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Perception and awareness of organic agriculture in Bhutan

Lepcha, N.[1*], Tshomo, K[2]., Pradhan, K[1]., Namgyel, K[1]., Pradhan, S[3]., Dorji, K[1]., Lhamo, S[1]., Dema, D[1]. and Dem, K[1].

[1]National Centre for Organic Agriculture, Thimphu, Bhutan; [2]Department of Agriculture, Ministry of Agriculture and Livestock, Thimphu, Bhutan; [3]National Soil Service Centre, Bhutan.

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Abstract Bhutan has been promoting organic agriculture (OA) as one of the sustainable farming practices. However, there has not been studied on the perception and awareness of this farming system at the national level. The majority of the respondents was 97.3% with familiar to OA. Regarding the first encounter of "organic Agriculture", it was the highest of 28.77% for the information from educational institution, followed by mass media (27.40%). The respondents were strongly agreed (Likert scale mean ($\bar{x}$)=4.43) that OA is found to be better for human health, agreed that it is related to the environmentally friendly ($\bar{x}$=4.08), and received a higher income ($\bar{x}$=3.41) than conventional agriculture (CA). They could not decide if it is higher crop productivity than CA ($\bar{x}$=3.29). Statistically, there was not significantly differed in gender for the preference of organic products (Pearson Chi-Square, p=0.609). Also, the farmers' age was not significantly influenced the adoption of OA (independent sample t-test, p=0.110). The majority of respondents (92%) were opted for an organic product over a conventional one. Regarding the reasons for choosing conventional products over organic ones, the highest 38.5% of respondents opted for them due to their affordable price, followed by accessibility. Regarding the preference for a type of organic products, the highest 40.1% preferred fresh organic fruits and vegetables, and followed by 20.7% opted for organic cereals. The preferred least was organic processed food, with 8.9% respondents. Only half of the respondents (56.7%) found that they had knew a governmental body to promote OA in Bhutan. The highest 40.4% of the respondents said that they would like to receive information on OA through various social media, followed by Television broadcast at 19.3%.

Keywords: Awareness, Bhutan, Consumers and farmers, Organic farming, Perception

Introduction

Bhutan initiated its organic farming programme in 2003 under the then Ministry of Agriculture. The country's unique developmental philosophy of Gross National Happiness, which fosters sustainable development and environmental preservation, supported organic farming adoption. Such a decision aligns with Babajani *et al.* (2023), who asserted that holistic strategies

[*]**Corresponding Author**: Lepcha, N.: **Email**: nlepcha1@gmail.com

that take into account sociological, economic, and environmental factors are required to address the world's food and environmental problems. The small Himalayan country, Bhutan, is primarily an agricultural one, with 43.5% of the population depending on agricultural activities for their livelihood. The agricultural land constitutes only 2.96% of the total land area of the country, which, along with allied sectors, contributes 14.96% to the country's GDP (MoAL, 2025). The farmers in Bhutan are largely smallholder subsistence farmers with an average land holding of 1.2 hectares (ICIMOD, 2018). The National Framework for Organic Farming in Bhutan (NFOFB) was published in 2006 to guide the development of organic farming in the country. The document states that by 2020, Bhutan envisioned being a wholly organic nation, which would significantly boost sales of Bhutanese agricultural products (DoA, 2006). Bhutan has the potential to become a leader in organic farming since the present global movement supports natural products and a clean environment (Duba *et al.,* 2008). However, the country has been pursuing its ambitious goal gradually, and organic agriculture development has been stated in several important published documents. One of the recently pursued megaprojects in the country, "Gelephu Mindfulness City", is striving to be 100% in its agricultural production (DoA, 2025). Food and Nutrition Security Policy of Bhutan 2023 states that the Government will invest in commodity-based landscape commercial organic agriculture for niche and premium markets for key commodities. Reduce the usage of synthetic fertilizers and agrochemicals over time while encouraging the development and consumption of organic and bio-inputs (MoAL, 2023a).

