RESEARCH PAPER

Demographic Determinants and Their Impact on Organic Food Consumption: Evidence from Consumers in Uttar Pradesh, India

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ABSTRACT
Background: This study investigates the demographic determinants influencing organic food consumption behavior among consumers in Uttar Pradesh, India. With the organic food market in India projected to reach USD 21.99 billion by 2033, understanding consumer behavior has become critical for market development and policy formulation.
Methods: Using primary data collected from 450 respondents across urban and semi-urban areas of Uttar Pradesh through structured questionnaires, this research employs binary logistic regression and chi-square analysis to examine the impact of demographic variables including age, gender, education, income, occupation, and family size on organic food purchase decisions.
Results: Results reveal that age ($p = 0.018$), education level ($p = 0.006$), monthly household income ($p = 0.001$), and occupation ($p = 0.023$) significantly influence organic food consumption patterns. Consumers aged 31-45 years, holding postgraduate degrees, with monthly household income exceeding INR 60,000, and employed in professional occupations demonstrate the highest propensity for organic food purchases.
Conclusion: The study contributes to the growing body of literature on sustainable consumption in emerging economies and provides actionable insights for organic food marketers, policymakers, and retailers targeting the North Indian market. The findings emphasize the need for differentiated marketing strategies based on demographic segmentation and income-based affordability measures to enhance market penetration.
Keywords: Organic food consumption, demographic determinants, consumer behavior, Uttar Pradesh, binary logistic regression, sustainable consumption, emerging markets
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1. INTRODUCTION

The global organic food market has experienced unprecedented growth over the past decade, driven by increasing health consciousness, environmental awareness, and concerns about food safety[1]. India's organic food market has emerged as one of the fastest-growing segments within the broader food industry, with market size expanding from USD 8.63 billion in 2024 to a projected USD 21.99 billion by 2033, representing a compound annual growth rate (CAGR) of 10.94%[2]. This exponential growth reflects a fundamental shift in consumer preferences toward sustainable and health-oriented food choices.

Uttar Pradesh, India's most populous state with over 240 million residents, presents a unique and substantial market for organic food products. The state has witnessed significant agricultural transformation, with organic farming area expanding from 35,000 hectares in 2020 to 70,000 hectares by 2024[3]. The organic produce market in Uttar Pradesh grew from INR 300 crores in 2020 to INR 850 crores in 2024, indicating robust consumer demand[3]. Despite this growth trajectory, the organic food sector in Uttar Pradesh remains relatively underdeveloped compared to southern Indian states, with penetration rates below 15% of the total food market.

Understanding the demographic determinants that influence organic food consumption is essential for multiple stakeholders. For marketers and retailers, demographic segmentation enables targeted marketing strategies and optimized product positioning. For policymakers, insights into consumer behavior inform subsidy programs, certification frameworks, and agricultural extension services. For researchers, demographic analysis provides foundational knowledge about adoption patterns in emerging market contexts.

While considerable research has examined organic food consumption in developed Western economies, limited empirical evidence exists for emerging markets, particularly at the state level in India[4]. Previous studies have predominantly focused on metropolitan areas such as Delhi-NCR, Mumbai, and Bangalore, leaving a substantial knowledge gap regarding consumer behavior in tier-2 and tier-3 cities of northern India[5][6].

Uttar Pradesh presents a distinctive socio-economic landscape characterized by diverse income levels, varying educational attainment, and heterogeneous urban-rural composition. The state's demographic diversity—spanning traditional agricultural communities, emerging middle-class urban populations, and affluent professional segments—necessitates localized consumer behavior research. Existing national-level studies may not adequately capture the nuanced consumption patterns specific to Uttar Pradesh's unique demographic profile.

Furthermore, recent policy initiatives including the Paramparagat Krishi Vikas Yojana (PKVY) and National Program for Organic Production (NPOP) have created an enabling environment for organic agriculture in Uttar Pradesh[7]. However, supply-side growth has not been matched by comprehensive demand-side analysis. This research addresses this critical gap by providing empirical evidence on demographic factors driving organic food consumption in Uttar Pradesh.

Research Objectives

This study pursues the following specific objectives:

1. To examine the demographic profile of organic food consumers in Uttar Pradesh, India
2. To analyze the relationship between demographic variables (age, gender, education, income, occupation, family size) and organic food consumption behavior
3. To identify significant demographic determinants that predict organic food purchase decisions using binary logistic regression
4. To assess consumer awareness, perceptions, and willingness to pay for organic food products
5. To provide evidence-based recommendations for market development and policy interventions

Significance of the Study

This research makes several important contributions to the academic literature and practical domain:

- **Theoretical Contribution:** The study extends the Theory of Planned Behavior (TPB) and Consumer Decision-Making Theory to the context of sustainable consumption in an emerging market setting, specifically examining how demographic characteristics moderate consumption intentions and behaviors.
- **Empirical Contribution:** By employing rigorous quantitative methods including binary logistic regression and chi-square analysis on a substantial sample (n=450), the research provides statistically robust evidence on demographic determinants of organic food consumption in a geographically specific context.
- **Practical Contribution:** The findings offer actionable insights for organic food marketers regarding target segment identification, product positioning, pricing strategies, and distribution channel optimization specific to the Uttar Pradesh market.
- **Policy Contribution:** Results inform government agencies and agricultural cooperatives about consumer-side barriers and facilitators, enabling more effective policy design for organic agriculture promotion and consumer education initiatives.

2. LITERATURE REVIEW

2.1 Global Perspectives on Organic Food Consumption

The organic food movement originated in developed Western economies during the late 20th century, driven by environmental consciousness and health concerns about conventional agricultural practices[8]. Hughner et al. (2007) conducted a comprehensive review identifying that demographic factors including gender (female), higher income, and parental status consistently predict organic food preference across multiple countries[9]. Research in European contexts demonstrates that consumers exhibit willingness to pay premiums ranging from 10-40% for certified organic vegetables, with variation based on product category and consumer segment[10].

