

Developing A Predictive Model To Classify Current And Prospective Organic Food Consumers In Mumbai Using Logistic Regression

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Abstract: Concern towards health and environment is fueling the growth of organic food consumption globally and also in India. As per studies Indian agriculture in remote places is organic by default, and marginal efforts would be required to make it certified organic. This is a big opportunity for the Indian agriculture and Indian organic industry. If the domestic organic food market is studied and systematically tapped it will provide stability to export oriented organic food companies and an additional income to the farmers and quality products to the customers. The research study is an exploration and quantification and of all the variables involved in organic food consumption in India and culminates in developing a predictive model. The model is developed using 622 observation collected from 1500 respondents from Mumbai and Navi Mumbai.

Index Terms: Logistic Regression, Organic Food, Predictive Modeling, Nutrition Consciousness, Safety Consciousness, Environment Consciousness, Sensory Benefit, Subjective Norms, Perceived Behavioral Control

1 INTRODUCTION

In recent years, the importance of food safety incidents around the world have raised consumers' health awareness and caused organic food to become a focus of public interest. In view of increased consumer awareness and consciousness of personal health, a wave of studies aimed at identifying the organic consumer is underway. The literature aiming at identifying the organic consumer is extensive and findings of these studies usually give contradictory insights. The search for universal profile of an organic food consumer is elusive and will remain elusive. This perpetual elusiveness is justified because of changing demographical and geographical context of the various studies. Various studies concerning consumer behavior vis-a-vis organic products have been conducted in many European Union countries and the US. These studies are done by many researchers chief among them being Davis et al., (1995); Roddy et al., (1996); Hutchins and Greenhalgh, (1997); Reicks et al., (1997); Latacz Lohmann and Foster, (1997); Kyriakopoulos and Oude Ophuis, (1997); Thompson, (1998); Thompson and Kidwell, (1998); Michelsen et al., (1996); Worner and Meier-Ploeger, (1999); Santucci et al., (1999); Govindasamy and Italia, (1999); Browne et al., (2000); Zanolli and Naspetti, (2001); Magnusson et al., (2001); Jones and Clarke-Hill, (2001); Wier and Calverley, (2002); Kyriakopoulos, (1996); Papastefanou et al., (1998); Zotos et al., (1999); Tzimitra-Kalogianni et al., (1999); Chryssochoidis, (2000); Chryssochoidis and Fotopoulos, (2000); Fotopoulos and Krystallis, (2001, 2002a, 2002b); Fotopoulos et al., (2003). A number of researches were conducted among consumers in various parts of India to find out about awareness levels, motivations and hindrances for organic food purchasing. The studies are carried by Garibay and Jyoti (2003), Menon, Sema, and Partap (2010) Rao et al. (2006), Dholakia and Shukul (2012), and Doel Mukherjee (2012). Efficient resource allocation is hall mark of management and hence marketing. A prediction of hot or warm prospects helps in channelizing all the monetary and non monetary resources for conversion of individuals into customers.

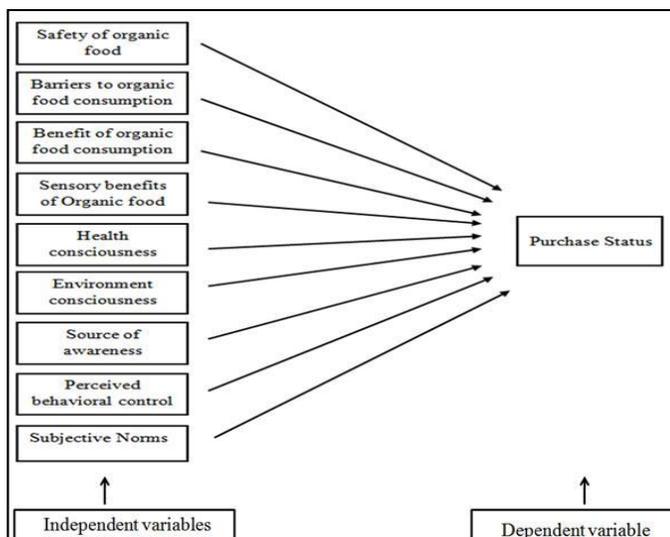
2 RESEARCH MOTIVATION AND PURPOSE

India is organic by default. India is bestowed with immense potential to produce all varieties of organic products due to its agro climatic regions. Despite the sweeping influence of chemical-based farming, traditional knowledge on sustainable

farming practices still exists in India, and in remote areas of the country. India has experienced good growth in the organic business sector. Exports reportedly grew between 25 and 30 percent, whilst domestic markets grew even faster at about 40 percent. The organic food market in India is forecast to grow at a CAGR of more than 25% during 2015 – 2020. By 2025 the Indian Organic food business is likely to be an Rs 75,000 crores. Focus on both export and domestic markets are crucial for this to happen. Without increase in demand for organic products from domestic customers, farmers will not be encouraged to take up organic farming. Effective marketing of organic products in local, regional and national markets could make a major contribution to securing the livelihoods of smallholder producers, to strengthening small family farm structures and sustainable development of the country's food and agriculture sector. The motivation for this research is fill the gap in the literature by providing a predictive model for identifying hot and warm prospects to the entrepreneur and marketers from India who are currently exporting and not targeting the Indian markets.