Bhutan also initiated the National Organic Flagship Programme (NOFP) as one of the flagship programmes in its 12th Five-Year Plan (FYP) (2018-2023). Furthermore, in 2020, the country instituted the National Centre for Organic Agriculture (NCOA), with a vital mandate to promote organic farming in the country through Research and Development (NCOA, 2025). To improve its marketing opportunities, the country's 13th Five-Year Plan emphasizes the production of high-value crops such as organic broccoli and asparagus (MoAL, 2023b). Currently, the country has found to be approximately 3,291.31 hectares of total registered area under organic management, which includes agricultural (crop) and community forest areas (wild collection). In compliance with the Bhutan Organic Standards, certified organic farmers use locally accessible organic inputs such as the Farmyard manure (FYM) and biopesticides instead of chemical fertilizers and agrochemicals in their fields (Lepcha *et al.,* 2021).

Generally, Bhutanese farmers are not well-informed about the range of interventions necessary to produce high-quality organic products. Low customer awareness and a host of market and value chain-related problems plague the organic sector. Under the medium and long-term priorities, investing in

awareness, training, and capacity development is crucial for a shift towards organic food and farming. This ensures consumer confidence and promotes a diverse organic sector (ICIMOD, 2018). NCWC (2020) recommended raising awareness among both female and male farmers about climate-smart and resilient agriculture, as well as ensuring women's access to organic farming. The "Strategy for 100% Organic Agriculture Development in Gelephu Mindfulness City" highlights a lack of awareness among farmers and consumers about organic farming. Advocacy campaigns should emphasize its environmental, health, and economic benefits, along with extension services and development support for transition (DoA, 2025). There is a need for community and consumer education on organic values. Still, there are many consumers who are unfamiliar with what defines organic (Ugyen, 2025).

Therefore, for the development of organic agriculture or moving towards a predominantly organic country, there is urgently needed to know the perceptions, level of awareness of producers and consumers on organic farming and provide robust support programmes. The respondents were from across the country, but farmers were purposively sampled from selected districts in the country. To obtain diverse perspectives, the study aimed to find the perceptions and level of awareness of organic agriculture from a wide audience with varied professions.

Materials and methods

Study location, period and sample size

The study was carried out in Bhutan, and the data were collected from January to December 2024, following the convenient time and travel arrangements. Consumers' data across different occupational groups were collected from all over the country, while the data for the farmers were purposively drawn from seven districts, namely, Thimphu, Paro, Chhukha, Samtse, Tsirang, Wangdue and Gasa (Figure 1). These districts were purposively selected due to the availability of certified organic farmers, Good Agricultural Practices' farmers and conventional farmers. Specifically, the conventional and GAP farmers were surveyed in three districts of Gasa, Wangdue, and Tsirang.

There was a total of 150 respondents during the study, spread across different occupational groups. Farmers comprised the largest (34.7%) of the total respondents.