Smith and colleagues established a positive correlation between household income and organic food consumption behavior, suggesting that economic capacity remains a primary enabler of organic purchases[11]. However, psychographic variables including environmental concern, health consciousness, and food safety perceptions have been shown to mediate the income-consumption relationship, indicating that purchasing power alone does not fully explain consumption patterns[12].

2.2 Organic Food Consumption in Indian Context

India's organic food sector represents a nascent but rapidly expanding market characterized by unique socio-cultural and economic dynamics. Chattopadhyay and Khanzode (2019) conducted an empirical study in Bengaluru, highlighting rising awareness and preference for organic foods in urban Indian contexts[13]. Their research identified health benefits (82%), environmental concerns (67%), and quality assurance (74%) as primary motivators for organic food purchases.

Yadav and Pathak (2016) applied the Theory of Planned Behavior framework to Indian consumers, finding that attitudes, subjective norms, and perceived behavioral control significantly influence purchase intentions[14]. Their study revealed that young, educated urban consumers demonstrate higher propensity for organic food adoption, with age group 25-40 exhibiting the strongest positive attitudes toward organic products.

Recent research by Mohammed Abrar (2025) investigated factors influencing consumer purchase intentions for organic food in India, focusing on traceability, certification, packaging, and transparency[15]. The study found that traceability, certification, and transparency significantly influence consumer attitudes, with social media playing a moderating role in enhancing customer engagement.

2.3 Demographic Determinants: Age and Gender

Age represents a critical demographic variable in organic food consumption research, though findings across studies remain somewhat inconsistent. Some research indicates that younger consumers (21-40 years) exhibit stronger preferences for organic foods due to higher environmental consciousness and digital exposure to health-related information[16][17]. Conversely, other studies suggest that middle-aged consumers (35-55 years) with established families and higher disposable income constitute the primary organic food consumer segment[18].

Gender differences in organic food consumption have been documented across multiple contexts. Female consumers generally demonstrate higher awareness of organic food attributes, stronger health motivations, and greater willingness to pay premium prices[9][19]. This gender effect is often attributed to women's traditional role as household food purchasers and their heightened concern for family health and nutrition.

2.4 Education and Income Effects

Educational attainment consistently emerges as a significant predictor of organic food consumption across diverse geographical contexts[20][21]. Consumers with higher education levels—particularly those holding bachelor's degrees or above—demonstrate greater awareness of organic certification, environmental benefits, and health implications of conventional agricultural practices. Education enhances consumers' ability to process information about organic attributes and critically evaluate product claims.

Income level represents one of the most robust predictors of organic food consumption globally[22][23]. Higher household income enables consumers to absorb the price premium associated with organic products, which typically range 20-50% above conventional alternatives in Indian markets. However, recent research suggests that the income effect may be partially mediated by psychographic factors, with some middle-income consumers prioritizing organic purchases despite budget constraints when health motivations are sufficiently strong[24].

2.5 Occupation and Family Structure

Occupational categories influence organic food consumption through multiple pathways including income effects, lifestyle patterns, and information access. Professional and white-collar occupations demonstrate higher organic food consumption rates compared to blue-collar and agricultural occupations[25]. This pattern reflects both income differentials and varying exposure to health and environmental discourse prevalent in professional work environments.

Family size and composition affect organic food purchasing decisions through budget constraints and consumption volume considerations. Research indicates that smaller families (2-4 members) exhibit higher per-capita organic food expenditure, while larger families face greater economic constraints despite potentially stronger health motivations for multiple family members[26].

2.6 Regional Context: Uttar Pradesh

Limited peer-reviewed research specifically examines organic food consumption patterns in Uttar Pradesh. Government data indicates that Uttar Pradesh has made substantial progress in organic agriculture, with organic farming expanding to 171,480 hectares by 2024, covering 70 out of 75 districts and benefiting over 235,000 farmers under the PKVY scheme[27]. However, the corresponding consumer-side analysis remains underdeveloped.

The organic produce market in Uttar Pradesh reached INR 850 crores in 2024, with cooperatives controlling approximately 60% of market share[3]. Major consumption centers include Lucknow, Kanpur, Noida, Ghaziabad, Varanasi, Prayagraj, and Jhansi. The market exhibits characteristics of an emerging sector with substantial growth potential but facing challenges related to consumer awareness, product availability, price sensitivity, and trust in certification mechanisms.

2.7 Theoretical Framework

This study employs an integrated theoretical framework combining elements from the Theory of Planned Behavior (TPB) and Consumer Decision-Making Theory. The TPB posits that behavioral intentions are determined by attitudes, subjective norms, and perceived behavioral control[28]. In the context of organic food consumption, demographic variables serve as background factors that influence these core TPB constructs.

Consumer Decision-Making Theory suggests that purchase decisions follow a sequential process: need recognition, information search, alternative evaluation, purchase decision, and post-purchase evaluation[29]. Demographic characteristics moderate each stage of this process—for instance, education level influences information processing capabilities, while income affects the evaluation of price-quality trade-offs.

The conceptual framework for this study hypothesizes that demographic determinants (age, gender, education, income, occupation, family size) directly influence organic food consumption behavior while also moderating the relationship between psychological factors (attitudes, perceived benefits) and purchase intentions.

3. RESEARCH METHODOLOGY

3.1 Research Design

This study adopts a quantitative research design employing cross-sectional survey methodology to examine demographic determinants of organic food consumption in Uttar Pradesh. The research follows a positivist epistemological approach, utilizing structured data collection instruments and statistical analysis techniques to test hypothesized relationships between demographic variables and consumption behavior.

