Extended Abstract

Paper Title	Organic Farming in Punjab, India: Status, Drivers, and Barriers

Abstract	200 words max

In the face of environmental challenges, declining agricultural production, and increasing cost of production, organic farming (OF) has been widely acknowledged as an effective and viable alternative to input-intensive conventional farming (CF). Due to the adverse environmental effects of CF, the growth of OF is gaining momentum rapidly worldwide. However, in India, the development of OF has only concentrated in a few states. The states like Punjab are showing slow growth in OF and lagging in its adoption. The negligible growth in Punjab motivates us to find the current status of OF in Punjab and to explore the reasons behind the low adoption. Therefore, the present study aims to identify the drivers and barriers of OF in Punjab. The study is based on primary data collected through the field survey of 355 farmers (150 organics and 205 conventional farmers) from Punjab, India. The results indicate that farmers' age, gender, education, household size, livestock, farmers' organizational membership, and training are the key drivers and the annual household income of the farmer, the primary source of income, farm size, and the farm's distance from the nearest Krishi Vigyan Kendras (KVK) are the barriers to OF adoption in Punjab. The study's findings suggest that policies should focus on enhancing education and training programs, organizational support, livestock integration, and targeted financial incentives for OF development in Punjab.

Keywords	Conventional Farming; Organic Farming; Adoption; Barriers; Drivers; Logistic Regression
JEL Code	Q15, Q16, Q18, Q24

Introduction

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The green revolution technologies play a significant role in achieving food self-sufficiency in India. However, this achievement comes with various sustainability challenges (environmental degradation, declining agricultural production, and increasing input cost) that stress the importance of balancing agricultural productivity and environmental sustainability. Over time, the focus has shifted from input-intensive farming practices to sustainable agricultural practices, of which organic farming (OF) has gained momentum. OF has grown noticeably in India in recent years. Globally, India holds the sixth position, with 2.66 million hectares of land under OF with 37.82 percent growth in organic agricultural land from 2018 to 2023 (IFBL-IFOAM, 2023). Regarding the status of organic producers worldwide, with a total of 1.6 million organic producers, India stands first with the world's largest organic producers. Although India's share of organic agricultural land is growing on a global scale, yet the growth has only concentrated in a few states in the country. Despite the extensive efforts taken by policymakers, the state like Punjab (with only 0.18 percent of country’s total cultivated OF area) is lagging in adopting of OF in India. Similarly, OF in Punjab is doing on only 0.22 percent of state’s net sown area. Therefore, a study on dynamics of OF is critical to gain insights into the determinants that influences farmers' decisions toward its low adoption. Understanding these determinants may pave the way for customized strategies and focused interventions to enhance OF. Hence, the current study aims to identify the drivers and barriers of OF.

Methodology

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A cross-sectional primary study through multi-stage sampling was conducted in the Indian state of Punjab. Punjab is divided into three geographical regions, viz. Majha, Malwa, and Doaba; hence, three districts were purposively selected from each of these three regions, namely Gurdaspur, Ferozepur, and Hoshiarpur, respectively. The reason for the selection of the mentioned district was the presence of a significant number of organic farmers. A total of 355 farmers (including 150 organic and 205 conventional farmers) were surveyed. The data were collected through a semi-structured questionnaire. To identify the drivers and barriers of the adoption of OF, a logistic model has been employed in the current study, with adoption as a dependent variable. Based on the existing review of literature on farmers' decision-making behavior, the current study has selected the characteristics of farmers, farmland and institutional support as the primary variables for identifying the drivers and barriers of farmers' decision of adoption. Among them, farmers' characteristics include age, gender, education, marital status, household size, farmers annual household income, income source, and access to ICT. Farmland characteristics cover region, farm size, livestock, and distance from the nearest KVK. The extension services, organizational membership, KCC, and training are the variables used under the institutional support factor.

Results

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Moreover, the results of logistic regression show that among the three categories analyzed—farmers' characteristics, farmland characteristics, and institutional support—variables in all categories significantly influence OF adoption. Specifically, farmers aged over 60, higher levels of education, and larger household sizes are positively associated with OF adoption. Conversely, higher annual household income and reliance on non-agricultural income sources are negatively correlated with OF adoption. Farm characteristics indicate that larger farm sizes decrease the likelihood of OF adoption, while larger livestock sizes and proximity to Krishi Vigyan Kendras (KVK) positively influence adoption. Regionally, farmers in Hoshiarpur and Ferozepur show a lower likelihood of OF adoption than those in the Gurdaspur region. Institutional support, particularly farmers' organizational membership and agricultural training, significantly impacts OF adoption, with respective increases of 31 percent and 21 percent in the likelihood of adoption. However, extension services and Kisan Credit Card (KCC) adoption do not emerge as significant factors in the study area. Further, the Hosmer-Lemeshow (HL) goodness of fit test and variance inflation factor analysis further validate the model's reliability, indicating no errors or risks, and multicollinearity issues, respectively. The value of correct classification suggests that 87.32 percent of the observations are correctly classified.

Discussion and Conclusion

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In conclusion, this study sheds light on the adoption dynamics of organic farming (OF) in India, focusing on the Punjab state, revealing a nuanced interplay of farm and farmers' characteristics, institutional support, and regional peculiarities. The logistic regression results underscore the significance of these factors, offering valuable insights for policymakers and stakeholders aiming to promote sustainable agricultural practices. The study finds that older farmers are more likely to adopt OF, possibly due to their health consciousness coupled with increased environmental awareness. Moreover, young farmers often hesitated to adopt OF due to the labour-intensive nature of the practice, which requires more manual work than CF. Education appears as a crucial driver, positively impacting adoption, highlighting the need of focused efforts to improve education availability in rural agricultural communities. Household size,

farm size, and animal ownership all have different effects, highlighting the significance of customizing policy to specific agricultural situations. The study also emphasizes the critical function of institutional support, highlighting the favorable impact of farmers' organizational participation and agricultural training. Understanding and addressing these multifaceted determinants (drivers and barriers) will pave the way for more sustainable and widespread adoption of OF practices in Punjab, contributing to the aim of balancing agricultural productivity and environmental sustainability in India.