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DEVELOPMENT OF SCALE TO MEASURE THE PERCEPTION OF FARMERS TOWARDS ORGANIC FARMING

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ABSTRACT

The present study was conducted to develop and standardize a reliable and valid scale to measure the perception of farmers towards organic farming. The Normalized Rank Order Method, as recommended by Guilford (1954), was used for scale development. A total of eight indicators were selected from eleven, based on their relevance percentage, weightage, and mean relevance scores. The scale values for each selected indicator were obtained through the rank order method. Furthermore, 41 sub-items corresponding to these indicators were identified through a relevancy test and t-test. To ensure the robustness of the developed scale, both validity and reliability tests were conducted. Internal consistency techniques were applied to assess the scale's validity, while the test-retest method was used to confirm its reliability (test-retest coefficient: 0.8986). These statistical techniques ensured that the scale accurately and consistently measured perception among farmers towards organic farming. The standardized scale can serve as a valuable tool for researchers, policymakers and agricultural extension workers to formulate targeted strategies for promoting organic farming. Its application will contribute to better decision-making, targeted training programs and enhance the adoption of organic farming.

Keywords: *Perception, Organic farming, Scale, Guilford, Rank order*

INTRODUCTION

The Indian agriculture sector has undergone significant improvement during the past few decades. Since the introduction of "Green Revolution" technologies, India's agriculture has transitioned from subsistence to commercial production. The Green Revolution has been the keystone of India's agricultural achievement, transforming the country from the arena of food deficiency to self-sufficiency by employing high-yielding varieties and higher levels of inputs of fertilizers and pesticides (Roychowdhury *et al.,* 2013). The input-intensive "Green Revolution" has concealed significant externalities in recent decades that have a negative impact on natural resources, human health, and agriculture itself, despite its success (Gamit & Vinaya, 2022). Increasing land fragmentation, diminishing natural assets, high costs for external farm inputs and pesticide-related health issues have threatened the livelihoods of many farming families and led to a climate of despair in many rural areas (Rohan & Vinaya, 2024).

In the present agricultural scenario, crop yield is declining day by day despite maximization of chemical inputs. The vicious cycle of chemical farming is now exposed in the increasing crop unsustainability, higher input requirement, poor soil quality as well as recurrent pest and disease infestation. The intensive use of agrochemicals such as fertilizers and pesticides/insecticides has led to the entry of harmful compounds into the food chain, death of natural enemies and deterioration of surrounding ecology (Chitale *et al.,* 2012) and decreased soil fertility, resulting in stagnation of agricultural productivity in recent years and environmental degradation (Narayanan 2005; Priya and Singh, 2022; Sharma *et al.,* 2024; Desai *et al.,* 2024; Sharma *et al.,* 2024; Rohan & Vinaya, 2022).

Higher production costs, high credit interest rates, uncertain agricultural market prices, growing costs of diesel inputs, and privatized seeds are characteristics of India's current agricultural sector (Badwal *et al.* 2019). Indian farmers as a result, especially smallholder farmers, are increasingly caught in a never-ending cycle of debt (Siddiqui, 2015). Over the past two decades, over 500,000 farmers in India have attempted suicide (Parvathamma, 2016). These issues can be combated with sustainable agriculture as it is ecologically sound, economically suitable and socially acceptable as it helps farmers to achieve self-sufficiency, and self-reliance (Vinaya et al., 2025; Singh and Thakur, 2022). Hence, the organic farming as one of the strategies for sustainable agricultural growth is crucial in present era. The key objective of organic farming resides in the development

of a self-sustainable farming system in harmony with nature which delivers ecologically and economically sustainable pure food with the enrichment of surrounding biodiversity and its entire components (Baraiya *et al.,* 2022).

The farmers' conception towards organic farming in general is relatively not that much positive despite the government efforts to create awareness regarding organic farming practices and its benefits in terms of sustainable income and better health (Prajapati *et al.,* 2018). Hence, the works of the researchers and policymakers should be brought into light in order to change the mindset of the farmers regarding misconceptions towards organic farming. In this context, it is of quite significance to study how organic farming is perceived as among the farmers who have adopted it. Therefore, a context-specific and well-defined measurement tool is essential to assess the perception (Desai *et al.,* 2024).