3 OBJECTIVE OF THE STUDY

The objective of the study is to develop a Logistic regression model which can be used to, predict the likelihood of an individual to become prospective organic food consumer using all the psychographical and demographical variables. Theoretical model



Hypothesis to be tested: Predictive Modeling using Logistic Regression: Hosmer Lemeshow test (HLT) tests the hypothesis for model appropriateness. In the test a comparison is made in count of observed and predicted cases and a chi-square statistics is calculated. If the difference is then it means that the built model is good. HLT, tests the null hypothesis Null hypothesis: The observed counts are equal to the predicted counts Alternative Hypothesis: The observed counts are not equal to the predicted counts When the Null is accepted it means the model is a good model. For failing to reject the null hypothesis the P value should be higher than the set significance value of 0.05. A significant P value against all the variables/factors included in the model building is used in the final model building and the values are included in the theoretical model.

4 LITERATURE DEVELOPMENT AND HYPOTHESIS

DEVELOPMENT

The following variables/constructs are involved in defining the intention to purchase organic food

Nutrition Consciousness

It is found in many studies that organic food is more nutritious than food which comes from traditional farms. In consumers view nutritional benefit of organic food and conventional food is same, although there are some organic produce buyers who say that organic food is more nutritious Sparling et al. (1992). Contrary to the above, research studies done by Jolly and Dhesi (1989) Morgan et al. (1990) and Estes et al. (1994) has come to a conclusion that irrespective of purchase status, all respondents feel that organic food is more nutritious than non organic food. Past studies have found that individuals view organic food as good quality food (Radman, 2005) and distinguish it as having a higher vitamin and mineral content than conventional products (Lea and Worsley, 2005).

Food Safety Concern

There are more American who view residual pesticide in food as more serious health hazard than those health hazard caused by the effects of second hand smoke, atmospheric pollution, hormones in milk and meat and food poisoning Morris et al.(1993). The concern for pesticide residue was more found in the buyers than the non buyers Jolly and Dhesi

(1989); Jolly (1991). In the same line it was found by Goldman and Clancy (1991) that out of the seven listed reasons, the second most important reason for buying organic food is the safety and protection one gets from residual pesticide found in non- organic food. A whopping 91% of organic food customers have voiced their concern about the ill effects of pesticides in the farming of non- organic produce Morris et al. (1993). Individuals concerned with the concerns of the ill effect of pesticide used in conventional produce are on the rise Sachs et al. (1987). Ott (1990) found that 33 percent of shoppers were not worried about the pesticide residue as against 50% of the shoppers who were ready to pay premium for buying certified pesticide residue free (CPRF) organic produce. Organic produce was ranked better than non organic food by eight participants out of twelve participants because the organic produce contains less chemical residues Jolly and Norris (1991). While selecting organic produce fifty two percent consumers scored on very concerned or extremely concerned on the item of pesticide residue while choosing organic food Cook (1992). Organic produce was bought by 15 percent of the consumers who had concerns about pesticide residue in conventional food Bruhn et al. (1992). On the same lines twelve percent of organic food was bought because organic produce are chemical free The Packer (1996). Morris et al. (1993) found that a large number of American want the regulator to chemical application in agriculture. In a study by Sparling et al.(1992) it was found that thirty percent of organic food purchaser cited they had pesticide residue a worry which make them buy organic food and this corresponded with twenty one percent purchaser of organic food who had concerns for their health who had bought organic food. This two finding suggest that pesticide residue and health is seen as connected by organic food buyers. Individuals who worry about food safety hold a favorable attitude towards organic food Roddy, Cowan and Hutchinson (1996).

