority of waste happens at the consumer level, particularly in developed countries. Understanding the role of consumer behavior plays in food waste generation is critical to formulating effective strategies to reduce waste and promote sustainability.

Consumer behavior, defined as the decision-making process involved in the acquisition, consumption, and disposal of food, is a central factor in the food waste cycle. Various elements of consumer behavior, including purchasing habits, food storage practices, meal planning, and attitudes toward food waste, contribute significantly to the amount of food discarded at the household level. For instance, over-purchasing, misinterpretation of food labels, and poor meal

planning often result in food being thrown away, even when it remains perfectly edible (Quested et al., 2013). Moreover, consumer perceptions of food value and safety also influence waste patterns, as food that is perceived as less valuable or unappealing—such as leftovers or foods close to their expiration date—are more likely to be discarded (Graham-Rowe et al., 2014).

Several factors shape consumer behaviors related to food waste. These include psychological drivers, socio-economic influences, and cultural factors. On a psychological level, the concept of "planned obsolescence" in food, where consumers often over-purchase due to marketing strategies or perceived scarcity, leads to excessive food waste (Stancu et al., 2016). Economic factors such as income level and food affordability also influence food waste patterns. Research suggests that higher-income households tend to waste more food due to the perceived abundance of resources, whereas lower-income households often exhibit more careful purchasing and disposal practices to avoid waste (Parizeau et al., 2015). In terms of cultural influences, varying societal norms about food and waste shape attitudes toward food conservation. In some cultures, food waste is seen as a moral issue, while in others, it may be overlooked or normalized (Zhang et al., 2019).

Food waste is not only an ethical concern, but also an environmental and economic one. It has been shown that food waste contributes to approximately 8-10% of global greenhouse gas emissions (FAO, 2019), as food that is discarded ends up in landfills where it decomposes anaerobically, producing methane—a potent greenhouse gas. The economic costs associated with food waste are staggering, estimated at over \$1 trillion annually (FAO, 2019). This economic burden affects consumers, food producers, and waste management systems alike. Furthermore, food waste exacerbates issues of food insecurity, as large amounts of food could have been redirected to feed those in need (Gustavsson et al., 2011).

Reducing food waste at the consumer level has emerged as a key focus for policymakers and organizations aiming to address these pressing challenges. A variety of strategies have been proposed, including public education campaigns, behavioral interventions such as food waste reduction apps, and changes to food labeling practices (Meyer et al., 2017). These initiatives focus on changing consumer habits by providing information on food storage, improving portion control, and reducing confusion around expiration dates and used before date.

This paper examines the link between consumer behavior and food waste, focusing on the psychological, social, and economic factors that influence consumer decisions. It explores how these behaviors contribute to food waste and considers potential interventions aimed at promoting more sustainable consumption practices. By understanding the drivers behind consumer food waste, this research aims to offer insights into how individual behaviors can be altered to reduce waste and contribute to more sustainable food systems.

Methodology

The study looks at behavioral interventions and their effectiveness in changing consumer behavior toward food conservation. A nationwide survey was conducted to assess consumer awareness of food waste, purchasing habits, storage practices, and attitudes toward food conservation. The survey targeted a representative sample of households, capturing data across various demographic groups. The study will be based on both primary and secondary data. For secondary data the study will largely base on The Food Loss and Waste Database of FAO,

Food: Material-Specific Data from U.S. Environmental Protection Agency (EPA). Besides, data from Organization for Economic Co-operation and Development (OECD), World hunger Index of WHO and UNEP Food Waste Index Report will also be used. Data from Directorate of economics and statistics, Ministry of Agriculture, NITI Ayog, NSS 68th Round , NSSO Tables with Notes on Some Aspects of Agriculture in India, Tables with Notes on Consumer Expenditure, NSS Report no. 586 Health in India, Ministry of Tourism are major sources of information in India. The sample data will be collected through face-to-face surveys, via phone or skype, based on the convenience of the experts, and will be transcribed verbatim and translated to English where needed. In all 400 households and 20 hotels, restaurants and eateries in Delhi NCR will be considered for a comprehensive survey. The survey will be targeted at people of 18 years of age or older who have responsibility for what happens with food; either for cooking or shopping for food belonging to different income group as income level has been found to be strong variable of food waste behavior. Two different sets of questionnaires for Households and hotels will be executed. The household questionnaire will be divided into three parts. The first will cover the socio-demographic characteristics of consumers such as gender, age, education, number in the household and household income. The second part will ask for information on what percentage and what kind of food they wasted at household level. The third part includes questions about attitudes and behavior. The questionnaire included items on self-reported food waste behavior, the intention not to waste food and on shopping and planning behavior.

