

Perception Analysis of Consumers towards the usage of Sustainable Organic Food Products in Indian Subcontinent

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ABSTRACT

Present study tries to explore and analyse interesting aspects related to consumer behaviour, perceptions and attitudes about organic food products in Indian sub-continent. It also relates such consumption patterns with the consumers' understanding and points of view towards organic food as well as their demographic, socio-economic, purchasing patterns and consumption patterns profiles. Based on the conceptual framework which identifies the required criteria that influences the consumer perceptions and attitude towards organic food products, data is collected from randomly selected organic food consumers through online as well as offline survey and using semi-structured questionnaire. A detailed data analysis using exploratory factor analysis is then performed using the SPSS software and results are presented.

Keywords

Organic food products, sustainability, purchasing patterns, consumption patterns

{Note: This paper is an extended version of the paper titled Aggarwal, R. and Banerjee, R. "A Conceptual Framework to measure customer experience towards organic food products in India" (with Banerjee, R.), presented at ICSMS, IMT Nagpur, 2018 }

1. INTRODUCTION

Environment sustainability is a growing concern today. Not only the today's era consumers but also the organizations are getting aware of the benefits of the sustainable food products such as organic food as an alternative to look for healthier options for food products. Credit obviously goes to the increasing education level as well as income level of the consumer which is making them more aware about the healthier options for food so that they can survive under the stress and competition of today. It goes by saying "Eat healthy, Stay healthy". In third world countries such as India, benefits of organic food products have been realized gradually and government is also launching new policies and reforms so as to motivate and train the farmers in sustainable farming practices and in the safe use of its products. Policy changes or new policy with regard to sustainable product sector will boost the economy of the country. Policies for new product development will not only enhance the upcoming sustainable products' entire supply chain but also increase the country's revenue simultaneously being environment conscious.

As consumers are becoming more health conscious, it is of curiosity to analyze the motivators behind the purchase of these sustainable or organic food products. Thus, the primary objectives of the present study are as follows:

- Identifying the level of awareness amongst consumers with respect to organic food products
- Studying the impact of education on the consumption pattern for organic food products
- Studying the buying behaviour and attitudes of consumers towards organic food products and identifying the success factor for sustainability of organic food product.
- Studying the correlation between the socio-economic factors and the beliefs and perception of consumers

The paper is arranged as follows: Section 2 deals with the literature review. Section 3 describes the case problem and the methodologies. Section 4 deals with conceptual framework and development of hypotheses. Section 5 presents the data analysis through factor analysis. Section 6 presents the managerial implications and extensions whereas section 7 presents concluding remarks.

2. LITERATURE REVIEW

This section presents the review of literature in two sub-sections. First section reviews the literature to identify various influencing factors building consumer perceptions towards organic food products whereas section 2.2 discusses various methodologies used over years to study and measure the effect of various factors on the consumer purchase of organic food products.

2.1 Literature review of the underlying criteria / constructs

Table 1 below shows the literature review of research papers underlying various criteria or constructs to determine the consumer perceptions, attitudes, awareness and purchasing behavior of consumers towards organic food products and their year of publication.

Table 1. Various constructs or criteria for measuring consumer perceptions about organic food products

| Constructs / criteria | Variables taken under study | Reference number |
|--|---|-------------------------------------|
| Consumer attitudes / motivation / perceptions / beliefs to purchase organic food products | gender, age groups, education, marital status, household size, per capita income, municipality size | [1],[2],[3],[4],[5],[6],[7],[8],[9] |
| Consumer willingness to pay for organic food products / consumer intention to buy organic food products | purchase intention, attitude, ethical self-identity, food safety concerns, health consciousness | [10],[11],[12],[13] |
| Consumer awareness / subjective and objective knowledge | Awareness , subjective knowledge , objective knowledge | [12],[14],[15] |
| Demographic variables (age , income , gender) and food choices | Food safety, convenience, education, age, house hold size, trust, price, openness, price | [16],[17],[18],[19],[20] |
| Pesticide free organic food products / no chemical material / health related determinants / food safety / food quality | Motivating factors - healthy, safety level, better treatment of animals, environment, natural taste, quality, fashion | [17],[21],[22],[23] |
| Organic labelling | Age, income, number of adults, number of children, gender, education, marriage, employment | [24-26] |
| Pricing / Purchase criteria | Monthly income , employment | [26] |

2.2 Literature review of the similar studies conducted

Attanasio *et al.* [27] interviewed 280 respondents using semi structured questionnaires examines the consumer's intention to purchase the organic food products in Pontina Province, Italy . The results indicated that the buying intention about the organic products is influenced by the perception about the value of organic food products and belief in the health and safety of the product. [28] examines about consumer perception, actual purchase behaviour, purchase intentions and interrelationship between them in context of organic food products in the district of Kluang, Johor, Malaysia. The results indicated that purchase of organic food was influenced by

consumers' perception of health, safety, environmental factors and animal welfare of products. Study by [29] focuses on increasing consumer awareness about organic foods among Australia. The sample size chosen for the study is 1011 through online survey based on demographic profile that support for the research hypotheses by revealing positive and significant effects of the healthiest, hedonism and trust on consumer purchase intention.