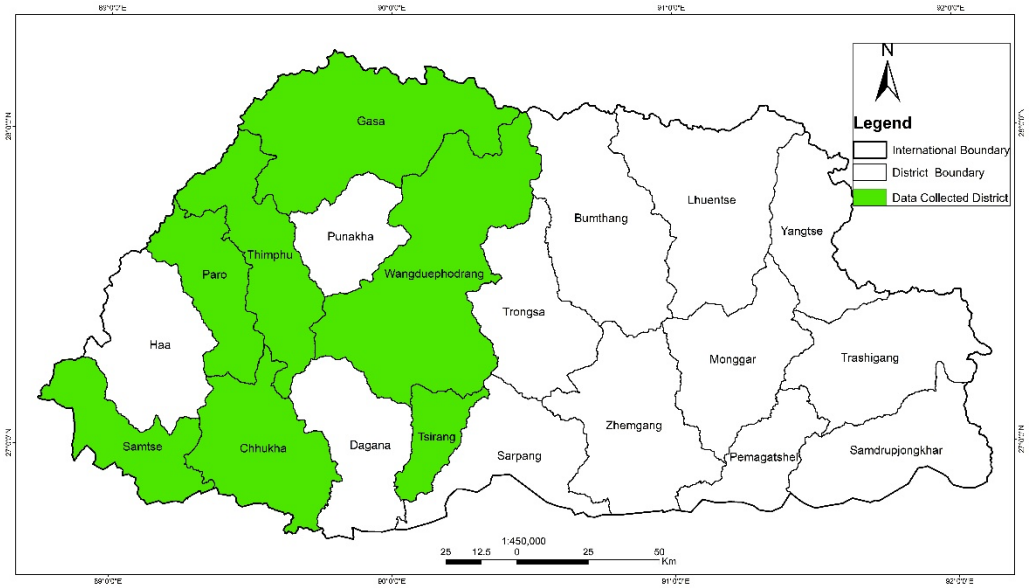


Figure 1. Districts from where farmers were purposively sampled for the study

Study methodology

Survey research was employed where primary data were collected through face-to-face in-depth interviews and an online Google sheet, using a semi-structured questionnaire. Before actual data collection, a draft questionnaire was sent to three experts to receive their feedback, to ascertain that the question items were in agreement with the objectives of the study. A pre-test on the draft questionnaire was also done for at least 30 respondents in Thimphu, Bhutan. The questionnaire was divided into two sections: 1st section gathered socio-demographic data; 2nd section on Organic agriculture perception and awareness data. The secondary data were collected from credible published sources such as research papers, annual reports, Government documents and others.

Data analysis

Descriptive, inferential statistics and Likert scale analysis were employed for the survey data analysis using IBM SPSS. Descriptive data analysis was employed to examine socio-demographic characteristics and preferences for receiving information about organic farming. Likert scale analysis was used to understand the degree of perception of organic agriculture. A Chi-Square test was applied to understand gender preference for organic products. Independent Samples t-test for comparing farmers' age with the adoption of organic farming.

A dichotomous group were tabulated for those questions with multiple response provision. Microsoft Excel, where applicable, was also used for graphical data analysis.

Ethical issue

There are no ethical issues concerning this study; informed consents from all the respondents were obtained before the data collection. Furthermore, prior approval from the National Centre for Organic Agriculture under the Department of Agriculture, Ministry of Agriculture and Livestock, Royal Government of Bhutan was obtained to undertake this study.

Results

Socio-demographic profile of the survey respondents

The study respondents' socio-demographic profile is detailed in Table 1. A total of 150 respondents took part in the survey research. About equal number of male and female respondents took part in the survey, and around 2.7% of the respondents chose to select the third gender. The mean age was 37 years, while the maximum and minimum were 69 and 17 years, respectively. The highest, around 38% of the respondents, were less than 30 years of age, while the lowest 4% were above 60 years. In educational level, degree and above constituted the highest respondents, around 43%, and the lowest was around 5% from the Middle School (7-8 grade). About 19% of the respondents had no education or had undergone basic non-formal education.

The survey data was obtained from diverse occupational backgrounds comprising farmers, students, entrepreneurs, Government employees, corporate employees, civil society organizations, international organization, retired personnel, armed forces and others [*De-suup* (a guardian of peace in Bhutan), embassy, local Govt]. Farmers made up the highest respondents, which was around 35%, while people working at the international organization were the least, at around 1%.

Table 1. Socio-demographic profile of the respondents (n=150)

Variables	Frequency	Percentage (%)
Gender		
Male	75	50
Female	71	47.3
Others	4	2.7
Total	**150**	**100**
Age		
Mean	37	
S.D	13.54	
Min	17	
Max	69	
< 30 Years	58	38.66
30-40 Years	29	19.33
41-50 Years	29	19.33
51-60 Years	28	18.66
>60 Years	6	4
Education level		
No education	14	9.3
Non-formal education	15	10.0
Primary School (1st-6th grade)	8	5.3
Middle School (7-8 grade)	7	4.7
Secondary (9th-12th grade)	41	27.3
Degree and above	65	43.3
Occupation		
Farmer	52	34.7
Student	26	17.3
Entrepreneur	23	15.3
Government employee	18	12.0
Others (*De-suup*, embassy, Local Govt).	17	11.3
Corporate employee	5	3.3
Civil society organization	3	2.0
Retired	3	2.0
Armed force	2	1.3
International organization	1	.7
Total	**150**	**100.0**

Farmers' type and the mean age of farmers pursuing the farming system

Amongst the farmers surveyed, the highest 59% comprised organic farmers, followed by the conventional farmers and the least 10% practised Good Agricultural Practices (GAP) (Figure 1). These farmers belonged to seven districts, spread across the country, namely, Thimphu, Paro, Chhukha, Samtse, Tsirang, Wangdue and Gasa. Thimphu had the highest number of respondents with 36%, while Chhukha and Samtse had the lowest with 2% each.

