

Towards Sustainable Agriculture: Farmers' Motivations and Constraints in the Adoption of Organic Farming in Punjab and Rajasthan

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Abstract

Organic farming is often promoted as a more sustainable form of agriculture, but farmers' willingness to adopt it depends on what they expect from the system and the difficulties they face in practice. The present study examines the main reasons farmers move towards organic farming and the constraints that affect its continuation and expansion in Punjab and Rajasthan. Primary data were collected through a structured questionnaire from 400 farmers, with 200 respondents selected from each state. Farmers' motivations were analysed using frequencies and percentages, while the problems associated with adoption were examined through mean scores, ranks and independent-samples t-tests. Health emerged as the strongest motivation for adoption. Personal health was reported by 97.25 per cent of respondents and farm health by 85.00 per cent. Profit was mentioned by 37.50 per cent, whereas only 9.00 per cent identified subsidy as a motivating factor. The results also show that farmers face several practical difficulties after adoption. Lack of a government agency for guidance received the highest mean score, followed by unstable market prices, reduction in yield and the absence of specialised organic markets. Financial support, research assistance and certification were also important concerns. The state-wise comparison revealed that farmers in Rajasthan reported greater difficulty on most of the problem statements, with significant differences found in sixteen of the twenty cases. However, market-price volatility, certification difficulties, the general financial burden and higher power and diesel consumption did not differ significantly between the two states. The findings indicate that farmers' interest in organic farming needs to be supported by regular technical guidance, dependable markets, better management of yield-related risks and simpler institutional support if adoption is to continue on a wider scale.

Keywords: Organic Farming, Sustainable Agriculture, Farmers' Motivation, Adoption Constraints.

Introduction

Agriculture has to meet present production needs without putting future productivity at risk. This concern has become more important in areas where intensive cultivation and prolonged dependence on purchased chemical inputs have placed pressure on soil, water and farm costs. Sustainable agriculture is therefore concerned not only with the amount produced, but also with whether the production system can remain workable over time without steadily weakening the resources on which farming depends.

Organic farming offers one possible response to these concerns. Instead of relying mainly on synthetic fertilisers and pesticides, it makes greater use of farmyard manure, compost, crop residues, bio-fertilisers and biological methods of crop protection. Such practices can reduce dependence on purchased chemical inputs and encourage recycling of resources within the farm. Their practical use,

however, depends on the conditions under which farmers operate. Availability of labour, livestock resources, suitable inputs, technical knowledge and marketing facilities can make organic cultivation easier for some farmers and more difficult for others.

Farmers also do not adopt organic farming for the same reason. For some, concerns relating to personal health, soil condition or reduced chemical exposure may be important. Others may give greater attention to expected profit, market price or government assistance. Previous research has similarly shown that health and environmental considerations can encourage adoption, while economic and institutional conditions influence whether farmers continue with organic farming after the initial shift (Sapbamrer & Thammachai, 2021). Thus, a positive view of organic farming does not necessarily result in complete or long-term adoption.

The difficulties become more apparent once a farmer begins practising organic cultivation. Produce may be grown separately but still sold through conventional marketing channels without a dependable premium. Certification can also lose much of its commercial value when suitable buyers or specialised markets are not available. At the farm level, problems such as lower yield, pest management and access to biological inputs may require regular technical assistance. These practical issues can influence whether a farmer continues with organic practices, increases the area under them or returns to conventional cultivation.

Punjab and Rajasthan provide different agricultural settings for examining these questions. Punjab is characterised by intensive cultivation and extensive irrigation, whereas Rajasthan includes irrigated, semi-arid and relatively low-input farming conditions. Variation in resources, production practices and market access may therefore affect both the reasons for adopting organic farming and the problems experienced after adoption. Rather than treating adoption as a simple decision to become organic or conventional, the present study considers the motivations that encourage farmers to move towards organic practices and the constraints that may limit their continuation or expansion.

This paper therefore examines farmers from the two states with particular attention to two connected issues: what encourages them to adopt organic farming and what makes adoption difficult to sustain or expand.

