PLANT SCIENCE TODAY
ISSN 2348-1900 (online)
Vol 11(sp4): 01–06
https://doi.org/10.14719/pst.5772

HORIZON
e-Publishing Group
HePG

RESEARCH ARTICLE

Farmers' preference of organic farming in Coimbatore district, India

Janakanandhini P[1], Malarkodi M[1]*, Divya K[1], Padma SR[2] & D Vidhya[3]

[1]Department of Agricultural and Rural Management, Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu, India

[2]Department of Agricultural Extension, Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu, India

[3]Department of Fruit Science, Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu, India

*Email: malarkodi.m@tnau.ac.in

OPEN ACCESS

ARTICLE HISTORY
Received: 15 October 2024
Accepted: 28 November 2024
Available online
Version 1.0 : 30 December 2024
Version 2.0 : 06 February 2025

Check for updates

Additional information

Peer review: Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

Reprints & permissions information is available at https://horizonepublishing.com/journals/index.php/PST/open_access_policy

Publisher's Note: Horizon e-Publishing Group remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Indexing: Plant Science Today, published by Horizon e-Publishing Group, is covered by Scopus, Web of Science, BIOSIS Previews, Clarivate Analytics, NAAS, UGC Care, etc
See https://horizonepublishing.com/journals/index.php/PST/indexing_abstracting

CITE THIS ARTICLE
Janakanandhini P, Malarkodi M, Divya K, Padma SR, Vidhya D. Farmers' preference of organic farming in Coimbatore district, India. Plant Science Today.2024;11(sp4):01-06. https://doi.org/10.14719/pst.5772

Abstract

Agriculture plays a pivotal role in the economies of developing countries like India, supporting livelihoods and food security. Organic farming avoids using synthetic inputs, such as fertilizers and pesticides. Instead, it focuses on organic matter (such as crop leftovers, animal residues, legumes and biopesticides) to maintain soil productivity and fertility while managing pests to support sustainable natural resources and a healthy environment. Using cross-sectional methodology, data were obtained from 100 respondents via structured interviews and analyzed using conjoint analysis. According to the findings, economic rewards and market demand strongly motivate the adoption of organic farming, while the complexity and costs of the certification process pose significant hurdles. The findings underscore the importance of targeted training to enhance farmers' knowledge and simplify the certification process. The studys' findings offer valuable insights for policymakers promoting organic agriculture. Key strategies include emphasizing economic incentives, raising awareness and streamlining certification procedures to support sustainable organic farming in the region. This research provides insights into the factors influencing organic farming adoption among farmers in developing agricultural contexts.

Keywords

environmental management; organic farming; preference; sustainable agriculture

Introduction

Agriculture is the backbone of rural economies in developing countries like India, providing livelihoods and food security. In India, farming provides a primary source of income for about 70% of the population. Organic farming avoids using synthetic agricultural inputs such as chemical fertilizers and pesticides (1). Instead, it relies on organic materials such as crop residues, animal manures, legumes and bio-pesticides to maintain soil productivity and manage pests in a way that supports sustainability. Organic farming is one of the methods for achieving sustainable agricultural goals. Traditional agriculture systems, particularly those in India, commonly include organic farming techniques such as intercropping, mulching and crop-livestock integration (2). However, organic farming is founded on various rules and certification programs that prohibit the use of practically all synthetic inputs and soil health is recognized as the primary concept of the methods.

Over the past decade, the global organic agricultural movement has grown significantly. This growth is reflected in recent data from FiBL and IFOAM-Organics International (2021), which show that organic agriculture now spans 72.3 million ha globally, with over 3.1 million certified producers. India, home to the highest number of accredited farmers, has experienced a surge in organic farming driven by rising consumer demand, greater awareness and supportive regulations. Despite Indias' leadership in organic farming, organic agriculture still occupies only 2.6% of global agricultural acreage, underscoring significant potential for further expansion. Organic agriculture, known for being both productive and sustainable, has the potential to enhance food security by diversifying crop and animal production systems, increasing revenue streams and improving dietary diversity (3-5). Demand for organic food continues to expand globally, with an average annual growth rate of 20-25% (6). In India, this growing awareness also fosters a strong export market for organic products. Organic farming rapidly expanded among Indian farmers and entrepreneurs, particularly in low-productivity areas, rainfed zones, hilly regions and northeastern states where fertilizer usage is less than 25 kg/ha/year (7).