Health Consciousness

The concept of safety and nutrition is connected with health. The main reason for given by 21 percent purchaser of organic food was health Sparling et al. (1992). The main reason given by 54 percent respondent from UK who purchased organic food was their concern for health Tregear et al (1994). The Packers (1996) found that the reason of 16 percent of organic food purchaser was for health reasons. In a study done by Jolly et al. (1989) which investigated the concern of additive, and preservatives and artificial coloring found that purchaser had a higher level of concern of addition of these chemical on their health. Positive attitude towards organic food has a root in the belief that organic food is good for health. As compared to conventional food organic is considered as healthier (Lea and Worsley, (2005), Magnusson et al. (2001) Radman (2005). Health as the strongest motivator for purchasing organic produce has been in found in many studies indicating that consumers purchase organic food for health reason Chinnici et al. (2002) Davies et al. (1995) Hutchins and Greenhalgh, (1997) Makatouni (2002) Padel and Foster (2005) Squires et al. (2001) Tregear et al. (1994). Health conscious customers are more likely to buy organic products than those who are less or not as health conscious Squires et al (2001). Positive attitude and health connection will vary in quantum for different types of organic food products Tarkiainen and Sundqvist (2005). Findings from research study by Lockie et al. (2004) indicate that there is no significant connection

between organic consumption and health consciousness. In fact research point that, to predict organic purchase health consciousness as a variable may not be sufficient Kristensen and Grunert (1991). Health as a dominant motivation towards organic consumption has been reported by almost all research studies (Alvensleben (1997) Backer (2004) Davies et al. (1995) Radman (2005) Padel and Foster (2005) Wier and Calverley (2002) Zanolini et al. (2004) Zakowska (2007). The most important factor to have an organic diet for elder people is health Wier and Calverley (2002). Historically studies have shown that health consciousness the most important reason for purchasing and consuming organic food Tregear et al. (1994) Huang (1996) Schlegelmilch et al. (1996) Hutchins and Greenhalgh (1997) Wandel and Bugge (1997) Von Alvensleben (1998) Magnusson et al. (2001) Squires et al. (2001) Padel and Foster (2005).

Environment Consciousness

Shoppers of organic food are motivated to buy organic food because they consider organic food to be environment friendly Zepeda and Deal (2009). Health or taste is the reasons why "regular organic food" consumers buy organic food and there is another set of consumer designates as "hardcore organic food consumer" who buys organic food for environmental and ethical reason along with health reasons (Hamzaoui and Zahaf 2009). An environmentally conscious customer is one who understands the implication of the entire life cycle impact of the product on the environment and tries to minimize this negative effect by his or her own behavior (Grunert and Juhl 1995). Goldman and Clancy (1991) find that of the top seven most cited reason for buying organic food, environmental concern accounted for four of the top seven. Sparling et al. found the concern for environment are responsible for eleven percent of organic food consumer to buy organic food. The fourth most cited reason for by organic food consumer to buy organic food was their concern toward environment (Estes et al. 1994). Morgan et al. (1990) report that 61.3 percent of organic food retailer rank "better for environment" as one of the top three reasons to sell organic produce. It was found by Jolly and Norris (1991) that five out of twelve organic food producer rank organic produce better for environment than conventional produce. Over 90 percent of both organic food purchaser and on organic food purchaser cite that they are concerned for the environment (Tregear et al. 1994). One of the strong motivator of purchase of organic food product is concern towards the environment (Davies et al., 1995; Hutchins and Greenhalgh, 1997). Tregear et al. (1994) says that only a part of the total motivation to buy organic food is explained by an individual concern for the environment. Out of those who purchased organic food only nine percent said they buy because they are concerned about the environment. If an individual is having a positive attitude towards environment it will get reflected in his or her intention towards environmentally friendly product such as organic food product (Alwitt and Pitts 1996). Increased consumption of organic produce is connected with the increased concern for environmental issues (Huang 1996). Study has proved that natural production methods and environment preservation is what interests consumer of organic food (Squires et al., 2001). Tregear et al. (1994) found those organic food product purchasers are more likely to get involved in environmental friendly activities like recycling and reusing. The strongest reason for organic food purchase remains health, the increasing concern for

environment is secondary motives to buy organic food (Alvensleben, 1997; Backer, 2004; Davies et al., 1995; Radman, 2005; Padel and Foster, 2005; Wier and Calverley, 2002; Zanolini et al., 2004). Health motivation is main factor to purchase organic food and the second biggest factor is ecological reasons to buy organic food after health reason in Germany (Alvensleben 1997). Organic food is preferred by young people because of environmentally friendly production methods (Wier and Calverley 2002). Vermeir and Verbeke (2006) and Chen (2007) have found that positive attitude and strong intention to purchase are seen in customers who are more involved in environmental related issues and environment protection. Ecological concerns have a significant effect on the attitude and hence purchase decision for organic food; however this is not the primary issue in the decision to purchase organic food. (Kristensen and Grunert, 1991; Von Alvensleben, 1998; Tregear et al., 1994; Schifferstein and Oude Ophuis, 1998).

