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RESEARCH PAPER

Constraints to Organic Farming Adoption among Small and Marginal Farmers in the Low Hill Region of Himachal Pradesh

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ABSTRACT

Organic farming is increasingly recognized as a sustainable alternative to conventional agriculture; however, its adoption remains constrained by multiple challenges, particularly in hilly regions. This study examined the major constraints faced by farmers practicing organic farming in the low hill districts of Kangra and Hamirpur in Himachal Pradesh. A total of 120 farmers, comprising 70 marginal and 50 small farmers, were selected through proportionate random sampling. Primary data were collected through personal interviews using pre-tested schedules, while percentage analysis and Chi-square tests were employed for interpretation. The findings revealed that production-related constraints were dominated by difficulties in managing weeds, pests, and diseases organically (75%), non-availability of quality seeds (66.67%), and low productivity (66.67%). High labour wages (70%) and labour shortages (63.33%) further intensified production challenges. Institutional constraints included high certification costs, longer conversion periods, and difficulty in fulfilling certification norms (88.33%). Marketing issues such as lack of market information (91.67%), low marketable surplus (85%), and high transportation costs (83.33%) were also significant. Additionally, monkey menace (83.33%) and stray animals (81.67%) emerged as major miscellaneous constraints. The Chi-square results indicated no significant differences in constraints faced by marginal and small farmers. The study highlights the need for policy support, simplified certification procedures, improved extension services, and better market infrastructure to promote sustainable organic farming in Himachal Pradesh.

HIGHLIGHTS

- Pest and weed management remained the major production constraint.
- Certification barriers hindered organic farming adoption.
- Poor market access reduced farmers' returns.
- Wildlife damage caused significant crop losses.
- Policy support is essential for sustainable organic growth.

Keywords: Organic farming, Farmers' constraints, Hill agriculture, Himachal Pradesh, Sustainable agriculture, Certification challenges, Market access

India, often referred to as the land of farmers, depends heavily on agriculture, which plays a vital role in ensuring food security, sustaining rural livelihoods, and contributing to the national economy. According to the World Bank (2023), agriculture employs more than 40% of India's workforce and remains critical for economic resilience, especially in rural areas. The United Nations Population Division (2019) projects that

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the global population will reach 9.7 billion by 2050, intensifying the challenge of sustainably feeding the world. In this context, smallholder farmers, who produce most of the food in developing nations but remain disproportionately poor, must be empowered through sustainable agricultural solutions (FAO, 2022).

While the Green Revolution significantly increased food production through high-yielding varieties and chemical inputs, it also increased production costs and dependency on external inputs, particularly affecting small and marginal farmers (Chadha *et al*. 2012; Singh *et al*. 2021). Furthermore, widespread use of synthetic fertilizers and pesticides has led to deteriorating soil health, water contamination, and biodiversity loss, threatening long-term sustainability (Ram *et al*. 2004; Meena *et al*. 2022). Growing awareness of these issues and increasing consumer demand for safe, eco-friendly, and chemical-free food foster a global transition toward organic farming (IFOAM, 2024).

Organic agriculture, by minimizing synthetic inputs and emphasizing ecological balance, offers an alternative path for sustainable food systems. With an average annual global market growth rate of 10–15%, the demand for organic products continues to rise in both developed and developing countries (Willer & Trávníček, 2024). As of 2024, organic agriculture is practiced in 188 countries, covering over 96 million hectares of land and involving 4.5 million producers. India ranks first globally regarding the number of organic producers, while Australia has the largest area under organic cultivation (Willer & Trávníček, 2024; FIBL, 2024). India's total area under organic certification (including wild harvest) has reached over 10.17 million hectares, with certified production reaching 2.9 million metric tonnes in 2022–23, comprising a wide range of commodities (APEDA, 2023).

Himachal Pradesh, located in the northwestern Himalayan region of India, presents a unique opportunity for organic farming due to its low reliance on chemical inputs (158 g/ha vs. the national average of 381 g/ha), traditional farming systems, and diverse agroecological zones. Despite limited benefits from the Green Revolution, the state's agriculture remains the backbone of its economy, engaging nearly 69% of the population (Government of Himachal Pradesh, 2023). Ongoing diversification into horticulture and off-season vegetables has demonstrated economic potential, yet rising input costs and environmental concerns are prompting farmers to explore organic alternatives (Sharma *et al.* 2023).

The state has taken institutional steps to promote organic agriculture, such as establishing the Model Organic Research Farm and the Department of Organic Agriculture and Natural Farming at CSK Himachal Pradesh Krishi Vishvavidyalaya (CSKHPKV), Palampur. These initiatives and support from the State Department of Agriculture under the Paramparagat Krishi Vikas Yojana (PKVY) aim to develop organic crop packages and create awareness about sustainable farming practices. The National Mission for Sustainable Agriculture and various state-level organic programs further reinforce the role of organic farming as a pathway to ecological and economic resilience (Ministry of Agriculture & Farmers Welfare, 2023).