Organic fertilizers and manures are crucial in maintaining long-term soil health by improving nutrient availability and enhancing microbial activity. These inputs enhance soil quality while preserving ecosystem functions such as biodiversity and water retention. Composting can be done using various biological sources, including plant and animal leftovers. Organic manure improves soil biological activity, increasing inorganic nutrient availability, humus levels and crop output. The National Organic Program (NOP) has established criteria for using organic manure in conventional farming systems. Organic manure is separated into bulky and concentrated organic manures (8, 9). Farmers' preferences for organic farming are shaped by economic benefits, environmental sustainability, societal norms and growing demand for organic products. According to studies, farmers are attracted to organic cultivation because it can improve soil health, lower input costs and fulfil rising consumer demand for organically produced food. Organic practices like crop rotation, composting and biological pest control address the decline in soil quality and ecosystem health caused by conventional farming. Organic practices like crop rotation, composting and biological pest control address the decrease in soil quality and ecosystem health caused by traditional agriculture (10). Another significant aspect influencing farmer preferences is their opinion of organic agriculture as environmentally sustainable. According to studies, farmers prioritizing environmental sustainability are more likely to choose organic farming methods.

Organic farming enhances soil health, reduces chemical runoff and conserves water, contributing to a more resilient and sustainable agricultural system (11). Organic farmers in India experience a considerable improvement in soil fertility and water retention capacity after adopting organic practices (12). Organic agricultural systems consume approximately 30-50% less energy and emit 30-50% fewer greenhouse gas emissions than conventional systems (13). Organic farming helps to conserve biodiversity by providing habitats for beneficial insects, birds and other creatures frequently removed by chemical pesticides (14). Organic farms often attract pollinators like bees and butterflies by planting diverse flowering plants.

Additionally, organic practices such as maintaining hedgerows and cover crops can provide shelter and food for birds and small mammals. These habits support a variety of species, promoting a balanced ecosystem and reducing the need for chemical inputs. This favourable environmental impact encourages farmers who care about sustainability to choose organic practices. Consumer perceptions of organic food as healthier, safer and more environmentally friendly have significantly boosted demand for organic food in the organic market (15). This shift in consumer tastes motivates farmers to embrace organic practices to benefit from the higher prices and market opportunities associated with organic products.

Furthermore, societal factors such as peer networks and community activities influence farmers' decisions to shift to organic farming. Organic farming offers ecological benefits like improved soil fertility, increased biodiversity and reduced pollution from chemical runoff (16). Organic farming practices such as green manuring, intercropping and natural pest treatments improve soil health and contribute to healthier ecosystems. These approaches reduce farmers' and communities' exposure to dangerous chemicals, lowering the likelihood of pesticide-related illnesses, an essential consideration in farmer decision-making (17).

Materials and Methods

The study was conducted in Coimbatore district, a prominent agricultural region in Tamil Nadu, India, known for its diverse farming practices. Coimbatore was selected for adopting varied agricultural techniques and the increasing interest in organic farming, particularly in low-input areas (18). A cross-sectional design was employed to capture a snapshot of farmers' preferences, allowing for a broad analysis of factors influencing organic farming adoption (19). Primary data was gathered through organized interviews with a pre-tested questionnaire. The questionnaire addressed key topics, including organic farming practices, perceived benefits, certification processes and market demand. The survey had a total of 100 respondents. The sample consisted of farmers actively practising organic cultivation, selected to reflect varying levels of experience and scale of operation. A purposive sampling was employed because the farmers included were registered organic farmers with diverse experiences and expertise in organic farming. Conjoint analysis, which allowed the researchers to understand how different attributes of a product or practice were valued by respondents, was used to determine the farmers' preference for organic production. The conjoint analysis allowed for the simultaneous evaluation of multiple factors, such as certification complexity, market demand and environmental benefits, to determine how each contributes to the decision to adopt organic practices (20).

