Archives of Agriculture and Environmental Science 10(1): 16-22 (2025)
https://doi.org/10.26832/24566632.2025.100103

e-ISSN: 2456-6632

This content is available online at AESA

Archives of Agriculture and Environmental Science

Journal homepage: journals.aesacademy.org/index.php/aaes

ORIGINAL RESEARCH ARTICLE

Econometrics analysis of consumers' willingness to purchase organic fruits and vegetables in Kathmandu Valley, Nepal

Susan Thapa[1*], Nirmal Thakuri[2], Raj K Adhikari[2], Arjun Goswami[3] and Sudesh Thapa[4]

[1]Krishak Dristi Association, Kritipur, Kathmandu, Nepal
[2]Department of Agribusiness, HICAST, Purbanchal University, Nepal
[3]Department of Economics, Tribhuvan University, Kathmandu, Nepal
[4]NMB Bank, Kathmandu, Nepal
[*]Corresponding author's E-mail: susanthapa002@gmail.com

ARTICLE HISTORY

Received: 09 December 2024
Revised received: 11 March 2025
Accepted: 14 March 2025

Keywords

Consumers' perception
General linear model
Willingness to buy

ABSTRACT

The number of people interested in environment-friendly products and becoming health-conscious has increased. The tendency of consumers to buy organic fruits and vegetables is growing gradually. Nonetheless, the number of people consuming organic fruits and vegetables is low in the case of Nepal due to the higher price of organic products. As a response to the problem, a study was conducted among 159 people who were randomly surveyed consumers of Kathmandu Valley to determine the various factors affecting the willingness of consumers to pay for organic fruits and vegetables. We used general linear regression model was applied to determine the consumers' willingness to purchase organic vegetables and fruits. The analysis shows that 46 percent of consumers are willing to pay up to 24 percent for conventional products. The study found that the factors like Income, and Education were significant factors in determining the willingness of consumers to purchase organic vegetables and fruits. Consumers' health awareness is critical in determining the attitude, intention, and frequency of purchasing organic vegetables and fruits However, this study shows that in underdeveloped nations like Nepal, health issues and environmental issues are not significant factors in consuming organic products, whereas higher income plays a significant role in purchasing organic products.

Citation of this article: Thapa, S., Thakuri, N., Adhikari, R. K., Goswami, A., & Thapa, S. (2025). Econometrics analysis of consumers' willingness to purchase organic fruits and vegetables in Kathmandu Valley, Nepal. *Archives of Agriculture and Environmental Science*, *10*(1), 16-22, https://dx.doi.org/10.26832/24566632.2025.100103

INTRODUCTION

Nepalese farmers used to practice pesticide and insecticide-free agriculture in the past. Pesticides were introduced after the green revolution, and farmers have gradually started using pesticides. Farmers are exposed to risk with the high use of pesticides and insecticides (Thapa *et al*., 2021a). Similarly, insecticides and pesticides degrade agricultural productivity and deteriorate farmers' environment and health (Thapa *et al*., 2021b). The recorded history shows that Judith Chase, an American woman pioneered practising commercial organic farming in Nepal (Tamang *et al*., 2011). The organic products of Nepal have high international market value, mainly cardamom, tea, coffee, and ginger top the charts of demand from Nepal (Gauchan *et al*., 2020). Organic products have high market value throughout the world. Various studies have credited health consciousness issues, food safety, and other environmental concerns as the reasons to purchase organic products (Krissoff, 1998; Makatouni 2002; Willer & Lernoud, 2013). Likewise, consumers prefer organic products due to their health and safety concerns. Apart from being a healthy product, organic products have their peculiar taste, appearance, and nutrient content, which lure consumers into buying organic fruits and vegetables (Makatouni, 2002). Worldwide, organic agriculture adopters are more than before (Willer & Lernoud, 2013). A study conducted in 2013 estimated that more than 1.8 million

people practice organic agriculture (Willer & Lernoud, 2013). In the case of Nepal, the concept of organic agriculture is at the primitive stage, with most of the organic farming concentrated in the nearby towns of the major cities. Similarly, the organic outlets are also concentrated in the major cities of Nepal. There are many dark sides to higher uses of chemical pesticides (Rani *et al.*, 2021). The higher services lead not only to environmental pollution but also cause the emergence of pests, disorders in plants, and ultimately a decrease in the productivity of the land (Hatamleh *et al.*, 2022). The baneful chemicals negatively affect beneficial organisms' earthworms, and predatory birds and ultimately soil health also deteriorates (Pahalvi *et al.*, 2021). Therefore, organic farming is considered the best way to address the side effects caused by harmful pesticides and fertilizers, as organic agriculture helps increase ground cover with compost and organic fertilizer (Anton *et al.*, 2014; Barton, 2018).