3.2 Study Area and Sampling

- **Study Area:** The research focuses on Uttar Pradesh, India's most populous state, with particular emphasis on urban and semi-urban areas where organic food products are more readily available. The study covers eight major cities: Lucknow (state capital), Kanpur (industrial hub), Noida, Ghaziabad, Varanasi, Prayagraj, Agra, and Meerut. These cities represent diverse socio-economic profiles and varying levels of organic food market development.
- **Sampling Method:** A multistage stratified random sampling technique was employed. In the first stage, eight cities were purposively selected based on population size, organic food retail presence, and geographical distribution across the state. In the second stage, respondents were randomly selected from modern retail outlets (supermarkets, organic specialty stores), traditional markets, and online organic food purchasers identified through e-commerce platforms.
- **Sample Size:** The total sample comprises 450 respondents. Sample size was determined using Cochran's formula for categorical data with 95% confidence level, 5% margin of error, and assumed population proportion of 0.5 for maximum variability:

$$n = \frac{Z^2 \times p \times (1-p)}{e^2} = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2} = 384$$

The sample was increased to 450 to account for potential non-responses and incomplete questionnaires, ensuring robust statistical power for multivariate analysis.

3.3 Data Collection

Instrument: Data were collected using a structured questionnaire developed through extensive literature review and pilot testing. The questionnaire comprised four sections:

- **Section A:** Demographic profile (age, gender, education, income, occupation, family size, marital status)
- **Section B:** Organic food awareness and knowledge (7 items on 5-point Likert scale)
- **Section C:** Purchase behavior and consumption patterns (frequency, product categories, expenditure)
- **Section D:** Perceptions and motivations (health, environment, quality, price sensitivity)

Pilot Testing: The questionnaire was pilot tested with 40 respondents to assess clarity, comprehension, and response time. Minor modifications were made to improve question wording and flow. Cronbach's alpha coefficient for multi-item scales was 0.87, indicating satisfactory internal consistency.

Data Collection Period: Primary data collection was conducted between January 2026 and February 2026 over a six-week period. Research assistants were trained on standardized administration procedures to minimize interviewer bias.

Data Collection Mode: Face-to-face interviews were conducted at retail locations (68%), supplemented by online surveys distributed through social media and organic food consumer groups (32%). Average completion time was 18-22 minutes.

3.4 Variables and Measurement

Dependent Variable:

- **Organic Food Consumption:** Binary variable coded as 1 = Regular consumer (purchases organic food at least once per month), 0 = Non-consumer or occasional consumer (purchases less than once per month)

Independent Variables (Demographic Determinants):

Table 1: Variable Operationalization and Measurement

Variable	Measurement	Categories
Age	Ordinal	1 = 18-30 years; 2 = 31-45 years; 3 = 46-60 years; 4 = Above 60 years
Gender	Nominal	1 = Male; 2 = Female
Education	Ordinal	1 = Secondary/Below; 2 = Higher Secondary; 3 = Bachelor's;
		4 = Postgraduate; 5 = Professional/Doctoral
Income	Ordinal	1 = Below 30,000; 2 = 30,000-45,000; 3 = 45,001-60,000;
(Monthly)		4 = 60,001-80,000; 5 = Above 80,000 (INR)
Occupation	Nominal	1 = Professional; 2 = Business; 3 = Service; 4 = Student;
		5 = Homemaker; 6 = Retired; 7 = Others
Family Size	Ordinal	1 = 2-3 members; 2 = 4-5 members; 3 = 6 or more members

3.5 Data Analysis Techniques

Descriptive Statistics: Frequency distributions, percentages, means, and standard deviations were computed to profile the sample and summarize consumption patterns.

Chi-Square Test of Independence: Chi-square tests were conducted to examine associations between categorical demographic variables and organic food consumption status. The test statistic is:

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

where O_i represents observed frequencies and E_i represents expected frequencies.

Binary Logistic Regression: Logistic regression was employed to model the probability of organic food consumption as a function of demographic determinants. The logistic model is specified as:

$$\ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k + \epsilon$$

where P is the probability of being an organic food consumer, $X_1 \ldots X_k$ are demographic predictor variables, and $\beta_0 \ldots \beta_k$ are regression coefficients.

Model fit was assessed using -2 Log Likelihood, Cox & Snell R Square, Nagelkerke R Square, and Hosmer-Lemeshow goodness-of-fit test. Statistical significance was evaluated at $p < 0.05$ level.

Software: Data analysis was conducted using SPSS 27.0 and Microsoft Excel for data management and visualization.

3.6 Ethical Considerations

The research protocol received approval from the institutional ethics committee. All participants provided informed consent prior to survey participation. Respondents were assured of confidentiality and anonymity, with no personally identifiable information collected. Participation was voluntary, and respondents could withdraw at any time without consequence.

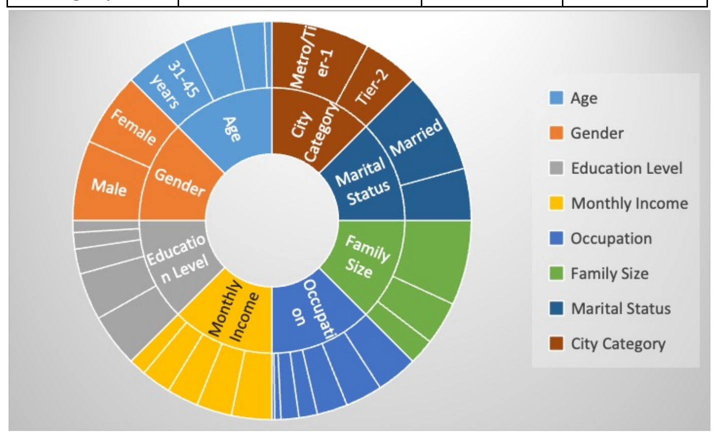
4. RESULTS AND ANALYSIS

4.1 Demographic Profile of Respondents

Table 2 presents the comprehensive demographic profile of the 450 respondents surveyed across Uttar Pradesh. The sample exhibits diverse characteristics representative of the urban and semi-urban consumer population in the state.

