



Modelling Sustainable Food Consumption Behaviour: Evidence from Urban Consumers

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ABSTRACT

Background: Sustainable Consumption Behaviour (SCB) has emerged as a critical area of inquiry as nations strive to align development goals with ecological responsibility. This paper investigates the underlying behavioural mechanisms that drive SCB for food products among urban consumers in the Delhi National Capital Region (NCR), a rapidly developing metropolitan hub in India.

Methods: The study conceptualizes SCB through determinants ranging from environmental value orientations to contextual and economic considerations. A structured questionnaire was administered to 785 respondents and analysis was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) in SmartPLS 4. The methodological approach incorporated comprehensive reliability and validity checks, along with hierarchical model assessment.

Result: The findings highlight complex interrelationships among the determinants of SCB, underscoring how urban consumers integrate environmental concern with economic practicality when making food-related decisions. The study provides empirical insights valuable for policymakers and agri-food stakeholders aiming to strengthen sustainable consumption patterns and promote responsible food systems in India.

Key words: Behavioural intention, Economic factors, Environmental value, Food products, PLS-SEM, Sustainable consumption behaviour.

INTRODUCTION

Sustainable Consumption Behaviour (SCB) has become a crucial aspect of contemporary sustainability research, especially as nations aim to pursue economic development while safeguarding the environment. With food systems contributing nearly one-third of global greenhouse gas emissions and resource depletion, the concept of sustainable food consumption has gained significant relevance. The environmental consequences of agricultural production further intensify this concern. Bhanushankar *et al.* (2025) illustrated how excessive use of chemical fertilizers and pesticides adversely affects both environmental sustainability and human health. Such evidence strengthens the argument that consumer food choices are directly linked to agricultural practices and environmental outcomes, thereby reinforcing the urgency of promoting sustainable consumption behaviour for food products. Within the framework of the United Nations Sustainable Development Goals (SDG 12: Responsible Consumption and Production), understanding consumer behaviour in food choices is vital for achieving long-term ecological balance.

Growing urban populations and shifting consumption habits in countries such as India have increased pressure on the environment. Recent empirical evidence also highlights the importance of socio-demographic factors in shaping food-related sustainability choices. For instance, Belmejdoub *et al.* (2025) demonstrated that dietary habits and consumption preferences are significantly influenced by education level, income and regional characteristics.

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Such findings suggest that sustainable food consumption behaviour is not only value-driven but also embedded within broader socio-demographic contexts, which is particularly relevant in diverse metropolitan regions like Delhi National Capital Region (NCR). The Delhi NCR, as one of India's largest metropolitan areas, represents a microcosm of this tension between rising prosperity and ecological strain. Despite increasing awareness about sustainability, actual behavioural adoption remains low highlighting the attitude-behaviour gap (Blake, 1999; Kollmuss and Agyeman, 2002).

Models like Theory of Planned Behaviour (Ajzen, 1991) and Value-Belief-Norm model (Stern, 2000) have been widely used to study decisions like organic purchasing, waste reduction and preference for local produce (Vermeir and Verbeke, 2008; Dean *et al.*, 2008). Research on sustainability labels and food choices further shows that consumer motivation and understanding significantly shape the uptake of sustainable food products (Grunert *et al.*, 2014). Extending these models, recent research highlights

the role of contextual and economic factors such as affordability, accessibility and trust in certification systems in determining sustainable food choices (Rana and Paul, 2017; Khan *et al.*, 2022).

SCB for food products is shaped by multiple drivers like environmentally oriented attitudes, moral responsibility and perceived consumer effectiveness positively influence sustainable purchase intention (Steg and de Groot, 2010; Chen and Lee, 2022). Economic considerations also play a dual role: while affordability often limits sustainable consumption, perceived long-term benefits and quality can enhance willingness to pay (Padel and Foster, 2005; Nandi *et al.*, 2017; Ahmad *et al.*, 2023). Evidence from the Indian context also supports this argument, showing that economic feasibility and perceived value strongly influence sustainable consumption behaviour among urban consumers (Oberoi and Bhandari, 2024). Supporting this argument, Kanaan Ghaffoori *et al.* (2025) found that consumers are willing to pay a premium for safe and sustainably produced meat products when they perceive higher quality and health assurance. This indicates that economic willingness is closely tied to trust and perceived value, particularly in emerging markets. At the same time, excessive environmental knowledge may have paradoxical effects, leading to information overload or scepticism toward green claims (Mohiuddin *et al.*, 2018; Li and Liu, 2023).

