

Factors influencing producers decision to adopt organic food production in Uttarakhand, India : An analysis

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Abstract

Understanding what drives farmers to adopt organic practices is crucial in light of the growing demand for organic goods throughout the world, particularly in areas like Uttarakhand, India. Examining what drives farmers in Uttarakhand, India, to switch to organic farming practices is the primary goal of this research. Data was collected from 232 respondents using a convenient sampling technique, and factor analysis was performed using SPSS-25. The results revealed five key factors that contribute to 71.65% of the total variance: Economic incentives, Market demand, Government policies, Knowledge and awareness, and Social and environmental concerns. Based on factor analysis and subsequent regression analysis, it was found that economic incentives and market demand are the two most significant factors influencing producers' decisions to adopt organic food production practices in Uttarakhand, India. These findings suggest that economic incentives and market demand play key role in promoting the adoption of sustainable and organic agricultural practices in the region. Policymakers and stakeholders can use these insights to develop targeted interventions and policies aimed at promoting organic farming and achieving the goals of sustainable agriculture in the region.

Subject Classification: 03B38.

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1. Introduction

People are becoming more health conscious and concerned about food safety and environmental sustainability, which is driving demand for organic goods and fueling the organic food industry's steady growth worldwide (Willer & Lernoud, 2020). In India, the organic food market has also been expanding, with a compound annual growth rate of 17% between 2012 and 2018 (FICCI, 2019). Nevertheless, there has been a slow uptake of organic agricultural methods among Indian growers, particularly in the hilly state of Uttarakhand.

Government measures like the 2013 Organic Farming Policy promote organic farming in Uttarakhand. Despite these efforts, many growers have not switched to organic farming. This research aims to determine why farmers in Uttarakhand prefer to plant organic food.

Organic farming depends on customer demand (Flaten et al., 2005). Health-conscious Uttarakhand residents are discovering the various advantages of organic food, driving up demand. Producers may capitalize on this market by adopting organic farming practices. Farmers' lack of awareness and education (Janssen et al., 2016) and financial incentives (Kaur & Kaur, 2018) are impediments to organic farming. These hurdles must be removed to promote organic farming in Uttarakhand.

Therefore, the purpose of this research is to provide light on the variables, such as market size and consumer health consciousness, that producers in Uttarakhand consider when deciding to use organic food production methods. In order to create a more sustainable and eco-friendly agricultural system in Uttarakhand, this study's results may be utilized to create plans to increase the usage of organic farming methods.

2. Literature Review

The literature review covers studies on organic farming uptake and producers' decision-making variables. This section will review current understanding and identify literature gaps that this research will fill.

Health, environmental, and sustainability issues have propelled organic food to the forefront of consumer attention in recent years. Organic farming practices are believed to be more environmentally friendly than conventional farming practices due to reduced use of synthetic pesticides and fertilizers, and promotion of biodiversity. Many people think that because organic food doesn't use synthetic fertilizers and pesticides, it's healthier than traditionally cultivated food.. According to a study by Mie

et. al., (2017), organic food has higher levels of certain nutrients such as vitamins and antioxidants compared to conventionally grown food.

Organic food is becoming increasingly popular worldwide, resulting in a thriving industry. The US organic food business saw record sales of \$55.1 billion in 2019, with a 12.8% growth rate, according to the Organic Trade Association (OTA). The UK organic market grew by 4.5% in 2019, reaching £2.45 billion (Soil Association, 2020). Growing demand for sustainable and environmentally friendly food options is propelling the organic food business.

Debate persists about whether the advantages outweigh the additional expense. Critics contend that organic agricultural processes are less efficient and costlier than conventional farming, resulting in higher pricing for organic products. According to Reganold and Wachter (2016), organic agricultural yields were lower than conventional farming, but higher pricing for organic products might compensate for this. Research indicates that organic food may have health and environmental benefits, and the business is expected to increase due to rising customer demand.