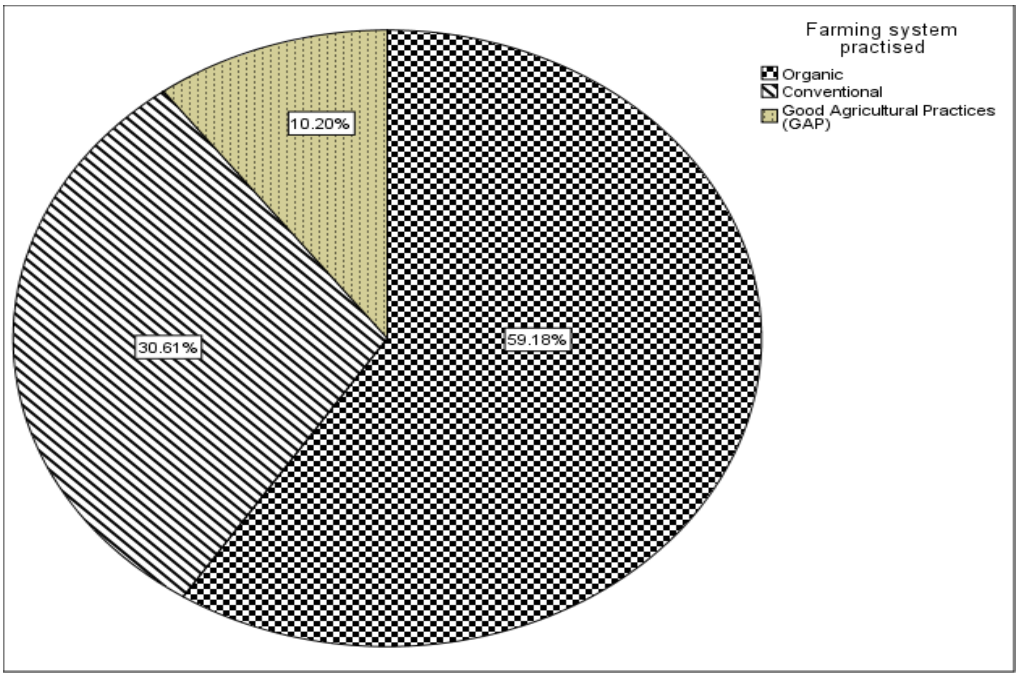


Figure 1. Type of farmer respondents

Districts for two farmers were not recorded due to the absence of the "district" question item in the initial questionnaire. The mean age of organic farmers was lower (44.34 years) compared to non-organic farmers (48.90 years). However, an independent sample t-test was carried out to examine if there is any significant difference in their mean age; the result revealed that farmers' mean age adopting organic farming (Mean=44.34, SD=9.947), and that of non-organic farmers (Mean=48.90, SD=9.136); $t(47)=-1.628$, $p=0.110$ was not significantly different (Table 2).

Table 2. Comparing farmers' age with the adoption of organic farming (Independent Samples t-test)

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
Farmer's Age	EVA	.193	.663	-1.628	47	.110	-4.555	2.798
	EVNA			-1.654	43.182	.105	-4.555	2.754

EVA (Equal variances assumed), EVNA (Equal variances not assumed).

Familiarity with the term "Organic farming" and the first encounter with the term

The majority (97.3%) of the respondents were familiar with the term organic farming, while the meagre 2.7% were not aware (Figure 2).