3. PROPOSED METHODOLOGY: Factor analysis

This sections presents in detail the questionnaire which was designed to be circulated amongst the target consumers. This has been presented in section 3.1 . Section 3.2 presents the conceptual framework to highlights the various criteria that build up the consumer attitude the purchase of organic food products in India. This serve as the basis for performing the factor analysis.

3.1 Data collection

Research is conducted in two stages . In the first stage, a focus group or targeted consumers have been recognized . Initially the research is exploratory in nature. Based on the literature exploration, various factors influencing the consumer's experience are determined and a questionnaire has been designed to collect the responses on various aspects of buying behaviour, consumption patterns, demand and supply gap, economics of consumers. Thereafter the questionnaire is circulated amongst the respondents of age groups 18-60 years who are contacted via online as well as offline survey. The questionnaire consists of closed as well as open ended questions.

3.2 Questionnaire design

Questionnaire consists of multiple sections. The first section of the questionnaire includes background questions which includes questions on demographic variables such as age, income, gender, education level, monthly income of family, occupation, family size and number of working persons in the family. Second section of the questionnaire includes the awareness questions. Third section of the questionnaire includes questions to test the customer's beliefs, knowledge, attitude and perceptions of consumers towards organic food products. Fourth section of questionnaire includes questions to test the consumption patterns and fifth section to test the purchasing behaviour of the consumers towards organic food products.

3.3 Conceptual framework

A brief snapshot of the conceptual framework have been presented below . Readers may refer to [30] for the detailed

explanation.

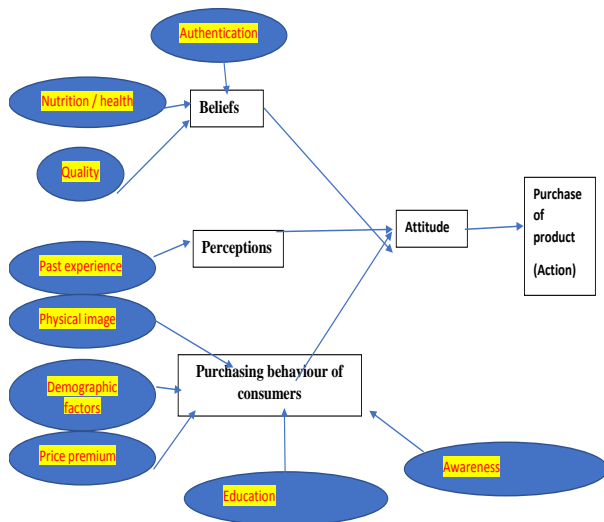


Figure 1: Conceptual framework portraying various factors affecting the attitude of the consumer to buy the organic food product

4. DEVELOPMENT OF HYPOTHESES

Various hypotheses are constructed to analyze the impact of belief, perceptions and purchasing behavior on building attitude of consumers towards the purchase of organic food products in India. These hypotheses have been discussed in detail and the literature explaining the concept in [30].

5. DATA ANALYSIS AND RESULTS

This section discusses the various stages of data collection, the scales and measures used, results of the analysis of demographic details of the respondents and the analysis of various aspects of consumer behaviour towards the organic food products purchase. The scale to measure these consists of 10 point Likert's scale (1=least influence / least spent to 10=most influence / extremely more spent) in which individuals entertain varying degrees of both satisfaction and dissatisfaction in their judgments. For each question, respondents were asked to mark the response that best described their level of agreement. Overall 50 complete and usable questionnaires were obtained. Some key features of the data analysis performed are as follows:

The collected data from the sample respondents have been analyzed and interpreted with the help of statistical tools like percentage analysis, Reliability test, KMO/Bartlett's test and exploratory factor analysis (at 100% cumulative variance).

A Likert-type scale was used when respondents were asked to point out their opinions and attitudes.

- Descriptive statistics has been further used to determine percentages, arithmetic means, and standard deviation.
- To perform the analysis software such as SPSS is used.

5.1 Descriptive statistics and Data visualization of the demographic characteristics of the respondents and their socio-economic data

