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Demographic Influences on Food Waste Reduction: A Review

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ABSTRACT

Food waste is a major global challenge, especially in regions where consumption habits create high levels of waste. This narrative review draws on international research to explore how demographic factors such as age, gender, education, income and household size affect consumer food waste reduction. Findings show that older adults and those with higher education are more likely to practise waste reduction, supported by stronger environmental awareness and better resource management. Gender effects vary across cultures such as some studies suggest women place more emphasis on minimising waste, though results are inconsistent. Wealthier and larger households tend to generate more waste, often due to bulk purchasing and fewer financial limits. Other factors, such as waste management systems and community initiatives, also shape consumer behaviour. The review identifies research gaps, particularly the need for long-term studies and broader cultural perspectives. It stresses the importance of tailored strategies that consider population diversity, storage limits and fast-paced lifestyles. These insights offer practical guidance for policymakers, planners and researchers seeking to encourage sustainable consumption and reduce food waste.

1. Introduction

Food waste is a serious issue for sustainability around the world, especially in high-populated area and high food usage [1]. About 25% of food that could be eaten is wasted annually, which hurts the environment, costs money and makes people less likely to have enough food [2]. People living in cities are affected by many social, economic and cultural factors that are important for causing and reducing food waste. Goal 12.3 of the Sustainable Development Plan is to cut food waste by half per person by 2030. To reach this goal, this review will provide information about what makes people across any setting reduce their food waste.

How people in cities reduce food waste depends significantly on age, gender, education level, income and family size [3, 4]. These factors might influence how easy it is to recycle or where people in the area like to eat, affecting how people act. For example, older people tend to be more thrifty

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and throw away less, while younger city dwellers may throw away more because of their busy lives [5]. Many reviews have looked at psychological or environmental factors, but not many have focused on how demographics affect people in cities [6]. That gap is filled by this narrative review, which brings together global studies to look at how demographic factors affect how consumers in different areas reduce food waste.

While numerous reviews have emphasized psychological or environmental determinants, fewer have examined how demographic characteristics drive food waste reduction. This review addresses that gap by providing a synthesis of international studies on the role of demographic factors.

2. Methodology

This narrative review uses a qualitative synthesis approach to examine how demographic characteristics influence food waste reduction. Search terms such as “food waste reduction,” “demographic influences,” “urban consumers” and “consumer behavior” were applied to scopus, web of science and google scholar. The review included peer-reviewed studies published between 2010 and 2025. Studies were included if they analyzed demographic variables such as age, gender, education, income or household composition in relation to consumer food waste. Geographical coverage included Europe, North America, Asia and the Middle East to ensure comparability and relevance across cultures. Findings from the selected studies were categorized by demographic factor to identify consistent trends, variations and research gaps.

3. Demographic Factors Influence Food Waste Reduction

This analysis demonstrates that demographic factors influence food waste reduction practices in urban or rural environments, shaped by cultural, economic and structural conditions. Demographic factors significantly shape food waste reduction practices among consumers, influenced by age, gender, education, income and household composition, as well as cultural, economic and structural conditions.

Age significantly influences food waste reduction. Older adults (50 and above) tend to waste less than younger individuals (18–35), primarily due to frugal habits and careful resource management. For instance, in Denmark, older households discard less food through practices like meal planning, while in Spain, a negative correlation exists between age and food waste generation [7]. Conversely, younger consumers, such as students in the UAE, generate more waste due to impulsive buying, limited cooking skills and time constraints [8]. These findings suggest that age-related behaviors vary by urban and rural context, with sustainability campaigns showing the potential to engage younger groups.

Gender impacts food waste reduction differently across cultures. In Western cities like London, males often produce more food waste due to lower involvement in cooking or meal preparation [9]. In contrast, in metropolitan China, females generate more waste, likely due to their primary responsibility for meal preparation [10]. These patterns highlight how traditional gender roles and lifestyles, such as time limitations for working women, shape waste behaviors, necessitating context-specific interventions. While several studies report that women prioritize waste minimization, results remain inconsistent across cultural settings.

Education is critical in fostering food waste reduction by enhancing environmental and economic awareness. In the European Union, higher education levels are associated with reduced food waste generation, as educated individuals adopt practices like composting and portion control [11].

However, the effectiveness of education is conditional on infrastructure. In regions with limited recycling facilities, educated consumers face barriers to sustainable practices [12].