Analytical tools

Conjoint analysis

Conjoint analysis determined farmers' preferences for organic farming by identifying key attributes influencing their decisions. Key attributes influencing farmers' preferences, such as economic incentives, certification complexity and perceived benefits, were identified (21). Conjoint analysis, a statistical technique used to analyze how individuals value distinct aspects of a product or service, is especially effective for evaluating the complicated trade-offs farmers face when choosing organic farming (22). Conjoint analysis better explains farmers' relative significance on multiple attributes such as awareness, perceived benefits, market demand and sustainability. This approach aids in determining which aspects of organic farming are most appealing to farmers and which may serve as hurdles to adoption (23).

Identifying significant traits through a personal interview

Selecting relevant attributes and attribute levels was a vital stage in the conjoint study because it ensures the study accurately reflects real-world choices and provides transparent, actionable insights. In conjoint analysis, personal interviews, expert assessments and group interviews are common methods for identifying key traits or 'factors' that influence decision-making (24). Individual interviews were used to determine the relevant characteristics and their levels. (25). Conjoint analysis has been frequently used to study preferences for several characteristics. In this study, the number of traits in the conjoint analysis was limited to avoid overwhelming respondents, who may find it challenging to assess multiple features simultaneously (26). Based on expert recommendations and literature reviews, seven key attributes: perceived benefits, awareness of NPOP, certification process, cost of certification, access to information, support from the Government and market demand were selected for analysis (27). These seven traits, each with multiple levels, could be combined into 2187 unique profiles, allowing for a comprehensive analysis of farmers' preferences. An orthogonal design was employed to reduce the number of combinations to a manageable set, simplifying the choice process for respondents. The Pearson correlation coefficient and Kendall–tau were used to assess the relationship between the attributes (28). A high correlation was defined as one with a correlation coefficient larger than 0.8, whereas a weak connection had a correlation coefficient less than 0.5.

Experiment design

Since these seven attributes formed 2187 models (37), the orthogonal design was chosen to produce the best primary effects model. The produced models from the orthogonal design were directly given to respondents, who were asked to express their level of preference for each model. The fundamental conjoint analysis model assumes a linear relationship between utility and each attribute level, as shown in Equation 1.

$$U(X)= \alpha ij\ \chi ij \qquad \text{Eqn. 1}$$

U(X) is the profiles' total utility.

αij is the utility or part–worth contribution linked to an attribute's jth level (j = 1, 2… ki).

If the jth level of the ith property is present, xjj = 1; if not,

ki = number of attribute levels i

m = quantity of attributes

The relevance of an attribute (i) is determined by the range of its part-worths (αij) across different levels. Other attributes determine the significance of an attribute. The OLS regression technique was used to estimate each respondent's preference function. The profile rating was the dependent variable and the coded attribute levels were the independent variables. The part-worth utilities that comprised the overall ratings of the profiles were then deduced from the predicted regression coefficients. The degree to which each attribute helped determine the utility or overall preference was considered to measure the attributes' relevance. Finally, the overall usefulness of each model was calculated based on its score and ranked accordingly.