5.1.1 Demographic distribution of the respondents

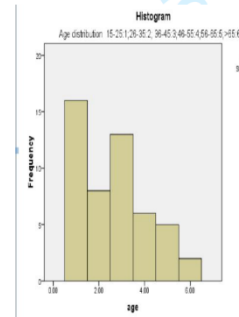


Figure 2: Age distribution of respondents

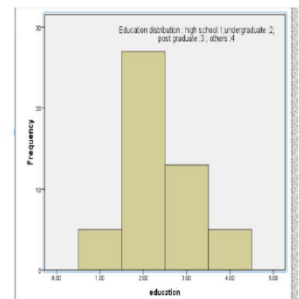


Figure 3: Education distribution of respondents

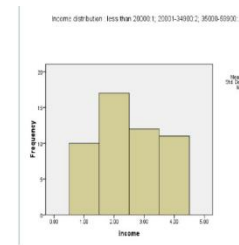


Figure 4: Income distribution of respondents

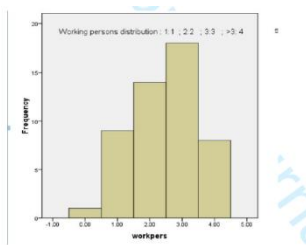


Figure 5: Working persons distribution of respondents

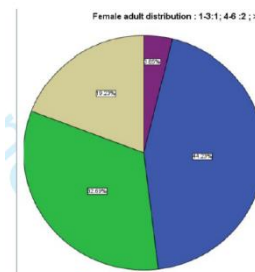


Figure 6: Female adult distribution of respondents

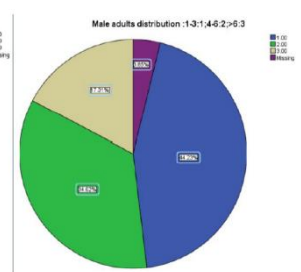


Figure 7: Male adult distribution of respondents

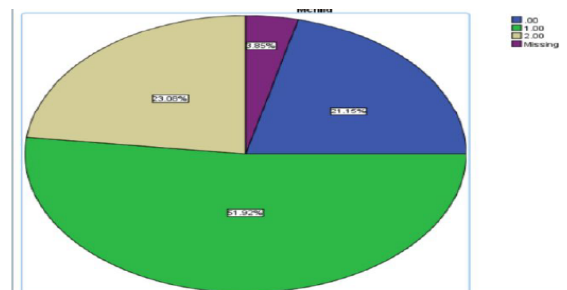


Figure 8: Male child distribution of respondents

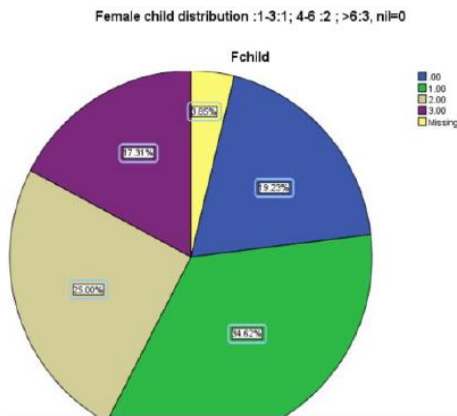


Figure 9 : Female child distribution of respondents

5.1.2 Data analysis of level of awareness about environment and organic food products

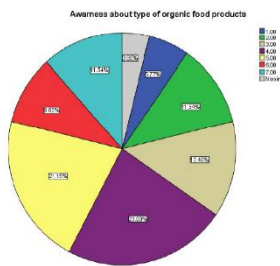


Figure 10 : all items specified :1; spices:2; pulses :3; fruits:4; vegetables:5; oilseeds:6; others (such as honey, tea etc.) :7

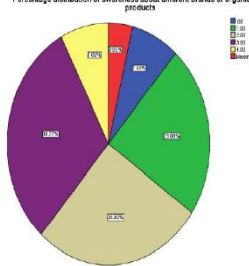


Figure 11 : Retail:1; TV:2; Newspaper: 4; Relatives : 3

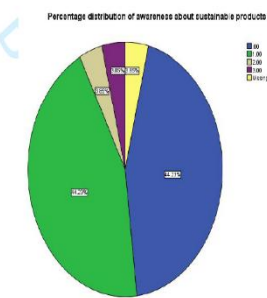


Figure 12: Scale is e-vehicle :1; biodegradable products :2; e-petrochemicals :3; recyclable products :4; composts:5; NO=0

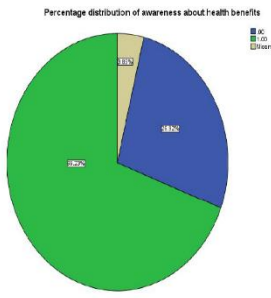


Figure 13 : Scale is Y=1; N=0

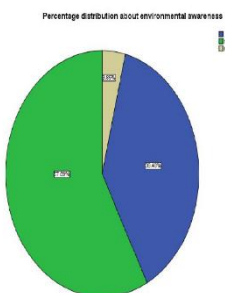


Figure 14: Y=1; N=0

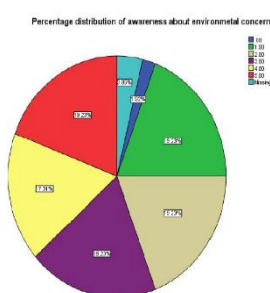


Figure 15 : environment friendly :1; ecology : 2; animal welfare : 3; others : 4; all of them : 5

5.1.3 Studying the correlation between the socio-economic factors and the beliefs and perception of consumers

Table 2. below shows the correlation between the socio economic and demographic profile of respondents with beliefs and perception about organic food purchase.