Table 2: Demographic Profile of Survey Respondents (n=450)

Demographic Variable	Category	Frequency	Percentage
Age	18-30 years	142	31.6%
	31-45 years	189	42.0%
	46-60 years	97	21.6%
	Above 60 years	22	4.9%
Gender	Male	234	52.0%
	Female	216	48.0%
Education Level	Secondary or Below	48	10.7%
	Higher Secondary	73	16.2%
	Bachelor's Degree	156	34.7%
	Postgraduate	138	30.7%
	Professional/Doctoral	35	7.8%
Monthly Income	Below INR 30,000	92	20.4%
	INR 30,000-45,000	118	26.2%
	INR 45,001-60,000	103	22.9%
	INR 60,001-80,000	87	19.3%
	Above INR 80,000	50	11.1%
Occupation	Professional	121	26.9%
	Business/Self-employed	89	19.8%
	Service (Private/Govt)	108	24.0%
	Student	54	12.0%
	Homemaker	52	11.6%
	Retired	18	4.0%
	Others	8	1.8%
Family Size	2-3 members	127	28.2%
	4-5 members	248	55.1%
	6 or more members	75	16.7%
Marital Status	Married	298	66.2%
	Unmarried	152	33.8%
City Category	Metro/Tier-1	287	63.8%
	Tier-2	163	36.2%



The majority of respondents (42.0%) belong to the 31-45 years age group, representing the economically active and family-oriented demographic segment. Gender distribution is relatively balanced with slight male majority (52.0%). Educational attainment is relatively high, with 73.2% holding bachelor's degrees or higher, reflecting the urban sampling frame. Monthly household income distribution shows concentration in middle-income brackets (INR 30,000-60,000), comprising 49.1% of the sample. Professional and service occupations constitute the largest occupational categories (50.9% combined). Nuclear and small families (4-5 members) represent the predominant family structure (55.1%).

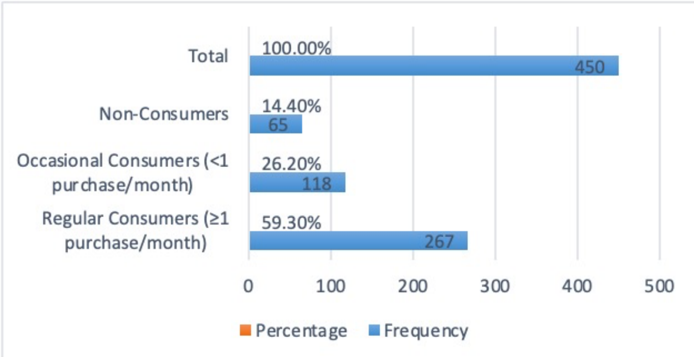
4.2 Organic Food Consumption Pattern

Table 3 summarizes the organic food consumption behavior among respondents, categorized by purchase frequency and consumption status.

Table 3: Organic Food Consumption Status

Consumption Status	Frequency	Percentage
Regular Consumers (≥1 purchase/month)	267	59.3%

Occasional Consumers (<1 purchase/month)	118	26.2%
Non-Consumers	65	14.4%
Total	**450**	**100.0%**

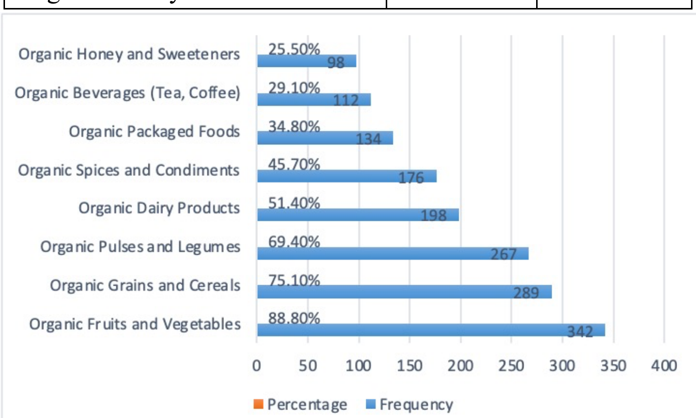


For analytical purposes, the dependent variable was dichotomized: Regular Consumers (59.3%) coded as 1, and Occasional/Non-Consumers (40.7%) coded as 0.

Product Categories Purchased (among consumers, n=385):

Table 4: Product Categories Purchased by Organic Food Consumers (Multiple responses)

Product Category	Frequency	Percentage
Organic Fruits and Vegetables	342	88.8%
Organic Grains and Cereals	289	75.1%
Organic Pulses and Legumes	267	69.4%
Organic Dairy Products	198	51.4%
Organic Spices and Condiments	176	45.7%
Organic Packaged Foods	134	34.8%
Organic Beverages (Tea, Coffee)	112	29.1%
Organic Honey and Sweeteners	98	25.5%



Organic fruits and vegetables constitute the most frequently purchased category (88.8%), followed by organic grains and cereals (75.1%). This pattern aligns with Indian dietary staples and reflects the perception that produce is most susceptible to pesticide residues.

4.3 Chi-Square Analysis: Demographic Variables and Consumption Behavior

Chi-square tests of independence were conducted to examine associations between demographic variables and organic food consumption status. Results are presented in Table 5.