Review of Literature

Research on organic farming suggests that farmers' adoption decisions are rarely based on a single consideration. Personal beliefs, expected economic returns, availability of resources and institutional support often operate together. Marketing conditions and government assistance have been found to influence adoption, while farming experience and land tenure may affect the importance farmers attach to different social and economic benefits. Training and continued institutional support are therefore relevant not only at the point of adoption but also during the period in which farmers adjust to new practices (Azam & Shaheen, 2019).

Health and environmental considerations form another important part of farmers' attitudes towards organic farming. Joseph and Unni (2021) found that education and knowledge shaped farmers' perceptions, particularly their views about the possible effects of organic practices on personal health and the environment. At the same time, inadequate information about organic inputs and bio-fertilisers created difficulties in actual practice. Similar conclusions emerged from the systematic review by Sapbamrer and Thammachai (2021), which identified health concern and favourable environmental attitudes as important drivers of adoption. Their review also showed that factors such as farm resources, production cost, location, extension contact and market access can either encourage or restrict a farmer's ability to continue with organic cultivation.

The expected advantages of organic farming therefore have to be considered together with the risks involved in conversion. Walia et al. (2022) discussed benefits relating to soil fertility, biodiversity and food quality, but also pointed to lower initial yield, inadequate awareness, certification difficulties and limited access to suitable markets. Evidence from a Pan-India survey presents a similar picture. Reddy et al. (2022) reported lower cultivation costs in several organic-farming situations, but yield reduction and difficulties relating to certification knowledge and premium markets continued to affect farmers. These studies indicate that environmental benefits alone may not be sufficient when farmers remain uncertain about production and the sale of their produce.

Evidence from Rajasthan is particularly relevant to the present study because it shows how local conditions can influence adoption. Yadav et al. (2022), while studying farmers covered under the

Paramparagat Krishi Vikas Yojana, found considerable variation in their knowledge of programme activities. This suggests that the existence of a government scheme does not necessarily mean that all participating or potential farmers have the same level of understanding about the support available to them. Earlier, Meena (2010) had examined organic farming in the irrigated north-western plains of Rajasthan and showed the importance of farmers' socioeconomic setting in the functioning of organic cultivation at the farm level.

More recent evidence from southern Rajasthan also points towards the importance of locally available resources. Singh et al. (2023) observed that the economic position of organic farming was related to access to local inputs, livestock resources and suitable markets. This is important because farmers who can obtain or prepare organic inputs locally may face different production conditions from those who depend on purchased inputs. The availability of suitable markets is equally important if farmers are expected to obtain an economic benefit from maintaining organic production.

Taken together, the reviewed studies show a fairly consistent pattern. Farmers may be attracted towards organic farming because of health, environmental or economic considerations, but continued adoption depends on whether they can manage production risks, obtain technical assistance, access suitable inputs, complete certification requirements and find reliable markets. The importance of these factors also varies with regional and socioeconomic conditions. Most of the available studies, however, examine particular districts, crops, programmes or individual states. Direct comparative evidence on the motivations of farmers and the relative intensity of adoption-related constraints in Punjab and Rajasthan within the same survey framework remains limited. The present study addresses this gap by examining these two dimensions among farmers selected from both states.

Objectives of the Study

- To examine the major factors motivating farmers to adopt organic farming practices.
- To identify and rank the main problems faced by farmers in adopting organic farming.
- To compare the intensity of these problems between Punjab and Rajasthan.

Research Methodology

The study is descriptive, analytical and comparative in nature. Primary data were collected during 2024 through a structured questionnaire from farmers practising organic farming either fully or on part of their holdings.

A multistage sampling procedure was followed for selecting the respondents. Five districts were covered from each state in order to represent different agricultural regions. In Punjab, the selected districts were Bathinda, Ludhiana, Amritsar, Jalandhar and Roopnagar. The Rajasthan sample included Sri Ganganagar, Hanumangarh, Jaipur, Sawai Madhopur and Kota. Forty farmers were selected from each district, giving a total sample of 400 respondents, with 200 farmers from each state.

The questionnaire included information on socioeconomic characteristics, sources of information, motivations, awareness of government initiatives, farmers' attitudes, farming practices, economic aspects and problems related to the adoption of organic farming. It was prepared after reviewing relevant literature and was refined through a pilot survey. The present paper uses only the information directly related to farmers' motivations and adoption constraints.