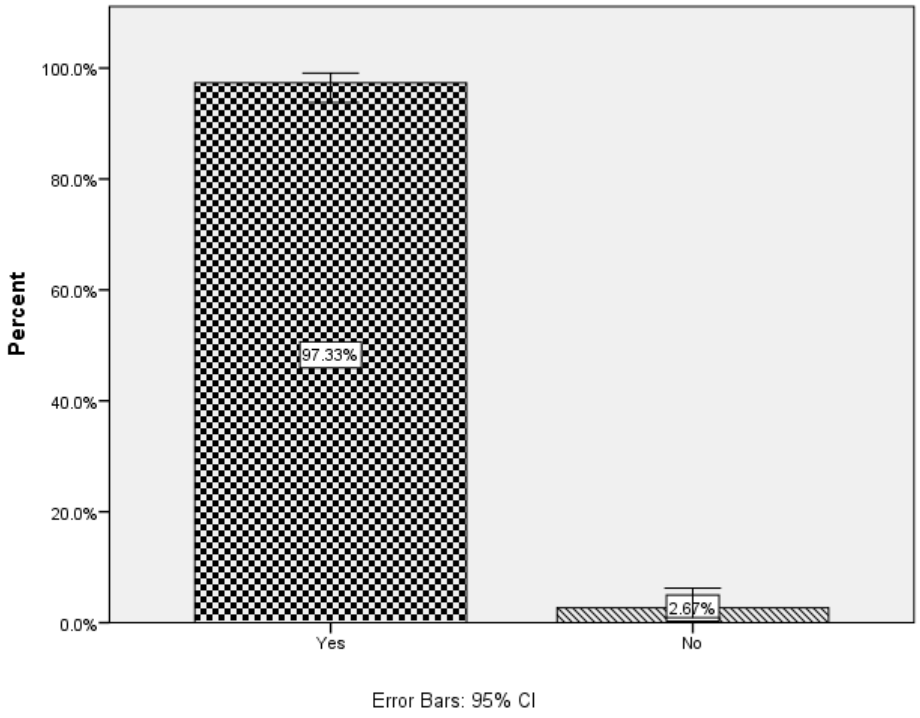


Figure 2. Familiarity with the term Organic farming

Concerning the first encounter of the term "organic farming", the highest 28.77% got the information at an educational institution, closely followed by receiving awareness from mass media such as Television, radio and others at 27.40% (Figure 3). Information provided by the non-governmental organization (NGO) stood at 3.42%, which was the least common source of awareness of organic farming. The majority of the respondents, 88.7% mentioned that they are aware of the differences between organic and conventional farming, while the remaining did not know.

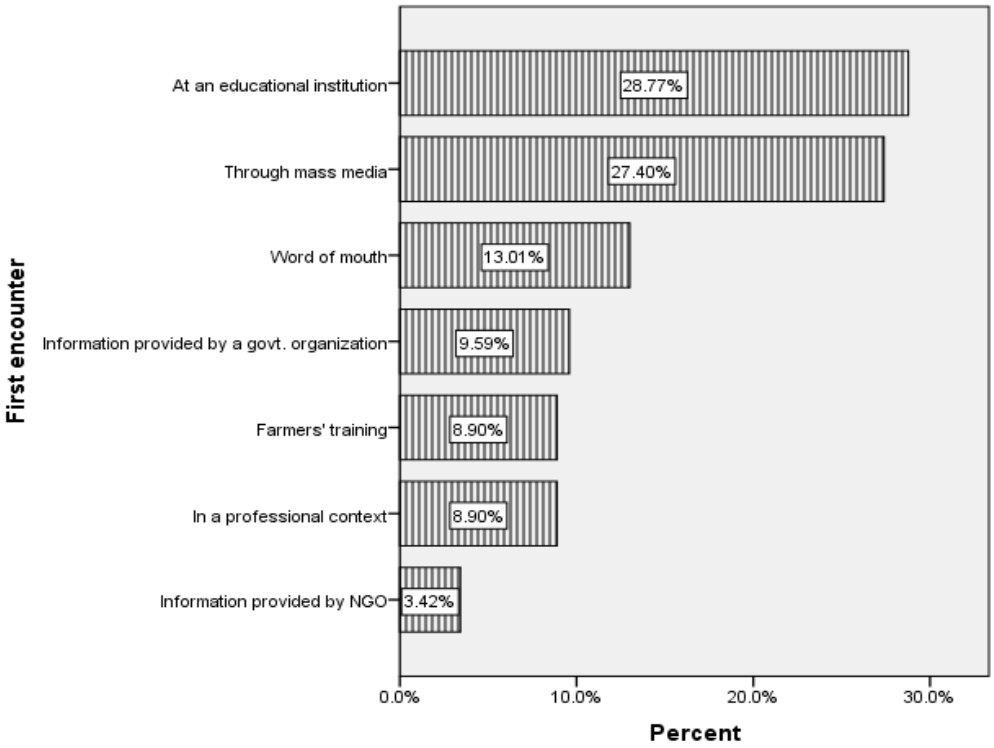


Figure 3. First encounter with the word "organic farming"

Perception of organic farming concerning environment, human health, crop productivity and income generation over the conventional one

Regarding the perception of organic farming, 55.3% and 41.3% strongly agreed that organic farming is better for human health and the environment, respectively, than conventional farming. The highest 36% agreed that organic receives higher income, and another 26.7% neither agreed nor disagreed if it has higher crop productivity than conventional farming. Furthermore, the mean interpretation revealed that respondents strongly agreed that organic farming is

better for human health, agreed that it is environmentally friendly, and receives a higher income than conventional farming. They could not decide if it has higher crop productivity than conventional farming (Table 3).