Contextual and infrastructural variables further influence the gap between intention and behaviour (SPJIMR WISE Tech, 2025). Access to certified products, eco-labelling and government incentives can strengthen sustainable choices, while poor infrastructure and limited options deter action (Singh and Verma, 2017; Khan *et al.*, 2022). The Indian urban consumer often faces these constraints, leading to inconsistent sustainable purchasing patterns despite strong environmental awareness.

Building upon these insights, the present study investigates the determinants of Sustainable Consumption Behaviour for food products among urban consumers in the Delhi NCR. While earlier Indian studies have examined sustainable consumption, most of these studies focus on general green purchasing or organic food adoption and treat behavioural intention as a single outcome. An exploratory study conducted in the Delhi NCR region by Oberoi and Bhandari (2025) also highlighted the growing awareness of sustainability among urban consumers but emphasized inconsistencies between intention and actual behaviour. However, their exploratory design did not comprehensively model the structural interrelationships among environmental, economic and contextual determinants, thereby necessitating a more integrated empirical approach as undertaken in the present study. In contrast, the present study differs by explicitly modelling SCB for food products as a distinct outcome, while simultaneously integrating environmental, individual, economic and contextual determinants within a single

empirical framework. Further, this research captures their combined influence in an urban Indian setting, thereby offering a more comprehensive explanation of why sustainable intentions do not consistently translate into actual food-related behaviour.

The study follows the given research questions:

- RQ1:** What are the key psychological, economic and contextual factors influencing SCB for food products in the Delhi NCR?
- RQ2:** How do environmental values and individual responsibility shape consumers' attitudes and choices toward SCB for food products?
- RQ3:** To what extent do affordability and perceived value influence willingness to purchase sustainable food products?
- RQ4:** How does environmental knowledge affect consumers' intention toward sustainable food practices?
- RQ5:** How do infrastructural and contextual factors influence actual SCB for food products?
- RQ6:** What is the role of behavioural intention in linking values, knowledge and actual SCB for food products?
- RQ7:** How can these insights inform strategies for promoting sustainable consumption within urban food systems?

To fulfil the study's purpose and explore the research questions, the following objectives were outlined:

1. To identify and analyze the key factors that influences sustainable consumption behaviour for food products in the Delhi NCR.
2. To examine the influence of specific antecedents on consumer's behavioural intention to engage in sustainable consumption for food products.
3. To investigate the role of behavioural intention in the relationship between its significant antecedents and sustainable consumption behaviour for food products.

MATERIALS AND METHODS

This study adopted a quantitative research design to examine the determinants of Sustainable Consumption Behaviour for food products among urban consumers in the Delhi National Capital Region (NCR). The research work was carried out at the School of Social Sciences, CHRIST (Deemed to be University), Delhi NCR. Primary data were collected using a structured questionnaire administered to respondents residing in different parts of Delhi NCR. The experiment was conducted during the period March 2023-May 2025, representing the research period of the study.

A non-probability convenience sampling technique has been used for sample selection. This method is considered appropriate because the research sought responses from any individual who is a consumer and could provide meaningful opinions on sustainable behaviour. A total of 900 questionnaires were distributed through both online and offline modes. The offline responses were collected in public places such as educational institutions, residential communities and shopping complexes, while online forms were circulated via social media and email.

After eliminating incomplete responses, 785 valid questionnaires were retained for analysis, providing a sufficient sample size for structural equation modelling. The sample includes respondents from diverse age groups, educational levels and area of residence, reflecting the heterogeneity of Delhi NCR's urban population.

The study used a structured questionnaire for primary data, divided into two sections. The first section recorded respondent demographic details and the second part consisted of statements measuring the constructs of the study on a Likert scale rated on a 1-5 scale, where 1 meant strongly disagree and 5 meant strongly agree. Each construct was measured through multiple items adapted from literature mentioned below in Table 1. These scales were slightly modified to ensure relevance and clarity for Indian respondents.

The collected data is coded and analyzed using Excel and SmartPLS 4 software. The analysis was conducted in two stages:

1. Descriptive analysis-to understand the demographic profile and central tendencies of responses using pie charts.
2. Inferential and Structural Analysis-to test hypotheses and examine relationships among variables using Smart PLS model testing.

The statistical tools used include:

- Reliability testing through Cronbach's alpha.
- CR and AVE for assessing convergent validity.
- Fornell-Larcker Criterion for testing discriminant validity.
- PLS-SEM for testing the proposed model and hypotheses using path coefficients, t-statistics and p-values.

To test the explanatory strength of the constructs, the study examined model fit indices and R^2 values. The effect of behavioural intention was tested through bootstrapping techniques with 5,000 resamples, which provided confidence intervals and significance values for indirect relationships.