The perception of farmers based on their experience in organic farming can help a lot to pave the way for the expansion and development of organic farming in the larger interest of the farming community (Rana *et al.,* 2022). Taking into consideration this, a study was conducted to develop and standardize the reliable and valid scale to measure the perception of farmers towards organic farming. The proposed scale will quantify key components and serve as a valuable tool for policymakers, researchers and extension agencies to formulate targeted strategies for promoting organic farming.

OBJECTIVE

To develop a scale to measure the perception of farmers towards organic farming

METHODOLOGY

According to Noll (1957), a standardized test is one that has been carefully developed by experts in alignment with well-defined objectives. The procedures for administration, scoring and interpretation are specified to ensure comparability of results and the establishment of predetermined standards across different age groups, regardless of when or where the test is conducted. In line with this definition, a standardized perception scale was developed to measure the perception of farmers towards organic farming using the Normalized Rank Order Method recommended by Guilford (1954). The method follows a structured set of steps to develop the scale effectively.

Identification of indicators

The possible indicators for determining the perception of farmers towards organic farming were identified after reviewing the related literature. After thorough scrutiny and comprehensive understanding, these indicators were consulted with the experts. Finally, eleven possible indicators that determine the perception of farmers towards organic farming were included for the scale construction and standardization. The selected indicators are Perception about sustainable agriculture, Perception about human health, Perception about soil conservation, Perception about ecological conservation, Perception about food security, Perception about marketing, Perception about climate change, Perception about organic products certification process, Perception about relative advantage, Perception about environmental betterment/benefit and Perception about self-reliance in inputs.

Selection of judges

To create the scale to measure perception towards organic farming, 80 experts including strategists, extension educators and scientists from various SAUs, Krishi Vigyan Kendra (KVKs), ICAR institutes, MANAGE and EEIs were chosen as judges to develop and standardize the Perception scale.

Judges' opinion

To study the relevancy of these indicators, opinion of the experts from the field of extension education and social science was sought. An official letter was mailed to the selected experts with a request to determine whether or not each of the components supplied to them was relevant and appropriate for developing the perception towards organic farming scale. They were also asked to add the component (s) that they feel to be useful to assess overall perception towards organic farming. Their opinion about the relevancy of indicators in terms of most relevant, relevant, somewhat relevant, less relevant and not relevant was collected and scoring was done as 5, 4, 3, 2 and 1 respectively for the above listed indicators. The responses from 50 judges could be obtained.

Relevancy of scale items/indicators

The data gathered were tabulated and analysed to calculate "Relevancy Percentage", "Relevancy Weightage" and "Mean Relevancy Score" for all the eleven items/ indicators by using the following formulas:

$$\textbf{Relevancy } \% = \frac{(MR \times 5) + (R \times 4) + (SWR \times 3) + (LR \times 2) + (NR \times 1)}{\text{Maximum possible score}} \times 100$$

$$\textbf{Relevancy Weightage} = \frac{(MR \times 5) + (R \times 4) + (SWR \times 3) + (LR \times 2) + (NR \times 1)}{\text{Maximum possible score}}$$

$$\textbf{Mean Relevancy Score} = \frac{(MR \times 5) + (R \times 4) + (SWR \times 3) + (LR \times 2) + (NR \times 1)}{\text{Number of judges responded}}$$

Table 1: Relevancy percent, relevancy weightage and mean relevancy score of the indicators as judged by experts

(n=50)

Sr. No.	Indicators	Relevancy %	Relevancy Weightage	Mean Relevancy Score	Remarks
1	Perception about sustainable agriculture	88.40	00.88	04.42	Selected
2	Perception about human health	90.40	00.90	04.52	Selected
3	Perception about soil conservation	93.20	00.93	04.66	Selected
4	Perception about ecological conservation	72.00	00.72	03.60	Not Selected
5	Perception about food security	70.00	00.70	03.50	Not Selected
6	Perception about marketing	79.60	00.79	03.98	Selected
7	Perception about climate change	73.20	00.73	03.66	Not Selected
8	Perception about organic products certification process	82.40	00.82	04.12	Selected
9	Perception about relative advantage	77.60	00.77	03.88	Selected
10	Perception about environmental betterment/benefit	81.20	00.81	04.06	Selected
11	Perception about self-reliance in inputs	80.00	00.80	04.00	Selected

For construction of the scale, those indicators having relevancy percent more than 75, relevancy weightage more than 0.75 and mean relevancy score more than 3.75 were considered as relevant items. Thus, out of eleven indicators, eight indicators were selected as presented in Table 1.

