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Intake of Animal-Based Foods and Consumer Behaviour towards Organic Food: The Case of Nepal

Mausam Budhathoki [1,2,*] and Sujita Pandey [3]

[1] Institute of Aquaculture, University of Stirling, Stirling FK9 4LA, UK
[2] Department of Management, Xavier International College, Kathmandu 44601, Nepal
[3] Department of Environmental Science, Aarhus University, Frederiksborgvej 399, 4000 Roskilde, Denmark; psujita01@gmail.com
* Correspondence: mausam.budhathoki@stir.ac.uk

Abstract: This study aims to segment Nepalese consumers based on the frequency of animal-based food intake and thereby the determinants of organic food purchasing behaviour to suggest possible marketing strategies for organic food suppliers. A face-to-face survey was conducted among Nepalese consumers (n = 527), underpinned by the theoretical framework, 'theory of planned behaviour (TPB)', and extended to include: knowledge, environmental concerns, health-consciousness, and background factors (socio-demographic and lifestyle characteristics). Three segments of consumer types were identified by employing k-means segmentation: All Low (n = 113), High Dairy (n = 246), and High Dairy and Meat (n = 168). A covariance-based structural equation modelling (CB-SEM) analysis indicated that perceived behavioural control ($\beta = 0.438$, $p < 0.001$) was the main predictor of organic food purchasing intention, followed by attitude ($\beta = 0.302$, $p < 0.001$), subjective norms ($\beta = 0.300$, $p < 0.001$), knowledge ($\beta = 0.211$, $p < 0.001$), and environmental concerns ($\beta = 0.208$, $p < 0.001$). Health-consciousness ($\beta = -0.034$, $p = 0.374$) showed no significant impact on organic food purchasing intention. Organic food purchasing intention had a strong positive impact on organic food purchasing behaviour. Socio-demographic and lifestyle characteristics were found to impact behavioural intention indirectly by their effects on attitude, subjective norms, perceived behavioural control, knowledge, and environmental concern. Income also had a direct impact on organic food purchasing behaviour. Further, consumers with a low intake of animal-based foods held positive attitudes towards organic food and had higher environmental concerns. The findings can be used to inform organic food producers and targeted marketing campaigns towards promoting organic food purchasing behaviour in Nepal and similar countries.

Keywords: organic food consumerism; animal-based foods; theory of planned behaviour; knowledge; environmental concern; health-consciousness; background factors

Citation: Budhathoki, M.; Pandey, S. Intake of Animal-Based Foods and Consumer Behaviour towards Organic Food: The Case of Nepal. *Sustainability* **2021**, *13*, 12795. https://doi.org/10.3390/su132212795

Academic Editor: Manuela Vega-Zamora

Received: 1 October 2021
Accepted: 17 November 2021
Published: 19 November 2021

1. Introduction

The United Nations' Sustainable Development Agenda—2030 implemented six programs to accelerate sustainable consumption and production in every nation, one of which is through food systems [1]. Researchers argue that organic food production may positively impact the overall food system by addressing the fundamental approaches of sustainable food systems through increased efficiency, consistency, and sufficiency [2,3]. Organic food production is one of the several approaches to sustainable food production that is considered ecologically safe, economically viable, and socially acceptable [4]. It is thus widely accepted as a holistic production management system to achieve sustainable food systems [5]. Furthermore, organic foods may serve as the transition to more sustainable food consumption [6,7] and as a fundamental factor of a more sustainable diet [2,8].

In recent years, the concept of sustainable food production and consumption is emerging in Nepal, mostly through the promotion and implementation of organic agriculture. At the governmental level, organic agriculture has drawn attention as a practical way for

sustainable agriculture where development and production are given a vital role in political goals. For instance, a recently formulated policy-level guiding document for the next 20 years, 'The Agricultural Development Strategy—2014' from the Ministry of Agricultural and Livestock Development, Government of Nepal, has pointed to the fact that "organic farming enhances environmental sustainability and contribute to biodiversity" [9]. Thus, the government increased the budget by an additional 25% in 2014 for Village Development Committees, which promote organic agriculture [10]. This might be one of the reasons that organic agricultural production in Nepal has increased considerably [11], where land use for organic agriculture was increased per annum by 26.6% from 2017 to 2020 [12]. Currently, Nepal's organic value-chain is comprised of 1622 producers (39 were certified producers and the rest with Participatory Guarantee System operational), six processors, and one exporter, producing a total of 210 metric tonnes of organic foods annually. Further, the demand for organic food is ever-growing, especially in the urban cities, Kathmandu, Lalitpur, Bhaktapur, Chitwan, and Pokhara, resulting in an increased number of shops favouring organic foods, mobile marketing of organically produced commodities, and outlets with organic foods [11–13]. The most commonly available organic foods in the Nepali market include vegetables, fruits, coffee, honey, tea, cereals, spices, and pulses [14]. It has been roughly estimated that around four million consumers residing in Kathmandu, Bhaktapur, and Lalitpur favour organically grown produce or other organic food products [12].

A recent study among 99 Nepalese consumers found that perception over taste, nutritional value, and environmental concern significantly influenced consumers' willingness to pay a premium price for organic vegetables [15]. However, the literature concerning Nepalese consumer beliefs of and motivation to buy organic foods remains limited. Further, the socio-demographic characteristics and perception of Nepalese consumers especially from urban cities are expected to change drastically, as Nepal has set a goal to meet the criteria set by the United Nations to graduate to a developing country by 2022. As a result, the Nepalese society is experiencing unprecedented change, and the fast-growing Nepalese middle class is driving the demand for more animal-based foods. Annually, Nepal spends more than 40 million USD on animal-based products to meet the increasing demand [16]. Thus, applying alternative theoretical approaches, such as Ajzen's theory of planned behaviour (TPB), might be beneficial for organic food practitioners, especially small-scale farmers, marketers, and retailers, to identify the key determinants of buying organic foods among Nepalese consumers. The findings from this study might be crucial to developing marketing strategies needed to accelerate the consumption of organic food in Nepal. Further, understanding consumers' attitudes and purchasing behaviour regarding organic food might also promote more sustainable food production and consumption in Nepal. Thus, this study aims to determine the determinants of organic food purchasing behaviour through employing the TPB framework, extended with knowledge, environmental concerns, health-consciousness, and background factors (socio-demographic and lifestyle characteristics). In addition, consumer segmentation was conducted based on their intake of animal-based foods to investigate its relationship with attitudes, subjective norms, perceived behavioural control, environmental concern, health-consciousness, and organic food purchasing behaviour.