Table 2. Correlation between education , income , occupation, quality trademark , type of quality mark , expiration date and beliefs & perceptions about organic food

| | | Correlations | | | | | | |
|-------------------|---------------------|--------------|--------|------------|------------------|-------------------|---------|---------|
| | | education | income | occupation | qualitytrademark | typeofqualitymark | expdate | beliefs |
| education | Pearson Correlation | 1 | -.088 | -.008 | -.229 | -.024 | .188 | -.024 |
| | Sig. (2-tailed) | | .544 | .955 | .110 | .868 | .190 | .869 |
| | N | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| income | Pearson Correlation | -.088 | 1 | .180 | -.054 | -.318 | -.030 | -.121 |
| | Sig. (2-tailed) | .544 | | .210 | .708 | .024 | .836 | .402 |
| | N | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| occupation | Pearson Correlation | -.008 | .180 | 1 | .012 | -.221 | -.013 | .036 |
| | Sig. (2-tailed) | .955 | .210 | | .933 | .122 | .927 | .806 |
| | N | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| qualitytrademark | Pearson Correlation | -.229 | -.054 | .012 | 1 | .060 | .012 | .351 |
| | Sig. (2-tailed) | .110 | .708 | .933 | | .676 | .935 | .013 |
| | N | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| typeofqualitymark | Pearson Correlation | -.024 | -.318 | -.221 | .060 | 1 | .008 | .094 |
| | Sig. (2-tailed) | .868 | .024 | .122 | .676 | | .958 | .517 |
| | N | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| expdate | Pearson Correlation | .188 | -.030 | -.013 | .012 | .008 | 1 | .022 |
| | Sig. (2-tailed) | .190 | .836 | .927 | .935 | .958 | | .880 |
| | N | 50 | 50 | 50 | 50 | 50 | 50 | 50 |
| beliefs | Pearson Correlation | -.024 | -.121 | .036 | .351 | .094 | .022 | 1 |
| | Sig. (2-tailed) | .869 | .402 | .806 | .013 | .517 | .880 | |
| | N | 50 | 50 | 50 | 50 | 50 | 50 | 50 |

*. Correlation is significant at the 0.05 level (2-tailed).

5.1.4 Analysis of the consumption patterns of the respondents

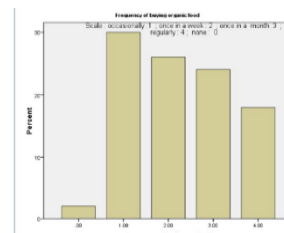


Figure 16 : Frequency of buying organic food

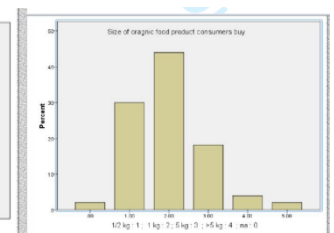


Figure 17 : Size of organic food product consumer buy

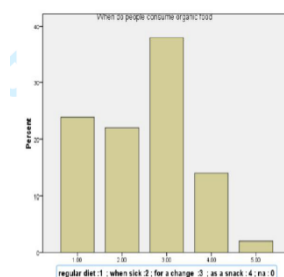


Figure 18 : When do people purchase organic food product

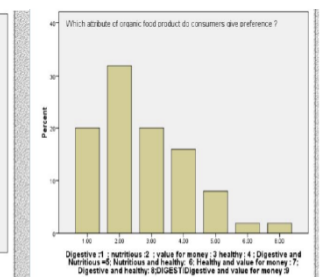


Figure 19 : Which attribute of organic food product do consumers give preference

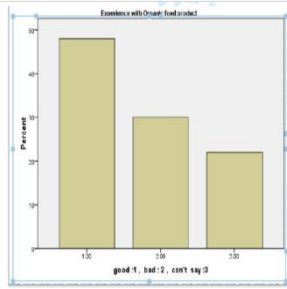


Figure 20 : Experience with organic food product

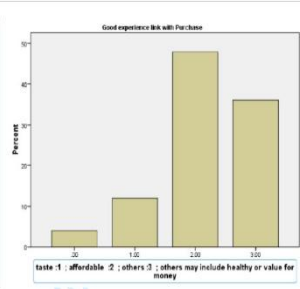


Figure 21 : Good experience link with Purchase

5.1.5 Analysis of purchase behaviour i.e. monetary distribution of salary on organic foods

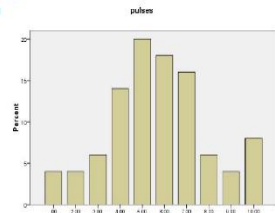


Figure 22: Percentage of money spent on purchase of Pulses
1: least spent ; 2: somewhat spent ; 3 : less spent ; 4: somewhat fairly spent ; 5: fairly spent ; 6: Meaning fully spent ; 7: over budget spent ; 8: highly spent ; 9: very highly spent ; 10: extremely spent

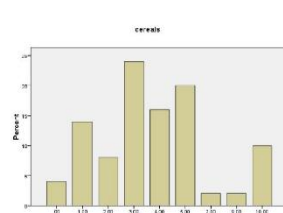


Figure 23: Percentage of money spent on purchase of Cereals
1: least spent ; 2: somewhat spent ; 3 : less spent ; 4: somewhat fairly spent ; 5: fairly spent ; 6: Meaning fully spent ; 7: over budget spent ; 8: highly spent ; 9: very highly spent ; 10: extremely spent

