

Estimate the potential demand for organic products case study households residing in Shiraz

Javad Shahraki¹ and Samaneh sadat hamraz^{2*}

1. Assistant professor of economic University of Sisatan and Baluchistan

2. Phd student of agriculture and environmental economic University of Sisatn and Baluchistan

Corresponding author: Samaneh sadat hamraz

ABSTRACT: Over time and increasing importance of the environment also increasing people's concern about the health of the individual, demand for healthy products have been increased and consumers' attitudes tend to use of organic products. This study investigates the factors affecting the potential demand for organic products in 2012 households living in shiraz towship. Needed data were collected with completing 300 questionnaires. logit model and a nonparametric test data has been used to analyzed. The results show that age, education level, monthly income, and the amount of households facing with non organic food problems had positive influence on the probability of the higher levels suggested scenario. Household size and gender variables have a negative impact on this issue. Finally, the proposal to more encourage households to consume organic products is given.

Keywords: organic products, consumers, Shiraz, the logit model, non-parametric tests

INTRODUCTION

In recent decades one of the greatest challenges which human society facing were the increasing world populations, food security and health issues. Produce resources restriction on one hand and population crisis on the other, cause Move from traditional agriculture to industrial agriculture or agricultural technology called the Green Revolution in the fifties. Green Revolution entering in agriculture technology Was accompanied by chemical entities, high-yielding varieties, irrigation methods and new machinery and so on. But less than two decades from the arrival process of chemical inputs in agricultural production, due to irregular and improper use of chemical inputs, produce Process will face new problems and crises. Problems and crises such as the emergence of new pests and diseases, resistant more than six hundred species to pests, diseases and weeds, poisoning, severe soil degradation and chemical erosion, , human health threat emerged. In recent decades, especially since the eighties these problems was caused, the movement towards organic farming be considered. Agricultural systems must meet the needs of modern man to provide what a man needed in a decade or even in a century. Thus, the sustainable agriculture is the goals to be achieved as quickly as possible. Organic farming is a farming system, which is based on agricultural ecosystems management, focusing on soil fertility and plant health and without using synthetic chemicals. This system is consistent with social conditions, regional and local economic. Today, increasing consumer awareness of these issues and the increasing reports of this material adverse effect on the health of consumers and the development of acute and chronic, Willingness of consumers to products produced in natural conditions possible even without the use of a variety of pesticides and fertilizers has increased. Japan is Asia's most important market for organic products and the sale of products from 2002 to the present, has been estimated at \$ 350 million. Also China, South Korea, Singapore, Hong Kong and Taiwan, are the other important markets for these products in Asia. Studies have shown that in Iran, due to dry weather conditions and abundance of labor force, more economical and easier to produce organic products from other countries in the world. Given the importance that these products have ever been released in Iran mainly, this study is an attempt to apply the potential (virtual) households are examined

for organic products. Among the existing research literature related to this topic can be mentioned the following : Ott(1990) in studies of supermarket shoppers, came to the conclusion that they want to pay 5 to 10 percent more for new and proven products in case of existence not any pesticide residues in products. But they are not willing to accept any apparent defects (whether from injury, crush, puncture, insect, etc.). Lockie and et al (2002) showed that in very general terms, analysis reveals that while consumers believed organic foods to be healthy and environmentally sound —both of which were considered desirable— these characteristics were subsumed by an overarching concern with convenience. Shang chang and Zipda (2004) in study organic food showed that consumers are concerned Greater for use chemicals and their impact on the environment and farm animals. Consumers of organic products, organic products are more aware. Their also has to bear higher prices for these products. Gill and et al (2000) in the study area, Madrid and Navarra in Spain, consumers' willingness to pay for organic products such as meat, Fruit and vegetables to the contingent valuation method and logit models have been examined. The results show that consumers are willing to pay for organic products are added to the rate. Gyau and Achim (2007) argue that the domestic market for organic produce and the future development of the organic sub-sector in Ghana would rely on the organic trading links with established export markets all over the world.owasu and owasu 2010 show that As much as 71% of the consumers are willing to pay over 50% price premiums for organic vegetables and over 82% are willing to pay 1%–50% price premiums for organic fruits. The empirical results indicate that human capital, product attributes and consumer perception influence consum ers' willing to pay for organic food products. The estimated market potential for organic fruit is GH¢32,117,113 (US\$ 26,453,433) per annum and that of organic vegetable is GH¢1,991,224 (US\$1,640,083) per annum suggesting a huge market potential for organic fruits in Ghana.