2. Theoretical Framework

2.1. Theory of Planned Behaviour

The theory of planned behaviour (TPB) [17,18] is a well-known and supported framework to explain and predict the consumption of organic food [19–23]. Several previous studies have indicated that the three core components of human behaviour proposed by the TPB framework, namely, attitude [24–26], subjective norms [24,27–29], and perceived behavioural control [30,31], altogether lead to the formation of organic food purchasing intention. Further, behavioural intention is an immediate antecedent and the most proximal predictor of organic food purchasing behaviour [27,29]. Using the TPB framework, this study hypothesized that:

Hypothesis 1 (H1). *Attitudes will positively influence purchasing intention towards organic food.*

Hypothesis 2 (H2). *Subjective norms will positively influence purchasing intention towards organic food.*

Hypothesis 3 (H3). *Perceived behavioural control will positively influence purchasing intention towards organic food.*

Hypothesis 4 (H4). *Intention to purchase organic food will positively influence organic food purchasing behaviour.*

2.2. Extension of the TPB Framework

Ajzen [18] suggests that the TPB framework can be modified and extended by additional constructs or adjusting the casual path of the constructs to deepen and broaden the framework. Researchers have also argued that the TPB model might not capture all the determining determinants of a more complex behaviour, such as food choices [30,32]. Therefore, several previous studies have extended the TPB with additional constructs to improve its descriptive and predictive power [29,33]. Hence, this study is based on previous attempts of the literature to include knowledge, environmental concern, health-consciousness, and background factors in the TPB framework in the pretext of consumption of organic food in Nepal.

According to the authors of [34], the knowledge of organic food is an important determinant and the only medium through which the consumers can distinguish between organic and non-organic foods. Previous studies have noted that consumers' knowledge of organic food had a significant influence on their intention to buy organic food [34–36]. Therefore, this study intended to examine:

Hypothesis 5 (H5). *Consumer's organic food knowledge significantly affects their intention to purchase organic food.*

In recent years, the number of environmentally conscious consumers is expanding, and consumers are more inclined towards reducing environmental issues, thus giving them a sense of being a good role model [37,38]. Organic food is perceived to have a less environmental impact and are purchased by environmentally conscious consumers [39]. Further, previous studies have found that environmental concern was the leading driver for purchasing eco-friendly products [40,41] and a significant predictor for intention to purchase organic food [29,42,43]. Based on these findings, this study intended to examine:

Hypothesis 6 (H6). *Environmental concerns among consumer positively and significantly affects their intention to purchase organic food.*

The authors of [44] stated that health-consciousness is "the degree to which health concerns are integrated into a person's daily activities". Health-consciousness is considered one of the substantial determinants for purchasing organic food as consumers perceive organic food as healthier, nutritious, and safe [45]. Previous studies have shown that health-consciousness significantly affects organic food purchasing intention [29,43,46]. Therefore, this study intended to also examine:

Hypothesis 7 (H7). *Health-consciousness among consumers positively and significantly affects their intention to purchase organic food.*

Background factors, such as socio-demographic characteristics or lifestyle variables, are expected to influence attitude, subjective norms, and perceived behavioural control to indirectly influence one's intention to perform a certain behaviour [47]. A previous study found that age, education, income, and marital status significantly influence attitudes

towards organic food, and also directly influence organic food purchasing behaviour [48]. Further, consumers' level of knowledge towards organic food [49], environmental concern and health-consciousness [50,51] relies upon their background factors. In previous studies, socio-demographic characteristics—age, income, education, marital status, and place of residence [41,52–54]—were significantly associated with buying behaviour towards organic foods. On the contrary, studies have indicated that age [55], gender [41], income [56,57], and education [58] had no significant association with buying behaviour towards organic foods. Further, previous studies have indicated that the level of organic food consumption is influenced by food group intake [8,59,60]. For instance, organic food users were associated with a lower intake of meat. Therefore, consistent with the TPB framework and these findings, this study intended to examine the effect of background factors (socio-demographic and lifestyle characteristics) on determinants of behavioural intention (i.e., attitudes, subjective norms, perceived behavioural control, knowledge, environmental concerns, health-consciousness) as well as organic food purchasing behaviour through the following hypotheses:

Hypothesis 8 (H8). *Age, gender, marital status, education, income, place of residence and intake of animal-based foods would significantly affect attitudes.*

Hypothesis 9 (H9). *Age, gender, marital status, education, income, place of residence and intake of animal-based foods would significantly affect subjective norms.*

Hypothesis 10 (H10). *Age, gender, marital status, education, income, place of residence and intake of animal-based foods would significantly affect perceived behavioural control.*

Hypothesis 11 (H11). *Age, gender, marital status, education, income, place of residence and intake of animal-based foods would significantly affect knowledge.*

Hypothesis 12 (H12). *Age, gender, marital status, education, income, place of residence and intake of animal-based foods would significantly affect environmental concerns.*

Hypothesis 13 (H13). *Age, gender, marital status, education, income, place of residence and intake of animal-based foods would significantly affect health-consciousness.*

Hypothesis 14 (H14). *Age, gender, marital status, education, income, place of residence and intake of animal-based foods would significantly affect behaviour towards purchasing organic food.*

All in all, based on the above discussion, a proposed TPB-extended model (Figure 1) was developed.