Ranking of the selected indicators

To obtain the rank of the selected indicators of the scale items, the same judges' opinion was used. The judges were requested to rank the selected eight indicators according to their relative importance in measuring perception towards organic farming.

Item analysis

After receiving the responses of the judges, the data were transformed and tabulated to a master table based on the judges' ranking. As shown in Table 2, the ri column represents the assigned ranks, followed by Ri, which denotes the reverse ranking. Each component's ranking frequency was tabulated accordingly.

For example, in the case of the indicator "Perception about sustainable agriculture", the fifty judges ranked eighteen times as first, followed by eight times as second, nine times as third, four times as fourth, three times as fifth, one time as sixth, two times as seventh and five time as eighth as shown in Table 2.

Computing the scale values

To determine the scale value of each item, ranked by judges, the centile position "P" based on the method suggested by Guilford (1954) was worked out. The "C" value (value determined to each centile value), Rj value and finally scale value, *i.e.*, Rc value, was worked out by using the following formula:

$$Rc = 2.357\ Rj - 7.01$$

The procedure for calculating the scale value of indicators has been explained by taking the example of the indicator "Perception about sustainable agriculture".

For computing Cj value, the judge's rating concerning its corresponding ranking was multiplied by C value.

Cj = (18 X 8) + (8 X7) + (9 X 6) + (4 X 6) + (3 X 4) + (1 X4) + (2 X 3) + (5 X 2) = 310

Rj value is calculated by dividing the Ca or Cj value of a particular indicator by the total number of judges.

$$Rj = 310/50$$

$$= 6.20$$

For calculating Rc (Scale value),

$$Rc = 2.357 \text{ X } Rj - 7.01$$

$$= 2.357\ (6.20) - 7.01$$

$$= 7.60$$

The computed scale values for all eight selected indicators are shown in Table 3.

Table 2: Method of working the scale values based on the ranks given by fifty judges on eight variables

ri	Ri	Indicators for determine perception towards organic farming										
		Perception about sustainable agriculture	Perception about human health	Perception about soil conservation	Perception about marketing	Perception about organic products certification process	Perception about relative advantage	Perception about environmental betterment/ benefit	Perception about self-reliance in inputs	SUM	P	C
1	8	18	18	07	04	01	01	01	00	50	94	8
2	7	08	13	09	03	02	00	08	07	50	81	7
3	6	09	04	18	05	03	04	04	03	50	69	6
4	5	04	03	04	10	05	10	09	05	50	56	6
5	4	03	05	02	03	13	10	06	08	50	44	4
6	3	01	03	02	06	09	11	11	07	50	31	4
7	2	02	03	05	07	11	10	07	05	50	19	3
8	1	05	01	03	12	06	04	04	15	50	06	2
Σfji		50	50	50	50	50	50	50	50	400	400	40
Σfji C		310	320	288	224	203	214	239	202	2000 (5Nn)		
MC=Rj		6.20	6.40	5.76	4.48	4.06	4.28	4.78	4.04	40 (5n)		
Rc		7.60	8.07	6.57	3.55	2.56	3.08	4.26	2.51	38.20		
Factor		19.90	21.14	17.19	9.29	6.70	8.06	11.14	6.58	100		

1. ri= Rank given by judges to eight variables

2. Ri= rank values (in the reverse order of ranks i.e., rank one getting eight, rank two getting seven)

3. Σ=total number of judges (frequency distribution) among several variables

4. P=centile value

Where Ri=rank value; n=number of variables ranked; C=values determined to each centile value.

5. Σfji=Total number of judges who have ranked eight indicators.