Since respondents were allowed to report more than one reason for adopting organic farming, motivational factors were analysed through frequencies and percentages as multiple responses. The percentages were therefore not expected to add up to 100.

Twenty statements were used to examine the problems faced by farmers in adopting organic farming. Responses were recorded on a five-point agreement scale, and mean scores were used to rank the constraints. A higher mean score represents a more strongly perceived problem. To examine whether the reported difficulties differed between Punjab and Rajasthan, independent-samples t-tests were applied. Differences with $p < 0.05$ were treated as statistically significant.

Results and Discussion

• Motivational Factors for Adopting Organic Farming

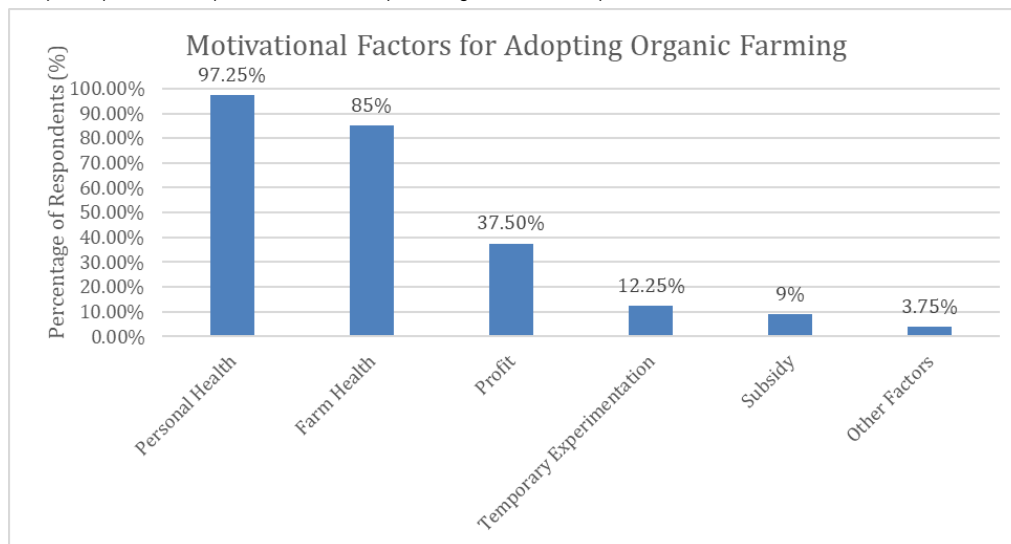
Farmers were asked to indicate the reasons that encouraged them to adopt organic farming. Because more than one response was permitted, each factor was analysed separately.

Table 1: Motivational Factors for Adopting Organic Farming

Motivational factor	Punjab n (%)	Rajasthan n (%)	Total n (%)
Personal health	200 (100.00)	189 (94.50)	389 (97.25)
Farm health	171 (85.50)	169 (84.50)	340 (85.00)
Profit	68 (34.00)	82 (41.00)	150 (37.50)
Temporary shift for experimentation	15 (7.50)	34 (17.00)	49 (12.25)
Subsidy	18 (9.00)	18 (9.00)	36 (9.00)
Other factors	10 (5.00)	5 (2.50)	15 (3.75)

Source: Field Survey.

Note: Multiple responses were permitted; therefore, percentages do not add up to 100.

**Figure 1: Motivational Factors for Adopting Organic Farming**

Source: Field Survey.

Note: Multiple responses were permitted.

Interpretation

Health-related considerations clearly dominated the reasons reported by the respondents. Personal health was mentioned by 389 farmers, representing 97.25 per cent of the total sample, while 340 respondents, or 85.00 per cent, identified farm health as an important reason for adopting organic practices. The pattern was similar in both states. All Punjab respondents referred to personal health, compared with 94.50 per cent in Rajasthan, while the proportion reporting farm health was almost the same in Punjab (85.50 per cent) and Rajasthan (84.50 per cent).