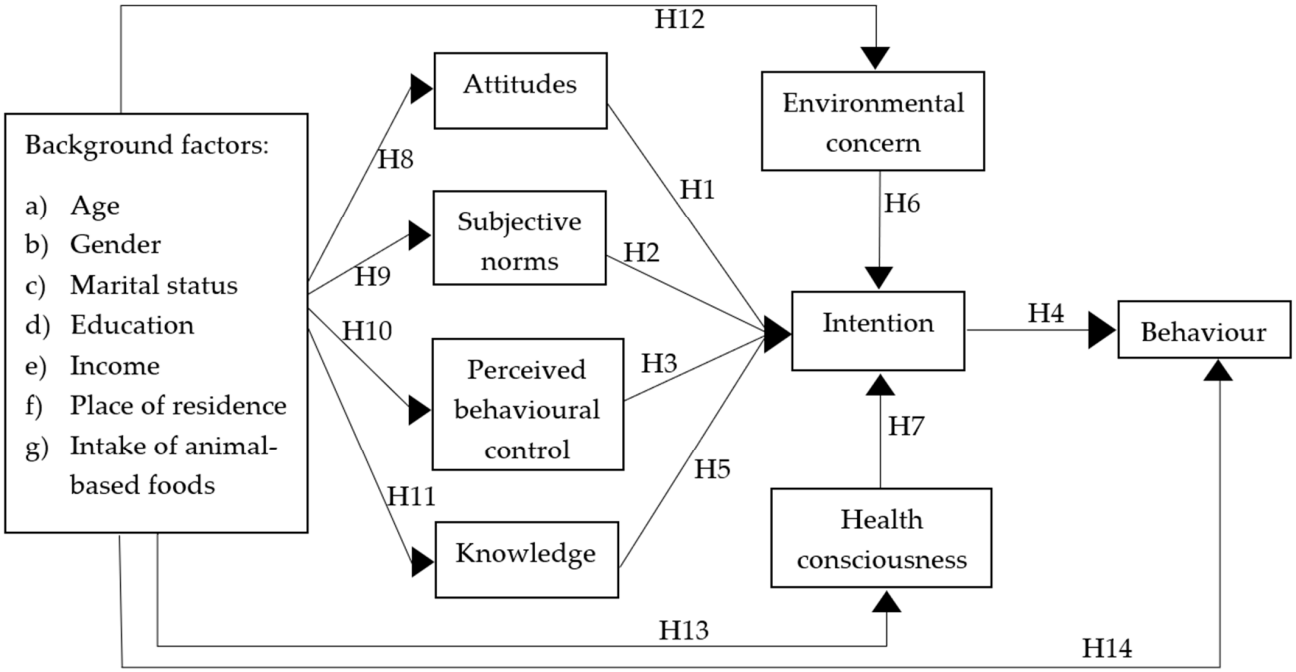

Figure 1. The proposed theory of planned behaviour (TPB) extended model for determining determinants of organic food purchasing behaviour.

3. Methods and Materials

3.1. Data Collection

A face-to-face survey was conducted by two trained interviewers among Nepalese consumers residing in three urban cities of Nepal, Kathmandu, Lalitpur, and Bhaktapur. To determine the appropriate sample size from the selected cities, G Power software [61] was used. A minimum sample size required for the intention to purchase organic food construct was 123 for a minimum power of 0.90 and effect size of 0.15. Thus, a systematic random sampling pattern was employed by approaching every third consumer coming to farmers' markets, outlets, and supermarkets having an organic food section. Data were collected between January and March 2021 (one month in each city). The inclusion criteria for participation were the age range of 18–65 years old, having previously bought organic food, and being willing to participate. Participants younger than 18 years and older than 65 years, who had not previously bought organic food and were not willing to participate were excluded from the survey. In case the consumer did not fulfil the inclusion criteria, the next immediate consumer was approached. Participants were made aware of the time needed (approximately 8 to 10 min), and written informed consent was obtained before completing the survey. This study examined non-response bias by comparing early and late responders (i.e., by selecting the first and last 50 observations) by employing the Mann–Whitney U test. The results indicated no significant difference in the research variables between early and late responders (p-value ranged from 0.053 for knowledge to 0.955 for health-consciousness). Therefore, non-response bias does not contribute to bias in this study [62].

3.2. Questionnaire and Measurement of Variables

The questionnaire was developed in English and then translated into the Nepali language. The translation and cross-cultural adaptation process by the Ref. [63] was followed, except for the back-translation. The authors of the Ref. [64] suggested that back-translation can be avoided if it does not have added benefits compared with an expert committee review. Initially, two independent translators translated the English version into Nepali. An expert committee that included the initial translators, one expert in consumer

research, one professor in marketing, and one consumer interested in organic food further reviewed the translated questionnaire and, after the consensus, a pre-final version was prepared. Finally, the pre-final version was pre-tested among 20 organic food consumers to check for consistency, layout, and understanding to produce the Nepali version of the questionnaire.

The questionnaire was organized into two sections. The first part consisted of questions about the socio-demographic characteristics of the respondents, including age ($\leq$20 years, 21–30, 31–40, 41–50, $\geq$51), gender (male, female), marital status (single, partner, married with children, or others), education (school, intermediate, bachelor's, masters and above, or others), and income (NPR 0–10,000, 10,001–40,000, 40,001–70,000, 70,001–100,000, $\geq$100,001, or no statement).

The second section consisted of questions about the respondent's frequency of intake of meat, fish, dairy, and egg per week measured using a 9-point scale, ranging from 1 as never, to 9 as more than 6 times per day. Thereafter, respondents reported their degree of agreement with the items measuring constructs of the proposed TPB-extended model (attitudes, subjective norms, perceived behavioural control, knowledge, environmental concerns, health-consciousness, and intention). Table 1 briefly presents the items measuring the constructs of the proposed TPB-extended model and their source of adoption. A five-point Likert scale ranging from 1 as "strongly disagree" to 5 as "strongly agree" was used to evaluate the items measuring the constructs of the proposed TPB-extended model. Behaviour (frequency of organic food purchases) was measured by the following item: "How often do you purchase organically grown produce or other organic food products?", ranging from 1 as never, to 6 as all the time.

Table 1. Items measuring the constructs of the proposed TPB-extended model and their source of adoption.