6. Σfjic= CJ

7. Rc=2.357XRj-7.01

Table 3: The computed scale values and ranking for eight indicators/components

Sr. No.	Selected indicators of the Perception towards organic farming	Scale value	Rank
1	Perception about sustainable agriculture	07.60	2
2	Perception about human health	08.07	1
3	Perception about soil conservation	06.57	3
4	Perception about marketing	03.55	5
5	Perception about organic products certification process	02.56	7
6	Perception about relative advantage	03.08	6
7	Perception about environmental betterment/benefit	04.26	4
8	Perception about self-reliance in inputs	02.51	8

Relevancy of sub-scale items of the indicators

Total eight indicators having a total of 90 items were included in the scale to measure perception towards organic farming. For each component, sub-items were prepared and they were also sent to fifty judges to seek their relevance in the measurement of the component under consideration. The judgment sheets were prepared with suitable instructions and sent to all the identified judges for their judgment on each of the items on a five-response category as most relevant, relevant, somewhat relevant, less relevant and non-relevant with 5, 4, 3, 2 and 1 scores, respectively for indicating the degree of relevance. Based on the fifty judges' responses, relevancy weightages were calculated for all the statements. Those sub-items having relevancy per cent more than 75 per cent, relevancy weightage of more than 0.75 and mean relevancy score of more than 3.75 of the judges were selected. Finally, total 64 statements were selected and the rest 26 were rejected.

Further, 64 items of different components which determine perception towards organic farming were analysed to see the agreement or disagreement among the judges to select them in the final format. Based on the data previously recorded to calculate relevancy percent, relevancy weightage and mean relevancy score, the respondents were arranged in ascending order based on total score. After that, twenty-five per cent of the subjects with the highest total score and twenty-five per cent with the lowest total scores were selected. These two groups provided the criterion groups in terms of which item analysis was conducted and the t-test was calculated. Based on the item analysis ('t' test), 23 items/statements were significant at five per cent, while 41 items/statements were non-significant and were finally retained in the scale to measure the perception of farmers towards organic farming. The items having the non-significant difference between the two criterion groups were selected as there is agreement among the judges about the particular items to be selected.

Thus, out of 90 items of various indicators, 64 items were selected based on relevancy; relevancy percent, and relevancy weightage and the rest 26 were omitted. Further analysis of each selected 64 statements was done by applying 't-test' to see agreement or disagreement among the judges and it was found that out of 64 statements, 23 statements were rejected and hence total 41 statements of different indicators reflecting the perception of farmers towards organic farming were included in the final format.

The calculated relevancy percent, relevancy weightage, mean relevancy score and values of 'the t-test' of those sub-components of perception of farmers towards organic farming are indicated in Table 4.

Table 4: Relevancy percent, relevancy weightage, mean relevancy score and t-test of the sub-items of perception towards organic farming as opined by experts (n=50)

Sr. No.	Statements	Relevancy %	Relevancy weightage	Mean Relevancy Score	Selected/ Rejected	t value	Selected/ Rejected
A.	**Perception about sustainable agriculture**						
1	Organic farming will give lesser yield. (-)	73.20	00.73	03.66	Rejected	--	--
2	Organic farming can be done successfully on both small and large scale. (+)	80.40	00.80	04.02	**Selected**	00.41	**Selected**
3	Organic farming is more complicated/ complex than inorganic farming. (-)	60.40	00.60	03.02	Rejected	--	--