Consumer perception

The previous studies carried out in the past show the major motivation for people consuming organic products is mainly motivated by attitudes toward organic products (Suciu *et al.*, 2019). A study carried out by Voon *et al.* (2011) found that a person's intention to eat organic products increases if the family members, near ones, or loved ones also wish to consume organic products (Voon *et al.*, 2011). Voon *et al.* (2011) stated that health motivation is the motivation to set a goal directly related to preventive health behaviour. In addition, ethical motives are a significant cause to increase the demand for organic products, such as the concern over the environment and the threat to the animal (McCauley *et al.*, 2006). Based on the study, environment-friendly consumer behaviour will affect the willingness to purchase organic goods. Moreover, consumer perceptions are explained by the motivation of organic food purchasers towards the freshness, taste, and health benefits of organic products that the consumer (Wier *et al.*, 2005). Higher doses of chemical fertilizers and agrochemicals to produce more food have contributed to uncertainties and environmental pollution, the resurgence of new plant pests, forest area degradation, flooding, erosion, and flood decline in the overall productivity of major food commodities (Kumar *et al.*, 2019). In a bid to reduce the effects of harmful chemicals, soil made of salt intake, the ground covered with compost, and fertilizers can be helpful (Ashraf *et al.*, 2019, Yang *et al.*, 2021). Realizing these facts, there have been growing concerns about the importance of organic farming in our country (Atreya *et al.*, 2020, Parajuli *et al.*, 2020). Therefore, farming system paradigms have shifted from increased production and productivity to a sustainable and eco-friendly system. In the early 1980s, a systematic approach influenced the organic farm course approach after establishing the Institute for Sustainable Nepal (INSAN). In 1987 an organic enthusiast from the USA, Judith Chase, began commercial organic farming in Nepal (Atreya *et al.*, 2020). Apart from that, some organizations like Nepal Permaculture Group (NPG), Organic World and Fair Future (OWF), HASERA organic farm, and SECARD NEPAL promote sustainable and organic agriculture. Despite the Nepalese population consuming a lower proportion of organic foods (Aryal *et al.* 2009), the number of people consuming organic products has increased Aryal *et al.* 2016). Likewise, the consumption and the areas used for production also increase (Bhatta and Doppler 2011). The micro-climatic zones in Nepal have always favoured organic foods; however, it is still not capitalized. Until now, most of the studies focused on determining the willingness of consumers to buy organic fruits and vegetables without using proper econometric tools (Shrestha 2022). This study uses a general linear model to determine the willingness of consumers to purchase organic foods and vegetables. The study aims to collect several bodies of evidence about the use of organic fruits and vegetables. There is scattered information in several databases about the use of organic fruits and vegetables. The disorganized information will be collected using scientific methods, meaningful interpretation of information will be made, and appropriate suggestions will be provided for using organic fruits and vegetables. Thus, the research will be instrumental in knowing the use of organic fruits and vegetables. The major rationale for doing this research is it is expected that people who uses organic products are on the rise. However, the number of reasons for using organic products is still unknown. Therefore, through this study we will unravel various factors that determine the use of organic products in Kathmandu valley.

MATERIALS AND METHODS

Kathmandu, the capital of Nepal, was selected as the study area for this research. The place is where people from the majority of districts come to reside. Furthermore, Kathmandu has many organic outlets in Nepal. The research study was purposively conducted in Kathmandu Valley to directly contact the consumer, producer, and retailer. Most of the questions were about the behaviour of buying organic foods. Questionnaires were made to know the willingness to pay for organic products. R-studio software was used for the data analysis.

General linear model

In a bid to know the various factors that influence the willingness of consumers to pay for the organic products in Kathmandu Valley, it is most important to understand the relationship between the explanatory variables and the desire to pay for the vegetables and fruits using the General Linear Model. R-studio software was used for the data analysis.

$$\sum n\, i{=}1\ \{Yi\ log\ [1 - F\ (-Xi\beta\ \sigma\ )] + (1 - Yi\ )\ logF\ (\ Ci - Xi\beta\ \sigma\ )\}$$

The General Linear Model technique can estimate the various effects of the independent variables, primarily qualitative (Pishbahar *et al.*, 2018).

The following model shows the various factors influencing consumers' willingness to purchase organic products are:

$$WTPi = \beta 0 + \beta 1\ H + \beta 2 \cdot G + \beta 3 \cdot ENVTi + \beta 4 \cdot FAMi + \beta 5 \cdot EDUi + \beta 6 \cdot INC + \beta 7 \cdot SUFFi + U$$

WTPi = binary dependent variable which is chosen between yes or no.