Construct	Items	Source of Adoption
Attitude	ATT1: 'I prefer organic food because it tastes better than non-organic food.' ATT2: 'I prefer organic food because it is more nutritious than non-organic food.' ATT3: 'Organic food products have higher quality than non-organic food.' ATT4: 'Organic food products are healthier than non-organic food.'	[41,65,66]
Subjective norms	SN1: 'The trend of buying organic foods among people surrounding me is increasing.' SN2: 'People around me generally believe that consuming organic food is better for health.' SN3: 'My close friends and family members would appreciate if I buy organic foods.'	[65]
Perceived behavioural control	PBC1: 'Most organic foods are widely available.' PBC2: 'Most organic foods are expensive to buy.' PBC3: 'Most organic foods are convenient to find.' PBC4: 'I find it difficult to judge the quality of most organic foods.'	[66,67]
Knowledge	KN1: 'In comparison with an average person I know a lot about organic foods.' KN2: 'I know the process of organic foods.' KN3: 'I know that organic foods are safer to eat.'	[41,68]
Environmental Concern	EC1: 'I am very concerned about the environment.' EC2: 'I would be willing to reduce my consumption to help protect the environment.' EC3: 'Humans are severely abusing the environment.'	[3,69]
Health-consciousness	HC1: 'I choose food carefully to ensure good health.' HC2: 'I consider myself as a health-conscious consumer.' HC3: 'I often think about health-related issues.'	[30,31,70]
Intention	INT1: 'I am willing to consume organic foods if they are available for purchase.' INT2: 'I intend to consume organic foods if they are available for purchase.'	[71]
Behaviour	BEH: 'How often do you purchase organically grown produce or other organic food products?'	[72]

3.3. Data Analysis

Data were manually entered into the IBM SPSS software for statistical analysis. All reversed scales were recorded in the same direction. Data were screened for assumptions of outliers through Cook's Distance, and Normality through the skewness and kurtosis index. Responses with Cook's Distance Values above 1 were removed from the study [73]. Further, a value of skewness below $\pm$3 and a kurtosis index below $\pm$10 in the data was

considered normal [74]. Furthermore, Harman's one-factor test was employed to check for common method bias [75].

For descriptive statistics, proportions and percentages were used to describe categories data. Respondents were segmented based on their frequency of animal-based food (meat, fish, egg, and dairy) intake per week employing k-means segmentation. This procedure yielded three segments that were labelled All Low, High Dairy, and High Dairy and Meat. A comparison of socio-demographic characteristics between the segments was performed employing the chi-squares test for nominal data and the Kruskal–Wallis test for ordinal data. Further, logistic regression was employed to determine the likelihood of belonging to the segments by attitudinal characteristics. In the model, socio-demographic characteristics (age, gender, marital status, education, and income) were adjusted.

Exploratory factor analysis (using principal component analysis) was performed for the constructs of the proposed TPB-extended model. Eigenvalues greater than 1 and varimax with Kaiser Normalization were selected to generate the factor loadings. Further, Kaiser-Meyer-Olkin and Bartlett's tests of sphericity value were selected to check the suitability of data for factor analysis. Reliability, validity (both convergent and discriminant), and multicollinearity of the proposed TPB-extended model constructs were also determined. The fulfilment of all the criteria led to covariance-based structural equation modelling (CB-SEM) analysis. Previous studies have indicated that CB-SEM is suitable for confirmatory factor analysis of conceptually developed models and is a commonly applied form of SEM when analysing psychometric analysis, such as attitudes and behavioural intentions [76,77].

The CB-SEM analysis followed a two-step modelling approach, as proposed by the Ref. [78]. In the first step, confirmatory factor analysis of the measurement model was performed to further assess the adequacy of the measurement model. In the second step, structural analysis through model fit statistics was performed to assess the best-fitting model. Model fit statistics include chi-square (χ^2), a ratio of chi-square and *df* (χ^2/df), the goodness-of-fit index (GFI), incremental fit index (IFI), comparative fit index (CFI), standardized root mean square residual (SRMR), and root-mean-square error of approximation (RMSEA). The CB-SEM analysis was performed in the IBM SPSS AMOS 27.0.0 software (Amos Development Corporation).

4. Results

4.1. Socio-Demographic Characteristics

Table 2 presents the socio-demographic characteristics of the respondents. After removing 18 incomplete responses, as well as a further 8 responses considering extreme outliers, the final sample consisted of 527 Nepalese consumers, 57.7% of which were females. The majority of the respondents (43.6%) held bachelor's degrees, with their marital status (56.5%) being married with children. Further, the socio-demographic characteristics of the segments (except for a place of residence) differed significantly between the three segments.

4.2. Segmentation

Table 3 shows the likelihood of belonging to each segment by attitudinal characteristics, and was adjusted for significant socio-demographic characteristics (age, gender, marital status, education, and income). Consumers in the All Low segment have positive attitudes towards organic food. Further, consumers who consider knowing organic food belong to the High Dairy segment, and consumers who exert greater perceived behavioural control towards organic food belong to the High Dairy and Meat segment.

Table 2. Socio-demographic characteristics of the three segments and the total sample % (n).

%(n)	All Low [a] (n = 113)	High Dairy [b] (n = 246)	High Dairy and Meat [c] (n = 168)	Total Sample (n = 527)	*p*-Value
Age (y)					<0.001 ***[d]
20 or younger	6.2(7)	5.7(14)	1.8(3)	4.6(24)	
21 to 30	35.4(40)	32.9(81)	17.9(30)	28.7(151)	
31 to 40	24.8(28)	24.8(61)	33.9(57)	27.7(146)	
41 to 50	23(26)	23.2(57)	31.5(53)	25.8(136)	
51 and above	10.6(12)	13.4(33)	14.9(25)	13.3(70)	
Gender					<0.001 ***[e]
Male	38.1(43)	32.1(79)	60.1(101)	42.3(223)	
Female	61.9(70)	67.9(167)	39.9(67)	57.7(304)	
Marital status					0.006 **[e]
Single	32.7(37)	30.9(76)	16.7(28)	26.8(141)	
Married	17.7(20)	17.5(43)	13.7(23)	16.3(86)	
Married with children	49.6(56)	51.2(126)	69(116)	56.5(298)	
Others	-	0.4(1)	0.6(1)	0.4(2)	
Education					0.011 *[d]
School	13.1(15)	14.6(36)	10.7(18)	13.1(69)	
Intermediate	27.4(31)	31.3(77)	23.8(40)	28.1(148)	
Bachelor	49.6(56)	41.9(103)	42.3(71)	43.6(230)	
Master and above	8.8(10)	11.4(28)	23.2(39)	14.6(77)	
Others	0.9(1)	0.8(2)	-	0.6(3)	
Income (NPR)					<0.001 ***[d]
0–10,000	21.2(24)	30.1(74)	2.4(4)	19.4(102)	
10,001–40,000	38.9(44)	41.5(102)	26.2(44)	36.1(190)	
40,001–70,000	20.4(23)	17.5(43)	25.6(43)	20.7(109)	
70,001–100,000	10.6(12)	3.3(8)	30.4(51)	13.5(71)	
≥100,000	1.8(2)	1.2(3)	9.5(16)	4(21)	
No statement	7.1(8)	6.5(16)	6.0(10)	6.5(34)	
Place of residence					0.927 [e]
Kathmandu	41.6(47)	38.2(94)	41.1(69)	39.8(210)	
Lalitpur	22.1(25)	25.6(63)	22.6(38)	36.2(126)	
Bhaktapur	36.1(41)	36.2(89)	36.3(61)	23.9(191)	