Income influences food waste behaviors in complex ways. Lower-income households minimize waste through meticulous portioning to stretch budgets, whereas higher-income households often generate more waste due to reduced financial constraints. In Italy, individual income correlates with the frequency of household food waste generation [13]. However, when supported by food recovery networks such as food banks, high-income households may contribute to waste reduction through donation practices [14]

Household composition significantly affects food waste patterns. Larger households, particularly in Asian cities like China, waste more during festive occasions due to over-preparation [10]. In contrast, smaller households in Western cities, such as Canada, generate less total waste but more per capita due to bulk purchasing and irregular eating habits [14]. In Italy and Germany, smaller households consistently produce less waste than larger ones [15]. In the UAE, dual-income households with children face time constraints, relying on convenience foods that increase waste [8]. These variations highlight the need for tailored solutions, such as accessible composting programs.

Table 1
Demographic Influences on Food Waste Reduction

Demographic Factor	Influence on Food Waste Reduction	Study Areas
Age	Older adults (50+) waste less due to frugal habits; younger consumers (18–35) waste more due to impulsive buying and time constraints.	Denmark: Older households discard less food [7]. Spain: There's a negative correlation between age and the amount of food waste discarded [7]. UAE: Students waste more due to lifestyle [8].
Gender	Males waste more in Western cities than females in some Asian contexts due to traditional roles. In China, females represent a larger waste generation as they prepare meals.	London: Males waste more [9]. China: Females generate more waste [10].
Education	Higher education increases environmental awareness, fostering practices like composting.	EU: The education level of individuals influences food waste generation [11].
Income	Lower-income households minimize waste due to budget constraints; higher-income households waste more but may adopt practices with awareness.	Italy: Individual income correlates with the frequency of home waste generation [13].
Household Composition	Larger households waste more due to over-preparation; single-person households waste per capita due to bulk buying.	China: Larger households waste during festivities [10]. Italy & Germany: Smaller households typically generate less waste than larger households [15]. Canada: Single households waste more per capita [14].

Urban factors, including recycling infrastructure, food banks, cultural practices and lifestyle constraints, significantly moderate the influence of demographic characteristics on food waste reduction in settings, as summarized in Table 2.

Table 2
Urban Factors Moderating Demographic Influences

Urban Factors	Impact on Food Waste Reduction
Recycling Infrastructure	Limited facilities hinder waste reduction, even among educated consumers [16].
Food Banks	Support surplus food donations, particularly among high-income households [17]
Cultural Practices	Festive over-preparation increases waste in larger households (Srivastava et [18].
Lifestyle Constraints	Healthy lifestyles and the practice of dining at home contribute to the reduction of food waste [19].

4. Implications

Policymakers should design strategies sensitive to demographic variations. Educational campaigns targeting youth and financial incentives for low-income households can help address waste disparities. Infrastructure investment in recycling and composting systems is crucial to enable sustainable practices among consumers. Addressing demographically shaped waste patterns is essential for aligning local actions with global targets such as SDG 12.3.

5. Conclusion

This review demonstrates how demographic variables including age, gender, education, income and household composition influence consumer food waste reduction across cultural and geographic contexts. Older and more educated individuals consistently show stronger waste reduction practices, while gender, income and household composition influence waste patterns differently depending on context. Cultural and racial dynamics, together with region-specific challenges such as ineffective recycling systems and legacy practices, emphasize the need for inclusive and localized strategies.

Future research should focus on long-term and cross-cultural studies to better connect demographic influences with both urban and rural systems. Ultimately, incorporating demographic diversity into food waste strategies is crucial for advancing global sustainability objectives and achieving targets such as SDG 12.3.

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Conflict of Interest Statement
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Author Contributions Statement
Normala Ahmad conceptualized the study, directed the literature review and composed the introduction and conclusion sections. Noor Zubaidah Abdul Rahman performed the literature review,

examined demographic factors and contributed to the methods and results sections. Selvakkumar K N Vaiappuri reviewed the paper prior to the final template submission.

Data Availability Statement

All data analyzed in this study are derived from publicly available sources and are cited in the references of this published article. No primary data were generated during this research. Additional details or datasets used are available from the corresponding author upon reasonable request.

Ethics Statement

This study was conducted using secondary data from publicly available sources, including peer-reviewed literature, governmental reports, and international organization publications, in accordance with ethical research standards. No human or animal subjects were involved, and thus, no ethical approval or informed consent was required.

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