Sensory Appeal

Sensory factors like taste are an important product feature for consumers groups who approach the purchase organic food (Pellegrini and Farinello 2009) and their evaluation of the organic product is the same way as used to evaluate conventional food products (Berardini et al. 2006). In Organic food purchase appearance and taste are one of the most important characteristics (Kuhar and Juvancic 2010; Castellini et al. 2008; Magnusson et al. 2001; Roddy, Cowan, and Hutchinson 1994). Luth and Spiller (2005) found that besides the claim of being organically produced, customers are ready to pay premium if the food has unique taste and smell. Sensory attributes of organic food are to be utilized in their argument to persuade customers to buy organic food (Padel and Foster 2005; Brennan and Kuri 2002). Studies targeting the organic food purchase and its connection with sensory attributes has been done in Italy (Stolz et al. 2010). Various product specific connections between sensory attribute and organic product purchase have been done in Pecorino cheese (Napolitano et al. 2009), extra virgin oil (Bracco et al. 2009; Midmore et al. 2005), and organic vegetable baby food (Vairo and Zanolini 2009).

Appearance

Bad looking products are not preferred by heavy buyers (Zanolini et al., 2004; Radman, 2005). Ott (1990) found that there was unwillingness amongst sixty two percent of consumer to buy organic food which have an inferior appearance quality, and also 88 percent would not accept organic products which have insect damage. Evidence of the connection between organic purchasing behavior and willingness to accept blemishes are there (Goldman and Clancy 1991). Shoppers who are worried about pesticides would be willing to purchase products with blemish and these constitute eighteen percent of the total shoppers whereas shoppers who are not worried of pesticide would buy blemished products constitute 6 percent of the population (Ott, 1990). The inverse relation between demand of organic product and blemish is marginal and not significant (Sparling and McKenzie, 1992; Goldman and Clancy, 1991; Tregear et al., 1994; Estes et al., 1994). Lin et al. (1986) finds that the importance of appearance diminishes as the preference for organic and pesticide free produce increases. Jolly and Norris (1991) reported that majority of (92 percent) of supermarket chain scored organic product appearance worst than non

organic products and had the faith that their customers also felt the same. Ott (1990) found that higher income and college educated had the tolerance for not good appearance in organic food.

Taste

Occasional buyers from Germany are influenced by the taste of organic products (Zanoli et al., 2004). Study from Croatia finds that old people, women and frequent organic food buyers find organic food to be tasty (Radman, 2005). One of the main reasons among men to buy organic food is the taste of the organic food is the finding of one of the European studies (Hofmann, 2006). Jolly and Dhesi (1989), Jolly and Norris (1991), and Sparling et al. (1992) found that consumers feel there is no difference between organic food and conventional food. Converse to the earlier finding Morgan et al. (1990), Estes et al. (1994), and The Packer (1996) found organic food tastes superior to conventional food.

Freshness and Shelf life

Conventional and organic produce has been scored as similar on the parameter of in store freshness (Sparling et al. 1992). The third most important reason to buy organic food is freshness (Estes et al. 1994). Increased freshness has been cited as one of the prominent reasons to buy organic food by seventeen percent of organic food purchaser (The Packer 1996). Majority of organic produce managers believe that conventional foods have better keeping qualities than organic food (Jolly & Norris 1991 and Morgan et al. 1990). Sparling et al. (1992) reports that in the eyes of the customer there is no difference between the keeping quality of organic produce and conventional produce. Many customers said that the motivation to buy organic produce is its longer shelf life as compared to conventional produce (Morgan et al. 1990).

Subjective Norms

Subjective norms are behavior and attitudes displayed by individual which are considered normal and acceptable by people who are close to the individual. Customers' attitudes and subjective norms are positively related (Tarkiainen and Sundqvist (2005). This finding is in tune with the study which asserts that consumer attitude and social norms are connected (Bamberg et al. 2007). A Finnish study reported that attitude towards purchasing organic food is influenced by subjective norms (Tarkiainen and Sundqvist 2005). Vermeir and Verbeke (2006), Chen (2007), Dean et al. (2008) and Thøgersen (2009b) found a linkage between subjective norms attitudes and subsequently purchase of organic food. Kumar (2012) reported that purchase intention of organic food is not significantly connected with subjective norms.

Perceived Behavioral Control

Perceived behavioral control is the feeling of difficulty one feels in doing certain things (Ajzen and Fishbein (1993). Ajzen (1991) says the Personal behavior control is the perception towards the importance of achieving the result and the assessment and judgment of his capability and of the available resources to perform a given behavior to achieve the result. Studies point towards a strong influence of personal behavioral norms on the choice of organic and conventional food (Thøgersen 2002). In organic food consumption since organic food is perceived costlier than its non organic counterpart and availability is an issue, people who feel they

do not have the buying power or time to invest in searching organic food may feel they lack the perceived behavioral control norms (Tarkiainen and Sundqvist, 2005). Perceived behavioral control is formed by perceived barriers and the perceived ability in overcoming the barriers in the context of organic food consumption (Thøgersen (2009a). Price and availability barriers are perceived as the biggest obstacles in the context of organic food consumption (Magnusson et al., 2001; Hill and Lynchehaun, 2002; Vindigni et al., 2002; McEachern and Willock, 2004; Padel and Foster, 2005; Krystallis and Chrysoschoidis, 2005; Hughner et al., 2007). Income and financial endowments and resources are required for getting the willingness to purchase organic products (Jäger, 2000; Torjusen et al., 2004; Kuhar and Juvancic, 2005; Ajzen, 2006; Gracia and de Magistris, 2007; Zepeda and Li, 2007; Riefler and Hamm, 2008). Similarly, organic food is sold at premium prices and its availability is limited to exclusive food outlets in Pakistan (Stream Organic, 2013).