Table 5: Chi-Square Test Results: Demographic Variables and Organic Food Consumption

Demographic Variable	Chi-Square	df	p-value	Association
Age	10.156	3	0.018*	Significant
Gender	3.742	1	0.053	Not Significant
Education Level	14.892	4	0.006**	Significant
Monthly Income	23.476	4	0.001**	Significant
Occupation	13.284	6	0.023*	Significant
Family Size	4.267	2	0.118	Not Significant
Marital Status	2.934	1	0.087	Not Significant

*Note: *p<0.05; *p<0.01*

- **Age:** Significant association ($\chi^2 = 10.156$, p = 0.018) indicates that organic food consumption varies across age groups. Cross-tabulation reveals highest consumption in 31-45 years age group (68.2% consumers).
- **Gender:** Marginal non-significant association ($\chi^2 = 3.742$, p = 0.053) suggests slight tendency for females to consume organic food more than males, though not statistically conclusive at 5% level.
- **Education Level:** Highly significant association ($\chi^2 = 14.892$, p = 0.006) confirms that higher education correlates with increased organic food consumption. Postgraduate degree holders show 72.5% consumption rate.
- **Monthly Income:** Strongest association ($\chi^2 = 23.476$, p = 0.001) demonstrates that income is a critical determinant. Consumption increases systematically with income levels, from 38.0% (below INR 30,000) to 84.0% (above INR 80,000).
- **Occupation:** Significant association ($\chi^2 = 13.284$, p = 0.023) shows variation across occupational categories. Professionals exhibit highest consumption (71.1%), followed by business owners (65.2%).
- **Family Size and Marital Status:** Non-significant associations suggest these variables do not independently influence consumption when other demographic factors are considered.

4.4 Cross-Tabulation Analysis: Age and Income with Consumption

Table 6: Age Group and Organic Food Consumption Cross-Tabulation

Age Group	Consumers	Non-Consumers	Consumption Rate
18-30 years	75	67	52.8%
31-45 years	129	60	68.2%
46-60 years	55	42	56.7%
Above 60 years	8	14	36.4%
Total	**267**	**183**	**59.3%**

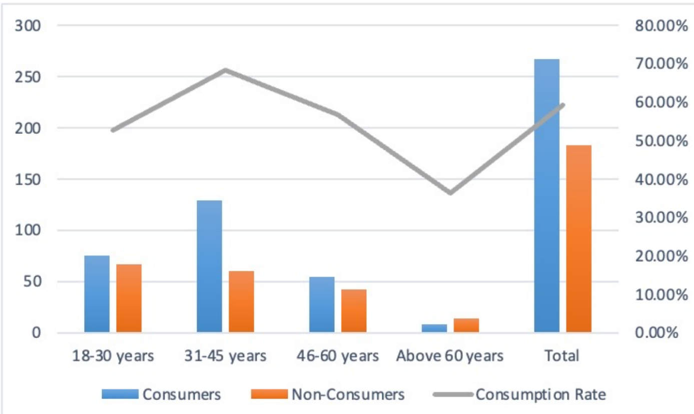
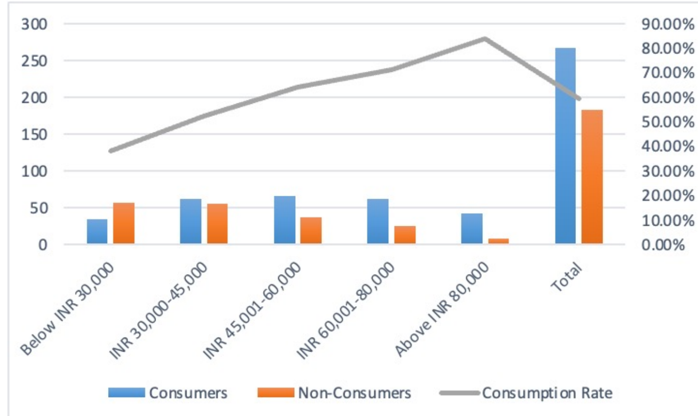


Table 7: Monthly Income and Organic Food Consumption Cross-Tabulation

Monthly Income	Consumers	Non-Consumers	Consumption Rate
Below INR 30,000	35	57	38.0%
INR 30,000-45,000	62	56	52.5%
INR 45,001-60,000	66	37	64.1%
INR 60,001-80,000	62	25	71.3%
Above INR 80,000	42	8	84.0%
Total	**267**	**183**	**59.3%**



The data reveal a clear positive relationship between income and consumption rate, with each successive income bracket showing higher organic food adoption. The 31-45 age group demonstrates peak consumption, likely reflecting optimal combination of health awareness, purchasing power, and family health responsibility.

4.5 Binary Logistic Regression Analysis

Binary logistic regression was employed to model the probability of being an organic food consumer as a function of demographic determinants. Table 8 presents the logistic regression results.

Table 8: Binary Logistic Regression Results: Demographic Determinants of Organic Food Consumption

Variable	B	S.E.	Wald	df	p-value	Exp(B)
Age	0.342	0.156	4.812	1	0.028*	1.408
Gender (Female)	0.267	0.198	1.818	1	0.178	1.306
Education Level	0.518	0.142	13.312	1	0.000**	1.679
Monthly Income	0.624	0.128	23.766	1	0.000**	1.866
Occupation	0.289	0.112	6.658	1	0.010*	1.335
Family Size	0.078	0.167	0.218	1	0.641	1.081
Constant	-4.567	0.734	38.692	1	0.000	0.010

*Note: *p<0.05; *p<0.01; Dependent Variable: Organic Food Consumption (1=Consumer, 0=Non-consumer)*

Model Fit Statistics:

Table 9: Logistic Regression Model Fit Statistics

Model Fit Indicator	Value
-2 Log Likelihood	467.342
Cox & Snell R Square	0.286
Nagelkerke R Square	0.384
Hosmer-Lemeshow Test (Chi-square)	9.246