Results and Discussion

Conjoint analysis

The conjoint analysis gave essential insights into farmers' preferences for organic growing in the Coimbatore area. The investigation provided detailed information on how several variables influenced respondents' decisions, including perceived benefits, awareness of NPOP standards, the certification procedure, access to information and market demand. Among the 5 selected features, perceived benefits and market demand were the most influential elements in adopting organic techniques, consistent with prior research demonstrating that economic and market factors frequently drive agricultural decisions (12, 29). Farmers strongly preferred organic practices when they saw real benefits such as greater profitability and long -term sustainability (30). Awareness of NPOP standards and the convenience of the certification process were also critical, implying that information and regulatory constraints may impede adoption, as emphasized in previous research (29). Access to information was rated moderately important, reinforcing that while informed decision-making is crucial, it is secondary to economic incentives. The orthogonal design and regression analysis confirmed these preferences, indicating the best combination of parameters to promote wider adoption of organic farming in the region.

Interpretation Preference of the sample farmers towards organic cultivation

The utility estimates from the conjoint analysis (Table 1) show that economic benefits and high demand are essential drivers of farmers' preferences for organic farming, consistent with research emphasizing economic incentives in decision-making (12). Awareness and access to information are also critical, with individuals aware of organic procedures preferring those more (29). The negative utility associated with low-cost options suggests that farmers may equate higher costs with better outcomes, which is in line with prior research indicating that more significant investments are often perceived as leading to more substantial benefits. The negative utility associated with low-cost options suggests that farmers may equate higher costs with better outcomes, which is in line with prior research indicating that larger investments are often perceived as leading to more significant benefits. The high values of Kendalls' tau (0.590) and Pearsons' R (0.855) demonstrate how well the model predicts preferences.

Interpretation Averaged Importance Score

The averaged importance scores illustrate the variable significance of attributes that influence farmers' choices for organic farming, with certification (21.22) and cost (18.458) being the most important considerations (Table 2). This finding is consistent with previous research showing that cumbersome certification processes can prevent farmers from adopting organic techniques (31). Awareness (14.082) and support (13.375) are also required, implying that enhanced knowledge and institutional aid are critical for increasing organic adoption rates

Table 1. Preference of the sample farmers towards organic cultivation

Utilities			
Dimensions	**Particulars**	**Utility Estimate**	**Std. Error**
Benefits of organic farming	Environmental Sustainability	−0.237	0.546
	Health Benefits of Consumers	−0.147	0.546
	Economic Advantages	0.383	0.546
Awareness of NPOP standards	Not Aware	0.342	0.546
	Somewhat Aware	−0.488	0.546
	Aware	0.147	0.546
Complicity in certification process	Simple	−0.140	0.546
	Moderately complex	0.347	0.546
	Very complex	−0.207	0.546
Cost of certification	Low cost	−1.098	0.546
	Moderate cost	0.858	0.546
	High cost	0.240	0.546
Access to information and training	Limited access	−0.04	0.546
	Moderate access	−0.405	0.546
	Extensive access	0.445	0.546
Support from Government	No support	0.348	0.546
	Some support	−0.412	0.546
	Extensive support	0.063	0.546
Demand for organic products	Low demand	−0.133	0.546
	Moderate demand	0.358	0.546
	High demand	−0.225	0.546
(Constant)		9.5	0.386

	Value	Sig.
Pearsons' R	0.855	0.001
Kendalls' tau	0.590	0.001

Correlations between observed and estimated preferences

Table 2. Averaged Importance Score

Importance Values	
Benefits of organic farming	10.771
Awareness of NPOP standards	14.082
Complicity in certification process	21.22
Cost of certification	18.458
Access to information and training	12.148
Support from Government	13.375
Demand for organic products	9.946
Averaged Importance Score	

(32). The lower importance of benefits (10.771) and demand (9.946) suggests that economic and regulatory factors outweigh perceived environmental or health benefits, underscoring the need for targeted efforts to promote organic farming.

Average importance interpretation

The bar chart depicts the relative relevance of numerous elements impacting organic farming, stressing that complexity in the certification process is the most important, followed by awareness of NPOP standards and cost of certification, as shown in Fig. 1. These findings are consistent with previous research emphasizing certification processes' relevance to organic adoption. Notably, while government backing and demand for organic products are evaluated, they are rated less critical than comprehending the difficulties of certification. Addressing these issues can potentially increase farmers' adoption of organic farming.