Financial considerations were much less prominent. Profit was reported by 150 farmers, accounting for 37.50 per cent of the sample. The share was somewhat higher in Rajasthan (41.00 per cent) than in Punjab (34.00 per cent). Temporary experimentation was mentioned by only 12.25 per cent of respondents, although it was more common among Rajasthan farmers. Subsidy was among the least frequently reported reasons, with only 9.00 per cent of respondents in each state identifying it as a motivation.

These findings indicate that the surveyed farmers were mainly attracted towards organic farming because of concerns related to their own health and the condition of the farm rather than because of government incentives. This pattern is broadly consistent with Joseph and Unni (2021) and Sapbamrer and Thammachai (2021), who also observed the importance of health and environmental considerations in farmers' attitudes towards organic farming. At the same time, the strong health-related motivation observed in the present study does not necessarily imply that farmers will increase the area under organic cultivation. Their willingness to continue or expand adoption also depends on the production, institutional and marketing problems they encounter.

- **Major Constraints in the Adoption of Organic Farming**

Respondents rated twenty adoption-related problems on a five-point agreement scale. Higher mean scores indicate that a problem was felt more strongly.

Table 2: Overall Ranking of Constraints in the Adoption of Organic Farming

Constraint	Mean Score	Rank
Lack of a government agency for guidance	4.720	1
Market price of produce is highly volatile	4.633	2
Decrease in yield	4.610	3
Lack of specialised organic markets	4.578	4
No financial support is provided by the government	4.505	5
Adequate research support is not available	4.497	6
Certification process is costly and complicated	4.475	7
Organic farming places a financial burden on farmers	4.345	8
Quality of seed available in the market is inferior	4.290	9
Finding a market for organic products is a major issue	4.148	10
Difficulty in finding bio-pesticides in the market	4.143	11
Lack of technical skills for organic farming	4.137	12
Skilled labour is not available for organic farming	3.688	13
Lack of storage facilities	3.638	14
Increase in cost of production	2.988	15
Lower product price of organic crop	2.240	16
Higher power and diesel consumption in organic farming	2.145	17
Insufficient encouragement from family members	2.068	18
Organic pesticides are expensive	1.908	19
Reduction in net profit over the years	1.875	20

Source: Computed from Field Survey Data.

Note: Mean scores are based on a five-point agreement scale; a higher mean indicates a greater degree of problem perceived by respondents.

Interpretation

The responses indicate that the main difficulties faced by farmers were not confined to one area. Institutional support, production risk and marketing problems all appeared among the highest-ranked constraints. The absence of a clearly identified government agency for guidance received the highest mean score (4.720). Market-price volatility followed with a mean of 4.633, while decrease in yield (4.610) and lack of specialised organic markets (4.578) occupied the third and fourth positions respectively.

These rankings show that farmers face uncertainty both during production and after the crop is harvested. A decline in yield directly affects output, while unstable prices and limited access to specialised markets create uncertainty about the amount ultimately realised from the produce. When organic produce has to be sold through ordinary market channels, farmers may not always receive a price advantage sufficient to compensate for the additional risks associated with cultivation.

Support-related difficulties were also rated strongly. Lack of government financial support ranked fifth, followed by inadequate research support and the costly and complicated certification process. The general financial burden of organic farming occupied the eighth position. Farmers also reported problems relating to seed quality, finding suitable markets, availability of bio-pesticides and technical skills, all of which recorded mean scores above 4.00.

Some problems, however, were perceived as relatively less serious. Increase in production cost ranked fifteenth. Lower product prices, higher power and diesel consumption, inadequate family encouragement, expensive organic pesticides and reduction in net profit were placed near the bottom of the ranking. These lower positions do not mean that such difficulties were absent; rather, the respondents considered them less important than problems relating to guidance, yield, markets and institutional support.

The findings are broadly in line with Walia et al. (2022), who identified yield reduction, certification and weak market access among the major barriers to organic farming. Reddy et al. (2022) also reported problems associated with certification knowledge and access to premium markets. In the

present study, however, the highest-ranked issue was the lack of a government agency for guidance. This suggests that farmers require a dependable source of practical assistance that can help them deal with several connected issues, including production practices, inputs, certification and marketing.

• State-wise Comparison of Constraints

The mean scores were compared between Punjab and Rajasthan through independent-samples t-tests. The complete comparison is presented in Table 3.