Ethical clearance for the study was obtained from the Research Conduct and Ethics Committee, Centre for Research, CHRIST (Deemed to be University), Bengaluru prior to data collection. Participation was voluntary and respondents were assured of anonymity and confidentiality. In addition, Common Method Bias (CMB) was assessed using VIF. All VIF values were below the maximum threshold of below 5 (for social science research), indicating that CMB was not a concern in the dataset.

RESULTS AND DISCUSSION

The collected data is analyzed using descriptive and inferential statistical techniques through SmartPLS 4 software. The analysis has been carried out in two main stages to assess the measurement and structural model in each stage. The model further explores how the variables influence behavioural intention, which further leads to changes in SCB.

The demographic analysis represented a wide range of age groups, educational backgrounds and income levels as described in Table 2. The gender distribution was balanced and the more than 50% of the respondents are aged between 18 to 25 years followed by 26 to 45 indicating a young and active consumer base. While educational levels in the table shows a dominance of graduates and postgraduates, suggesting a well-informed urban population, the income profile reveals that while a significant share of respondents belonged to middle-income households, the presence of both higher- and lower-income groups. This demographic profile reflects the diversity and heterogeneity of Delhi NCR, capturing perspectives from both developed and emerging sections of society.

Cronbach's alpha and composite reliability (CR) values for all variables were above the accepted threshold of 0.70, confirming reliability in Table 3. The AVE for each construct exceeded 0.50, establishing convergent validity. Discriminant validity was verified using the Fornell-Larcker criterion in Table 4, the results indicated that the scale items were statistically sound and appropriate for further model testing.

The structural model evaluated using PLS-SEM yielded an R^2 value of 0.879 for behavioural intention and 0.686 for sustainable consumption behaviour, revealing that the predictors collectively contribute to 87.9% of the variance in behavioural intention and it contributes to 68.6% of the variance in SCB. These values in Table 5 indicate a strong predictive power and high explanatory capability of the proposed model.

The analysis from Table 6 revealed that environmental value, economic factors, environmental sensitivity significantly affect behavioural intention positively ($p < 0.05$) with $\beta = 0.805$, $\beta = 0.326$ and $\beta = 0.081$ respectively, indicating that stronger pro-environmental values, perceived economic benefits and emotional concern for the environment each contribute to forming intentions to act sustainably, with environmental value being the most

Table 1: Literature of scale adoption.

Literature	Factors
Wang <i>et al.</i> (2014), Journal of Cleaner Production	Environmental value, Environmental responsibility, Environmental sensitivity, Response efficacy, Perceived behavioral control, Perception of consequence, Contextual factors (divided into economic factors), Behavioral Intention
Mohiuddin <i>et al.</i> (2018), Sustainability	Environmental knowledge

Source: Author.

influential driver. Environmental knowledge ($\beta = -0.16$, $p < 0.05$) and perceived behavioural control ($\beta = -0.048$, $p < 0.05$) significantly negatively influences behavioural intention suggesting that greater knowledge of environmental

concerns and consequences and higher perceived ability to act may also heighten perceptions of barriers, complexity, or scepticism, thereby reducing consumers' confidence or motivation to engage in sustainable food practices.

Table 2: Demographic profile of the respondents.

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	408	52
	Female	377	48
Age group (years)	18-25	369	47
	26-45	322	41
	46-60	94	12
Educational qualification	Upper elementary	8	<1
	Secondary		<1
	Senior secondary	71	9
	Higher education	706	90
Household income (INR)	0-2L.5L	260	33
	2.5L-5L	110	14
	5L-7.5L	110	14
	7.5L-10L	103	13
	Above 10L	202	26

Source: Author.

Table 3: Table of construct reliability and validity.

Variables	Cronbach's alpha (>0.7)	Composite reliability (rho a) (>0.7)	Composite reliability (rho c) (>0.7)	Average variance extracted (AVE) (>0.5)
Behavioral intention	0.809	0.815	0.888	0.725
Contextual factors	0.914	0.918	0.936	0.747
Economic factors	0.908	0.911	0.927	0.646
Environmental value	0.930	0.938	0.939	0.564
Environmental knowledge	0.880	0.881	0.913	0.679
Environmental sensitivity	0.921	0.922	0.962	0.927
Perceived behavioral control	0.894	0.896	0.919	0.653
Sustainable consumption behaviour	0.959	0.961	0.963	0.519

Source: Author.

Table 4: Table of discriminant validity.