Sr. No.	Statements	Relevancy %	Relevancy weightage	Mean Relevancy Score	Selected/ Rejected	t value	Selected/ Rejected
4	Organic farming is a way of preserving old and traditional valuable practices. (+)	82.00	00.82	04.10	**Selected**	01.70	**Selected**
5	Adoption of organic farming is a boon for agriculture. (+)	76.00	00.76	03.80	**Selected**	01.97	**Selected**
6	Organic farming is a viable solution for local problems. (+)	63.60	00.64	03.18	Rejected	--	--
7	Organic farming is essential to succeed in agriculture without harming the environment. (+)	86.40	00.86	04.32	**Selected**	01.53	**Selected**
8	Organic farming strengthens the use of indigenous knowledge. (+)	86.00	00.86	04.30	**Selected**	01.52	**Selected**
9	Organic farming improves water use efficiency. (+)	82.40	00.82	04.12	**Selected**	01.53	**Selected**
10	Organic farming conserves and preserves the environment. (+)	88.80	00.89	04.44	**Selected**	02.75*	Rejected
11	Organic farming leads to optimum utilization of resources. (+)	84.40	00.84	04.22	**Selected**	03.28**	Rejected
12	Organic farming is the only way for sustainable agriculture. (-)	67.60	00.68	03.38	Rejected	--	--
B.	**Perception about human health**						
1	Organic manures applied in the field are not harmful to human health. (+)	94.40	00.94	04.72	**Selected**	01.67	**Selected**
2	Organic produce is non-hazardous. (+)	84.80	00.85	04.24	**Selected**	03.50**	Rejected
3	Consumption of organic produce helps in maintaining the body's immune system. (+)	80.80	00.81	04.04	**Selected**	01.87	**Selected**
4	Human health has no relation with the products whether organically or inorganically produced. (-)	52.00	00.52	02.60	Rejected	--	--
5	If I do organic farming, then my family members will have better health condition. (+)	78.00	00.78	03.90	**Selected**	01.94	**Selected**
6	Organic manures help to improve the quality of produce. (+)	83.20	00.83	04.16	**Selected**	03.50**	Rejected
7	Increasing health consciousness/awareness among people will enhance/increase the demand for organic produce. (+)	88.80	00.89	04.44	**Selected**	01.67	**Selected**
8	Organic farming is very essential to bring about a state of "be healthy and let others be healthy" in the society. (+)	87.20	00.87	04.36	**Selected**	02.48*	Rejected
9	Organic farming is safer and more conducive/ convenient for human as well as animal health. (+)	82.00	00.82	04.10	**Selected**	03.21**	Rejected
C.	**Perception about soil conservation**						
1	Organic farming maintains soil fertility better than inorganic farming. (+)	92.00	00.92	04.60	**Selected**	-00.21	**Selected**
2	Organic manures help improve soil health. (+)	90.80	00.91	04.54	**Selected**	01.85	**Selected**
3	Organic farming increases the carbon content of the soil. (+)	90.40	00.90	04.52	**Selected**	01.84	**Selected**
4	Organic farming promotes/increases the microbial activity in the soil. (+)	90.00	00.90	04.50	**Selected**	01.90	**Selected**

Sr. No.	Statements	Relevancy %	Relevancy weightage	Mean Relevancy Score	Selected/ Rejected	t value	Selected/ Rejected
5	Organic farming reduces soil erosion. (+)	74.00	00.74	03.70	Rejected	--	--
6	Due to the usage of organic matter, the porosity of the soil improves. (+)	82.80	00.83	04.14	**Selected**	03.43**	Rejected
7	Organic farming reduces the water holding capacityof soil. (-)	64.40	00.64	03.22	Rejected	--	--
8	Organic farming improves the organic content in the soil. (+)	81.20	00.81	04.06	**Selected**	04.27**	Rejected
9	Organic farming is the best option to improve soil productivity. (+)	78.00	00.78	03.90	**Selected**	01.91	**Selected**
D.	**Perception about marketing**						
1	Organic farming is beneficial to both producers and consumers. (+)	87.20	00.87	04.36	**Selected**	01.13	**Selected**
2	Organic farm produce can be easily sold in the market. (+)	70.40	00.70	03.52	Rejected	--	--
3	Organic farming can be an excellent/ a potential source of foreign exchange. (+)	75.20	00.75	03.76	**Selected**	00.68	**Selected**
4	The demand for organic farm produce is limited only to a specific group of people. (-)	79.20	00.79	03.96	**Selected**	01.98	**Selected**
5	Consumers prefer to buy organic produce even at higher prices. (+)	75.20	00.75	03.76	**Selected**	02.02	**Selected**
6	Organic farm produce would fetch more price than inorganic farm produce. (+)	80.80	00.81	04.04	**Selected**	01.87	**Selected**
7	Export opportunities for organic farm products are very limited. (-)	72.40	00.72	03.62	Rejected	--	--
8	Consumers perceive the quality of produce from organic farming to be of high standards. (+)	78.40	00.78	03.92	**Selected**	04.32**	Rejected
9	Organic farm produce fetches higher market price in international/local market. (+)	83.60	00.84	04.18	**Selected**	03.27**	Rejected
10	Organic farming enables/increases the availability of high-quality food at reasonable price. (+)	76.00	00.76	03.80	**Selected**	03.68**	Rejected
E.	**Perception about organic products certification process**						
1	Certification of organic farm produce is helpful in creating trustworthiness among consumers. (+)	92.40	00.92	04.62	**Selected**	01.53	**Selected**
2	I can manage my farm according to organic products certification standards. (+)	85.60	00.86	04.28	**Selected**	02.81**	Rejected
3	Organic products certification is very beneficial in fetching higher prices for farm produce. (+)	88.00	00.88	04.40	**Selected**	01.94	**Selected**
4	The standards for organic products certification are impractical due to excessive restrictions. (-)	68.00	00.68	03.40	Rejected	--	--
5	Government policies are conducive/favorable to the organic products certification process. (+)	78.00	00.78	03.90	**Selected**	01.82	**Selected**
6	The monopoly of certification agencies for organic farming creates difficulties for farmers to obtain organic products certification. (-)	72.40	00.72	03.62	Rejected	--	--