Note: [a] All Low = Low-frequency intake of meat, fish, dairy, and egg. [b] High Dairy = High-frequency intake of dairy and low-frequency intake of meat, fish, and egg. [c] High Dairy and Meat = High-frequency intake of dairy and meat and low-frequency intake of fish and egg. [d] Kruskal-Wallis test. [e] Chi-square test. Significant codes: *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$ (two-tailed).

Table 3. Likelihood of belonging to the segment by attitudinal characteristics.

(Total: n = 527)	Segment 1 All Low (n = 113)		Segment 2 High Dairy (n = 246)		Segment 3 High Dairy and Meat (n = 168)	
	OR	CI	OR	CI	OR	CI
Attitudes towards organic food	**1.613**	**(1.083–2.401)**	0.887	(0.628–1.254)	0.775	(0.523–1.148)
Subjective norms	0.860	(0.625–1.183)	1.099	(0.828–1.460)	1.041	(0.747–1.450)
Perceived behavioural control	0.984	(0.774–1.252)	**0.634**	**(0.507–0.792)**	**1.853**	**(1.420–2.416)**
Knowledge towards organic food	0.889	(0.662–1.195)	**1.429**	**(1.096–1.864)**	**0.695**	**(0.513–0.942)**
Environmental concern	1.331	(0.994–1.780)	0.829	(0.648–1.062)	0.945	(0.710–1.258)
Health-consciousness	0.968	(0.700–1.338)	0.840	(0.627–1.125)	1.261	(0.910–1.745)

Note: Odds ratios (OR) > 1 show a higher likelihood of being in the segment when agreeing with the statement per increment on the Likert scale. Confidence interval (CI) > 1 or <1 indicates that 95% of the time, one group will be more or less likely to belong to the segment per increment on the Likert scale. The bold numbers represent significance OR, according to logistic regression, being adjusted by age, gender, marital status, education and income. In the model, dependent variables were cluster memberships.

4.3. Harman's One-Factor Test, Exploratory Factor Analysis, Reliability, Validity, and Multicollinearity Tests

The results from Harman's one-factor test indicated that the total variance of the first factor was 22.117% variance, which was less than 50%, indicating no presence of common method bias [75]. Further, exploratory factor analysis extracted seven factors (attitudes, subjective norms, perceived behavioural control, knowledge, environmental

concern, health-consciousness, and intention) that explained 68.838% of the variance in the data. The Kaiser–Meyer–Olkin measure of sampling adequacy equals 0.799, whereas Bartlett's Test of Sphericity was significant at <0.001, indicating appropriateness for further analysis [79]. The value of Cronbach's alpha among items ranged from 0.681 for subjective norms to 0.865 for perceived behavioural control, indicating satisfactory reliability [80]. The value of composite reliability (CRC) that determined construct reliability ranged from 0.772 for intention to 0.894 for perceived behavioural control, indicating the value exceeded the threshold value of 0.7 [81]. The value of the average variance extracted (AVE) of each construct exceeded the minimum threshold of 0.50, establishing convergent validity. The value of the variance inflation factor (VIF) ranged from 1.003 for health-consciousness to 1.376 for attitudes, indicating no issue of multicollinearity among the constructs [82]. Table 4 shows the value of factor loadings, reliability, validity, and multicollinearity.

Table 4. Factor loadings, validity, reliability, and multicollinearity tests.

Constructs	Items	Factor Loadings	Cronbach's α	AVE	CRC	VIF
Attitudes	ATT1	0.813	0.819	0.602	0.858	1.376
	ATT2	0.751				
	ATT3	0.802				
	ATT4	0.736				
Subjective norms	SN1	0.792	0.681	0.547	0.783	1.350
	SN2	0.724				
	SN3	0.700				
Perceived behavioural control	PBC1	0.855	0.865	0.679	0.894	1.220
	PBC2	0.883				
	PBC3	0.824				
	PBC4	0.728				
Knowledge	KN1	0.753	0.722	0.598	0.816	1.222
	KN2	0.829				
	KN3	0.736				
Environmental concern	EC1	0.719	0.735	0.611	0.824	1.237
	EC2	0.758				
	EC3	0.862				
Health-consciousness	HC1	0.879	0.770	0.705	0.877	1.003
	HC2	0.857				
	HC3	0.781				
Intention	INT1	0.779	0.685	0.629	0.772	1.336
	INT2	0.808				

Note: AVE = Average variance extracted, CRC = Composite reliability, VIF = Variance inflation factor.

Table 5 shows the discriminant validity. The study by the Ref. [83] suggested that the inter-construct correlation coefficient <0.8 represents adequate discriminant validity. Further, the square root of the AVE of each construct was greater than the inter-construct correlation coefficient, establishing discriminant validity [84]. All in all, the proposed TPB-extended model represents adequate validity (convergent and discriminant), reliability, and multicollinearity.

Table 5. Correlation between the constructs and descriptive statistics.

Constructs	ATT	SN	PBC	KN	EC	HC	INT	BEH
Attitude (ATT)	**0.77**							
Subjective norms (SN)	0.37 **	**0.73**						
Perceived behavioural control (PBC)	0.29 **	0.27 **	**0.82**					
Knowledge (KN)	0.38 **	0.28 **	0.20 **	**0.77**				
Environmental concern (EC)	0.26 **	0.35 **	0.18 **	0.15 **	**0.78**			
Health-consciousness (HC)	−0.02	−0.01	0.00	0.01	0.00	**0.83**		
Intention (INT)	0.31 **	0.33 **	0.36 **	0.22 **	0.34 **	0.03	**0.97**	
Behaviour (BEH)	0.51 **	0.46 **	0.55 **	0.39 **	0.32 **	−0.03	0.62 **	**1**
Mean	4.19	3.91	3.06	3.35	3.87	4.29	3.61	4.50
Standard deviation	0.64	0.77	0.93	0.81	0.83	0.66	0.93	1.11

Note: Significant codes: ** = $p < 0.01$ (two-tailed) estimated through Pearson's correlation test, the bold value represents the square root of average variance extracted (AVE).