Results and Discussion

Socio-economic profile and demographic characteristics: The demographic and socio-economic profile provides insight into the characteristics of the surveyed population based on gender, household size, age distribution, occupation, and monthly expenses. In the present study, majority of respondents are female (67.5%), while males constitute 30% of the sample (Table 1). The study showed that most respondents live in nuclear families (20%). In terms of household size, 27.5% have less than two members, 20% have 2 to 4 members, and 25% have more than four members. On average, households consist of 3.65 adults and 1.025 children (below 18 years old), indicating a mix of working-age individuals and dependents. Majority of the respondents are post graduate (42.5%) followed by Doctorate (27.5%). The occupational detail reveals that students form the largest occupational group (45%), followed by the unemployed (20%), employed individuals (17.5%), self-employed individuals (10%), and retired individuals (7.5%). This suggests a significant proportion of the population is in the education sector, with a lower percentage in formal employment. The monthly income detail showed that a large percentage of respondents (55%) reported having no monthly expenses. Meanwhile, 7.5% spend between ₹10,000 to ₹25,000, 25% spend ₹25,000 to ₹50,000, and 12.5% spend more than ₹50,000. The absence of spending for over half of the population could indicate financial dependence, possibly due to the high student population.

The socio-economic and demographic finding highlights a predominantly female, student-heavy population with varied household sizes and income levels, impacting overall economic behavior and consumption patterns. Though available literatures highlights that food waste is influenced by various socio-economic and demographic factors, affecting both the quantity and

causes of waste. Higher-income households tend to waste more food due to increased purchasing power, preference for fresh food, and lack of concern about cost (Parfitt et al., 2010). In contrast, lower-income households waste less as they prioritize resource management and meal planning (Secondi et al., 2015). Moreover, education level also plays a key role. People with higher education may be more aware of food waste issues but still waste food due to busy lifestyles, bulk buying, and a preference for convenience foods (Principato et al., 2020). On the other hand, those with lower education levels might waste less due to traditional cooking habits and cost-conscious behavior. Demographic factors such as age and family structure also impact food waste. Younger individuals, especially students and working professionals, often waste food due to irregular eating habits and dining out (Hebrok & Boks, 2017). Larger families may waste food due to over-purchasing or improper storage, whereas older adults tend to be more resourceful. Urban areas typically generate more food waste than rural areas due to lifestyle differences and access to processed foods (Gustavsson et al., 2011). Addressing food waste requires targeted strategies considering these socio-economic and demographic factors to promote sustainable consumption habits.

Table 1: Socio-economic profile of the respondents

Parameters		Percentage
Gender	Female	67.5
	Male	30
Household Size	Nuclear family	20
	less than 2	27.5
	2vto 4	20
	>4	25
Age class*	No of adults	3.65
	No of children(below 18 yrs)	1.025
Education	Schooling	12.5
	Undergraduate	12.5
	Graduate	5
	Post graduate	42.5
	Doctorate	47.5
Occupation	Unemployed	20
	Employed	17.5
	Self employed	10
	Retired	7.5
	Student	45
Monthly expense*	None	55
	Less than 10,000	0
	10,000 to 25,000	7.5
	25,000 to 50,000	25
	More than 50,000	12.5

Note: * Age class is calculated as mean and Monthly expense in Rupees

Consumer and grocery shopping: The shopping behavior of respondents indicates frequent grocery shopping and a preference for fresh produce (Table 2). A majority (55%) shop multiple times a week, while 22.5% shop once a week. Monthly shopping is less common (20%), highlighting a tendency toward frequent purchasing rather than bulk buying. While 32.5% always make a shopping list, 30% do so often, and 22.5% occasionally. A small percentage (12.5%) rarely plan their purchases, and only 2.5% never use a shopping list, suggesting that most respondents engage in some level of meal planning. 62.5% have purchased food items in bulk, while 37.5% have not. This suggests that while many prefer fresh and frequent shopping, bulk buying is still a common practice. The majority (65%) purchase fresh produce daily, while 15% buy it twice a week. Weekly (12.5%) and fortnightly (7.5%) shopping for fresh food is less common, indicating a strong preference for fresh ingredients. Overall, respondents show a pattern of frequent shopping, with a mix of planned and spontaneous purchases, impacting food waste and consumption habits.