However, the transition to organic farming is not without challenges. Farmers report constraints such as high costs of organic inputs (e.g., vermicompost and oil cakes), difficulty accessing and transporting green manure, lack of region-specific organic production guidelines (particularly for rice), and insufficient knowledge of organic crop management techniques such as crop rotation and water use (Ranganatha *et al.* 2001; Thakur & Sharma, 2022). A study by Kumar *et al*. (2023) revealed that over 60% of smallholders in hilly regions perceive organic farming as risky due to uncertain yields, certification complexities, and limited market access.

Given this background, the present study aims to systematically examine the constraints farmers face when adopting organic farming in the lower hilly regions of Himachal Pradesh. Identifying these barriers is crucial for formulating effective policy interventions, institutional support, and farmer-centric extension strategies to promote a sustainable regional transition to organic agriculture.

MATERIALS AND METHODS

The present study was conducted in Himachal Pradesh, a state characterized by diverse agro-climatic conditions and increasing policy emphasis on sustainable agriculture. The study area was purposively selected based on the active role of Chaudhary Sarwan Kumar Himachal Pradesh

Krishi Vishvavidyalaya in promoting organic and natural farming through regular training programmes organized in collaboration with the Japan International Cooperation Agency. Among the districts of the state, Kangra and Hamirpur were purposively selected because they recorded the highest number of training programmes related to organic farming. These districts predominantly consist of marginal and small landholding farmers, making them suitable for examining the constraints associated with organic farming adoption.

A multistage sampling technique was employed for selecting respondents. Initially, a comprehensive list of villages from Kangra and Hamirpur districts where organic farming training programmes had been conducted was prepared. From this list, six villages were randomly selected, comprising three villages from each district. Thereafter, beneficiary farmers practicing organic farming were identified, and a sample of 120 farmers was selected using the proportional allocation method. The selected respondents were categorized based on landholding size into marginal farmers having landholdings of less than one hectare (<1 ha) and small farmers having landholdings of more than one hectare (>1 ha). The final sample consisted of 70 marginal farmers (58.33%) and 50 small farmers (41.67%), representing the farming structure of the study region.

The study relied on both primary and secondary sources of data. Primary data were collected from selected respondents through personal interviews using a well-structured and pre-tested interview schedule designed to capture information related to production, technological, institutional, marketing, and miscellaneous constraints in organic farming. Secondary data were collected from published reports, government documents, research articles, and institutional publications related to organic agriculture and sustainable farming practices.

For analytical purposes, the constraints reported by farmers were classified into different categories and analysed using simple tabular analysis and percentage techniques to estimate the proportion of respondents facing each problem. To examine whether significant differences existed between marginal and small farmers regarding the constraints faced, the Chi-square test of homogeneity was employed by using the following notation:

$$\chi^2 = \Sigma \frac{(O_i - E_i)^2}{E_i}$$

with $(n-1)(c-1)$ degrees of freedom, where, O_i = Observed frequency of problems confronted by farmers, E_i = Expected frequency of i^{th} problem, n = number of frequencies and c = number of constraints.

This analytical framework enabled a systematic assessment of the major barriers affecting the adoption and expansion of organic farming among small and marginal farmers in the low hill region of Himachal Pradesh.

RESULTS AND DISCUSSION

Organic farming in the low hill region of Himachal Pradesh is increasingly promoted as a sustainable alternative to conventional agriculture; however, farmers continue to encounter several operational and institutional bottlenecks that restrict its large-scale adoption. The findings of the study reveal that farmers practicing organic farming face multidimensional constraints related to production, institutional support, marketing, and external environmental factors. These challenges significantly affect farm productivity, profitability, and long-term sustainability. The responses collected from sample farmers were analysed and presented through different categories of constraints, and the results are discussed with reference to Tables 1 to 3.

The production-related constraints faced by organic farmers are presented in Table 1, which categorizes problems into input-related constraints, labour and machinery-related constraints, and technology-related constraints. Among input-related problems, the most severe issue reported by farmers was the difficulty in managing weeds, insect pests, and diseases through organic methods, as reported by 75.00 percent of respondents. This reflects the dependence of farmers on traditional methods that often lack immediate effectiveness compared to chemical alternatives. The non-availability of quality seeds and low productivity of organically grown crops were equally reported by 66.67 percent of respondents, indicating that productivity concerns remain a major deterrent in shifting fully toward organic cultivation. Further, 65.00 percent of farmers stated that the preparation of organic inputs such as

compost and bio-fertilizers is labour-intensive and costly, while 61.67 percent reported non-availability of organic inputs in local markets. Scarcity of bio-fertilizers and manures (56.67%) and high seed costs (60.00%) were also notable challenges. Similar findings were reported by Kumar *et al.* (2021), who observed that high input costs and labour scarcity significantly constrained organic farming adoption in hilly areas.