MATERIALS AND METHODS

To investigate the factors affecting households' potential demand for organic products, a sample of 300 Shiraz city residents randomly selected. Then the participants were asked to respond to questions. Citizens were divided into two main groups: Those who allocated more than 50% of his demand to organic product whenever organic produce will be supply in the city and Group opposed them those that are less than this amount of products they demand. Devoted to the study of the demand for organic products is the dependent variable. This is a qualitative variable that can binary aliquots of one (over 50%) and zero (less than 50%). In such cases to study the effects of factors affecting the decision from the regression models with qualitative dependent variable is used. Logit model is used in this study. Structural econometric logit model is (Maddala, 1983):

$$Z_i^* = X_i\beta + U_i \quad i = 1,2,3,\dots, n \quad (1)$$

Where Z_i^* shows Percentage allocation by i-th household to organic products demand. X_i Shows a collection of social- economical attribute including Age (years), education (dummy calibration uneducated 0, Primary 1, Guide 2, Diploma 3 associate degree 4, BA 6, MSc 7, Ph.D 8), monthly income (Thousand Rials), gender (Zero Woman, one Man), household size (people), dealing with the problems of non-organic products (in the face of one and zero otherwise), head of household (head of household if that person is one and otherwise zero). β is the vector of pattern parameters and U_i is residua term. In logit model probability of that i-th individual to allocate 50% of its demand for organic products defined as below:

$$P_i = F(Z_i) = F(X_i\beta) = \frac{1}{1 + e^{-x_i\beta}} \quad (2)$$

And the probability that the i-th demand for organic products is less than 50% makes with below equation:

$$1 - P_i = \frac{1}{1 + e^{z_i}} = \frac{1}{1 + e^{x_i\beta}} \quad (3)$$

In above equation F showed cumulative distribution function, P shows probability. Effect of changes in Kth independent variable X_{ik} on probability of using organic products fined by below equation.

$$\frac{\partial P_i}{\partial X_{ik}} = \frac{e^{z_i}}{(1 + e^{z_i})^2} \beta_k \tag{4}$$

In addition with having partially derivatives from above equation, elasticity of k th independent variable estimate by below equation (Maddala, 1983).

$$\varepsilon_i = \left[\frac{e^{z_i}}{(1 + e^{z_i})^2} \beta_k \right] \cdot \frac{X_{ik}}{P_i} \tag{5}$$

Estimating above pattern done by Maximum Likelihood Estimator and Shazam software

RESULTS AND DISCUSSION

The introduction of the sample in this part some of the socio-economic characteristics of the sample studied. Based on the calculated mean and standard deviation of age, it seems like most people are in the younger group. Based on these results highest frequency related to age group less than 20 years. The lowest frequency is in the age group over 50 years. Other social characteristic that affect attitudes and decisions is their educational level. Based on data collected from a sample survey of educational level, diploma level of education are the most frequent. Then, with a slight difference Associate Degree and BA are the most frequent. Variable Dimensions of household or family size including other variables that impact on decision making. There are more people in the household leads to increased load dependent households and therefore leads to less likely to respond to environmental factors. Based on a detailed study on this variable most of the population is a family with 4 or 5 people. In the next position, households with 6 or 7 people are located. As the study shows, the sample has large size of households. Since if there is more than one person employed in family cause increasing the family income and in addition decreased the Sponsorship of households headed. Among other factors that influence how people make decisions is their sex. Previous studies indicate more prevalent in women about react to environmental factors. Only 31.3% of the subjects were male. Individual's income, including economic factors that affect attitudes and views also reflects their performance in different fields. Initial investigation showed in this study that the mean and standard deviation of income was 10318330 and 1420300 Rials. Distribution of income of the sample is indicated that among sample the highest annual income distribution is in the Group under one million. Due to the double effect of family headed households and managing the purchase and consumption of organic products, this variable has also been studied. 243 people have negative response to this question shows that most headed households have not been selected.