Promotion and Information

Morris et al. (1993) reported that on knowing about the finding on pesticide issued by Food and Drug Administration (FDA) and Environment Protection Agency (EPA), American (90%) supported reduction in the use of chemicals in farms and 85% of American would support Political leaders who stood for stringent laws on use of pesticides in farms. Information about the amount of chemical should be provided to the consumer was felt by eighty six percent of the participants (Morris et al., 1993). Weaver et al. (1992) find that lack of information is the cause for 22 percent of the respondents who did not change their buying habits in spite of having concerns with the presence of pesticide. Knowledge is a key pivot which influences the purchase of organic food (Laroche et al., 2001; Hill and Lynchehaun 2002; Moorman et al. 2004). Hutchins and Greenhalgh (1997) have a rudimentary and basic understanding of as to what is organic and view that organic food is free from chemicals. The consumer know that organic products are less processed in comparison to conventional food, they are natural and raw (Lyons et al. 2001). Hill and Lynchehaun (2002) reports that the core benefits and characteristics may be understood by the individuals but the farming practices which lead to organic product and how this farming practices are different from conventional farming practices is not known by the same individual. Consumers have very little knowledge about the inspection process (Padel and Foster, 2005) and very few customers understood the certification process of organic farming (Lockie et al., 2002). As per Chrysoschoidis, (2000); Padel and Foster, (2005) attitude towards organic food is influenced by consumer knowledge. Brucks (1985) classifies knowledge as subjective knowledge, objective knowledge and prior experience. The perception of knowledge is subjective knowledge and is also known as self rated knowledge. Lack of confidence is due to low level of subjective knowledge (Chrysoschoidis, 2000; Padel and Foster, 2005). Objective knowledge is what the consumers actually know and finally prior experience is defined as what the consumers have experienced before (Brucks 1985). Stobbelaar et al. (2007) asserts that the more knowledge consumers have about organic food, the more positive they are in their attitude. Ellen (1994) says that subjective knowledge is more influential than objective knowledge in formation of attitude. Consumers who have consumed organic food before tend to have more positive

attitude as compared to non experienced consumers. Different sources can add to the knowledge of consumer about organic food. Subjective knowledge of individuals can be influenced in a major way by company initiated marketing communication (Gracia and De Magistris 2007). Communication initiated by public administration, local government, notifications from ecological organization, social media, social networks has an impact on the knowledge. Reading food advertisement and food safety articles have different response towards concern for safety (Govindasamy and Italia 1997b). Food safety advertisement creates a sense of trying to be being manipulated and hence individual does not become safety conscious. Food safety article is perceived as an attempt to educate the customer hence after reading customer becomes safety conscious. Corollary is that food article creates a concern for self with respect to food safety and triggers a response to buy organic food irrespective of the high premium.

Price Effect

Demand of organic food is price sensitive. Price premium as a barrier to organic food consumption is reported by Estes et al. (1994). Price is a major impediment in purchasing organic food (Lea and Worsley, 2005; Magnusson et al., 2001; Radman, 2005; Magnusson et al. 2001; Padel and Foster, 2005; Tregear et al., 1994; Robles et al., 2005; Wier and Calverley, 2002; Zanolli et al., 2004; Zakowska, 2007). Organic product is costly than non organic product is perceived by both buyers and non buyers, but non - buyers consider it more costly (Tregear et al., 1994). As reported by Harris Poll (1989) and Weaver et al., (1992), 49 to 81 percent of population is ready to pay more for organic products. 83 percent of Americans are ready to pay a premium for foods containing fewer chemicals (Morris et al., 1993). Weaver et al (1992) reported that one fourth of the population would pay up to five percent more for pesticide-free produce; 10 percent would be paid by 31 percent of the population and 26 percent of the population would pay up to 15 percent more. Readiness to pay price premium and the quantum of premium varies across product categories. Customers are ready to pay 30 to 40 percent more per pound for apples, peaches, broccoli, and carrots customers (Jolly et al 1989). For organic grapefruit customers are ready to pay of 15-69 cent per pound (Buzby and Skees 1994). A premium of 21 percent per jar is commanded by organic baby food (Harris, 1997). The percentage of population ready to pay premium by Hartman group was 13 percent. Ott (1990) reported that to purchase CPRF (Certified Pesticide-Residue-Free produce) five percent would be paid more by 57 percent of the population, ten percent more would be paid by 10 percent of the population and one third of the population is ready to pay any premium. The low tolerance for premium pricing in purchase of organic food is seen in low income earning group (Tarkiainen and Sundqvist 2005). Paying premium needs an internal justification by the customer in the sense that the premium is having a utility of getting higher value (Hill and Lynchehaun, 2002; Padel and Foster, 2005). This justification is often difficult, as a consumer lacks the information to adequately assess their purchases (Padel and Foster 2005). There are many studies which point to the fact that consumer are willing to pay price premium for organic foods (Lockie et al., 2004; Hutchins and Greenhalgh, 1997; Radman, 2005). Customers are ready to pay 30 percent premium for organic food (Davies et al. 1995). On an average 10 to 20 percent premium is