Sr. No.	Statements	Relevancy %	Relevancy weightage	Mean Relevancy Score	Selected/ Rejected	t value	Selected/ Rejected
7	Certification of organic produce is very costly/expensive. (-)	62.80	00.63	03.14	Rejected	--	--
8	Certification process of organic produce is very cumbersome/complex. (-)	75.20	00.75	03.76	**Selected**	01.65	**Selected**
9	The organic products certification process is time-consuming. (-)	75.60	00.76	03.78	**Selected**	05.56**	Rejected
F.	**Perception about relative advantage**						
1	Economic welfare of farmers is not at all possible through organic farming. (-)	70.80	00.71	03.54	Rejected	--	--
2	Organic farming is of little or no value in today's context. (-)	63.60	00.64	03.18	Rejected	--	--
3	Organic farming is the only way to save earth and environment. (+)	75.20	00.75	03.76	**Selected**	01.78	**Selected**
4	Chemical fertilizers are a boon for farmers to increase the yield. (-)	67.20	00.67	03.36	Rejected	--	--
5	Organic farming is undoubtedly more advantageous than inorganic farming. (+)	77.60	00.78	03.88	**Selected**	01.56	**Selected**
6	Organic farm produces are far better in quality than inorganic produces. (+)	81.60	00.82	04.08	**Selected**	01.90	**Selected**
7	Not to talk of higher yield, but even normal yield is not possible through organic farming. (-)	60.40	00.60	03.02	Rejected	--	--
8	Higher net returns could be obtained/ achieved only after two to three years of organic farming. (-)	77.60	00.78	03.88	**Selected**	00.33	**Selected**
9	The cost of crop production can be reduced in organic farming by utilizing family members for farm work. (+)	72.40	00.72	03.62	Rejected	--	--
10	I will definitely recommend other farmers to adopt organic farming. (+)	78.00	00.78	03.90	**Selected**	01.37	**Selected**
11	It is not quite advisable to adopt organic farming fully on all the land that a farmer has. (-)	68.80	00.69	03.44	Rejected	--	--
12	Reliance on only organic farming practices can lead a farmer to bankruptcy. (-)	69.20	00.69	03.46	Rejected	--	--
G.	**Perception about environmental betterment/benefit**						
1	Profits are more important for farmers than the environmental issues. (-)	76.00	00.76	03.80	**Selected**	01.35	**Selected**
2	The indiscriminate use of pesticides results in increasing toxic residues in soil and water. (+)	89.60	00.90	04.48	**Selected**	04.20**	Rejected
3	Organic farming does not pollute the environment and natural resources. (+)	82.80	00.83	04.14	**Selected**	01.87	**Selected**
4	Organic farming will conserve water resources more efficiently than inorganic farming. (+)	83.60	00.84	04.18	**Selected**	02.18*	Rejected
5	To prevent further environmental degradation, it is very important to create awareness among the farmers about organic farming. (+)	85.60	00.86	04.28	**Selected**	01.39	**Selected**
6	Organic farming has a negative impact on the environment. (-)	46.00	00.46	02.30	Rejected	--	--
7	Organic farming leads to a chemical free environment. (+)	77.60	00.78	03.88	**Selected**	03.21**	Rejected
8	Organic farming does not emit toxic/ poisonous gases into the air. (+)	76.00	00.76	03.80	**Selected**	04.87**	Rejected