Table 3: State-wise Comparison of Constraints in the Adoption of Organic Farming

Constraint	Punjab Mean	Rajasthan Mean	p-value	Result
Lack of a government agency for guidance	4.650	4.790	0.002	Significant
Market price of produce is highly volatile	4.590	4.675	0.088	NS
Decrease in yield	4.455	4.765	<0.001	Significant
Lack of specialised organic markets	4.400	4.755	<0.001	Significant
No financial support is provided by the government	4.350	4.660	<0.001	Significant
Adequate research support is not available	4.430	4.565	0.020	Significant
Certification process is costly and complicated	4.420	4.530	0.073	NS
Organic farming places a financial burden on farmers	4.335	4.355	0.735	NS
Quality of seed available in the market is inferior	3.960	4.620	<0.001	Significant
Finding a market for organic products is a major issue	3.785	4.510	<0.001	Significant
Difficulty in finding bio-pesticides in the market	3.980	4.305	<0.001	Significant
Lack of technical skills for organic farming	3.910	4.365	<0.001	Significant
Skilled labour is not available for organic farming	3.460	3.915	<0.001	Significant
Lack of storage facilities	3.100	4.175	<0.001	Significant
Increase in cost of production	2.195	3.780	<0.001	Significant
Lower product price of organic crop	2.080	2.400	<0.001	Significant
Higher power and diesel consumption in organic farming	2.130	2.160	0.706	NS
Insufficient encouragement from family members	1.655	2.480	<0.001	Significant
Organic pesticides are expensive	1.825	1.990	0.037	Significant
Reduction in net profit over the years	1.755	1.995	0.006	Significant

Source: Computed from Field Survey Data.

Note: NS = Not Significant. Statistical significance was assessed at the 5 per cent level.

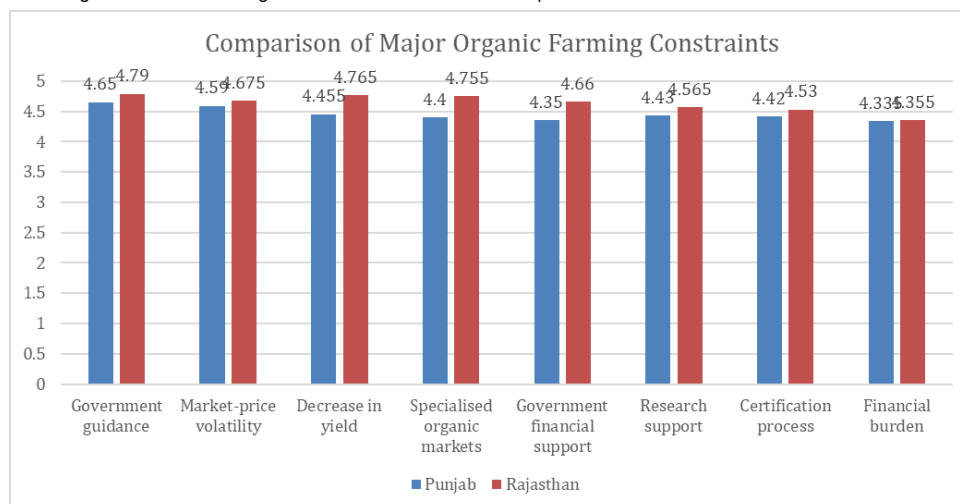


Figure 2: Comparison of Major Constraints in Punjab and Rajasthan

Source: Computed from Field Survey Data.

Mean scores are based on a five-point agreement scale.

Interpretation

The state-wise results show that farmers in Rajasthan generally experienced the reported constraints more strongly than those in Punjab. Significant differences were found for sixteen of the twenty statements. Lack of a government agency for guidance remained a major problem in both states, although the mean score was higher in Rajasthan (4.790) than in Punjab (4.650), and the difference was statistically significant ($p = 0.002$). Yield reduction also showed a sizeable difference, with a mean of 4.765 in Rajasthan compared with 4.455 in Punjab ($p < 0.001$). A similar pattern was observed for the lack of specialised organic markets, where the respective mean scores were 4.755 and 4.400.