With respect to labour and machinery constraints shown in Table 1, high labour wages emerged as the most critical issue, reported by 70.00 percent of respondents. Organic farming requires intensive manual labour for activities such as compost preparation, weeding, and pest management, thereby increasing labour dependency. About 63.33 percent of respondents reported non-availability of human labour during peak agricultural operations, while 58.33 percent highlighted high rental charges for tractors and power tillers. Additionally, 40.00 percent of respondents faced difficulty in obtaining farm machinery or bullocks at the required time. These findings suggest that labour shortages and mechanization constraints increase production costs and discourage farmers from adopting organic practices on a larger scale.

Technology-related constraints depicted in Table 1 further indicate inadequate technical knowledge among farmers. About 61.67 percent of respondents reported the absence of a standardized package of practices for organic farming, while 55.00 percent indicated insufficient knowledge regarding insect and pest management. Lack of proper guidance in preparing organic inputs and insufficient demonstration units for farmyard manure, compost, and liquid manure preparation were reported

Table 1: Problems and constraints faced by farmers in the production of organic crops (Per cent response)

Sl. No.	Problems	Marginal	Small	Overall
(A)	**Related to inputs**			
1	Non-availability of organic biomass for preparing compost	45.71	44.00	45.00
2	Non-availability of urine/dung of local/indigenous cow	42.86	60.00	50.00
3	Preparation of organic inputs is labour-intensive and costly	60.00	72.00	65.00
4	Non-availability of organic inputs in the market	54.29	72.00	61.67
5	Management of weeds, insect pests, and diseases is difficult	71.43	80.00	75.00
6	Scarcity of bio-fertilizers and manures	42.86	76.00	56.67
7	Non-availability of quality seeds	62.86	72.00	66.67
8	The cost of seed is high	62.86	56.00	60.00
9	Low quality/Poor germination of seeds	45.71	56.00	50.00
10	Lack of irrigation facilities	20.00	24.00	21.67
11	Drought at critical stages of plant growth	37.14	20.00	30.00
12	Low productivity level of organically grown crops.	65.71	68.00	66.67
(B)	**Related to labour and machinery**			
1	Non-availability of human labour	65.71	60.00	63.33
2	High wages & labour	68.57	72.00	70.00
3	Non-availability of bullock/tractor/power tiller at the proper time	45.71	32.00	40.00
4	High charges for tractor/power tiller	65.71	48.00	58.33
(C)	**Related to technology**			
1	Lack of knowledge about insect/pest control in organic farming	60.00	48.00	55.00
2	Lack of knowledge about weed management practices in organic farming	42.86	48.00	45.00
3	Lack of proper guidance regarding the preparation of organic inputs	48.57	60.00	53.33
4	Lack of knowledge about the use of liquid organic fertilizers	45.71	36.00	41.67
5	Non-availability of a package of practices on organic farming	62.86	60.00	61.67
6	Insufficient demonstration units for FYM/compost/liquid manure preparation	48.57	60.00	53.33
7	Lack of soil and water testing facilities	48.57	56.00	51.67

The calculated chi-square value of 9.73 was non-significant at 1% significance level with a tabulated chi-square value of 24.77 at 17 degrees of freedom.

Table 2: Institutional constraints and marketing constraints faced by the organic farmers (Per cent response)

Sl. No.	Constraints	Marginal	Small	Overall
(A)	**Institutional Constraints**			
1	Certification is difficult and time-consuming	82.86	76.0	80.00
2	The certification fee is high	91.43	84.0	88.33
3	The conversion period from inorganic to organic is longer	88.57	88.0	88.33
4	Difficulty in fulfilling certification norms/rules	85.71	92.0	88.33
5	Certification agencies are fewer and located at distant places	51.43	52.0	51.67
6	Lack of timely and appropriate transfer of technology measures by the extension organization/Agri. Dept./ private agencies.	91.43	80.0	86.67
7	Insufficient extension staff	74.29	60.0	68.33
8	Lack of supply of printed material in Hindi regarding various practices of organic farming	65.71	60.0	63.33
(B)	**Marketing Constraints**			
1	Disposal of produce is difficult due to a lack of specialized agencies	77.14	52.00	66.67
2	Low level of marketable surplus	82.86	88.00	85.00
3	Purchase agencies at longer distances	71.43	64.00	68.33
4	High transportation charges	80.00	88.00	83.33
5	Lack of marketing information	91.43	92.00	91.67
6	Lack of storage facilities	71.43	48.00	61.67
7	Low prices of produce	74.29	68.00	71.67
8	Problem in the sale of organic products	51.43	56.00	53.33

A calculated chi-square value of 11.37 was non-significant at 1% significance level with a tabulated chi-square value of 22.31 at 15 degrees of freedom.

by 53.33 percent of respondents each. Similarly, 51.67 percent of respondents highlighted the lack of soil and water testing facilities. These findings indicate that insufficient technical support and weak extension services limit farmers' confidence in adopting scientific organic farming methods. The calculated Chi-square value of 9.73 was found to be non-significant at the 1 percent level, indicating that production-related constraints did not significantly differ between marginal and small farmers.