Hosmer-Lemeshow Test (p-value)	0.322
Overall Classification Accuracy	73.8%

- **Monthly Income** (B = 0.624, $p < 0.001$, Odds Ratio = 1.866): Monthly household income emerges as the strongest predictor of organic food consumption. Each unit increase in income category multiplies the odds of being an organic food consumer by 1.866. This finding confirms that economic capacity remains the most critical enabler of organic food purchases in the Uttar Pradesh context.
- **Education Level** (B = 0.518, $p < 0.001$, Odds Ratio = 1.679): Education level shows highly significant positive effect. Higher educational attainment increases the likelihood of organic food consumption by a factor of 1.679 per education level increment. This reflects enhanced awareness, information processing capabilities, and valuation of health and environmental benefits associated with education.
- **Age** (B = 0.342, p = 0.028, Odds Ratio = 1.408): Age demonstrates significant positive effect, with each age group increase raising the odds by 1.408. This suggests that older consumers (up to 60 years) exhibit higher propensity for organic consumption, likely due to increased health consciousness and established purchasing power.
- **Occupation** (B = 0.289, p = 0.010, Odds Ratio = 1.335): Occupational category significantly influences consumption behavior, with professional occupations associated with 33.5% higher odds of organic food consumption compared to baseline categories.
- **Gender** (B = 0.267, p = 0.178, Odds Ratio = 1.306): While females show 30.6% higher odds of being organic consumers, the effect is not statistically significant in the multivariate model, suggesting that gender effects may be mediated through other demographic variables.
- **Family Size** (B = 0.078, p = 0.641, Odds Ratio = 1.081): Family size does not significantly predict consumption, indicating that household composition has minimal independent effect when income and other factors are controlled.

The Hosmer-Lemeshow test ($p = 0.322 > 0.05$) indicates good model fit, with no significant difference between observed and predicted values. The Nagelkerke R^2 of 0.384 suggests that demographic variables explain approximately 38.4% of the variance in organic food consumption behavior, indicating moderate predictive power. The model correctly classifies 73.8% of cases, demonstrating satisfactory discriminatory ability.

4.6 Consumer Awareness and Perceptions

Table 10 presents consumer awareness levels and perceptions regarding organic food attributes across the sample.

Table 10: Consumer Awareness and Perceptions (5-point Likert Scale: 1=Strongly Disagree, 5=Strongly Agree)

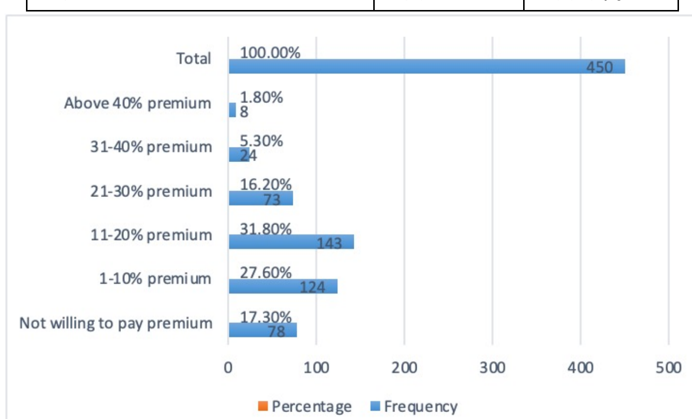
Awareness/Perception Item	Mean Score	Std. Dev.
Awareness of organic certification logos	3.42	1.18
Understanding of organic farming practices	3.67	1.05
Perceived health benefits of organic food	4.21	0.87
Perceived environmental benefits	3.89	0.94
Trust in organic certification	3.28	1.23
Perceived quality superiority	4.05	0.91
Perceived price reasonability	2.67	1.15

Consumers exhibit strong agreement regarding perceived health benefits (Mean = 4.21) and quality superiority (Mean = 4.05) of organic food. Environmental benefits are moderately valued (Mean = 3.89). However, significant concerns exist regarding price reasonability (Mean = 2.67), with consumers perceiving organic products as overpriced relative to benefits. Trust in organic certification remains moderate (Mean = 3.28), suggesting need for stronger regulatory communication and consumer education.

4.7 Willingness to Pay Premium

Table 11: Willingness to Pay Premium for Organic Food Products

Premium Percentage Range	Frequency	Percentage
Not willing to pay premium	78	17.3%
1-10% premium	124	27.6%
11-20% premium	143	31.8%
21-30% premium	73	16.2%
31-40% premium	24	5.3%
Above 40% premium	8	1.8%
Total	**450**	**100.0%**



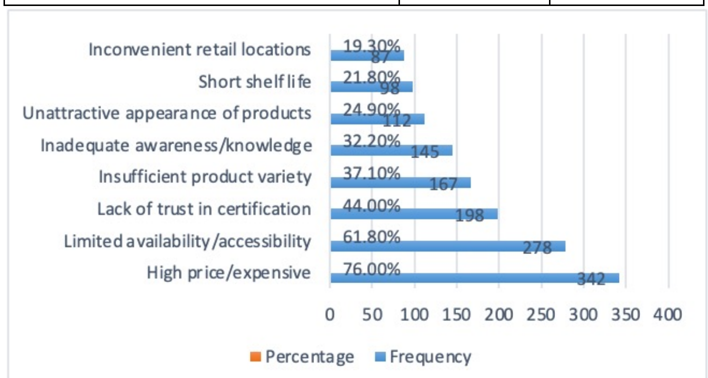
The majority of consumers (59.4%) are willing to pay 1-20% premium for organic products, with median willingness at 15% premium. Only 7.1% demonstrate willingness to pay premiums exceeding 30%, indicating price sensitivity constraints. Income positively correlates with premium willingness (Pearson r = 0.467, p < 0.001).

4.8 Purchase Barriers

Respondents identified primary barriers preventing or limiting organic food purchases (multiple responses permitted):

Table 12: Barriers to Organic Food Purchases (n=450, multiple responses)

Purchase Barrier	Frequency	Percentage
High price/expensive	342	76.0%
Limited availability/accessibility	278	61.8%
Lack of trust in certification	198	44.0%
Insufficient product variety	167	37.1%
Inadequate awareness/knowledge	145	32.2%
Unattractive appearance of products	112	24.9%
Short shelf life	98	21.8%
Inconvenient retail locations	87	19.3%



Price emerges as the dominant barrier (76.0%), followed by limited availability (61.8%) and trust concerns (44.0%). These findings highlight critical supply-side and market infrastructure challenges requiring policy attention.