4.4. Measurement Model and Structural Analysis

The results from confirmatory factor analysis using maximum likelihood estimation indicated the value of model fit indices of the measurement model representing an adequate model fit (χ^2/df = 2.413, GFI = 0.927, IFI = 0.937, CFI = 0.936, SRMR = 0.041, RMSEA = 0.052) with factor-loading of each item >0.6 [81]. Further, the result from structural analysis shows that the value of the model fit indices of the proposed TPB-extended model represents a good model fit (χ^2/df = 2.490, GFI = 0.898, IFI = 0.906, CFI = 0.904, SRMR = 0.053, RMSEA = 0.053). The original TPB model was also tested for model fit statistics (χ^2/df = 3.887, GFI = 0.927, IFI = 0.935, CFI = 0.935, SRMR = 0.047, RMSEA = 0.074). The proposed TPB-extended model, original TPB model, and TPB model extended with knowledge, environmental concerns, and health concerns were compared for their predictive power. The results suggested that including knowledge, environmental concerns, health-consciousness, and background factors in the original TPB has better predictive power for behaviour (Adjusted R2 = 0.912) than the original TPB model (Adjusted R2 = 0.786) and the TPB-extended model without background factors (Adjusted R2 = 0.793). Further, the model fit statistics of the proposed TPB-extended model were satisfactory (χ^2/df = 2.507, RMSEA = 0.053) when compared to the original TPB model (χ^2/df = 3.887, RMSEA = 0.074) and the TPB-extended model without background factors (χ^2/df = 2.432, RMSEA = 0.052). The result supported the inclusion of knowledge, environmental concern, health-consciousness, and background factors in the TPB framework in the case of organic food consumption among Nepalese consumers. The model fit statistics are shown in Table 6.

Table 6. Model fit statistics and predictive power of the model.

Model Fit Statistics	Measurement Model	Original TPB Model [a]	TPB-Extended with EC, KN, and HC	TPB-Extended Model with EC, KN, HC, and Background Factors	Standard Norms [b]
χ^2	448.744 ***	272.104 ***	510.742 ***	824.914 ***	≥0, $p < 0.05$
Scaled χ^2/df	2.413	3.887	2.432	2.477	>1 and <5
GFI	0.927	0.927	0.919	0.898	≥0.90
IFI	0.937	0.935	0.936	0.905	≥0.90
CFI	0.936	0.935	0.935	0.904	≥0.90
SRMR	0.041	0.047	0.045	0.057	<0.08
RMSEA (90% CI)	0.052 (0.046–0.058)	0.074 (0.065–0.083)	0.052 (0.046–0.058)	0.053 (0.049–0.058)	≤0.08
Adjusted R2 (Intention)	-	0.536	0.568	0.517	
Adjusted R2 (Behaviour)	-	0.786	0.793	0.909	

Note: [a] Original TPB model = Direct path from attitude, and subjective norms to intention and perceived behavioural control to both intention, and behaviour [17]. [b] Source: [85,86]. TPB = Theory of planned behaviour. EC = Environmental concern, KN = Knowledge, HC = Health-consciousness, GFI = Goodness of Fit index, IFI = Incremental Fit Index, CFI = Comparative Fit Index, SRMR = Standardized Root Mean Square Residual, RMSEA = Root Mean Square Error Approximation, CI = Confidence Interval. Significant codes: *** = $p < 0.001$.

4.5. CB-SEM Analysis

The results from CB-SEM analysis (Table 7) indicated that attitudes, subjective norms, and perceived behavioural control were all significant predictors of the consumer's intention to purchase organic food, therefore supporting hypotheses H1, H2, and H3, respectively. Perceived behavioural control was the main predictor of behavioural intention (β = 0.438, t = 7.371, $p < 0.001$), followed by attitudes (β = 0.302, t = 5.892, $p < 0.001$), and subjective norms (β = 0.300, t = 5.612, $p < 0.001$). Behavioural intention (β = 0.945, t = 10.121, $p < 0.001$) significantly affects organic food purchasing behaviour, thus supporting hypothesis H4. The additional constructs included in the original TPB, that is, knowledge (β = 0.211, t = 4.444, $p < 0.001$), and environmental concern (β = 0.208, t = 4.332, $p < 0.001$) had a positive and significant influence on the intention to purchase organic food; thus, hypotheses H5 and H6 were supported. However, the additional construct, that is, health-consciousness (β = −0.034, t = −0.861, $p = 0.374$), had no significant influence on the intention to purchase organic food, rejecting hypothesis H7.

Table 7. Structural relationship between the constructs of the proposed TPB-extended model and their status.

Paths	Standardised Estimates	Standard Error	t-Value	*p*-Value	Hypothesis Status
ATT→INT	0.302	0.046	5.892	***	H1: Supported
SN→INT	0.300	0.043	5.612	***	H2: Supported
PBC→INT	0.438	0.047	7.371	***	H3: Supported
INT→BEH	0.945	0.158	10.121	***	H4: Supported
KN→INT	0.211	0.043	4.444	***	H5: Supported
EC→INT	0.208	0.038	4.332	***	H6: Supported
HC→INT	−0.034	0.039	−0.861	0.374	H7: Rejected

Note: ATT = Attitude, SN = Subjective norms, PBC = Perceived behavioural control, KN = Knowledge, EC = Environmental concern, HC = Health-consciousness, INT = Intention, BEH = Behaviour. Significant codes: *** = $p < 0.001$.