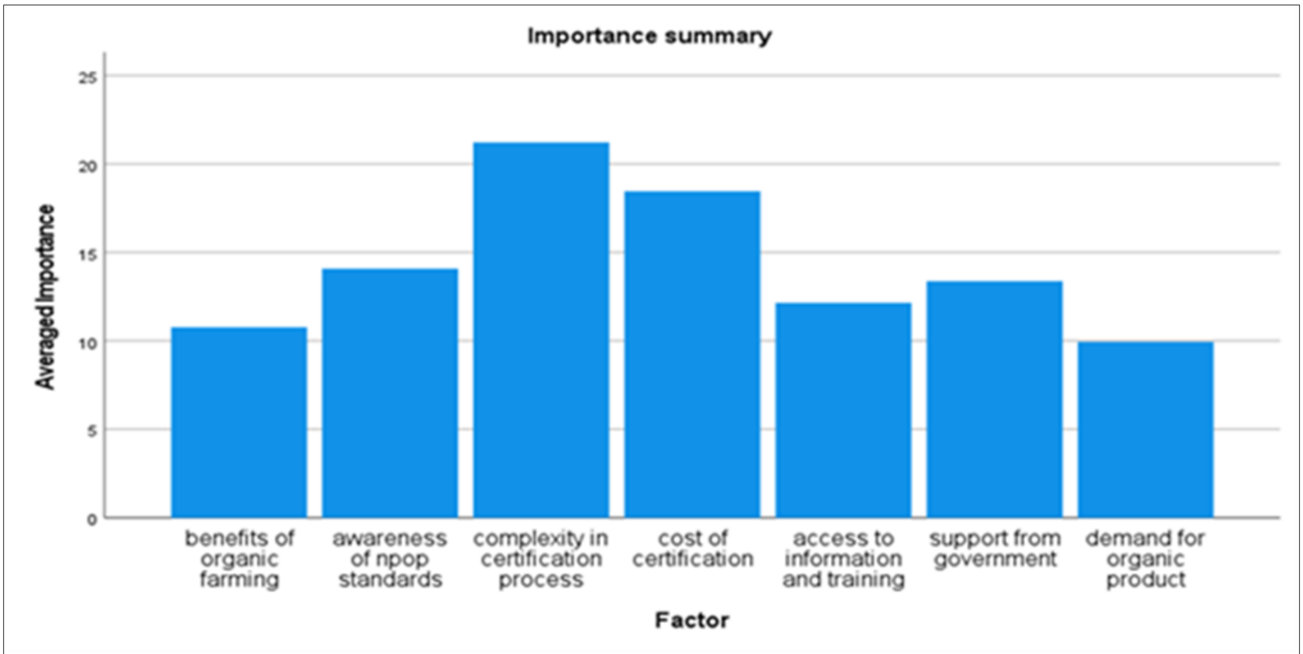

Fig. 1. Average Importance.

Conclusion

The study done in the Coimbatore district identifies key elements impacting farmers' desire for organic farming. The findings show that the complexity of the certification process and accompanying expenses are the biggest impediments to adoption, while economic rewards and market demand play important roles in generating interest. Awareness of NPOP standards and access to information were identified as crucial but secondary elements, underlining the necessity for targeted educational activities. Despite the lesser importance of perceived benefits, the findings highlight the need for faster certification processes and institutional assistance to promote organic farming uptake. The strong correlation between observed and estimated preferences supports the models' dependability, offering a clear path forward for policymakers seeking to promote organic agriculture. Overall, raising awareness, simplifying certification and resolving economic constraints are critical to creating a sustainable organic agricultural environment in the region.

Acknowledgements

Authors would like to express sincere thanks to Tamilnadu Agricultural University, Government of Tamilnadu and organic farmers in and around Coimbatore district and department of agriculture and extension personnels.