5. DISCUSSION

5.1 Principal Findings and Theoretical Implications

This study provides robust empirical evidence that demographic determinants significantly influence organic food consumption behavior among consumers in Uttar Pradesh, India. The binary logistic regression model identifies monthly household income, education level, age, and occupation as statistically significant predictors, collectively explaining 38.4% of variance in consumption behavior. These findings align with and extend existing theoretical frameworks on sustainable consumption in emerging market contexts.

Income as Primary Determinant: The emergence of monthly income as the strongest predictor (Odds Ratio = 1.866, p < 0.001) confirms that economic constraints remain the fundamental barrier to organic food adoption in Uttar Pradesh. This finding resonates with research by Smith et al. demonstrating positive correlation between income and organic food consumption across diverse geographical contexts[11]. However, the Uttar Pradesh context exhibits particularly steep income gradients, with consumption rates varying from 38.0% (low-income) to 84.0% (high-income) segments. The 20-50% price premium associated with organic products in Indian markets creates an affordability gap that excludes lower-income consumers despite potential health motivations.

Education Effect and Information Processing: The significant effect of education level (Odds Ratio = 1.679, p < 0.001) supports cognitive theories of consumer decision-making, wherein higher education enhances information processing capabilities, critical evaluation of product claims, and appreciation of long-term health-environment trade-offs[20][21]. Consumers with postgraduate education demonstrate 72.5% organic food adoption rate, compared to 35.4% among those with secondary education or below. This educational gradient suggests that knowledge deficits represent a substantial barrier addressable through targeted consumer education initiatives.

Age Profile and Life-Stage Effects: The inverted U-shaped relationship between age and consumption, with peak adoption in the 31-45 years age group (68.2%), reflects optimal convergence of health consciousness, family responsibility, and purchasing power. This finding differs from Western contexts where younger consumers (18-30) often exhibit strongest environmental motivations[16]. The Uttar Pradesh pattern suggests that organic food consumption is driven more by family health concerns and affordability than by environmental ideology among younger demographics.

Gender Non-Significance in Multivariate Model: While females show directionally higher consumption tendency in univariate analysis, gender becomes non-significant when controlling for other demographic variables (p = 0.178). This contrasts with Western research consistently identifying gender as significant predictor[9][19]. The Indian context may reflect household-level rather than individual-level purchase decisions, with food procurement often representing joint family choices transcending individual gender preferences.

5.2 Comparison with Existing Literature

The findings align substantially with recent Indian organic food research. Rastogi and Chopra (2019) similarly identified age, education, and income as significant demographic determinants in Delhi-NCR context[25]. Mohammed Abrar (2025) highlighted certification, transparency, and traceability as critical factors, indirectly validating the trust concerns (44.0% of respondents) observed in this study[15]. Yadav and Pathak (2016) found that young, educated urban consumers show higher propensity for organic adoption, consistent with the educational effects documented here[14].

However, this study extends previous research by providing state-specific evidence for Uttar Pradesh—a geographically and demographically distinct region compared to metropolitan areas that have dominated Indian organic food research. The consumption rate of 59.3% regular consumers in urban Uttar Pradesh exceeds national estimates of 40-45%, suggesting above-average market development in the sampled cities.

The willingness to pay premium of 1-20% (median 15%) observed among Uttar Pradesh consumers falls within the lower range of international estimates (10-40%)[10], indicating price sensitivity characteristic of emerging market consumers. This tempered willingness to pay reflects income constraints and immature market development compared to Western contexts.

5.3 Policy and Managerial Implications

For Organic Food Marketers and Retailers:

1. **Demographic Segmentation Strategy:** Target marketing efforts toward high-probability segments: consumers aged 31-45 years, postgraduate education, household income exceeding INR 60,000, and professional occupations. This segment exhibits 70-84% organic adoption rates and represents the most receptive market.
2. **Income-Based Product Positioning:** Develop tiered product offerings addressing multiple income segments. Introduce economy organic product lines at 10-15% premium to penetrate middle-income segments (INR 30,000-60,000), while maintaining premium offerings for high-income consumers willing to pay 25-40% premiums.
3. **Educational Marketing Communications:** Given education's significant effect, invest in information-rich marketing emphasizing health benefits, environmental impacts, and production process transparency. Educational campaigns can partially compensate for formal education gaps through accessible health and sustainability messaging.
4. **Distribution Expansion:** Address the accessibility barrier (61.8% of respondents) through multi-channel distribution including modern retail partnerships, dedicated organic stores in tier-2 cities, and e-commerce platforms reaching consumers beyond metropolitan areas.

For Policymakers and Government Agencies:

1. **Price Subsidy Mechanisms:** Implement consumer-side subsidies or tax exemptions to reduce price premiums, particularly for staple categories (grains, pulses, vegetables). Direct subsidy support enabling 10-15% price reduction could substantially expand market access for middle-income segments.
2. **Certification Trust Building:** Strengthen NPOP certification communication and enforcement to address the 44% trust deficit. Public awareness campaigns explaining certification standards, surprise audits, and penalties for fraudulent claims would enhance consumer confidence.
3. **Supply Chain Development:** Invest in infrastructure connecting organic farmers with urban markets in Uttar Pradesh, reducing distribution costs and improving product availability. The 70,000 hectares of organic farmland in the state represents substantial supply potential requiring market linkage enhancement[3].
4. **Consumer Education Programs:** Develop state-sponsored consumer education initiatives targeting lower-education segments, explaining organic benefits, certification systems, and health-environment linkages. School-based nutrition education incorporating organic agriculture concepts could build long-term awareness.