Table 3. Perception of organic farming over the conventional one (Likert scale analysis)

Perception Item	Strongly disagree (%)	Disagree (%)	Neither agree nor disagree (%)	Agree (%)	Strongly agree (%)	Std. Deviation	Mean ($\bar{x}$)	Interpretation
Organic agriculture (OA) is better environmentally[a].	8.7	1.3	6.7	30.7	41.3	1.211	4.08	Agree
OA has higher crop productivity[b].	2.7	23.3	26.7	22	16	1.119	3.29	Undecided
OA receives a higher income[c].	3.3	20.7	16.7	36	14	1.109	3.41	Agree
OA is better for human health[d].	4	1.3	2.7	28	55.3	0.94	4.43	Strongly agree

Likert scale: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree. [a]11.3% non-participants, [b]9.3% non-participants, [c]9.3% non-participants, [d]8.7% non-participants. The interpretation in the table was referred to (Best and Kahn, 1998).

Amongst the respondents who did not know the differences between organic and conventional farming, 67% of them mentioned that they are interested in learning about alternative food production systems to conventional farming, while the remaining 33% were not interested.

Consumers' preference for organic products

About an equal number of Bhutanese males (50%) and females (47%) preferred organic products. Statistically, also, there was no significant difference in gender for the preference of organic products (Pearson Chi-Square, value 0.992[a], df 2, p-value 0.609) (Table 4). All of the third gender prefer organic products.

Table 4. Gender preference for organic produce/products (Chi-Square test)

			Type of produce/product			Chi-Square Tests			
			Conventional	Organic	Total		Value	df	Asymp.Sig. (2-sided)
Gender	Male	Count	2	69	71	Pearson Chi-Square	.992[a]	2	0.609
		Expected Count	3.0	68.0	71.0	Likelihood Ratio	1.2	2.0	0.562
	Female	Count	4	64	68	N of Valid Cases	143		
		Expected Count	2.9	65.1	68.0				
	Other	Count	0	4	4				
		Expected Count	.2	3.8	4.0				
Total		Count	6	137	143				
		Expected Count	6.0	137.0	143.0				

4 cells (66.7%) expected count less than 5. The minimum expected count was 17.

During a routine grocery shopping, the majority of respondents (92%) said they would opt for an organic product over a conventional one if given the option between two products of the same food, one of which is organic and the other comes from conventional farming. While scanty 4% preferred conventional products, and remaining 4% did not participate in this interrogation.

The highest 57.7% of the respondents chose healthcare as the important reason for consuming organic products over conventional ones, which was followed by environmental concerns, with 23.8% of respondents. The least of 2.6% opted for organic products because of the affordable price (Table 5).

Regarding the preference of consumers for a type of organic produce (Table 6), the highest 40.1% preferred fresh organic fruits and vegetables, followed by 20.7% who opted for organic cereals, such as rice, quinoa, and buckwheat. The least preferred was organic processed food, with 8.9% respondents.

Table 5. Reasons for choosing organic products

Reasons for choosing organic product[1]	Responses	
	N	Percent
Health concerns	131	57.7%
Environmental concerns	54	23.8%
Others - support to organic farmers	22	9.7%
Accessibility	14	6.2%
Affordable Price	6	2.6%
Total	227	100.0%

[1]Dichotomy group tabulated at value 1. N=138, non-participants=12. The total is greater than the actual survey respondents because of multiple responses by each individual, as designed in the questionnaire.

Table 6. Preference for a type of organic produce/products

Organic item[1]	Preference	
	N	Percent
Organic vegetables and fruits	126	40.1%
Organic cereals	65	20.7%
Wild collections	52	16.6%
Organic dairy products	43	13.7%
Organic processed food	28	8.9%
Total	314	100.0%

[1]Dichotomy group tabulated at value 1. N=143, non-participants: 7. The total is greater than the actual survey respondents because of multiple responses by each individual, as designed in the questionnaire.