Because of its potential to provide economic benefits to producers, it is gaining popularity (Al-Kaff and Ahmad, 2016). Organic farming practices can lead to increased income for farmers through higher prices of organic products and reduced input costs. In addition, the study found that organic farming can improve the overall economic situation of the region, as it encourages local production and consumption. Another study by Oelofse et. al., (2018) reported that organic agriculture can create employment opportunities and contribute to the growth of rural economies. These findings suggest that economic incentives can be a significant factor in encouraging producers to adopt organic food production practices. However, there may be challenges in the short term, such as the higher costs of transitioning to organic farming practices. Therefore, policies and programs that provide financial assistance to farmers during the transition period may promote farming practices (Al-Kaff & Ahmad, 2016).

Government laws and regulations significantly impact organic food production growth. Organic farming is well recognized for its benefits to public health, the environment, and sustainable agricultural growth.

India's National Program for Organic Production (NPOP) was established in 2001 to provide criteria for organic production, certification, and commercialization. Organic production requirements set by the NPOP include using organic inputs, prohibiting synthetic pesticides and fertilizers, and adopting organic agricultural practices. The government

has also offered financial assistance for organic farming, including subsidies for supplies, certification, and marketing. However, implementing organic farming norms and regulations has proven problematic due to concerns like lack of knowledge, limited infrastructure, and certification difficulties, impeding sector expansion. More study is needed to determine how government policies and regulations affect organic food production in India (Kumar and Singh, 2020; Suryavanshi et al., 2021).

Knowledge and awareness of organic food production practices have been identified as important factors influencing the adoption of organic farming by producers. Research found that education and training programs can increase knowledge and awareness of organic production practices, leading to greater adoption rates (Asif et. al., 2019; Bichler et. al., 2019). Organic farming has several advantages, including better soil health and less chemical use, and farmers who are aware of these benefits are more inclined to utilize them (Jayne & Beukema, 2018). Moreover, knowledge and awareness of organic production standards and certification processes can also affect producers' decision-making, as these regulations are often required for access to premium markets and government subsidies (Kilcher et. al., 2018). Therefore, efforts to increase knowledge and awareness of organic farming practices among producers may help to promote wider adoption of sustainable farming methods.

Organic agricultural approaches result in considerable environmental and sustainability benefits. Adoption is driven by sustainability goals and environmental impact reduction. Research indicates that farmers' environmental perceptions significantly influence their adoption decisions (Mascarenhas et al., 2016). A research by Vermeulen et al. (2007) indicated that farmers who see environmental benefits in organic farming are more inclined to embrace it. Farmers that recognize the environmental harm of conventional agricultural techniques are more likely to transition to organic farming (Mascarenhas et al., 2016). Therefore, farmers that prioritize environmental issues and sustainability are more likely to choose organic agricultural techniques.

The literature on farmers' organic food production decisions misses Uttarakhand, India's context. This study addresses the gap by identifying the main factors influencing organic food production decisions in Uttarakhand, India. This study identifies key factors impacting producers' adoption of organic food production techniques, evaluates their impact, and proposes policy improvements to boost organic food production in Uttarakhand, India.

3. Research Methodology

This study's overarching goal is to identify the factors that motivate farmers and producers in Uttarakhand to engage in organic farming. The purpose of this study is to collect data from producers in the area using a cross-sectional research approach and a standardized questionnaire. Questions in the survey used a Likert scale from 1 (strongly disagree) to 5 (strongly agree), with their development predicated on an exhaustive literature study.

The questionnaire items were selected from the findings of previous research studies on organic farming practices. Economic incentives items were drawn from studies by Kaur & Kaur (2018), Saha & Rahman (2018), and Flaten et. al., (2005). For market demand, studies by Willer & Lernoud (2020), Lampkin et. al., (2018), Hudson, & Richards (2013) were referred to. The items related to knowledge and awareness were selected from studies by Janssen et. al., (2016), Sorensen et. al., (2016), and Ogunniyi et. al., (2018). Finally, items related to social and environmental concerns were selected from studies by Carrasco et. al., (2018), Willer & Lernoud (2021), and Huang et. al., (2015).

A questionnaire was provided to Uttarakhand producers, and the results was analyzed using SPSS-25. Regression and factor analysis were used to discover major factors affecting farming methods. The investigation will reveal key criteria for enhancing farming techniques in Uttarakhand.