Sr. No.	Statements	Relevancy %	Relevancy weightage	Mean Relevancy Score	Selected/ Rejected	t value	Selected/ Rejected
9	Inorganic fertilizers, insecticides and other chemicals used in non-organic farming cause long term harmful effects to the environment. (+)	86.40	00.86	04.32	**Selected**	01.96	**Selected**
10	Safety of the environment can't be guaranteed through organic farming also. (-)	62.80	00.63	03.14	Rejected	--	--
11	Crop protection measures taken in organic farming are environment friendly. (+)	82.80	00.83	04.14	**Selected**	03.05**	Rejected
12	Going back to nature through organic farming is the only way to save the environment. (+)	78.00	00.78	03.90	**Selected**	03.64**	Rejected
13	Organic farming increases biodiversity. (+)	82.80	00.83	04.14	**Selected**	01.81	**Selected**
14	Organic farming is helpful in maintaining the right balance between mankind, wildlife and the environment. (+)	85.20	00.85	04.26	**Selected**	01.93	**Selected**
H.	**Perception about self-reliance in inputs**						
1	My dependence on external agri inputs has much decreased on account of organic farming. (+)	82.00	00.82	04.10	**Selected**	02.87**	Rejected
2	Organic farming will decrease the production cost by reducing the input purchases. (+)	83.20	00.83	04.16	**Selected**	00.48	**Selected**
3	Effective weed management in agriculture is not possible without chemical herbicides. (-)	68.80	00.69	03.44	Rejected	--	--
4	Organic farming is very difficult to practice due to difficulties in obtaining organic resources. (-)	72.00	00.72	03.60	Rejected	--	--
5	It is very difficult to meet the requirement of all the farm inputs for organic farming through own farm itself. (-)	76.80	00.77	03.84	**Selected**	01.57	**Selected**
6	Farmers practicing organic farming can be self-reliant for inputs to a large extent, if not fully. (+)	79.60	00.80	03.98	**Selected**	02.88**	Rejected
7	Cost of seed treatment becomes cheaper by using organic inputs. (+)	79.20	00.79	03.96	**Selected**	00.98	**Selected**
8	Procurement of organic resources/farm inputs for organic farming is not a problem at all. (+)	76.80	00.77	03.84	**Selected**	01.88	**Selected**
9	Crop protection cost is reduced through organic inputs. (+)	78.80	00.79	03.94	**Selected**	01.38	**Selected**
10	Labour cost for application of organic inputs is less as compared to inorganic inputs. (+)	66.80	00.67	03.34	Rejected	--	--
11	Organic farming conserves and adds farm resources in the field. (+)	84.40	00.84	04.22	**Selected**	01.88	**Selected**
12	Organic farming practices are labour intensive; hence costly. (-)	70.40	00.70	03.52	Rejected	--	--
13	Lower input costs and higher net returns attract farmers towards organic agriculture. (+)	72.80	00.73	03.64	Rejected	--	--
14	Requirement of huge quantity of organic manure is a major problem in organic farming. (-)	78.00	00.78	03.90	**Selected**	03.52**	Rejected
15	Transport cost is higher in organic farming because large quantities of organic manures are required. (-)	76.40	00.76	03.82	**Selected**	03.83**	Rejected

*Significant at 0.05 level of probability **Significant at 0.01 level of probability

Validity of the scale

The validity of the developed scale was measured by two types of validity tests namely, content validity and construct validity.

Content validity

The content validity of the scale was established in two ways; first, the items selected for inclusion in the scale were based on an extensive review, and secondly, the opinion of experts was obtained to find out whether the items suggested were suitable for inclusion in the scale or not. During the development of the scale, all the procedure for the selection of indicators and item was followed and those items and indicators were selected which had the agreement of judges. Thus, the scale developed was based on content validity.

Construct validity

The internal consistency technique recommended by Anastasi (1976) was used to determine the construct validity of the scale. The scores of each component were correlated with the overall perception scores in the internal consistency technique. The information was collected for this purpose from the non-sample area. The coefficients of correlation were determined separately and the 'r' values ranged from 0.518 to 0.869. The coefficients of 7 components were significant at a probability level of 0.01; while one was significant at 0.05 probability level indicating higher scale validity.