Reasons for their preference for conventional produce

Regarding the reasons for choosing conventional products over organic ones, the highest 38.5% of respondents opted for them due to their affordable price, followed by accessibility and health concerns at 24.4% each. Environmental concerns were the least reason (12.8%) for opting for the conventional products (Table 7).

Awareness of the organic agriculture-promoting organizations in the country

About half of the respondents (56.7%) stated that they knew of a governmental body that promotes, researches or regulates organic farming in Bhutan. Out of these respondents, the highest 45.1% were aware of the National Centre for Organic Agriculture (NCOA) and following 18.8% knew about the Bhutan Food and Drug Authority (BFDA) (Table 8). The respondents selected

the Agriculture Research and Development Centres (ARDCs) in third place with 11.8%.

Table 7. Reasons for choosing conventional products

Reasons for buying conventional product[1]	Responses	
	N	Percent
Affordable price	30	38.5%
Accessibility	19	24.4%
Health concerns	19	24.4%
Environmental concerns	10	12.8%
Total	78	100.0%

[1]Dichotomy group tabulated at value 1. N=70, non-participants: 80.

Table 8. Awareness of the governmental body that promotes, researches or regulates organic farming in Bhutan

Governmental body[1]	Responses	
	N	Percent
National Centre for Organic Agriculture	65	45.1%
Bhutan Food & Drug Authority	27	18.8%
Agriculture Research & Development Centre	17	11.8%
College of Natural Resources	15	10.4%
District Agriculture Sector	10	6.9%
Dept. of Agriculture Marketing & Cooperatives	5	3.5%
Department of Trade	3	2.1%
Bhutan Broadcasting Service	2	1.4%
Total	144	100.0%

[1]Dichotomy group tabulated at value 1. N=83, non-participants=67.

The majority of the respondents (71.3%) said that they do not know any non-government body that promotes, researches or regulates organic farming in Bhutan, while the remaining know it. Those who knew, the highest (41.5%) was for Farmers' Group and Cooperatives, followed by private organization (29.3%) and *Samdrup Jongkhar* Initiative (SJI) (17.1%).

The respondents' preferences for receiving the information on OA

When asked how best they would prefer to receive further information about the development of Organic Agriculture in Bhutan, the highest 40.4% of the respondents said that they would like to receive it through various social media such as Facebook, etc., followed by Television (Bhutan Broadcasting Service) at 19.3%. The least preference was through the agricultural extension programme at 0.4% (Table 9).

Table 9. Preference to receive further information about the development of Organic Agriculture in Bhutan

Preference to receive organic information[1]	Responses	
	N	Percent
Social media	90	40.4%
Television broadcast	43	19.3%
Email	40	17.9%
SMS	16	7.2%
In Print	12	5.4%
Awareness training programme	7	3.1%
News paper	6	2.7%
Radio	6	2.7%
Journals	2	0.9%
Agriculture Extension	1	0.4%
Total	223	100.0%

[1]Dichotomy group tabulated at value 1. The total is greater than the actual survey respondents because of multiple responses by each individual as designed in the questionnaire.

Discussion

The research finding was to understand the perceptions of Bhutanese people on organic farming in the country. It is important for future policy interventions and for the development of the organic agriculture sector in the country. The data were collected from a diverse occupational group scattered across the country with both online and printed questionnaires. Out of the total respondents, farmers were the largest group, and organic farmers made up the highest percentage among them.

Statistically, there was no significant age difference between farmers practicing organic and conventional farming. This contradicts the findings of (Thinley and Tashi, 2020) as compared to older farmers, younger farmers who were more enthusiastic about organic farming. The majority of the respondents were familiar with the term organic farming. They are firstly encountered the term from an educational institution or the mass media. Similarly, the majority of them knew the difference between organic and conventional farming. In contrast, in a study made by Thinley and Tashi (2020) who stated that a majority of respondent farmers were not aware of organic farming. Unlike this current study, the authors had reasoned that a remote location of their study area could led to less awareness. Regarding the perception of organic farming with respect to conventional, the respondents strongly agreed that organic agriculture is better for human health, agreed that it is better for the environment and income generation. El-Hage Scialabba (2013) reported that organic food offers higher levels of beneficial fatty acids, omega-3 fatty acids, vitamin C, and secondary metabolites, dry matter and mineral content compared to conventional. Some of