β1 = intercept of health; β2 = intercept of gender; β3 = intercept of environmental factors; β4 = intercept of family membersβ5 = intercept of education; β6 = intercept of income; β7 =intercept of suffering from diseases; U = stochastic coefficient.

The various dependent variables that possess possibilities to affect the willingness of consumers to buy organic fruits and vegetables are considered in Table 1, which is suitable to the particular areas. The model for the study is given below. The various variables can be a person's attitude towards organic vegetables in which they might either "strongly disagree" to "strongly agree" range. Explanatory variables used for the models are:

Willingness to pay for organic products

Understanding the willingness to purchase organic foods provide useful information about whether people want to buy an organic product over conventionally produced products (Hamzaoui-Essoussi & Zahaf, 2012). WTP can be defined as "the maximum price a buyer accepts to pay for a given number of goods or services" (Le Gall-Ely 2009, p.93). A systematic review carried out by Katt & Meixner (2020) found that Willingness to purchase organic products depends upon several factors such as income, family size, education of people, and price of organic products (Katt & Meixner, 2020). In this study willingness to purchase organic products was measured against the premium price of organic products. In cities developing countries and cities like Kathmandu, the income of people plays a deciding factor to purchase organic products from the market (Milić *et al.*, 2022). Furthermore, premium price, which refers to the above-average price of organic products available in the market plays an important role in purchasing organic products.

Survey design

We developed a small pre-test from 49 respondents. By taking the references from the pre-test, we developed the primary survey for the study. The population for the survey was taken from the main vegetables and fruit markets of the Kathmandu, Lalitpur, and Bhaktapur districts. Simple random sampling and with-in-person interviews were conducted among 159 families of Kathmandu, Lalitpur, and Bhaktapur districts in 2018 AD. The questionnaires focus on collecting the willingness of farmers to pay. We asked consumers to evaluate each statement using the 5-point Likert scale (five = strongly agree, one = strongly disagree). Tables 1 and 2 represents the various statements of knowledge about organic products by the respondents and Table 3 represents the various statements of respondent's friendly attitude to environment. Likewise, other questions were asked about the consumers' perception or knowledge about the vegetable growing practices, which was also designed in the Likert Scale, ranging from Strongly Agree to Strongly Disagree. Finally, consumers' attitude towards the environment was assessed using the Likert Scale.

Table 1. Description of variables used in the model.

Variable name	Description
Willingness to pay (WTP) (% higher premium above conventional).	The willingness of the consumer to pay for organic fruits and vegetables.
Health concerns	The attitude of respondents towards health.
Gender (G)	1 = female, 0 = Male
Environment (ENVT)	Respondent's friendly attitude for environment index (Likert scales of 5 statements): 1 = Strongly disagree, 2 = Disagree, 3 = indifferent, 4 = Agree, 5 = Strongly agree
Number of People in a Family (FAM)	Number
Education (EDU)	Education of respondent (ordinal variable): 1 = Illiterate, 2 = Primary School, 3 = Senior high school, 4= B.Sc., 5 = M.Sc., 6 = Ph.D.
Income (INC)	Income of the respondents per month
Suffering from diseases (SUFF)	Experience suffering from diseases due to consumption of vegetables and fruits 1= Yes; 2=No, 3= Do not know

Where, WTP = Willingness to Purchase organic foods and vegetables. G = Gender of the participants; EDU = Education level of the participants; FAM = Number of People in a Family Health Concerns = Attitude of respondents toward health; ENVT = Respondent's attitude toward environmental index; INC = Income of the respondents in a month; SUFF = Experience suffering from diseases due to consumption of vegetables and fruits.

Table 2. Statements of knowledge about organic products by the respondent's index.

1. Organic farming does not use chemicals to produce vegetables and fruits.
2. These organic fruits and vegetables are healthier than conventional fruits and vegetables.
3. While producing organic fruits and vegetables, natural methods are preferred to deal with pests.
4. Organic fruits and vegetables highly reduce the chances of cancer and other diseases.
5. The organic manures enhance the flavour of vegetables and fruits produced organically.
6. The cost of organic fruits and vegetables is higher than conventional fruits and vegetables.
7. Organic fruits and vegetables are natural and environmentally friendly.

Table 3. Statements of respondent's friendly attitude to environment index.