Table 8 shows the results of the background factors (age, gender, marital status, education, income, place of residence, and intake of animal-based foods) that influenced the constructs (attitudes, subjective norms, perceived behavioural control, knowledge, environmental concern, health-consciousness, and behaviour) of the proposed TPB-extended model [18]. Attitudes, subjective norms, perceived behavioural control, knowledge, environmental concerns and behaviour were significantly influenced by several background factors. In particular, attitude is influenced by marital status (β = 0.129, $p = 0.033$), indicating that married consumers with children have a more positive attitude towards organic food, thus supporting Hypothesis H8c. More favourable attitudes were found for consumers with incomes higher than NPR 40,000 (β = 0.165, $p = 0.002$) and with a lower intake of animal-based foods (β = 0.116, $p = 0.016$), supporting Hypotheses H8e and H8g (respectively). Gender (β = 0.131, $p = 0.010$) was significantly influenced by subjective norms, supporting Hypothesis H9b, which indicates that female consumers perceived more pressure to purchase organic food. Perceived behavioural control was influenced by gender (β = 0.091, $p = 0.049$), and income (β = 0.216, $p < 0.001$), supporting Hypotheses H9b and H9e, respectively. This indicated that female consumers with higher income had a perceived ease of purchasing organic food. Knowledge was influenced by the consumer's education (β = 0.156, $p = 0.003$), and place of residence (β = 0.173, $p < 0.001$), supporting Hypotheses H11d and H11f (respectively), which indicates that consumers with higher education and who were residing in the capital city of Kathmandu had higher levels of knowledge towards organic food. Gender (β = 0.145, $p = 0.004$), marital status (β = 0.157, $p = 0.011$), and segment (β = 0.097, $p = 0.049$) significantly influenced environmental concerns, supporting Hypotheses H12b, H12c, and H12g, respectively. This indicated that females, with their marital status being married with children and who consumed a lower intake of animal foods, had higher levels of environmental concerns. Health-consciousness was not influenced by any background factors considered in this study, thus rejecting hypotheses H13a–g. The organic food purchasing behaviour was influenced by consumers'

income (β = 0.096, p = 0.007), supporting Hypothesis H14e, which indicates that Nepalese consumers with higher incomes had a higher purchasing frequency of organic food.

Table 8. Structural relationship between background factors and constructs of the proposed TPB-extended model.

	Endogenous Variables													
	H8: ATT		**H9: SN**		**H10: PBC**		**H11: KN**		**H12: EC**		**H13: HC**		**H14: BEH**	
R2	**0.056**		**0.062**		**0.050**		**0.068**		**0.084**		**0.017**		**0.909**	
Background factors	Coeff	p	Coeff	p	Coeff	p	Coeff	p	Coeff	p	Coeff	p	Coeff	p
(a) Age (≥41 = 1)	0.116	n.s.	−0.057	n.s.	0.048	n.s.	0.073	n.s.	−0.094	n.s.	0.052	n.s.	0.063	n.s
(b) Gender	0.000	n.s.	**0.131**	**0.010**	**0.091**	**0.049**	−0.004	n.s.	**0.145**	**0.004**	0.086	n.s.	−0.029	n.s
(c) Marital status (Married with children = 1)	**0.129**	**0.033**	0.103	n.s.	0.019	n.s.	0.109	n.s.	**0.157**	**0.011**	0.071	n.s.	−0.058	n.s
(d) Education (≥Bachelor = 1)	0.055	n.s.	−0.006	n.s.	−0.020	n.s.	**0.156**	**0.003**	0.002	n.s.	−0.038	n.s.	−0.044	n.s
(e) Income (≥40,001 = 1)	**0.165**	**0.002**	0.097	n.s.	**0.216**	***	0.088	n.s	0.003	n.s.	0.028	n.s.	**0.096**	**0.007**
(f) Place of residence (Kathmandu = 1)	0.018	n.s.	0.077	n.s.	0.011	n.s.	**0.173**	***	0.058	n.s.	0.058	n.s.	−0.020	n.s
(g) Segment [a] (All Low = 1)	**0.116**	**0.016**	0.032	n.s.	0.022	n.s.	−0.010	n.s.	**0.097**	**0.049**	−0.011	n.s.	0.040	n.s

Note: [a] Segment was based on the frequency of animal-based foods (meat, fish, egg, and dairy) intake per week. All Low = Low frequency intake of meat, fish, dairy, and egg. ATT = Attitudes, SN = Subjective norms, PBC = Perceived behavioural control, KN = knowledge, EC = Environmental concern, HC = Health-consciousness, BEH = Behaviour. Significant codes: *** = $p < 0.001$. n.s. = not significant.

5. Discussion and Implications

This study attempted to segment consumers based on their intake of animal-based foods and determine the determinants influencing organic food purchasing behaviour in one of the emerging economies. The findings of the study strongly confirm the adequacy of the TPB model in the pretext to determine organic food purchasing behaviour among Nepalese consumers. Knowledge of organic food, environmental concern, health-consciousness, and background factors increased the explained variance of purchasing behaviour towards organic food. Among the TPB framework constructs, perceived behavioural control has appeared as the most significant determinant (β = 0.415) of Nepalese consumers' intention to buy organic food. These results were consistent with those yielded by the previous studies [30,87]. Nepalese consumers' strong perceived behavioural control towards organic food advocates for the fact that organic food practitioners need to understand that consumers are more concerned about their inability to buy organic foods. They should make organic foods available at local stores at a reasonable price and train Nepalese consumers to judge the quality of organic foods, thus promoting purchasing experience and habits towards organic foods. A study by the Ref. [88] found that 'consumers are pragmatic and will not go to several stores to buy organic foods', thus, making organic foods available at several local stores is necessary to trigger people's intention to purchase organic food. Moreover, increasing the availability of organic foods in local stores might also reduce the indirect search costs for organic food and help enhance the buying experience of organic foods among Nepalese consumers. Several previous studies have found that a higher price [89] and low availability [70,90] of organic food act as barriers to the consumption of organic food.