reasonable for customers and they are ready to spend (Lockie et al., 2004; Hutchins and Greenhalgh, 1997; Radman, 2005).

Availability

Lack of availability of organic produce is the biggest impediment in organic consumption. Padel and Foster (2005) report that 25 percent of customers in UK are not aware as to where to look for organic food and 35 percent of the find it very hard to locate where organic food are available. Huang, (1991) found that 84 percent participants say that when the product is conveniently available then they will buy. Organic food handlers 81 percent working in the downstream side agree there is no adequate supply of organic food (Morgan et al., 1990). There are many studies which resonates with the finding of inadequate availability (The Packer, 1996; Jolly & Norris, 1991; Morgan et al., 1990; Sparling et al., 1992). Supplies were limited at stores that sell organic produce. This sentiment was echoed in a study carried in 1996 by the Food Marketing Institute Organic is going to mainstream, its availability has moved from specialty stores to large supermarket chains (Jones et al., 2001; Tutunjian, 2008). As per Organic Monitor (2006) 95 percent of organic retailing is done through mainstream stores and 5 percent of retailing is done through specialty stores. In certain nations, distributors are advancing their very own line of organic food products under explicit brand names (Rostoks, 2002; Tutunjian, 2004). A direct link like a farmers market between the producer and consumer is acting as an alternative channel (Smithers et al. 2008). Two channels are emerging in the organic food distribution. This is based on whether the customer is regular or hardcore. Hardcore customer is the one who does not compromise on anything except organic. To reach the regular consumer, standard distribution channel mechanism (supermarket) will work and for the hardcore consumer an innovative approach such as box delivery, farmers market, and specialty store would work. In the farmers markets which a type of direct channel in which the consumer gets a chance to interact and socialize with the producer, ask them questions pertaining to the origin, type, cooking tips, and the farming methods (Smithers et al. 2008). In the conventional distribution channel the consumer do not get a chance to interact with the producer because the channel length comprises of distributors, dealer, and wholesalers. This channel is used for consumer who wants many things under one roof.

Certification

Trust in the veracity of the organic food is the edifice on which organic food market development will happen. To enhance distribution and thereby market development certification and labeling are important. Organic labels are important indicators of quality and hence safety from the consumers perspective (Hamzaoui and Zahaf, 2008). Organic labels are sign of trust and a sense of buying a product which is regulated and hence safe (Torjusen et al., 2004). Trust operates on two aspects in organic food. The organization producing and the organization certifying the organic food produced. Sources of trust emanate from the public regulation and certifications (Sassatelli and Scott, 2000). Information is the starting point of any transaction. In view of customer demanding more information about the food and the food system trust in the certifying agency and the organic label and all the marketing system emerges as an important issue (Torjusen et al. 2004). In retailing organic food seventy five percent of organic produce

managers cite that lack of standards and grading a problem in keeping organic food and this rank third in their problem list (Jolly and Norris, 1991, and Morgan et al., 1990). Label carrying pesticide use is desired by all consumers (Buzby and Skees, 1994). It was found that organic apples demand increased by 6.12 to 11.7 pounds Van Ravenswaay and Hoehn (1991a). Willingness to pay also increased by accurate labeling. Consumers' lack of trust in organic labeling practices influences the knowledge about the organic food and its production system (Padel and Foster, 2005). Organic labeling are unreliable is the feeling of 50 percent of consumers (Lea and Worsley's 2005). This point a lack of trust in the method organization applies the word organic and means that organic label lack authority (Lyons et al. 2001). Lockie et al. (2002) also confirm the earlier argument; saying that consumers were skeptical of the reliability of the labeling of organic products.