1. Organic farming does not cause a significant amount of environmental degradation
2. Traditional ways of farming without contemplating the harmful effects of the environment cause degradation of the domain.
3. Environment destruction cannot be reversed.
4. Some problems which are more severe than nature, like unemployment and poverty, are pressing.
5. I have no problem paying for the protection of the environment.
6. Organic farming should be encouraged.
7. First, pesticide consumption should be decreased and slowly discouraged due to the precarious nature of human health.

RESULTS AND DISCUSSION

Consumers' willingness to pay for organic fruits and vegetables

The Table 4 shows that the study found that nearly 60.7 percent of the customers were interested in buying organic fruits and vegetables. Likewise, Figure 1 shows that willingness to pay for organic fruits and vegetables. The total percentage of people willing to purchase organic products is higher than that of people living in sub-urban areas (Shrestha & Baral, 2019). The study conducted by Coulibaly *et al.* (2011) found that nearly 86 percent of consumers in Ghana and 95 percent in Benin showed their willingness to purchase organic fruits and vegetables at a bid premium price (Coulibaly *et al.*, 2011). The study found that consumer willingness to buy organic fruits and vegetables declined as the price increased. A similar result was shown in the study carried out by Vapa-Tankosić *et al.* (2018) among the Serbian people to understand the willingness of consumers to purchase organic products. However, people with higher incomes did not affect their willingness to purchase organic products. Likewise, in the study by Mohd Suki (2018) price of organic products deciding factor to purchase organic materials.

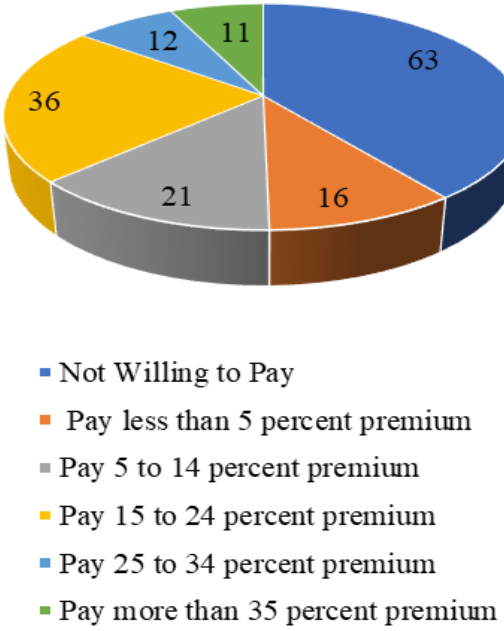

Figure 1. *Willingness to purchase organic products.*

Knowledge about organic fruits and vegetables in Kathmandu, Lalitpur, and Bhaktapur district

Knowledge about organic products plays an important role in purchasing the products (Canova *et al.*, 2020). Most consumers do not have prior knowledge of differentiating organic products from conventional products (Nuttavuthisit & Thøgersen, 2017). However, the result of the study showed that most of the consumers strongly agree that they know about organic fruits and vegetables, which is shown in Table 5 and Figure 2. The result obtained is summarized in the table below for the organic fruits and vegetable knowledge question. In Table 2, the result showed that 70 percent of the respondents "agree" and "strongly agree" with the knowledge about the products. Likewise, only 20 percent of the respondents "disagree" and "completely disagree" with the presented statements. Most of the consumers have sound knowledge about organic fruits and vegetables. Nevertheless, 20 percent of the respondents were ignorant of pesticide-free vegetables and fruits.

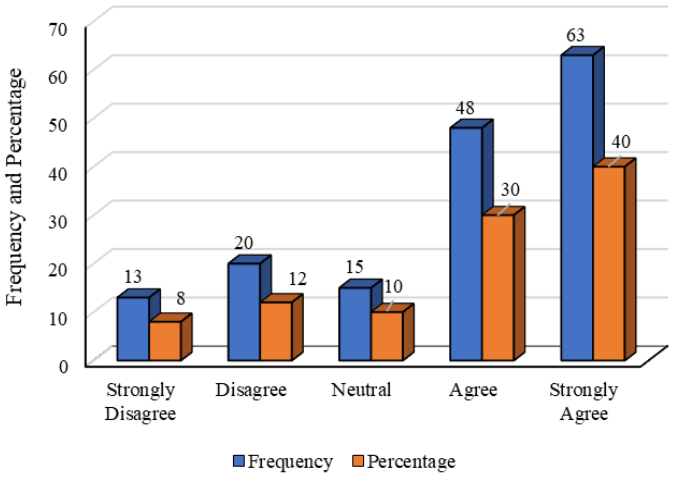

Figure 2. *Distribution of knowledge about organic fruits and vegetables.*

Table 4. Distribution of willingness to pay (WTP).