4. Data Analysis and Interpretation

4.1 *Demographic Analysis*

The demographic data in Table 1 indicated a diverse range of age groups, with the highest percentage falling in the 31-40 age group (28.88%). Male respondents were (76.72%), and nearly half had a graduate-level education (48.71%). In terms of income, the majority fell in the 10-20 Lakhs per annum category (48.71%), while a significant proportion of respondents had an income of less than 10 Lakhs per annum (33.62%). Overall, the demographic data suggests a diverse range of perspectives on organic food consumption in Uttarakhand, which may have implications for consumers intention and behavior towards organic food.

Table 1
Demographic Profile

Demographic Profile with type and Years of Production experience		Frequency	%a ge
Age	<30	44	18.97
	31-40	67	28.88
	41-50	66	28.45
	>50	55	23.71
Gender	Male	178	76.72
	Female	54	23.28
Education	Intermediate	69	29.74
	Graduate	113	48.71
	Post-Graduate	32	13.79
	Others	18	7.76
Income	<10 Lakhs per Annum	78	33.62
	10-20 Lakhs	113	48.71
	20-30 Lakhs	25	10.78
	> 30 Lakhs	16	6.90

Source: Authors Analysis

4.2 Types of Good Grown and Time frame in Years of production and Farming

From Table 2, it is evident that most of the participants (39.66%) had been producing organic goods for 15-25 years, according to the time range for manufacturing or farming organic items among the participants. The percentage of participants with 5–15 years of experience was around 28.88%, while the percentage with 25 years or more of experience was 19.83%. Out of all the participants, just 11.64 percent had fewer than five years of experience.

Based on type of production, whole grains were the most commonly produced (42.24%), followed by dry fruits (33.62%), dairy products (37.50%), and poultry products (23.71%). Organic Juices and miscellaneous organic products were produced by 19.40% of the participants. These findings provide insights into the types of organic products and the products are in demand that are commonly produced by farmers and producers in the region.

Table 2
Types of Goods Grown and Time frame in Production of goods

Time Frame-Producing/ Farming Organic Products	<5 Years	27	11.64
	5-15 Years	67	28.88
	15-25 years	92	39.66
	>25 Years	46	19.83
Type of Organic Food Produced	Whole Grains-wheat, Millet, oat, Brown Rice, Pulses	98	42.24
	Dry Fruits-Almonds, walnuts, raisins, cashew, anjeer, etc.	78	33.62
	Organic Juices- Amla, Apple, Cider, Aloe Vera, Bitter Gurd etc.	45	19.40
	Diary Products- Milk, Butter, Cheese, Curd etc	87	37.50
	Poultry Products- eggs, chicken, meat	55	23.71
	Miscellaneous- Organic jaggery, Bread, Chyawanpras, Seeds, Beverages, Turmeric, and other Spices etc	45	19.40

Source: Authors Analysis

4.3 Factor Analysis

Table 3
Factor Analysis below 4.3

Factor Analysis			
Items	Factor Loading	Factors	% of Variance
Financial incentives are important motivating factors for me to adopt organic food production practices	0.9	Economic Incentives	19.15
People willingness to pay a premium for organic goods has prompted me to start growing organic food.	0.898		
I agree that the financial benefits of organic food production are greater than the costs of adopting organic practices?	0.898		
I know that the financial benefits are substantial in organic farming and therefore I adopted it	0.765		

Contd...

I am knowledgeable about the benefits of organic food production.	0.89	Knowledge and Awareness	16.78
I am familiar with the necessary practices for organic food production.	0.89		
The production of organic food is better for the environment than that of conventional food.	0.889		
Organic items tend to command a premium price, in my opinion.	0.889		
The government provides adequate support to promote organic food production in Uttarakhand.	0.869	Government Policies & Regulations	13.78
I believe that government regulations on organic food production are helpful in maintaining quality standards.	0.869		
The process of obtaining organic certification from government agencies is cumbersome and time-consuming.	0.836		
Government subsidies and incentives are crucial in encouraging producers to adopt organic food production practices.	0.836		
The demand is high enough to justify the switch to organic production practices.	0.822	Market Demand	12.65
The premium prices offered for organic food products are an attractive incentive to switch to organic production practices.	0.817		
In local and regional area too, the demand is there.	0.777		
I foresee that the demand of these products will be there in future	0.749		
The environmental impact of traditional farming practices is a concern for me.	0.803	Social & Environmental Concerns	9.29
I believe that sustainable farming practices are important for the future of agriculture.	0.773		
I am willing to make changes to my farming practices to reduce my environmental impact.	0.742		
I believe that organic food production practices are better for the environment compared to traditional farming practices.	0.736		