5 METHODOLOGY OF THE STUDY

The research study is to develop a predictive model. The work is a cross-sectional research. The study uses Logistic regression for developing the model. Logistic regression is the technique used by many researchers in developing a predictive model. This is done because of its simplicity and robustness. The probability of the occurrence of an event is predicted by logistic regression.

Sampling and data collection; The target population of this study is the residents of Mumbai and Navi Mumbai. Snow ball technique was used for sampling. The reason being, the penetration of organic food is only 17%. Snow ball sampling technique is used because organic food consumption is not mainstream consumption item. A pre-test typically involves a few experienced interviewers completing around 25-75 interviews. Oksenberg et al., (1991). This study distributed the pre-test questionnaires from 1-15 November 2016, and targeted the main food purchaser of each household. This study distributed 100 pre-test questionnaires, and 68 effective ones were returned, for a recovery rate of 68 per cent. The Cronbach's alfa of each dimension was greater than 0.7. The item-to-total-correction score was greater than 0.5; hence, the questionnaire had good internal consistency and reliability. Based on these results, this study formally administered the questionnaire.

The data collection was done in two phase. The first phase started in the month of November 2016. Organic Farmers Markets are held at Mahim Natures park (Sion) and in Bandra near St Andrews Church. Verbal permission was taken from Ms. Kavita Mukhi Organizer of Farmers Markets, to take responses from individual who patronize this market. Eighty nine responses were collected by intercepting organic fruits and vegetables consumer. Eighty nine responses were collected by visiting the farmers market on five Sundays. In the second phase reference of these consumers were used to further get responses of individual who were organic fruits and vegetables consumer. An online version of the questionnaire was made on Google forms. A link of the form was made and sent to individuals residing in Mumbai and Navi Mumbai. To increase the response rate the link was sent through Facebook message, LinkedIn and Whatsapp. Pre tested questionnaire link was sent to approximately 1500 individuals email, Facebook and Whatsapp. Out of these only 749 responded.

6 DATA ANALYSIS

Two questions are used to define current and prospective customer. The two questions are 1) Have your purchased organic food in the last one year? 2) Are you interested in purchasing organic food? Individuals who are positive on both the two questions are current customers and the customers who are positive only on the second but a prospective customer negative on the first are prospective customer. This new derived variable is the dependent variable and christened as purchase status. A binomial logistic regression model was developed using the nine factors as an abstract of the entire continuous psychographic variable and demographic variables. The demographic variables are categorical in nature. The reason why factors were taken and not the entire psychographic variable was not incorporated in the final model because during model building that was not leading to any increase in predictive capability and also it was leading to less cases per variable. The model is developed using 622 observations and then tested on 40% and 60% of randomly selected sample from the same dataset to do validation of the developed model. Also model was developed using randomly selected 40% data and the testing was done on the entire data of 622 observation and 60% randomly selected observation. In all these the classification accuracy hovered around 70%. The base line comparison without the model was 62.9%. The model contributed to increase of 11.2% in classification accuracy using the model. All the variables were entered simultaneously to build the predictive model. For formal testing of the concordance of predicted probabilities match the observed probabilities the Hosmer and Lemeshow test is used. The Hosmer and Lemeshow Test provide a formal test assessing whether the predicted probabilities match the observed probabilities. The measurement of the correspondence of the actual and predicted values of the dependent variable is done by the Hosmer and Lemeshow test. If the concordance is high it means there is a small difference in the observed and predicted and it indicates a better model. In Hosmer and Lemeshow test comparison of observed frequencies is done against the expected frequencies and chi-square is calculated. A good model is indicated by a non-significant chi square value.

In the developed model the goodness-of-fit statistic is 8.129

Construct no	Construct name	Cronbach's Alpha/Composite reliability
F1	Safety of organic food	0.873/0.849
F2	Barriers to organic food consumption	0.832/0.846
F3	Benefit of organic food consumption	0.847/0.85
F4	Sensory benefits of Organic food	0.794/0.861
F5	Health consciousness	0.775/0.882
F6	Environment consciousness	0.754/0.792
F7	Source of awareness	0.656/0.652
F8	Perceived behavioral control	0.719/0.616
F9	Subjective Norms	0.744/0.719

and it is tested as a chi-square value and is associated with a p value of 0.421, indicating an acceptable match between predicted and observed probabilities.