Category	Proportion	Frequency
Not willing to pay	63	39.6
Willingness to pay less than 5 percent premium	16	10
Willingness to pay 5 to 14 percent premium	21	13
Willingness to pay 15 to 24 percent premium	36	23
Willingness to pay 25 to 34 percent premium	12	8
Willingness to pay more than 35 percent premium	11	6.4

Table 5. Distribution of knowledge about organic fruits and vegetables.

Response	Frequency	Percentage	Cumulative
Strongly Disagree	13	8	8
Disagree	20	12	20
Neutral	15	10	30
Agree	48	30	60
Strongly Agree	63	40	100
Total	159	100	

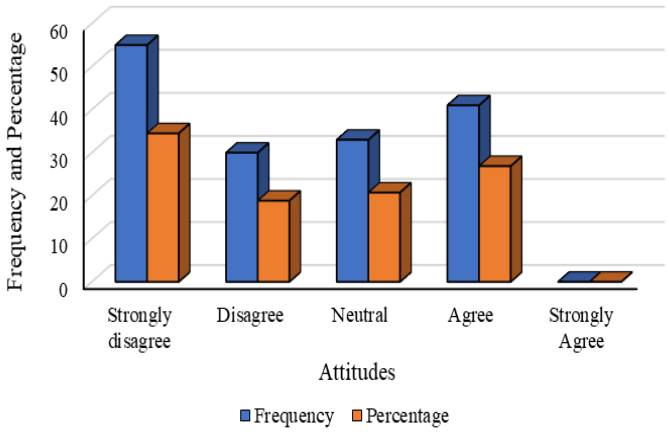

Figure 3. *Attitude towards various environmental indices.*

Environment

Environmental issues are also regarded as important factors that influence consumers' willingness to purchase organic products (Choi & Johnson, 2019). However, the study carried out by Maichum *et al.* (2016) found that the knowledge of various environmental issues did not translate into purchasing organic products (Maichum *et al.*, 2016). Likewise, Figure 3 represents the frequency and percentage of attitude of respondents towards environment indices. To the question asked to what extent they care about the environment and avoid pesticide-laced vegetables, most of the respondents' replies ranged from "agree" to "strongly agree" with the friendly statements that brought them to the organic shop, whereas 13 percent of the respondents replied they disagree to disagree with the views strongly. It shows that the respondents give high priority to environmental protection. Overall, the study shows nearly more than 50 percent of respondents do give more priority to environmental protection and choose products grown using pesticides and insecticides over organic products. However, there is still nearly 21 percent of respondents were aware of organic products and their usefulness to the environment.

Descriptive statistics

The research depicts that the mean income of the consumer is NRs. 61,720 per month, which is higher than the mean average income of the country (The World Bank 2022). The family size of the respondents is average. Similarly, mostly some male respondents participated in the research. Furthermore, those who purchased organic fruits and vegetables were health conscious. Most of the respondents who participated in the study had completed the study up to the bachelor's level.

General linear model

We can see that some of the factors such as age are not significant factors that affect the consumer's willingness to buy organic fruits and vegetables. Whereas a study conducted by (Khan *et al.*, 2018) showed that age is a significant contributor to consumers' willingness to buy organic fruits and vegetables (Khan *et al.*, 2018). An income above 40,000 showed the consumer's desire to purchase organic fruits and vegetables. A study carried out by (Hayati *et al.*, 2017) also showed similar results (Hayati *et al.*, 2017). The literature shows that income significantly impacts consumers' willingness to buy organic fruits and vegetables. The variables such as Health and Environment play a vital role in determining the willingness to pay for organic fruits and vegetables. Similar results were shown by the study (Nandi *et al.*, 2017). Consumers' health awareness is critical in determining the attitude, intention, and frequency of purchasing organic vegetables and fruits (Magnusson *et al.*, 2003). However, this study shows that in underdeveloped nations like Nepal, health issues and environmental issues are not significant factors to consume organic products, whereas higher income played a significant role in purchasing organic products. In the study respondents with income above NRs. 50,000 and 70,000 were statistically significant to purchase organic products. Many factors impact the willingness of consumers to buy organic vegetables and fruits and vegetables. The research paper omitted the role of some demographic factors like the age of the respondents in the study. In contrast, some other critical demographic factors like gender and family size were included in the study. Some interesting findings of the research are that the respondents' family size did not play any role in purchasing organic fruits and vegetables. Similarly, the gender of the respondents did not play any role in buying organic fruits and vegetables. However, various previous research carried out in the past has shown that the gender of the individuals who participated in the study plays a vital role in purchasing organic products (Nandi *et al.*, 2017; Magnusson *et al.*, 2001). The study points out that the education of individuals involved played a significant role in purchasing organic fruits and vegetables. The systematic review aimed at finding the consumers' willingness to pay for organic fruits and vegetables by Katt & Meixner (2020), found environmental and health factors play an important role in purchasing organic products (Katt & Meixner, 2020). In contrast to previous findings, the current study which uses the general linear model found that the attitude of consumers towards the environment and health did not significantly impact buying organic fruits and vegetables among the consumers in Kathmandu Valley, Nepal. The role of the attitude of consumers towards organic fruits and vegetables was insignificant. Among the Nepalese buyers, the individual's income played a significant role in purchasing commodities. Similarly, the individuals having income above 50,000 NRs increased the willingness of the consumers to buy organic fruits and vegetables in the outlets. The research output is in line with the research carried out in India and Pakistan (Nandi *et al.*, 2017b; Khan *et al.*, 2018). The study carried out by Silva *et al.* (2007) found that people overestimate their willingness to pay when they are interviewed; therefore, instead of questioning the people's willingness to purchase organic products should be measured without making them aware that they are buying organic fruits and vegetables (Silva *et al.*, 2007). Various studies have pointed to the auction-based purchase to estimate the willingness to pay the organic fruits and vegetables (Vecchio & Borrello 2019; Canavari *et al.*, 2019).