the adverse effects of conventional agriculture on our environment include soil pollution, eutrophication, biodiversity loss, a substantial contributor to climate change, soil acidification, and a decline in soil fertility (Średnicka-Tober *et al.,* 2016). Kumar *et al.* (2021) stated that the increasing global standard of living has resulted in a growing demand for organic products. These products are ecologically friendly and healthier for consumers. Tshomo (2017) found that advantages to health and awareness of the negative consequences of agrochemical use were cited as key motivators in the adoption of organic farming in two studied districts of Bhutan. Similarly, Thinley and Tashi (2020) found that the third-highest respondents understood organic farming to be a healthy one, and environmental benefits were one of the reasons for continuing or adopting organic agriculture.

The study found that the second-highest number of respondents opined that organic agriculture leads to low income in the country. Lepcha *et al*. (2021) reported that venturing into organic potato production in the west-central region led to lower farmers' income in Bhutan. Tashi and Wangchuk (2016) found no premium price for organic rice. However, the higher income perception of the respondents in this study remains valid if farmers receive a higher premium price for their organic produce (Sgroi *et al.,* 2015; Suwanmaneepong *et al.,* 2020). They could not decide if organic farming has higher crop productivity than conventional one. This finding aligns with the results of Feuerbacher *et al.* (2018) who discovered that organic crop yields in Bhutan were 24% lower than those of conventional crops. A similar yield reduction in organic crop production compared to conventional in Bhutan was also previously reported (Lepcha *et al*., 2021; Thinley and Tashi, 2020).

The majority of the conventional farmers shared their interest to know about alternative food production systems. Similarly, given a chance, the majority of the respondents preferred to buy organic products over conventional ones. No significant difference was observed for the preference for organic products concerning gender. This agrees with Singh and Verma (2017), who found that for the purchasing behaviour of organic food items, there was no significant difference between the genders. The foremost reason given by the respondents for choosing organic products for consumption was for health reasons. This aligns with the findings of (Thinley and Tashi, 2020). This was followed by the environmental benefits. Interestingly, respondents who opted for conventional products over organic the highest of them said that they preferred it because of the affordable price. Similarly, customers' willingness to buy a product based on its affordability has been shown by other studies (Adeoye and Balogun, 2012; Yangdon *et al*., 2024). Supporting this finding, in the current study, in contrast, the least mentioned reason by the respondents for choosing

organic products was the price affordability. This entails to success in organic product marketing in Bhutan in the current scenario, organic products need to be sold at a competitive price with respect to the conventional ones. Accessibility was another reason for their preference for conventional products. Bhutan currently has only one organic sales outlet in the capital, which markets certified organic products. There is needed for more such outlets in other parts of the country, so that organic products are easily accessible to consumers. Fresh organic fruits and vegetables were preferred most by the respondents, followed by cereals. Based on this finding, the organic farmers in Bhutan are recommended to produce more of vegetables, fruits and selective cereals such as quinoa, buckwheat, millets, rice, etc.

Only half of the respondents knew the key organizations which promoted, researched or regulated organic agriculture in the country, such as the NCOA and the BFDA. More awareness creation and publicity by these organizations, including the NGOs, to the public, would be considered a vital for organic agriculture promotion in the country. Modern social media platforms were firstly preferred for receiving information on the development of organic agriculture, followed by broadcast on national television. This aligns with ICIMOD's recommendation that we utilize digital media to create awareness campaigns promoting organic agriculture (ICIMOD, 2018).

To conclude, generally, Bhutanese are aware of OA, and their preference for organic products is mainly due to health, environmental and higher income benefits. Addressing consumers' demand, organic farmers need to prioritize vegetable and fruit production, followed by some cereals. Price competitiveness for organic products with respect to the conventional products and their accessibility would be crucial for the success of the organic programme. The organic promoters could use the preferred social and television broadcast to reach their stakeholders. The Government organizations responsible for promoting OA need to further create publicity on their programme to reach the consumers and farmers. Although satisfactory, the study is recommended that gathering the data would be surveyed from a larger sample size in the future, so that respondents would become more representative. The future investigation could focus entirely on consumers or farmers with a bigger sample size. Furthermore, there is also a need to study the perception of the Bhutanese on the organic regulation and certification system in the country.

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Conflicts of interest

No conflict of interest has been observed for all the authors involved in this study.

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