Concerned about residual toxic chemicals on health and the demand for organic products

Given that one of the reasons for this attitude to the consumption of organic products by consumers has been mentioned; here, the role of this factor as a factor influencing the willingness to consume organic products has been studied. To investigate these factors, respondents were asked: Are you worry in contact with pesticides and fertilizer residues in fruits and vegetables health heart. 82% of respondents have responded positively the question, while the 17.7% of people have negative response this question. This is evidenced by the increase in diseases such as cancer, is the main reason being the use of chemicals under the influence of the toxins, People about the toxic chemicals be concerned. Due to the some discomfort and problems from using non-organic products consumers seeking, here respondents were asked: If the use of non-organic products have encountered with problems it should be mentioned. 208 respondents answered this question were negative, and 92 people have responded positively. The respondents have answered the questions and problems that have been encountered are expressed as follows:

Allergy (30), food poisoning (20 cases), headache (10 cases), abdominal pain (2 cases), diarrhea (20 cases), stomach upset (10 cases). Set according to information provided to the respondents, they were asked about the tendency to consume organic products, the results showed: Among the 300 respondents, 231 people have positive attitudes towards organic food and only 69 people have expressed their unwillingness and negative response. These results showed much families interest in the use of these products. Then the rate of households allocate their consumption of organic products is questionable. The answer is presented in the table below.

Table 1. Percentage allocation of organic products

Answer type	frequency	percentage
10	40	13.2
20	24	8
30	21	7
40	24	8
50	45	15
60	6	2
70	20	6.6
80	36	12
90	20	6.6
100	65	21.6

According to the above table, most people tend to allocate their consumption to organic products for more than 50 percent. In next part the effect of these variables on potential demand for organic products has been studied.

The results of estimate the potential demand for organic products-

In the logit and probit models, the estimated coefficients (β) have no economic interpretation (Whistler). The only consideration is the sign of these coefficients. Coefficients among the most renowned economists are marginal effects and elasticity (Whistler). The results of this study indicate that age, education level, monthly income of households and exposure to arising from non-organic food consumption has a positive influence on the likelihood of higher levels for scenario is suggested. Family size and gender variables have a negative impact on this issue. With increasing age, the potential demand for organic products increases. This can be observed in case of the most risk averse older people and the importance of their own health. On the other hand, older people due to consumption of healthy food in the past, have a greater tendency to use these types of products. Previous studies have been carried out with different results. Some studies indication of the positive impact of this variable and some negative impact even in cases where no impact is identified. Individuals with higher levels of income have higher demand for organic products rather than their front. This may be due to the financial capabilities of most of these people what is certain is that organic produce is more expensive than other products. These products are also generating more waste. Considering all these factors are expected to be higher prices for organic products over conventional products. Thus, individuals with higher incomes are more able to buy this product. About the results matching of this study with previous studies, such as age, large differences are viewed. Women than men tend to consume more organic products. It could be due to the women's overall importance to family health. Many women due to the financial burden of household dependents have a liberal. In most studies, women have a greater tendency to purchase organic products than men. Other factor influencing more demand for organic products is educational level. The agent had a positive impact that individuals with higher levels of education have more tendencies to buy organic products. Because they have more information about the harmful chemicals found in food waste. People who are heads of households than others have been tendency to pay more for organic products. These have more concern for the health of people in the household, so they are paying more attention to their health. It is more important to consume more healthy products. Whatever number of households is higher makes higher household's monthly cost and load Sponsorship. This variable has a negative impact on the level of tendency to consume organic products. Another factor that has been discussed in most studies, dealing with the problems in the use of non-organic food and the amount of waste food is concerned. Based on previous studies often encounter problems such as toxicity and the high level of the individual concerned, they tend to consume organic products has increased. In this study, similar results were obtained. In other studies, factors such as race, marital status, the amount concerned for the environmental problems and etc have been studied. In this study, these variables were also included in the first model and since the model had little effect on the final results of the fitting are not included in the model. Based on the partial elasticity calculated, all variables except age and education are inelastic. This can help in future policy. Accordingly, by increase one year of age, they tend to use organic products as much as 1.23 percent decrease. Also, with any degree increase educated people more likely to use organic products as much as 1.9 percent increase. Therefore, for implementation this scenario people with higher age and education shall be selected as a target group. Being inelastic of the other variables indicate that the variables tend to consume organic produce individuals toward independent variables of the model did not show a strong reaction. Marginal effects showed the effect of independent variables on higher levels of consumer acceptance of organic products in probability model. Based on these influential factors were exposures problems in the use of non-organic products are sex and head households. Based on calculated Marginal effects a percentage increase in exposure arising from the use of non-organic products , the