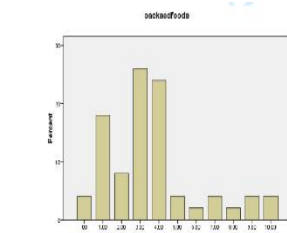


Figure 24: Percentage of money spent on purchase of Packaged foods
1: least spent ; 2: somewhat spent ; 3 : less spent ; 4: somewhat fairly spent ; 5: fairly spent ; 6: Meaning fully spent ; 7: over budget spent ; 8: highly spent ; 9: very highly spent ; 10: extremely spent

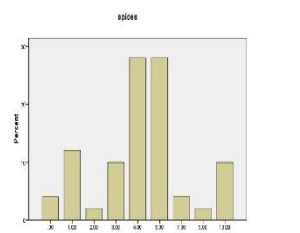


Figure 25: Percentage of money spent on purchase of Spices
1: least spent ; 2: somewhat spent ; 3 : less spent ; 4: somewhat fairly spent ; 5: fairly spent ; 6: Meaning fully spent ; 7: over budget spent ; 8: highly spent ; 9: very highly spent ; 10: extremely spent

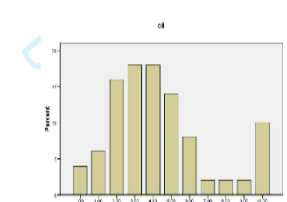


Figure 26: Percentage of money spent on purchase of Oil
1: least spent ; 2: somewhat spent ; 3 : less spent ; 4: somewhat fairly spent ; 5: fairly spent ; 6: Meaning fully spent ; 7: over budget spent ; 8: highly spent ; 9: very highly spent ; 10: Extremely spent

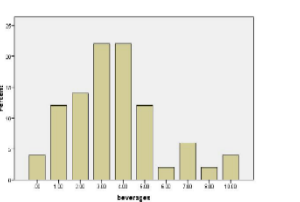


Figure 27: Percentage of money spent on purchase of Beverages
1: least spent ; 2: somewhat spent ; 3 : less spent ; 4: somewhat fairly spent ; 5: fairly spent ; 6: Meaning fully spent ; 7: over budget spent ; 8: highly spent ; 9: very highly spent ; 10: Extremely spent

5.1.6 Factor analysis

Factors considered for consumer perception towards organic products . Factor analysis is used to analyze and identify the consumer perception towards organic products. The 15 factors identified namely Factor 1 , Factor 2 , ...Factor 15 given in the table below. First, the rotated component matrix factor loadings greater than 0.5 is to be selected . Extraction method used is principle component analysis. Rotation method used is varimax with Kaiser normalization. Factor loadings in rotated component matrix at 100 % cumulative variance .