Variables	BI	CF	EF	EV	EK	ER	ES	PBC	RE	SCB
Behavioral intention	0.852									
Contextual factors	0.739	0.864								
Economic factors	0.800	0.616	0.804							
Environmental value	0.632	0.706	0.716	0.751						
Environmental knowledge	0.811	0.814	0.766	0.750	0.824					
Environmental responsibility	0.685	0.640	0.701	0.724	0.695	1.000				
Environmental sensitivity	0.700	0.622	0.703	0.718	0.682	0.838	0.963			
Perceived behavioral control	0.633	0.635	0.717	0.688	0.696	0.574	0.625	0.808		
Response efficacy	0.580	0.569	0.623	0.606	0.617	0.536	0.596	0.637	1.000	
Sustainable consumption behaviour	0.708	0.809	0.673	0.623	0.678	0.678	0.688	0.635	0.704	0.721

Source: Author.

BI = Behavioural intention; CF = Contextual factors; EF = Economic factors; EV = Environmental value; EK = Environmental knowledge; ER = Environmental responsibility; ES = Environmental sensitivity; PBC = Perceived behavioural Control; RE = Response efficacy; SCB = Sustainable consumption behaviour.

Table 5: Table of goodness of fit.

Variables	R-square	R-square adjusted
Behavioral intention	0.879	0.878
Sustainable consumption behaviour	0.686	0.685

Source: Author.

Table 6: Table of hypothesis testing.

Hypotheses testing (Direct effect)	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Behavioral intention -> Sustainable consumption behaviour	0.828	0.828	0.011	74.741	0.000
Contextual factors -> Behavioral intention	-0.034	-0.033	0.030	1.141	0.254
Economic factors -> Behavioral intention	0.326	0.325	0.058	5.659	0.000
Environmental value -> Behavioral intention	0.805	0.806	0.034	23.467	0.000
Environmental knowledge -> Behavioral intention	-0.160	-0.161	0.055	2.925	0.003
Environmental responsibility -> Behavioral intention	-0.031	-0.031	0.031	1.025	0.305
Environmental sensitivity -> Behavioral intention	0.081	0.080	0.026	3.109	0.002
Perceived behavioral control -> Behavioral intention	-0.048	-0.048	0.024	2.012	0.044
Perception of consequence -> Behavioral intention	-0.031	-0.032	0.021	1.511	0.131
Response efficacy -> Behavioral intention	0.022	0.022	0.020	1.103	0.270

Source: Author.

The findings suggests that behavioural intention is not significantly influenced by contextual factors, environmental responsibility, perception of consequence and response efficacy ($p > 0.05$) suggesting that consumers in Delhi NCR face real-world constraints, low access to options that are sustainable and a tendency to view sustainability as a collective rather than personal duty, while also doubting the impact of individual actions which is further affected by methodological limitation of single-item measures used for these constructs.

The analysis of role of behavioural intention as a pathway through which independent variables influenced sustainable consumption behaviour indicated that BI ($\beta = 0.828$, $p < 0.05$) significantly mediated the relationships between the predicting factors and SCB.

The results reinforce the premise that sustainable consumption is a multifaceted behaviour shaped by both internal and external influences. The analysis confirms that SCB in Delhi NCR is determined by the interplay of environmental, individual, economic and contextual variables. Behavioural intention emerged as a central mediator linking values, emotions and practical considerations to actual behaviour.

CONCLUSION

The study examined the determinants of Sustainable Consumption Behaviour (SCB) for food products among urban consumers in the Delhi NCR. The findings show that environmental value, environmental sensitivity and economic factors significantly influence behavioural intention, with environmental value emerging as the strongest predictor. This indicates that ethical concern and

emotional connection to environmental issues play an important role in shaping sustainable food choices. At the same time, environmental knowledge and perceived behavioural control demonstrated negative relationships with intention, suggesting that awareness alone does not automatically lead to action. Consumers may recognise environmental concerns but still face practical barriers such as cost, availability and trust in certification systems. Behavioural intention was found to strongly predict actual sustainable consumption behaviour, reaffirming its central role in translating attitudes into action. The findings also indicate that contextual factors, environmental responsibility, perception of consequence and response efficacy did not show a significant direct influence on sustainable consumption behaviour, suggesting that structural constraints and limited personal efficacy may reduce the impact of these variables in the urban Indian context. The results highlight that sustainable food decisions are influenced by a balance between moral motivation and economic practicality.

Overall, the study suggests that strengthening certification credibility, improving product accessibility and enhancing affordability can support wider adoption of sustainable food consumption. Encouraging responsible food choices at the urban level can contribute meaningfully to long-term environmental sustainability and the resilience of India's agri-food system.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. All authors have read and approved the final version of the manuscript.

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