For Organic Farmers and Producer Cooperatives:

1. Focus production on high-demand categories: fruits, vegetables, grains, and pulses which show 69-89% purchase rates among consumers
2. Explore direct-to-consumer marketing models reducing intermediary costs and price premiums
3. Pursue group certification approaches to reduce individual farmer certification costs
4. Develop local processing and packaging capabilities enabling value addition

5.4 Study Limitations

This research acknowledges several limitations that provide context for interpretation and suggest directions for future research:

- **Sampling Limitations:** The study focuses on urban and semi-urban areas where organic food availability is higher. Rural consumers, constituting approximately 65% of Uttar Pradesh's population, are underrepresented. Future research should examine rural organic food consumption patterns and farmer self-consumption behavior.
- **Cross-Sectional Design:** The cross-sectional methodology captures consumption behavior at a single time point, limiting causal inference. Longitudinal research tracking consumption evolution as income and awareness increase would provide stronger causal evidence regarding demographic effects.
- **Self-Reported Data:** Survey responses may be subject to social desirability bias, with consumers potentially over-reporting organic food consumption due to perceived health and environmental desirability. Behavioral observation or purchase transaction data would provide more objective consumption measures.
- **Omitted Variable Bias:** The model explains 38.4% of variance, indicating that unmeasured variables—

including psychographic factors (attitudes, values, health consciousness), product-specific factors (availability of preferred products), and contextual factors (social influence, retail environment)—contribute substantially to consumption decisions. Future research should integrate demographic and psychographic variables in comprehensive models.

- **Binary Consumption Measure:** The dichotomous dependent variable (consumer vs. non-consumer) does not capture consumption intensity, expenditure levels, or product category preferences. More nuanced dependent variables examining consumption frequency, expenditure share, or product diversity would provide richer insights.
- **Regional Specificity:** Findings are specific to Uttar Pradesh and may not generalize to other Indian states with different socio-economic profiles, agricultural practices, or market development levels. Comparative multi-state research would illuminate regional variations.

5.5 Future Research Directions

Building on this study's findings and limitations, several promising research directions emerge:

1. **Psychographic-Demographic Integration:** Develop comprehensive models integrating demographic determinants with psychographic constructs (health consciousness, environmental concern, food safety attitudes) to explain greater variance in consumption behavior.
2. **Longitudinal Cohort Studies:** Track consumption evolution over 3-5 years as markets mature, examining how demographic effects change with market development and whether early adopters differ systematically from later adopters.
3. **Rural-Urban Comparative Analysis:** Examine organic food consumption determinants in rural Uttar Pradesh contexts, comparing farmer self-consumption patterns with urban consumer behavior.
4. **Intervention Experiments:** Conduct randomized controlled trials testing effectiveness of specific interventions (price discounts, educational messaging, certification communication) in increasing organic food adoption across demographic segments.
5. **Product-Category Specific Analysis:** Investigate whether demographic determinants vary across product categories (fresh produce vs. processed organics vs. dairy), enabling category-specific marketing strategies.
6. **Cultural and Social Influence:** Examine role of social networks, religious beliefs, and traditional food practices in shaping organic food preferences within Uttar Pradesh's culturally diverse population.
7. **Economic Impact Analysis:** Assess economic welfare effects of organic food consumption, examining household expenditure patterns, nutritional outcomes, and health cost implications.

6. CONCLUSION

This study provides comprehensive empirical evidence on demographic determinants of organic food consumption in Uttar Pradesh, India, contributing to the growing literature on sustainable consumption in emerging market contexts. Using data from 450 respondents across major urban centers and employing rigorous quantitative analysis including chi-square tests and binary logistic regression, the research identifies monthly household income, education level, age, and occupation as significant predictors of organic food adoption.

The findings reveal that Uttar Pradesh's organic food market exhibits characteristics of an emerging sector with 59.3% regular consumption rate among urban and semi-urban consumers, substantial growth potential, but significant barriers related to price (76.0% of respondents), availability (61.8%), and certification trust (44.0%). The market demonstrates clear demographic segmentation, with consumers aged 31-45 years, holding postgraduate degrees, earning monthly household income exceeding INR 60,000, and employed in professional occupations representing the core consumer segment with 70-84% adoption rates.

The study's theoretical contribution lies in validating and extending existing frameworks on demographic determinants to the Uttar Pradesh context, revealing that economic constraints remain more determinative than in developed Western markets, while environmental motivations play a relatively lesser role compared to health concerns. Practical contributions include actionable segmentation strategies for marketers, targeted policy recommendations for government agencies, and infrastructure priorities for market development.

As India pursues ambitious sustainable development goals and agricultural transformation toward organic farming expands, understanding consumer-side adoption patterns becomes increasingly critical. This research demonstrates that demographic factors create systematic variation in organic food consumption, necessitating differentiated strategies rather than one-size-fits-all approaches. Income-based affordability measures, education-focused awareness campaigns, trust-building certification communication, and distribution expansion represent priority interventions for accelerating organic food market development in Uttar Pradesh.

The organic food sector in Uttar Pradesh stands at a critical juncture. With 70,000 hectares of organic farmland producing for an INR 850 crore market, substantial supply-side progress has been achieved. The research evidence indicates that demand-side potential exists across demographic segments but remains constrained by price barriers and market infrastructure limitations. Strategic interventions addressing these constraints could unlock substantial market expansion, simultaneously advancing consumer health outcomes, environmental sustainability, and farmer livelihoods.

Future research should build on these demographic foundations by integrating psychographic constructs, examining consumption dynamics longitudinally, and evaluating specific intervention effectiveness through experimental designs. As organic food markets mature in India's emerging urban centers, continuous monitoring of consumption patterns and determinants will be essential for evidence-based policy and strategy formulation.

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