Conclusion

The study focused on various factors in determining the willingness of consumers to buy organic vegetables and fruits. The study showed the factors like Income, and Education as significant factors in determining the willingness of consumers to pay for organic vegetables and fruits. Although, the past studied showed that health as most critical factor in determining the consumer's willingness to buy organic fruits and vegetables. In developing country like Nepal, health factor was not a significant factor that determine the willingness to purchase organic products. The descriptive results showed that 60.1 percent of customers were willing to buy organic fruits and vegetables. The willingness to purchase organic fruits and vegetables decreases with an increase in the bid premium of the fruits and vegetables. Therefore, the study provides insights into the organic agricultural scenario in Nepal. The research findings can be useful to the producer to target the sales of organic fruits and vegetables.

DECLARATIONS

Author contribution statement

Conceptualization: N.T., S.T. and R.K.A.; Methodology: S.T., N.T. and R.K.A.; Software and validation: S.T., S.T., N.T., A.G., R.K.A. and Z.Z.; Formal analysis and investigation: S.T.; Resources: S.T.; Data curation: ST, NT; Writing—original draft preparation: S.T., N.T., S.T.; Writing—review and editing: S.T.; Visualization: S.T.; Supervision: R.K.A.; Project administration: S.T.; Funding acquisition: Not applicable. All authors have read and agreed to the published version of the manuscript.

Conflicts of interest: The author declare that there are no conflicts of interest regarding the publication of this manuscript.

Ethics approval: This study did not involve any animal or human participant and thus ethical approval was not applicable.

Consent for publication: All co-authors gave their consent to publish this paper in AAES.

Data availability: The data that support the findings of this study are available on request from the corresponding author.

Supplementary data: No supplementary data is available for the paper.

Funding statement: No external funding is available for this study.

Additional information: No additional information is available for this paper.

REFERENCES

Anton, A., Fekete, G., Darvas, B., & Székács, A. (2014). Environmental risk of chemical agriculture. *Engineering Tools for Environmental Risk Management. Vol. 1. Environmental Deterioration and Contamination—Problems and Their Management*, 93-112.

Aryal, K. P., Pashupati, C., Sangita, P., & Govinda, S. (2009). Consumers' willingness to pay for organic products: A case from Kathmandu Valley. *Journal of Agriculture and Environment* 10: 15–26.

Aryal, K. K., Neupane, S., Lohani, G. R., Jors, E., Neupane, D., Khanal, P. R., & Karki, K. B. (2016). *Health effects of pesticide among vegetable farmers and the adaptation level of integrated pest management program in Nepal, 2014*. Nepal Health Research Council.

Ashraf, S., Ali, Q., Zahir, Z. A., Ashraf, S., & Asghar, H. N. (2019). Phytoremediation: Environmentally sustainable way for reclamation of heavy metal polluted soils. *Ecotoxicology and Environmental Safety*, *174*, 714-727.

Atreya, K., Subedi, B. P., Ghimire, P. L., Khanal, S. C., & Pandit, S. (2020). A review on history of organic farming in the current changing context in Nepal. *Archives of Agriculture and Environmental Science*, *5*(3), 406-418.