Authors' contributions

JN conducted data gathering, research analysis and drafted the manuscript. MM assisted me in preparing the interview schedule, conducting research and writing the manuscript.

Compliance with ethical standards

Conflict of interest: The authors declared that they have no competing interests.

Ethical issues: None

References

1. Das S, Chatterjee A, Pal TK. Organic farming in India: a vision towards a healthy nation. Food Quality and Safety. 2020;4(2):69-76. https://doi.org/10.1093/fqsafe/fyaa018
2. Patel SK, Sharma A, Singh GS. Traditional agricultural practices in India: an approach for environmental sustainability and food security. Energy Ecology and Environ. 2020;5(2):253-71. https://doi.org/10.1007/s40974–020–00158–2
3. Mäder P, Fliessbach A, Dubois D, Gunst L, Fried P, Niggli U. Soil fertility and biodiversity in organic farming. Sci. 2002;296 (5573):1694-97. https://doi.org/10.1126/science.1071148
4. Osei S, Owusu M, Pomaa YP, Boateng M. A study of student perception of organic agriculture and organic foods. Ghana J Animal Sci. 2013;7(2):142-50. https://doi.org/10.1016/j.telpol.2017.07.008
5. Sartaj A, Ali T, Bashir Z, Kousar S, Rasool F. Organic farming and its services in sustainable agriculture-an overview. Emer Issues Agri Sci. 2023;5:94-106. https://doi.org/10.9734/bpi/eias/v5/10607f
6. Ramesh P, Singh M, Rao AS. Organic farming: Its relevance to the Indian context. Curr Sci. 2005;88(4):561-68. https://doi.org/10.59317/9789389571264
7. Mitra S, Devi H. Organic horticulture in India. Horticulturae. 2016;2 (4):17. https://doi.org/10.3390/horticulturae2040017
8. Santhoshkumar M, Reddy GC, Sangwan P. A review on organic farming–sustainable agriculture development. Int J Pure Appli Bio. 2017;5(4):1277-82. https://doi.org/10.18782/2320–7051.5649
9. Migliorini P, Wezel A. Converging and diverging principles and practices of organic agriculture regulations and agroecology: A review. Agron for Sustain Develop. 2017;37:1-18. https://doi.org/10.1007/s13593–017–0472–4
10. Reddy BS. Organic farming: status, issues and prospects–a review. Agri Eco Res Rev. 2010;23(2):343-58. https://doi.org/10.55362/ije/2022/3641
11. Khurana A, Kumar V. State of organic and natural farming: challenges and possibilities. New Delhi: Centre for Sci and Environ; 2020.
12. Singh A, Thakur RK. Understanding the perception, constraints and reasons for the adoption of organic farming. Indian Res J Ext Edu. 2022;22(5):110. https://doi.org/10.54986/irjee/2022/dec_spl/110–117
13. Pimentel D, Burgess M. An environmental, energetic and economic comparison of organic and conventional farming systems. In: Pimentel D, Peshin R, editor. Integrated pest management. Springer: Dordrecht; 2014:141-66. https://doi.org/10.1007/978–94–007–7796–56
14. Pretty JN, Noble AD, Bossio D, Dixon J, Hine RE, Penning de Vries FW. Resource conserving agriculture increases yields in developing countries. ACS Publications; 2006. https://doi.org/10.1021/es051670d
15. Krystallis A, Vassallo M, Chryssohoidis G, Perrea T. Societal and individualistic drivers as predictors of organic purchasing revealed through a portrait value questionnaire (PVQ)-based inventory. J Con Behav Int Res Rev. 2008;7(2):164-87. https://doi.org/10.1002/cb.244
16. Ramanjaneyulu A, Sainath N, Srinivas M. Promotion of organic farming: roles of key players. Biotica Res Today. 2020;2(8):731-34. https://doi.org/10.9734/irjpac/2020/v21i2130290
17. Ramanjaneyulu A, Madhavi A, Rao PJM. Organic farming in Pigeon pea: BMPs, problems and opportunities. Res Today. 2020;2(9):896-900. https://doi.org/10.59317/9789358875461
18. Jaganathan D, Bahal R, Burman RR, Lenin V. Knowledge level of farmers on organic farming in Tamil Nadu. Indian Res J Ext Edu. 2016;12(3):70-73.
19. Sushmita DRG, Yadav B. Knowledge of farmers regarding organic farming certification. Int J Chem Stud. 2020;8(1):508-11. https://doi.org/10.22271/chemi.2020.v8.i1g.8308
20. Green PE, Srinivasan V. Conjoint analysis in marketing: new developments with implications for research and practice. J of Marketing. 1990;54(4):3-19. https://doi.org/10.1177/002224299005400402
21. Conner D, Miller J, Zia A, Wang Q, Darby H. Conjoint analysis of farmers' response to conservation incentives. Sustain. 2016;8 (7):684. https://doi.org/10.3390/su8070684
22. Sivaraj P, Philip H, Chinnadurai M, Asokhan M, Sathyamoorthi K. Constraints and suggestions of certified organic farmers in practicing organic farming in western zone of Tamil Nadu, India. Int J Curr Microbiol Appli Sci. 2017;6(3):1270-77. https://doi.org/10.20546/ijcmas.2017.603.146
23. Nagy LB, Unger–Plasek B, Lakner Z, Temesi Á. Confidence in organic food: a cross–country choice-based conjoint analysis of credibility factors. Human Soc Sci Com. 2023;10(1):1-11. https://doi.org/10.1057/s41599–023–02293–7
24. Al–Omari B, Farhat J, Ershaid M. Conjoint analysis: A research method to study patients' preferences and personalize care. J of Personalized Med. 2022;12(2):274. https://doi.org/10.3390/jpm12020274
25. Hernosa S, Siregar L, Hanum C, Supriana T. Conjoint analysis of consumer preferences for pineapple fruit in Labuhan Batu district, North Sumatra. IOP Conf Ser: Earth and Environ Sci; 2021. https://doi.org/10.1088/1755–1315/892/1/012012