Not every problem differed significantly between the two states. Market-price volatility was rated very highly in both Punjab (4.590) and Rajasthan (4.675), but the difference was not significant. The same was true for the costly and complicated certification process, the general financial burden of organic farming, and higher power and diesel consumption. These four constraints may therefore be viewed as broadly shared concerns among the sampled farmers rather than problems concentrated mainly in one state.

The larger state-wise differences were seen in areas connected with infrastructure, inputs and production conditions. Lack of storage facilities received a mean score of 4.175 in Rajasthan compared with 3.100 in Punjab. Difficulty in finding a market for organic produce was also more strongly reported in Rajasthan, with a mean of 4.510 against 3.785 in Punjab. Rajasthan farmers further reported greater difficulty with seed quality, availability of bio-pesticides, technical skills and skilled labour. The difference in production cost was particularly noticeable, with a mean of 3.780 in Rajasthan and 2.195 in Punjab.

The comparison suggests that organic-farming constraints should not be treated as identical across regions. Some difficulties, particularly unstable prices and certification, were common to farmers in both states, whereas storage, market access, input availability and production-related problems were more severe in Rajasthan. This supports the need for region-specific support rather than applying the same intervention uniformly in both states. The importance of local resources and market arrangements has also been noted in earlier studies from Rajasthan (Meena, 2010; Singh et al., 2023).

Policy Implications

The findings point first to the need for more accessible guidance at the local level. Since lack of a government agency for guidance emerged as the highest-ranked problem, farmers should have a clearly identified point of contact where they can obtain practical information on production methods, suitable inputs, certification requirements, government assistance and marketing. Such support would be more useful if it continued during cultivation rather than being limited to occasional awareness programmes.

Marketing also requires greater attention. Price volatility and the absence of specialised organic markets were among the most serious constraints reported by farmers. Better buyer linkages, separate collection arrangements and timely market information could reduce some of this uncertainty. Certification support should also be connected with actual marketing opportunities. If farmers complete certification but are unable to sell their produce through a recognised organic channel, the commercial value of certification remains limited.

Yield-related risk is another area where general promotion may not be enough. Farmers are more likely to continue organic cultivation when they can see how recommended practices perform under local crop and soil conditions. Demonstration plots, regular technical advice and support for nutrient and pest management can therefore be more useful than relying only on financial incentives. Assistance during the transition period should address both the possible fall in yield and the practical difficulties farmers face while adjusting to organic methods.

The comparison between Punjab and Rajasthan further suggests that support should not be identical in both states. Rajasthan farmers reported greater difficulty in areas such as storage, seed quality, availability of biological inputs, technical skills and market access. These areas require stronger attention in the state. At the same time, problems such as unstable prices and certification were common to farmers in both Punjab and Rajasthan. A common policy framework may therefore be useful, but its implementation should allow enough flexibility to respond to regional conditions.

Conclusion

The study examined the main reasons that encourage farmers to adopt organic farming and the problems that affect its continuation and expansion. Health-related considerations were the strongest motivations reported by the respondents. Personal health and farm health were mentioned much more frequently than profit or subsidy, showing that the interest of the sampled farmers in organic farming was not mainly driven by financial incentives.

At the same time, adoption was constrained by several production, institutional and marketing difficulties. Lack of a government agency for guidance emerged as the highest-ranked problem, followed by unstable market prices, reduction in yield and the absence of specialised organic markets. The state-wise comparison also showed that farmers in Rajasthan experienced many of these difficulties more strongly than farmers in Punjab. However, market-price volatility, certification difficulties, the general financial burden of organic farming and higher power and diesel consumption were reported at broadly similar levels in both states.

The findings therefore suggest that willingness to adopt organic farming is only one part of the transition. Farmers also need regular technical guidance, access to suitable inputs, support in managing yield-related risk, workable certification arrangements and dependable markets. These elements need to operate together if farmers are expected to continue organic practices or increase the area under organic cultivation.

The study further shows that a uniform approach may not be equally suitable for both states. While some problems are common, others are closely related to regional conditions. Policies that build on farmers' existing health-related motivation and address the practical constraints faced in their own production and market environment are more likely to support stable and sustained adoption of organic farming.

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