Barton, G. A. (2018). *The global history of organic farming*. Oxford University Press.

Bhatta, G. D., & Doppler, W. (2011). Smallholder peri-urban organic farming in Nepal: A comparative analysis of farming systems. *Journal of Agriculture, Food Systems, and Community Development*, *1*(3), 163-180.

Canavari, M., Drichoutis, A. C., Lusk, J.L., & Nayga Jr, R.M. (2019). How to run an experimental auction: A review of recent advances. *European Review of Agricultural Economics*, *46*(5), 862-922.

Canova, L., Bobbio, A., & Manganelli, A. M. (2020). Buying organic food products: the role of trust in the theory of planned behavior. *Frontiers in Psychology*, *11*, 575820.

Choi, D., & Johnson, K. K. (2019). Influences of environmental and hedonic motivations on intention to purchase green products: An extension of the theory of planned behavior. *Sustainable Production and Consumption*, *18*, 145-155.

Coulibaly, O., Nouhoheflin, T., Aitchedji, C. C., Cherry, A. J., & Adegbola, P. (2011). Consumers' perceptions and willingness to pay for organically grown vegetables. *International journal of vegetable science*, *17*(4), 349-362.

Gauchan, D., Palikhey, E., Sthapit, S., Joshi, B. K., Manandhar, H. K., & Jarvis, D. I. (2020). Organic farming and marketing of traditional crops in Nepal Mountains: Gaps, issues and opportunities for improvement. *Traditional Crop Biodiversity for Mountain Food and Nutrition Security in Nepal*, *163*.

Hamzaoui-Essoussi, L., & Zahaf, M. (2012). Canadian organic food consumers' profile and their willingness to pay premium prices. *Journal of international food & agribusiness marketing*, *24*(1), 1-21.

Hatamleh, A. A., Danish, M., Al-Dosary, M. A., El-Zaidy, M., & Ali, S. (2022). Physiological and oxidative stress responses of *Solanum lycopersicum* (L.) (tomato) when exposed to different chemical pesticides. *RSC advances*, *12*(12), 7237-7252.

Hayati, B., Haghjou, M., & Pishbahar, E. (2017). Effecting factors on consumers' willingness to pay a premium for pesticide-free fruit and vegetables in Iran. *MOJ Food Process Technol*, *4*(5), 137-145.

Katt, F., & Meixner, O. (2020). A systematic review of drivers influencing consumer willingness to pay for organic food. *Trends in Food Science & Technology*, *100*, 374-388.

Khan, J., Khanal, A. R., Lim, K. H., Jan, A. U., & Shah, S. A. (2018). Willingness to pay for pesticide free fruits: Evidence from Pakistan. *Journal of International Food & Agribusiness Marketing*, *30*(4), 392-408.

Krissoff, B. (1998). Emergence of US organic agriculture: Can we compete? Discussion. *American Journal of Agricultural Economics*, *80*(5), 1130-1133.

Kumar, R., Kumar, R., & Prakash, O. (2019). The impact of chemical fertilizers on our environment and ecosystem. *Chief Ed*, *35*(69), 1173-1189.

Le Gall-Ely, M. (2009). Definition, measurement and determinants of the consumer's willingness to pay: a critical synthesis and avenues for further research. *Recherche et Applications en Marketing (English Edition)*, *24*(2), 91-112.

Magnusson, M. K., Arvola, A., Hursti, U. K. K., Åberg, L., & Sjödén, P. O. (2003). Choice of organic foods is related to perceived consequences for human health and to environmentally friendly behaviour. *Appetite*, *40*(2), 109-117.

Magnusson, M. K., Arvola, A., Hursti, U. K. K. K., Eberg, L., & Sjödén, P. O. (2001). Attitudes towards organic foods among Swedish consumers. *British Food Journal*, *103*(3), 209-227.

Maichum, K., Parichatnon, S., & Peng, K. C. (2016). Application of the extended theory of planned behavior model to investigate purchase intention of green products among Thai consumers. *Sustainability*, *8*(10), 1077.

Makatouni, A. (2002). What motivates consumers to buy organic food in the UK? Results from a qualitative study. *British Food Journal*, *104*(3/4/5), 345-352.

McCauley, L. A., Anger, W. K., Keifer, M., Langley, R., Robson, M. G., & Rohlman, D. (2006). Studying health outcomes in farmworker populations exposed to pesticides. *Environmental Health Perspectives*, *114*(6), 953-960.

Milić, D., Simin, M. T., Glavaš-Trbić, D., Radojević, V., & Vukelić, N. (2022). Why I buy organic products–perception of middle income country consumers (Republic of Serbia). *Economics of Agriculture*, *69*(2), 497-515.