| E | O | MA | FA | UOF | TSP | HBA | EA | EC | IQM | B | WCOF | SOF | EOF | GELP | HOF | SOF | GSOF | POF | FOF | Pr | HBA | AW | PI | Ad | Pr | Visualattractiveness | | |
|------|------|------|------|------|-------|------|------|------|------|------|------|-------|------|------|-------|------|-------|-------|------|------|------|------|------|------|------|----------------------|------|-------|
| 1.00 | .088 | .008 | .032 | .109 | .132 | .163 | .283 | .216 | .128 | .024 | .024 | -.039 | .216 | .042 | -.093 | .066 | -.050 | .365 | .087 | .082 | .172 | .000 | .125 | .201 | .016 | .042 | .068 | -.074 |
| .088 | 1.00 | .180 | .007 | .106 | -.075 | .139 | .097 | .258 | .156 | .318 | .121 | -.117 | .002 | .078 | .224 | .348 | .265 | -.011 | .037 | .072 | .031 | .117 | .031 | .040 | .315 | .260 | .248 | .116 |
| .008 | .180 | 1.00 | .137 | .111 | .226 | .249 | .188 | .022 | .097 | .221 | .036 | .127 | .289 | .175 | -.004 | .140 | .140 | .160 | .162 | .099 | .391 | .196 | .320 | .217 | .066 | .100 | .242 | .167 |
| .032 | .007 | .137 | 1.00 | .255 | -.128 | .219 | .064 | .142 | .016 | .085 | .195 | .194 | .084 | .046 | .178 | .258 | .248 | .123 | .095 | .039 | .275 | .158 | .027 | .219 | .328 | .326 | .204 | -.053 |
| .109 | .106 | .111 | .255 | 1.00 | -.051 | .190 | .153 | .170 | .035 | .298 | .279 | .177 | .001 | .282 | .102 | .140 | .164 | .025 | .086 | .216 | .123 | .193 | .047 | .272 | .128 | .265 | .163 | -.234 |
| .132 | .075 | .226 | .128 | .051 | 1.000 | .120 | .078 | .000 | .422 | .030 | .019 | -.115 | .096 | .115 | -.145 | .206 | -.042 | .103 | .150 | .081 | .105 | .087 | .039 | .079 | .039 | .124 | .064 | -.013 |
| .163 | .139 | .249 | .219 | .190 | .120 | 1.00 | .011 | .095 | .067 | .278 | .337 | -.023 | .071 | .344 | .250 | .024 | .352 | .117 | .064 | .095 | .201 | .067 | .070 | .133 | .038 | .155 | .137 | -.036 |
| .283 | .097 | .188 | .064 | .153 | .078 | .011 | 1.00 | .218 | .064 | .027 | .133 | -.263 | .139 | .204 | -.157 | .232 | -.015 | .168 | .024 | .104 | .034 | .025 | .046 | .100 | .021 | .250 | .315 | -.153 |
| .216 | .258 | .022 | .142 | .170 | .000 | .095 | .218 | 1.00 | .039 | .072 | .035 | -.131 | .016 | .113 | .010 | .076 | .029 | .014 | .056 | .101 | .098 | .223 | .209 | .164 | .010 | .000 | .086 | .181 |
| .128 | .156 | .097 | .016 | .035 | -.422 | .067 | .064 | .039 | 1.00 | .091 | .123 | .178 | .187 | .104 | .150 | .283 | .245 | .060 | .217 | .072 | .129 | .088 | .034 | .079 | .071 | .342 | .045 | -.051 |
| .024 | .318 | .221 | .085 | .298 | .030 | .278 | .027 | .072 | .091 | 1.00 | .094 | -.123 | .233 | .225 | -.082 | .283 | -.324 | -.288 | .161 | .170 | .086 | .082 | .031 | .314 | .173 | .105 | .128 | .000 |
| .024 | .121 | .038 | .195 | .279 | .019 | .337 | .133 | .035 | .123 | .094 | 1.00 | .288 | .101 | .297 | -.118 | .016 | -.100 | .190 | .273 | .117 | .164 | .016 | .013 | .086 | .110 | .151 | .067 | .203 |
| .039 | .117 | .127 | .194 | .177 | -.115 | .023 | .263 | .131 | .178 | .123 | .288 | 1.00 | .002 | .266 | -.140 | .308 | -.012 | .021 | .010 | .071 | .223 | .124 | .183 | .004 | .239 | .362 | .402 | .213 |
| .216 | .002 | .289 | .084 | .001 | .096 | .071 | .139 | .016 | .187 | .233 | .101 | .002 | 1.00 | .102 | -.068 | .082 | -.240 | -.123 | .017 | .319 | .035 | .188 | .226 | .018 | .085 | .047 | .052 | -.137 |
| .042 | .078 | .175 | .046 | .282 | .115 | .344 | .204 | .113 | .104 | .225 | .297 | .266 | .102 | 1.00 | .067 | .089 | .007 | -.081 | .024 | .098 | .373 | .144 | .078 | .110 | .042 | .171 | .168 | .064 |
| .093 | .224 | .004 | .178 | .102 | -.145 | .250 | .151 | .010 | .150 | .082 | .118 | -.140 | .068 | .067 | 1.00 | .265 | .404 | -.098 | .203 | .092 | .076 | .230 | .116 | .113 | .343 | .344 | .058 | .031 |
| .065 | .348 | .140 | .258 | .140 | -.203 | .024 | .232 | .076 | .283 | .283 | .016 | .308 | .082 | .089 | .265 | 1.00 | .349 | .006 | .128 | .151 | .214 | .165 | .205 | .068 | .354 | .513 | .352 | .207 |
| .050 | .265 | .140 | .248 | .164 | -.042 | .352 | .015 | .029 | .245 | .324 | .100 | -.012 | .240 | .007 | .404 | .348 | 1.00 | .391 | .046 | .091 | .169 | .147 | .151 | .227 | .187 | .390 | .049 | -.028 |
| .365 | .011 | .160 | .123 | .025 | .103 | .117 | .168 | .014 | .060 | .288 | .190 | .021 | .123 | .081 | -.098 | .006 | .391 | 1.00 | .083 | .047 | .213 | .197 | .343 | .682 | .050 | .020 | .079 | .154 |

5.1.7 KMO's and Bartlett test

| | | |
|---|--------------------|-------------|
| Kaiser Meyer Olkin measure of sampling adequacy | | 0.493 (0.5) |
| Bartlett test of sphericity | Approx. chi square | 619.876 |
| | d.f | 406 |
| | Significance | .00 |

The above table shows that KMO test has been applied to the resulting correlation matrix to test whether the relationship amongst the variables are significant or not . The test results shows that the significant value is approx.. 0.5 which is acceptable and therefore there is a significant relationship amongst the variables . The Bartlett test should be significant (i.e., a significance value of less than .05); here the Bartlett test value is .00 which signifies that the variables are correlated highly enough to provide a reasonable basis for factor analysis as in this case .