Table 5: Correlation of total score of each component of perception towards organic farming with overall perception towards organic farming score

Sr. No.	Components	'r' value
1	Perception about sustainable agriculture	0.823**
2	Perception about human health	0.869**
3	Perception about soil conservation	0.795**
4	Perception about marketing	0.735**
5	Perception about organic products certification process	0.548*
6	Perception about relative advantage	0.684**
7	Perception about environmental betterment/benefit	0.775**
8	Perception about self-reliance in inputs	0.518*

* Significant at 0.05 level of probability and ** Significant at 0.01 level of probability

Reliability of the scale

To know the reliability of perception towards organic farming, the test-retest method was used. In this method, the developed scale to measure perception towards organic farming with 41 items was administered twice to the 20 respondents at 15 days intervals, who were neither previously interviewed nor had a chance to come in the final sample of the study. Thus, two sets of scores were obtained for each of the 20 respondents. By calculating the coefficient of correlation between the two sets of perception towards organic farming scores, an estimate the stability of measurement called the stability reliability coefficient was obtained.

The perception towards organic farming test under study was found to be highly stable and dependable (r = 0.89). The reliability coefficient was calculated with the help of Rulon's formula, as suggested by Guilford.

Administration of the scale

The scale contains 41 statements reflecting different indicators and for each indicator, items were arranged in an arbitrary mode in which 41 statements of eight indicators *viz*., perception about sustainable agriculture, perception about human health, perception about soil conservation, perception about marketing, perception about organic certification process, perception about relative advantage, perception about environmental betterment/benefit and perception about self-reliance in inputs were arranged on the five-point continuum of Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree with a scoring of 5, 4, 3, 2, and 1 for positive and reverse for negative statements. The range of possible scores was 41 to 205. The final scale for perception towards organic farming was administered to the respondents, who expressed their agreement or disagreement with each item by selecting any one of five response categories.

RESULTS AND DISCUSSION

Developing the perception index

After obtaining the scale values of individual components of perception towards organic farming and total scale value as represented in Table 3, perception Index was calculated by using the following formula:

$$\mathbf{PI} = \left(\frac{R_1}{M_1}\right) \times W_1 + \left(\frac{R_2}{M_2}\right) \times W_2 + \cdots + \left(\frac{R_n}{M_n}\right) \times W_n \times 100$$

\s

where,

PI = Perception Index of respondents towards organic farming

R_1, R_2,..,R_n= Score for perception towards organic farming obtained by the respondent for the particular indicator (received score for each indicator by each respondent)

M_1, M_2,….,M_n= Potential score of the respondent for particular indicator for perception towards organic farming

W_1, W_2,…,W_n= Ratio Scale Value of the item to its total scale value of the scale

CONCLUSION

The present study successfully developed and standardized a scientifically reliable and valid scale to measure the perception of farmers towards organic farming. By applying the Normalized Rank Order Method, eight key indicators out of the initially identified eleven were finalized based on rigorous relevancy criteria. Further refinement through item analysis led to the selection of 41 valid and reliable statements representing multiple dimensions of farmers' perception towards organic farming. The developed scale demonstrated high construct validity and strong reliability (test-retest coefficient of 0.89), confirming its consistency and accuracy in measuring perception. Overall, the scale provides a comprehensive and multidimensional tool that can effectively assess farmers' perception towards organic farming. It can be widely utilized by researchers, extension professionals and policymakers to design targeted interventions, strengthen training programs and promote the adoption of organic farming practices. The study thus contributes significantly to evidence-based decision-making in sustainable agricultural development.

RECOMMENDATION

The standardized and validated scale developed in this study can be utilized by policymakers, extension agencies and agricultural institutions to accurately assess farmers' perception towards organic farming and design evidence-based interventions accordingly. The findings further recommend strengthening awareness programmes, certification support, capacity-building initiatives and targeted extension strategies to enhance the adoption and sustainability of organic farming practices.

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CONFLICTS OF INTEREST

The author declares no conflict of interest.

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