Findings from this study suggest that attitudes towards organic food positively and significantly influence the intention to buy organic food. These findings are consistent with findings from previous studies [25,26,41]. Thus, organic food practitioners could focus on promoting the benefits of consuming organic food in comparison to non-organic foods (e.g., being healthy, nutritious, higher quality, tasty, and safe) to enhance consumers' purchasing intention towards organic food. For instance, media campaigns could be designed involving well-known influencers of food and drink as spokespersons to manifest good taste by consuming organic foods. Moreover, the results from this study show that knowledge of organic food is a significant predictor of Nepalese consumers' purchasing intention towards organic food. This result is consistent with previous studies [41,68]. Previous

studies have shown that knowledge of organic food can effectively reduce consumers' uncertainty and create trust, thereby increasing attitudes and buying intention towards organic food [91,92]. Thus, organic food practitioners could focus on providing organic food knowledge and invest in educating consumers with credible information through various channels, including organic food fairs, farms, and farmers' markets to precipitate purchasing intention towards organic food among Nepalese consumers. Further, it is recommended to use enough and reliable labelling information to help consumers determine the quality of their products, thus creating trust and positive attitudes towards organic food [57]. For instance, urban Nepalese consumers were paying premium prices for organic vegetables on the basis of 'trust' and they were further willing to pay 10–15 percent more if organic vegetables were labelled and certified [14].

Subjective norms significantly influence the intention to purchase organic food among Nepalese consumers. The findings are consistent with previous studies [26,28,29]. The outcome of subjective norms specifies marketers need to capitalise on the importance of social influence in the formation of intention through marketing strategies, such as word-of-mouth marketing [93]. Further, Al–Swidi et al. [65] argued that targeting opinion leaders who can deliver positive word-of-mouth about organic food might result in an increased level of interest and confidence towards the use of organic food among potential consumers.

Environmental concern was a significant determinant of intention to purchase organic food among Nepalese consumers. The finding aligns with the previous findings of the Refs. [26,94,95]. However, previous studies have found altruistic motives like environmental concern to be a less important determinant of organic food consumption than egoistic motives, like health concerns [30,96]. In contrast, the findings from this study indicated that purchasing intentions towards organic food was not significantly influenced by health-consciousness. These findings are consistent with a previous study among Malaysian consumers [97]. Therefore, a marketing campaign could be launched to make Nepalese consumers aware of the environmental benefits of consuming organic food, affecting behavioural intentions to finally promote organic food purchasing behaviour.

Background factors (gender, marital status, education, income, place of residence, and segment based on intake of animal-based foods) seem to indirectly influence behavioural intention by their effects on attitudes, subjective norms, perceived behavioural control, knowledge, and environmental concerns, whereas income also seems to directly influence organic food purchasing behaviour. Females reported greater social pressure, perceived behavioural control, and environmental concern. Similarly, previous studies have found that subjective norms have an impact on females to choose organic foods [98,99] and females express slightly greater environmental concern than their male counterparts [100,101]. Further, it seems that married consumers with children have favourable attitudes towards organic food and greater environmental concerns. The findings support the legacy hypothesis—the increase in environmental concern after having children as parents consider their legacy left to their offspring with regards to environmental quality [102]. Further, Nepalese consumers with a lower intake of animal-based foods seem to have favourable attitudes towards organic food and greater environmental concerns. A recent study has found that among the considered motivating factors regarding food choice (environmental concern and health concerns), environmental concerns had a significant positive influence on the willingness to adopt a more plant-based diet among consumers from China and New Zealand [103]. The findings from this study also indicate that income seems to have a positive influence on attitudes, perceived behavioural control, and behaviour. The findings were consistent with the findings from a previous study [48]. However, the author of the Ref. [48] found that other background factors, such as age, education, and children in the household positively and significantly influenced organic food purchasing behaviour (but not income).

Limitations

There are several limitations associated with this study. Firstly, the cross-sectional design of the observation did not allow us to infer causality between the constructs of the proposed TPB-extended model. Secondly, consumers' purchasing behaviour of organic food was determined using self-report measures, thus subjecting the study to a methodological limitation [104]. Further, although this study employed a validated questionnaire from previous studies, one of the items in the questionnaire, 'My close friends and family members would appreciate if I buy organic foods', might have resulted in a double-barrelled bias. Data were collected from three urban cities in Nepal, where findings will need to be validated in peri-urban or rural populations. Besides the TPB constructs, this study included three additional factors: knowledge, environmental concerns, and health-consciousness. Other relevant factors, such as trust, product quality, labels, and animal welfare might have strengthened the understanding of consumers' decision-making processes regarding consumers' organic food purchasing behaviour, and improved the predictive ability of the TPB framework. Further, this study utilized only subjective knowledge to analyse the consumers' knowledge of organic food, whereas Aertsens et al. [68] suggested employing both subjective and objective knowledge for measuring organic food knowledge. Finally, this study employed a quantitative method of data collection and analysis that prevented us from gaining deeper insights into the consumers' organic food purchasing decisions.

6. Conclusions

In conclusion, this study segmented Nepalese consumers based on their intake of animal-based foods and applied the TPB framework extended by knowledge, environmental concern, health-consciousness, and background factors (socio-demographic and lifestyle characteristics). Perceived behavioural control was the main predictor of organic food purchasing intentions, followed by attitude, subjective norms, knowledge, and environmental concerns. Health-consciousness showed no significant influence on organic food purchasing intentions. Gender, marital status, education, income, and segment based on intake of animal-based foods were the background factors that significantly affected attitudes, subjective norms, perceived behavioural control, knowledge, and environmental concern. Income also had a direct influence on organic food purchasing behaviour. The findings suggest that efforts to increase organic food purchasing intentions through targeting perceived behavioural control, attitudes, subjective norms, knowledge, and environmental concern may have a significant effect on increasing organic food consumption among Nepalese consumers. The findings from this study can be used to inform organic food producers and targeted marketing campaigns towards promoting organic food consumption in Nepal's urban populations. Future studies might employ a mixed-method research approach to investigate deeper insights into the determinants of organic food purchasing behaviour, as organic food consumption in Nepal is still a new phenomenon. Further, future studies might also collect national longitudinal data employing a psychographic segmentation approach to determine organic food purchasing behaviour among different consumer segments in Nepal.

Author Contributions: Conceptualization, M.B. and S.P.; methodology, M.B.; software, M.B.; validation, S.P.; formal analysis, M.B.; resources, M.B.; data curation, M.B.; writing—original draft preparation, M.B. and S.P.; writing—review and editing, M.B. and S.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research did not receive any external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author.

Acknowledgments: We are thankful to Kabin Shrestha for his administrative and technical support. We are also thankful to Mijash Humagain and Rabin Karki for data collection and to Alexandra Pounds for proofreading the final version of the manuscript.

Conflicts of Interest: The authors declare no conflict of interest.

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