Mohd Suki, N. (2018). Determinants of consumers' purchase intentions of organic vegetables: Some insights from Malaysia. *Journal of Food Products Marketing*, *24*(4), 392-412.

Nandi, R., Bokelmann, W., Gowdru, N. V., & Dias, G. (2017). Factors influencing consumers' willingness to pay for organic fruits and vegetables: Empirical evidence from a consumer survey in India. *Journal of Food Products Marketing*, *23*(4), 430-451

Nuttavuthisit, K., & Thøgersen, J. (2017). The importance of consumer trust for the emergence of a market for green products: The case of organic food. *Journal of Business Ethics*, *140*, 323-337.

Pahalvi, H. N., Rafiya, L., Rashid, S., Nisar, B., & Kamili, A. N. (2021). Chemical fertilizers and their impact on soil health. *Microbiota and Biofertilizers, Vol 2: Eco-friendly Tools for Reclamation of Degraded Soil Environs*, 1-20.

Parajuli, S., Shrestha, J., & Ghimire, S. (2020). Organic farming in Nepal: A viable option for food security and agricultural sustainability. *Archives of Agriculture and Environmental Science*, *5*(2), 223-230.

Pishbahar, E., Ghahremanzadeh, M., Ainollahi, M., & Ferdowsi, R. (2018). Factors influencing agricultural credits repayment performance among farmers in East Azarbaijan province of Iran.

Rani, L., Thapa, K., Kanojia, N., Sharma, N., Singh, S., Grewal, A. S., & Kaushal, J. (2021). An extensive review on the consequences of chemical pesticides on human health and environment. *Journal of Cleaner Production*, *283*, 124657.

Shrestha, A., & Baral, S. (2019). Consumers' willingness to pay for organic agriculture products: a case study of Nepalgunj city, Banke. *International Journal of Agriculture Environment and Food Sciences*, *3*(2), 58-61.

Shrestha, R. M. (2021). Factors Affecting Consumer Purchase Intentions of Organic Products in Lalitpur District. *Pravaha*, *27*(1), 125-130.

Silva, A., Nayga Jr, R. M., Campbell, B. L., & Park, J. L. (2007). On the use of valuation mechanisms to measure consumers' willingness to pay for novel products: A comparison of hypothetical and non-hypothetical values. *International Food and Agribusiness Management Review*, *10*(2), 165-180.

Suciu, N. A., Ferrari, F., & Trevisan, M. (2019). Organic and conventional food: Comparison and future research. *Trends in Food Science & Technology*, *84*, 49-51.

Tamang, S., Dhital, M., & Acharya, U. (2011). Status and scope of organic agriculture in Nepal. *Food and Sustainable Agriculture Initiative, Forestaction, Lalitpur*.

Thapa, S., Piras, G., Thapa, S., Goswami, A., Bhandari, P., & Dahal, B. (2021). Study on farmers' Pest management strategy, knowledge on pesticide safety and practice of pesticide use at Bhaktapur district, Nepal. *Cogent Food & Agriculture*, *7*(1), 1916168.

Thapa, S., Piras, G., Thapa, S., Rimal, P., Thapa, A., & Adhikari, K. (2021). Blockchain-based secured traceability system for the agriculture supply chain of ginger in Nepal: A case study. *Archives of Agriculture and Environmental Science*, *6*(3), 391-396.

Vapa-Tankosić, J., Ignjatijević, S., Kranjac, M., Lekić, S., & Prodanović, R. (2018). Willingness to pay for organic products on the Serbian market. *International Food and Agribusiness Management Review*, *21*(6), 791-801.

Vecchio, R., & Borrello, M. (2019). Measuring food preferences through experimental auctions: A review. *Food Research International*, *116*, 1113-1120.

Voon, T. J. P., Ngui, K. S., & Agrawal, A. (2011). Determinants of willingness to purchase organic food: An exploratory study using structural equation modeling. *International food and agribusiness management review*, *14*(2), 103-120.

Wier, M., Andersen, L. M., & Millock, K. (2005). Information provision, consumer perceptions and values: The case of organic foods. *Environment, Information and Consumer Behaviour*, 161-178.

Willer, H., & Lernoud, J. (2013). Organic Agriculture Worldwide: Key results from the FiBL-IFOAM survey on organic agriculture worldwide 2013. Slide collection.

Yang, F., Tang, C., & Antonietti, M. (2021). Natural and artificial humic substances to manage minerals, ions, water, and soil microorganisms. *Chemical Society Reviews*, *50*(10), 6221-6239.