5.1.8 Component Matrix

| | Component | | | | |
|--------------------------|-----------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 |
| education | .003 | -.252 | .339 | .365 | .317 |
| income | -.352 | .248 | -.242 | .130 | -.218 |
| occupation | -.056 | -.120 | .300 | -.269 | -.503 |
| Madults | .318 | .428 | .137 | .060 | .412 |
| Fadults | .240 | .596 | .239 | -.179 | .041 |
| useoforgfood | -.067 | -.223 | .419 | -.293 | -.136 |
| typesustainableproducts | .299 | .373 | .331 | -.113 | -.354 |
| healthbenefitsawareness | -.230 | -.166 | .360 | .435 | .226 |
| environawareness | .021 | -.301 | -.175 | .367 | -.086 |
| environconcern | .168 | .227 | -.389 | .484 | .078 |
| typeofqualitymark | .300 | .204 | .266 | -.102 | .362 |
| beliefs | -.139 | -.437 | -.208 | -.050 | -.106 |
| whendoyouconsumeorga | .400 | .041 | -.219 | -.354 | .197 |
| nifood | .214 | .110 | .115 | -.184 | .598 |
| sizeoforganicfood | .278 | .247 | .124 | -.527 | -.137 |
| expwithorgfood | .310 | .314 | -.245 | .260 | -.226 |
| goodexplinkwithpurchase | .563 | .242 | -.375 | .103 | .016 |
| howdoyoubuyorgfood | .457 | .338 | .101 | .451 | -.324 |
| incomesspentonorganicfo | .322 | -.209 | .568 | .415 | -.052 |
| od | .420 | .035 | .093 | .173 | .182 |
| priceoforganicfood | -.313 | .354 | .239 | -.182 | .097 |
| frequencyofbuyingorgfood | .707 | -.223 | .301 | -.246 | .176 |
| price | .619 | .517 | -.164 | .064 | -.149 |
| healthconscious | .670 | -.505 | .128 | .043 | .016 |
| awareness | .329 | .017 | .723 | .207 | .143 |
| peergroupinfluence | .653 | .023 | -.112 | .030 | .439 |
| advertisement | .605 | .339 | -.316 | .078 | .190 |
| packaging | .703 | -.090 | -.034 | -.353 | .225 |
| preservatives | .559 | -.581 | -.268 | -.163 | -.023 |
| visualattractiveness | | | | | |

Extraction Method: Principal Component Analysis.
a. 5 components extracted.

Fig. 28. Component matrix

5.1.8.1 The rotated component matrix

| | Component | | | | |
|--------------------------|-----------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 |
| education | .052 | -.067 | -.052 | -.163 | .614 |
| income | .108 | .437 | -.016 | .283 | -.157 |
| occupation | .232 | -.285 | -.094 | .639 | -.078 |
| Madults | .265 | .292 | .531 | -.065 | .189 |
| Fadults | .102 | .122 | .632 | .273 | -.068 |
| useoforgfood | .047 | -.540 | .019 | .189 | .067 |
| typesustainableproducts | .049 | .007 | .325 | .606 | -.035 |
| healthbenefitsawareness | -.220 | -.085 | -.030 | -.164 | .605 |
| environawareness | -.049 | .180 | -.443 | -.039 | .177 |
| environconcern | -.060 | .671 | -.079 | -.083 | .070 |
| typeofqualitymark | -.070 | -.160 | -.169 | -.601 | -.095 |
| beliefs | -.009 | -.170 | -.454 | -.141 | -.113 |
| whendoyouconsumeorga | .514 | .083 | .121 | -.071 | -.288 |
| nifood | .062 | -.166 | .407 | -.507 | .093 |
| sizeoforganicfood | .288 | -.178 | .342 | .310 | -.349 |
| expwithorgfood | .008 | .532 | -.004 | .286 | -.092 |
| goodexplinkwithpurchase | .379 | .581 | .024 | .135 | -.167 |
| howdoyoubuyorgfood | .016 | .512 | .059 | .568 | .230 |
| incomesspentonorganicfo | .151 | -.051 | -.079 | .364 | .693 |
| od | .341 | .228 | .085 | .080 | .260 |
| priceoforganicfood | -.268 | -.184 | .461 | -.054 | -.046 |
| frequencyofbuyingorgfood | .794 | -.154 | .079 | .226 | .199 |
| price | .586 | .104 | -.546 | .219 | .060 |
| healthconscious | .693 | -.037 | -.354 | .223 | .293 |
| awareness | .230 | -.144 | .293 | .309 | .663 |
| peergroupinfluence | .679 | .351 | .140 | -.107 | .136 |
| advertisement | .455 | .603 | .196 | .054 | -.109 |
| packaging | .806 | .030 | .101 | .081 | -.108 |
| preservatives | .677 | -.017 | -.526 | .036 | -.109 |
| visualattractiveness | | | | | |

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 9 iterations.