Factor	Exp (B)	P value
F1- Safety of organic food	1.387	0.028
F2- Barriers to organic food consumption	1.472	0.004
F3- Benefits of organic food consumption	1.261	0.110
F4- Sensory benefit of organic food	0.757	0.035
F5 – Health consciousness	0.818	0.130
F6 – Environment consciousness	0.676	0.004
F7- Source of awareness	0.856	0.087
F8 - Perceived behavioral control	1.098	0.338
F9- Subjective norms	0.833	0.138

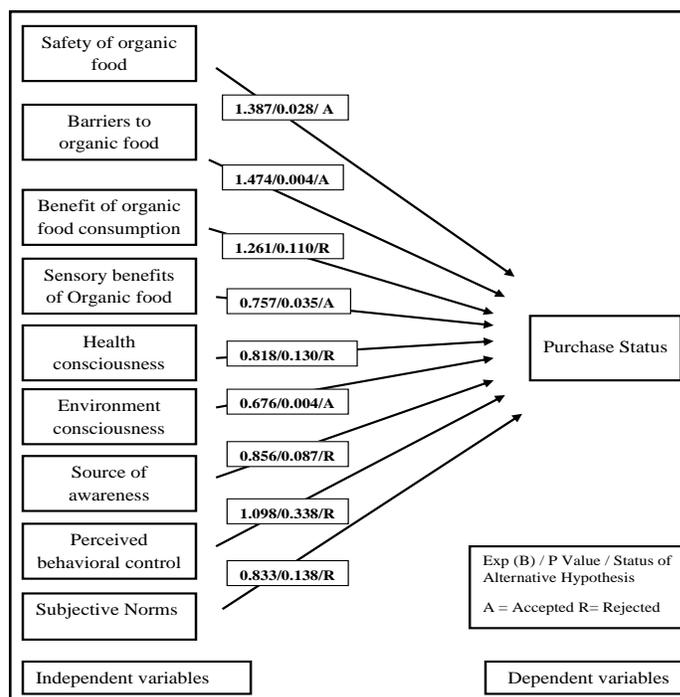
The significant variables are F1, F2, F4 F6 V3 V10, Qualification, and Income. The nomenclature of F1, F2, F4 F6 V3 and V10 are as below.

F1	Safety of organic food
F2	Barriers to organic food consumption
F4	Sensory Benefits
F6	Environment consciousness
V3	Knowledge of Organic fruits and vegetables
V10	Willing to buy organic fruits and vegetables because the benefits outweigh the cost

The model is as follows: $\text{Log (odds for prospective organic food consumer)} = -3.320 + 0.327 (F1) + 0.388 (F2) - 0.279 (F4) - 0.392 (F6) - 1.008 (V3) - 0.884 (V10) + 2.134 (\text{Qualification}_4) + 2.793 (\text{Qualification}_5) + 0.932 (\text{Household income}_3)$ Interpretation of the Exponentiated Log odds of the coefficient of each factors One-unit increase in the factor safety of organic food multiplies the odds of being in group of interested but not purchased by 1.387, given the simultaneously inclusion of other factors in the model. The observed relation is significant. One-unit increase in the barriers to organic food consumption multiplies the odds of being in group of interested but not purchased by 1.474, given the simultaneously inclusion of other factors in the model. The observed relation is significant. One-unit increase in the benefits of organic food consumption multiplies the odds of being in group of interested but not purchased by 1.261, given the simultaneously inclusion of other factors in the model. The observed relation is not significant. One-unit increase in the factor sensory benefits of organic food consumption reduces the odds of being in group of interested but not purchased by 24.3 percent (1-0.757), given the simultaneously inclusion of other factors in the model. The observed relation is significant. One-unit increase in the factor health consciousness reduces the odds of being in group of interested but not purchased by 18.2 percent (1-0.817), given the simultaneously inclusion of other factors in the model. The observed relation is not significant. One-unit increase in the factor environment consciousness reduces the odds of being in group of interested but not purchased by 32 percent (1-0.676), given the simultaneously inclusion of other factors in the model. The observed relation is significant. One-unit increase in the factor awareness reduces the odds of being in group of interested but not purchased by 14.4 percent (1- 0.856), given the simultaneously inclusion of other factors in the model. The observed relation is not significant. One-unit increase in the perceived behavioral control multiplies the odds of being in group of interested but not purchased by 1.098, given the simultaneously inclusion of other factors in the model. The observed relation is not significant. One-unit increase in subjective norms reduces the odds of being in group of

interested but not purchased by 16.7 percent (1-0.833), given the simultaneously inclusion of other factors in the model. The observed relation is not significant. Individuals who are in the income group of Rs 20000 to 30000 are 2.539 times more likely to be in the prospective group than the individuals who are from the income group of more than Rs 70000. The observed relation is not significant. Individuals who are graduates are 8.447 times more likely to be prospective consumers than individuals who are post doctorates. The observed relation is not significant. Individuals who are post graduates are 15.851 times more likely to be prospective consumers than individuals who are post doctorates. The observed relation is not significant. Individuals who scored no on the questions my knowledge of organic fruits and vegetables is good are 2.73 times more likely to be prospective consumer than who said yes. Individuals who scored no on the questions I am willing to buy organic fruits and vegetables because the benefit outweigh the cost are 2.42 times more likely to be prospective consumer than who said yes.

7 Conclusion



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