26. Reibstein D, Bateson JE, Boulding W. Conjoint analysis reliability: Empirical findings. Marketing Sci. 1988;7(3):271-86. https://doi.org/10.1287/mksc.7.3.271

27. Oyedele G, Wole-Alo F, Owolabi K, Okunlola J. Small-scale farmers' perception on organic farming status in Ondo state, Nigeria. American J Agri Forestry. 2018;6(6):186-90. https://doi.org/10.9734/bjast/2015/16707

28. Hauser JR, Rao VR. Conjoint analysis, related modelling and applications. In: Yoram W, Paul E G, editors. Marketing research and modelling: progress and prospects: a tribute to Paul E Green. Boston: Springer; 2004. p. 141-68. https://doi.org/10.1007/978–0–387–28692–1_7

29. Das S, Chatterjee A, Pal TK. Organic farming in India: a vision towards a healthy nation. Food Quality and Safety. 2020;4(2):69-76. https://doi.org/10.1093/fqsafe/fyaa018

30. Devi S, Verma M, Gupta S, Tiwari I. Awareness, perception and attitude of farmers' regarding organic farming. J Pharmacog Phytochem. 2019;8(3):2000-02

31. Pudjiasuti SS, Ernantje H, Paulus U, Charles K. Farmers' perceptions of organic agriculture: a review. Russian J Agri Soc Eco Sci. 2022; 12 (2):62-67. https://doi.org/10.4314/jae.v24i4.3

32. Sujianto, Gunawan E, Saptana, Syahyuti, Darwis V, Ashari, et al. Farmers' perception, awareness and constraints of organic rice farming in Indonesia. Open Agri. 2022;7(1):284-99. https://doi.org/10.1515/opag–2022–0090