The institutional and marketing constraints encountered by organic farmers are presented in Table 2. Institutional constraints emerged as one of the most significant barriers to organic farming adoption. A large proportion of farmers reported that certification fees were high (88.33%), the conversion period from conventional to organic farming was too long (88.33%), and fulfilling certification norms was difficult (88.33%). Moreover, 86.67 percent of respondents stated that timely transfer of technology by extension agencies and agricultural departments was inadequate. Around 80.00 percent of respondents reported that certification procedures were difficult and time-consuming, while 68.33 percent highlighted insufficient extension staff. The lack of printed materials in Hindi regarding organic practices was reported by 63.33 percent of respondents. These findings indicate that institutional barriers significantly reduce farmers' willingness to transition toward certified organic farming systems. Similar observations were made by Thakur and Sharma (2022), who emphasized certification complexities as a major hurdle in hill agriculture.

Marketing constraints reported in Table 2 reveal that lack of market information was the most severe issue, affecting 91.67 percent of respondents. Farmers often remain unaware of prevailing prices, demand conditions, and potential marketing channels for organic produce. Low marketable surplus was reported by 85.00 percent of respondents, which limits farmers' bargaining power in markets. High transportation charges were identified by 83.33 percent of farmers due to poor road connectivity and distant markets in hilly areas. Additionally, 71.67 percent of respondents faced low prices for their produce, while 68.33 percent reported that purchasing agencies were located far from production centers. About 66.67 percent highlighted difficulties in disposing of produce due to the

absence of specialized agencies, and 61.67 percent cited inadequate storage facilities. The calculated Chi-square value of 11.37 was non-significant, suggesting that both marginal and small farmers experienced similar institutional and marketing constraints. These findings are consistent with Haneef *et al.* (2019), who also reported transportation costs and poor market information as major barriers in organic farming.

Table 3: Miscellaneous constraints faced by the organic farmers (Per cent response)

Sl. No.	Constraints	Marginal	Small	Overall
1	Stray animals	94.29	64.00	81.67
2	Birds	34.29	24.00	30.00
3	Monkeys	82.86	84.00	83.33
4	Pigs	54.29	56.00	55.00

Apart from production and market-related challenges, farmers also faced miscellaneous problems associated with wildlife and stray animals, as presented in Table 3. Among these, monkey menace was reported as the most serious issue by 83.33 percent of respondents, followed closely by stray animals at 81.67 percent. These problems are particularly severe in hilly regions where agricultural fields are often located near forest areas. About 55.00 percent of respondents reported damage caused by pigs, while 30.00 percent faced losses due to birds. Farmers emphasized that despite investing significant time and resources in organic farming, crop destruction by wild and stray animals substantially reduces their income and discourages further adoption of sustainable farming practices. Devi *et al.* (2020) similarly identified wild animal attacks as one of the major constraints in organic farming across Himachal Pradesh. The calculated Chi-square value of 1.37 was non-significant at the 1 percent level, indicating that these challenges were uniformly experienced across farm categories.

Finally, the study reveals that organic farming in the low hill region of Himachal Pradesh is constrained by a complex combination of production inefficiencies, institutional rigidities, market imperfections, and environmental threats. The non-significant Chi-square values across all categories indicate that both marginal and small farmers face nearly identical challenges. Therefore, strengthening extension services, simplifying certification procedures, improving market infrastructure, ensuring timely availability of organic inputs, and addressing wildlife-related crop damage are crucial for enhancing the sustainability and profitability of organic farming in the region.

CONCLUSION

The study highlights that organic farming in the low hill region of Himachal Pradesh is constrained by multiple production, institutional, marketing, and environmental challenges that limit its wider adoption among marginal and small farmers. Major issues include difficulties in managing weeds, pests, and diseases organically, high labour and input costs, complex certification procedures, inadequate market information, high transportation expenses, and crop damage caused by wild animals. The non-significant Chi-square results suggest that these constraints are uniformly faced by both marginal and small farmers. To promote sustainable organic agriculture in the region, policymakers should focus on improving extension services, simplifying certification processes, strengthening market linkages, ensuring timely availability of organic inputs, and developing measures to protect crops from wildlife damage.

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