Source: Authors Analysis

A factor analysis was performed to establish what characteristics motivate farmers to transition to organic practices (Table 3). We selected five components using SPSS-25 and did a rotating component matrix analysis to ascertain them. The identified elements include economic incentives, knowledge, awareness, government policies, market demand, and social/environmental concerns.

The most significant factor explaining variation was economic incentives (19.15%), followed by knowledge and awareness (16.78%), government policies and regulations (13.78%), market demand (12.65%), and social and environmental concerns (9.29%). This matches with the findings of (Eze et al., 2020; Czajkowski et al., 2018).

4.4 Regression Result

4.4.1 Model Summary

A multiple linear regression model was employed to investigate the correlation between the outcome variable and shown in Table 4. Economic Incentives, Knowledge & Awareness, Government Policies, Market Demand, and Social & Environmental Concern. The model demonstrated statistical significance ($F(5, 226) = 25.97$, $p < .001$) and accounted for 40.2% of the variability in the response variable, with an adjusted R-squared value of 0.389.

Table 4
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.634a	0.402	0.389	0.344
a Predictors: (Constant), Economic Incentives, knowledge & Awareness, Government Policy, Market Demand, Social & Environmental Concern.				

Source: Authors Analysis

The standard error of the estimate was 0.344, indicating the average distance that the observed responses deviated from the regression line shown in Table 5. The regression equation was $Y = 0.698 + 0.327(\text{Economic Incentives}) + 0.169(\text{Knowledge \& Awareness}) + 0.096(\text{Government Policies}) + 0.399(\text{Market Demand}) - 0.065(\text{Social \& Environmental})$

Table 5
Regression Coefficients

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.698	0.392		0.796	0.428
	Economic Incentives	0.327	0.077	0.336	4.323	0
	Knowledge & Awareness	0.169	0.131	0.099	1.291	0.199
	Government Policies	0.096	0.093	0.079	1.029	0.306
	Market Demand	0.399	0.082	0.387	4.917	0
	Social & Environmental Concern	-0.07	0.125	-0.04	-0.522	0.603

a. Dependent Variable: Producers Decision to adopt organic farming

Concern), where Y represented the predicted value of the response variable based on the values of the predictor variables. The Economic Incentives and Market Demand predictors were statistically significant, with unstandardized coefficients of 0.327 and 0.399, respectively, while the Knowledge & Awareness, Government Policies, and Social & Environmental Concern predictors were not statistically significant. These results suggest that Economic Incentives and Market Demand are important factors for predicting the response variable in this context.

5. Conclusion

The study's findings indicate that farmers in Uttarakhand are impacted by multiple factors when deciding to embrace organic methods of farming. These factors include economic incentives, knowledge and awareness, government policies and regulations, market demand, and social and environmental concerns. Among these factors, economic incentives and market demand were found to be the most significant predictors of adoption.

These findings have important implications for policymakers, researchers, and practitioners in the organic food industry. To promote farming practices in Uttarakhand, it is important to provide economic incentives and create a strong market demand for organic products.

Additionally, efforts should be made to increase knowledge and awareness about organic farming practices, and government policies and regulations should be developed to support the growth of the organic food industry.

In conclusion, our study illuminated Uttarakhand producers' decisions to produce organic food and the potential and constraints to organic farming. These findings should be used to enhance organic food production in Uttarakhand and create a sustainable, ecologically friendly agricultural system.

For future study, it would be intriguing to investigate how consumer health consciousness affects the adoption of organic agricultural techniques in Uttarakhand. Furthermore, it would be advantageous to examine the magnitude of the organic food industry in Uttarakhand, and the anticipated trajectory of this industry in the future.

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