Table 2: Consumer responds for grocery shopping

Questions regarding grocery shopping	Responds (%)
1. How often you go for grocery shopping or online purchase?	
Once a week	22.5
Multiple times a week	55
Monthly	20
2. Do you make a shopping list before grocery shopping ?	
Always	32.5
Often	30
Occasionally	22.5
Rarely	12.5
Never	2.5
3. Have you ever purchased food items in bulk?	
Yes	62.5
No	37.5
4. How often you purchase fresh produce (milk, fruits, vegetables)?	
2times a week	15
Daily	65
Weekly	12.5
Fortnightly	7.5

Food wastage: The survey results reveal key insights into food waste habits, reasons for food disposal, and awareness of its environmental impact (Table3). The most common reasons for throwing away food include leftovers not being consumed (27.5%), expiration dates (25%), and food decomposition (20%). Cooking large quantities (17.5%) and poor taste (5%) also

contribute to waste, while overbuying and improper storage are less common (2.5% each). A majority (62.5%) estimate portion sizes while cooking, while 37.5% use scoops, which may contribute to food waste due to inaccurate portioning. Encouragingly, 40% of respondents donate leftover food, and 37.5% consume it later. However, 17.5% throw leftovers away, and only 5% compost them. The main contributors include meal leftovers (45%), expired products (22.5%), and stored leftovers that were later discarded (20%). Partly used food (10%) and completely unused items (2.5%) are less frequent. Most respondents (77.5%) are aware of the environmental impact of food waste, and 75% strongly agree that reducing waste is a personal responsibility. Encouragingly, 90% have taken steps to reduce food waste, showing a positive attitude towards sustainable food management.

Table 3: Consumer respond towards Food Wastage

Questions regarding food waste	Respond (%)
1. What is the main reason for throwing away food?	
Expiration date	25
Tastes bad	5
Food decomposed	20
Cooked large quantity	17.5
Overbuying	2.5
Leftover not consumed	27.5
Improper food stored	2.5
2. What is the measurement method you use while cooking your meal?	
Scoop method	37.5
Estimation method	62.5
3. What you usually do with the leftovers	0
Consume it later	37.5
Donate	40
Throw away	17.5
Compost	5
None	2.5
4. What do you think contributed most to food waste in your household?	
Rarely	0
Forgot to use it	0
Extra buying	0
Buying because its cheap	0
Portion size while cooking	2.5
Sometimes family doesn't like it	0
kids don't consume their portion	0
5. The product that you disposed of last week, in which category they fall into?	
Leftover after storing	20
Expired product	22.5
Meal leftover	45

Partly used food	10
Completely unused	2.5
6. Are you aware of the environmental impact of food waste?	
Yes	77.5
No	22.5
Do you believe that reducing food waste is a personal responsibility?	0
Strongly agree	75
Agree	22.5
Disagree	2.5
Have you ever taken steps to reduce food waste in your household?	0
Yes	90
No	10

The results suggest that while consumer awareness and motivation to reduce food waste are increasing, substantial barriers remain, particularly related to lack of knowledge and misconceptions about food safety. Economic factors also play a critical role, with wealthier households more likely to waste food due to overconsumption and less concern for financial consequences. Behavioral interventions, such as providing clearer food labels, offering tips on portion control, and using technology to track food expiration dates, could significantly reduce food waste. However, these interventions need to be tailored to different socio-economic groups to maximize their effectiveness. Public policies that support food redistribution, as well as incentives for businesses to reduce food waste, can also play a key role in minimizing food loss at the consumer level.

Food waste is a complex issue influenced by a range of psychological, socio-economic, and cultural factors. Consumer behavior is central to understanding why food is wasted and identifying strategies for reducing waste at the household level. By improving consumer awareness, providing behavioral nudges, and implementing targeted policies, it is possible to reduce food waste, benefiting both the environment and society. Future research should focus on identifying more personalized interventions that take into account the diverse factors influencing food waste in different demographic groups.

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