possibility of Suggested higher levels of willingness to pay increases of 0.26, however, if other factors remain constant .When the other variables are constant, men tend to pay less than 0.22 percent are women. When the other variables are constant, men tend to pay less than 0.22 percent than women. Those who headed households were also more likely than others to accept a higher level of willingness to pay as much as 0.17 percent. With increasing number of persons in each household, the more likely for consumption acceptance of organic products increased by 0.01 percent. With each level of education increases the probability of adopting higher levels of consumption of organic products increased by 0.11%. Percentage of right predictions statistic calculated showed high the ability of the model to describe the dependent variable. This means that the 90 per cent of observed correctly estimated by the mode. In Logit model to assess the overall significance of the model and goodness of fit likelihood ratio test statistic is used (Torshizi & Salami, 2007). This test is similar to the function of the F test in regression models. Maddala and MacFadh coefficient of determination is within acceptable limits. According to the statistics provided positive significant amount, it is determined that the overall model is significant. According to Results of the LM² test and the significant level of 95%, heteroskedasticity does not exists in the pattern.

Table 2. Results of logit model using maximum likelihood estimation

variables	coefficient	t-statistic	elasticity	Marginal effect
constant	-8.56	-1.18 ^{ns}	-4.08	-
age	1.1	1.5 ^{***}	1.23	0.01
Education level	1.14	1.03 ^{ns}	1.9	0.11
Monthly income	0.000001	0.42 ^{ns}	0.25	0.0000007
sex	-2.27	-1.57 ^{***}	-0.68	-0.22
Number of households	-1.14	-1.2 ^{ns}	-0.32	-0.01
Confrontation	2.7	1.5 ^{***}	0.72	0.26
Head of household	1.76	2.35 ^{**}	0.17	0.17
Likelihood Ration (L.R)		9.97 ^{**}	Maddala R ²	0.33
Percentage of right predictions		0.9	McFadden R ²	0.35
LM ² test	13.53 ^{**}		Chow R ²	0.36

***: Statistically significant at 10% level ** significant at the 5% level, ns: no significant

CONCLUSION

The results of this study indicate the high tendency to consumption organic products compared to common products. The importance of dealing with problems such types of allergies, food poisoning and other complications has occurred in the use of non-organic products.

According to the results, factors such as older age, higher education and income are more intensify use of organic products. If the target is detected correctly, can be a production planning and supply these products to be profitable. Finally, to achieve the ideal conditions for a good demand for organic products, the following suggestions are offered:

To create demand in the price level, credibility, training and price support be determined. It must follow the necessary training, credit support price of organic products to form and gradually create a real market for these products. The lack of sufficient knowledge of the properties of organic products is one of the main reasons for the low interest to use it. The issue with the culture and information can be overcome. Certainly in this part media, especially radio and television have large role in the duty to inform and acquaint the public sector. Due to the need for differentiation and separation of organic products from other products created database in the field of production, processing, marketing of organic products, created for booths offering organic products in the markets for agricultural products; created special brands for organic products in the diagnosis of the products of other common products can be fruitful. Due to continuous changes in their tastes, continuing with marketing information about supply and demand, Prices, production and consumption markets for organic products and organizing and participating in trade shows domestic and foreign goods more familiar is recommended to people with organic products.

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