Fig. 29 Rotated component matrix

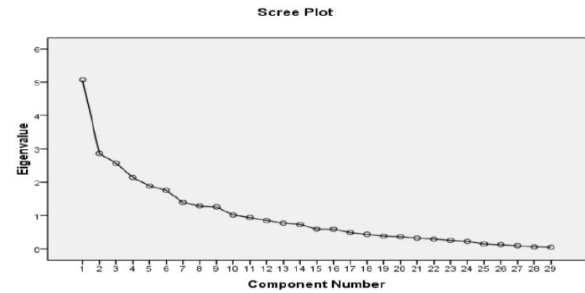
5.1.8.2 The total variance explained

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|-----------|---------------------|---------------|--------------|-------------------------------------|---------------|--------------|-----------------------------------|---------------|--------------|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 5.069 | 17.481 | 17.481 | 5.069 | 17.481 | 17.481 | 4.171 | 14.393 | 14.393 |
| 2 | 2.803 | 9.671 | 27.352 | 2.803 | 9.671 | 27.352 | 2.795 | 9.638 | 24.021 |
| 3 | 2.572 | 8.889 | 36.220 | 2.572 | 8.889 | 36.220 | 2.624 | 9.440 | 33.060 |
| 4 | 2.144 | 7.394 | 43.614 | 2.144 | 7.394 | 43.614 | 2.601 | 9.399 | 42.036 |
| 5 | 1.888 | 6.509 | 50.123 | 1.888 | 6.509 | 50.123 | 2.345 | 8.495 | 50.123 |
| 6 | 1.758 | 6.062 | 56.185 | | | | | | |
| 7 | 1.391 | 4.798 | 60.983 | | | | | | |
| 8 | 1.285 | 4.432 | 65.415 | | | | | | |
| 9 | 1.261 | 4.347 | 69.763 | | | | | | |
| 10 | 1.016 | 3.504 | 73.266 | | | | | | |
| 11 | .941 | 3.245 | 76.512 | | | | | | |
| 12 | .855 | 2.950 | 79.462 | | | | | | |
| 13 | .775 | 2.671 | 82.133 | | | | | | |
| 14 | .735 | 2.533 | 84.666 | | | | | | |
| 15 | .590 | 2.036 | 86.702 | | | | | | |
| 16 | .588 | 2.028 | 88.730 | | | | | | |
| 17 | .489 | 1.695 | 90.415 | | | | | | |
| 18 | .438 | 1.511 | 91.926 | | | | | | |
| 19 | .396 | 1.332 | 93.258 | | | | | | |
| 20 | .366 | 1.263 | 94.520 | | | | | | |
| 21 | .326 | 1.125 | 95.645 | | | | | | |
| 22 | .285 | 1.017 | 96.662 | | | | | | |
| 23 | .254 | .874 | 97.536 | | | | | | |
| 24 | .223 | .789 | 98.305 | | | | | | |
| 25 | .149 | .513 | 98.818 | | | | | | |
| 26 | .126 | .435 | 99.253 | | | | | | |
| 27 | .099 | .348 | 99.593 | | | | | | |
| 28 | .084 | .222 | 99.815 | | | | | | |
| 29 | .054 | .185 | 100.000 | | | | | | |

Extraction Method: Principal Component Analysis.

Fig. 30 The total variance explained

5.1.8.3 Scree plot



6. MANAGERIAL IMPLICATIONS

The present section deals with the managerial and IT related implications . For the detailed implications in other horizons such as logistics and / or infrastructure and management , authors may refer to [30]. They have been described in detail as follows :

1. Information technology and data analytics perspective

Apart from Factor analysis , Bayesian analysis can be applied and data visualization can be performed with the bigger data set to study the consumer behaviour towards organic food products and testing of hypotheses can also be made .

2. Conceptualization of consumer perception Bayesian network

A Bayesian Network may be implemented in order to analyse the consumer perception about organic food products in developing countries like India through consumer perception and satisfaction survey data. The survey assessed the perception , belief and level of awareness and motivation towards the purchase of organic food products using several attributes. An important issue could be in consumer perception survey is to find which aspects of their perception, beliefs and purchasing behaviours influences their motivation and attitude to purchase . Bayesian Network is a useful tool to analyse such impact with the advantage that it produces graphical output that are easy to understand and make it simple to conduct

probabilistic inference for prediction.

Bayesian learning : In recent years, Bayesian network structure is a rapidly growing field of research. The initiation of classifiers from datasets of pre-classified cases is an important issue in Bayesian network learning. A most probable approach in the given scenario is the Greedy search constraint-based approach [31] . In general Greedy search approach is used to structure when the system is relatively unknown to us. Greedy search starts at a specific point in the structure space thereby considering all nearest neighbours of the existing point moving towards the neighbour with highest score . Algorithm eventually terminates when no neighbour appears with a higher score .

3. Higher research perspective : data mining and big data

The research topic offers a plethora of possibilities for researchers . The study takes in to consideration just one category of sustainable food products *i.e.* organic food products . As mentioned in the questionnaire attached in the appendix , the concept can be extended to include biodegradable products , E-vehicle or even composts .

Apart from greedy search algorithm (which is used to structure the data), meta heuristics and evolutionary algorithms may be applied in case of finding a compromised solution considering the optimization aspects of the modelling

a discussion beyond the scope of present research work and serve as a excellent opportunity for researchers.

7. CONCLUDING REMARKS

Present study tries to explore and analyze interesting aspects related to consumer behavior , perceptions and attitudes about organic food products in Indian sub-continent . It also relates such consumption patterns with the consumers' understanding and points of view towards organic food as well as their demographic, socio-economic, purchasing patterns and consumption patterns profiles. Based on the conceptual framework which identify the required criteria that influences the consumer perceptions and attitude towards organic food products, data is collected from randomly selected organic food consumers through online as well as offline survey and using semi-structured questionnaire. A detailed data analysis is then performed applying factor analysis approach and results are presented . Further extension of the present research work could be a comparative analysis of Factor analysis and Bayesian analysis which is a working paper by corresponding author and beyond the scope of present research paper. However it may be discussed at length upon the readers' request.

8. ACKNOWLEDGEMENTS

Authors are thankful to Recventures Education Services Private Limited for funding and support for communicating this research .

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