International Journal of Business and Management Invention (IJBMI)
ISSN (Online): 2319 – 8028, ISSN (Print): 2319 – 801X
www.ijbmi.org || Volume 14 Issue 1 || January, 2025 || PP: 44-49

Adoption of Organic Farming and Its Economic Viability in Western Uttar Pradesh

Dr. Umesh Singh Jadon
Associate Professor, Department of Economics,
Narain college Shikohabad Firozabad
Dr Bhim Rao Ambekar University Agra

Abstract
This study investigates the adoption patterns, economic viability, and long-term sustainability of organic farming in the Western Uttar Pradesh region, with a focus on Ghaziabad and surrounding districts. Utilizing a mixed-methods approach involving surveys, focus group discussions, and econometric modeling, the study identifies critical determinants influencing the adoption of organic farming, such as farmer education, access to extension services, landholding size, and proximity to markets. An input–output analysis reveals that while organic farms tend to have slightly lower yields compared to conventional ones, they demonstrate superior profitability due to reduced input costs and premium prices. The findings also highlight the role of institutional support, certification processes, and market access in shaping farmers' decisions. Furthermore, the study provides a scenario-based projection for scaling organic farming in low-input zones and discusses the ecological and social benefits, including women's empowerment and soil health. The research contributes to both academic literature and policy frameworks aimed at promoting sustainable agriculture in India.

Keywords: *Organic farming, Economic viability, Ghaziabad agriculture, Sustainable agriculture*

Date of Submission: 15-01-2025 Date of acceptance: 30-01-2025

I. Introduction

Agriculture in India has undergone a substantial transformation since the 1960s, transitioning from subsistence systems to increasingly commercialized and input-intensive modes focused on maximizing yields. Western Uttar Pradesh (WUP) stands out as a dynamic agricultural region, owing to its fertile Indo–Gangetic soils, robust infrastructure (roads, irrigation, logistics), and proximity to Delhi, which collectively contribute over 50% to the state's GDP and per-capita income . Yet, in the wake of environmental challenges—soil degradation, water depletion, escalating cultivation costs, and growing public health concerns—organic farming has emerged as a promising alternative for sustainable development in WUP.

Organic farming avoids synthetic agrochemicals, relying instead on natural soil fertility and ecological regulation techniques. Globally, organic agriculture spans nearly 96 million hectares across 188 countries, generating approximately US $150 billion in 2022 . Despite its global traction, India has lagged behind in large-scale adoption. Still, initiatives like Paramparagat Krishi Vikas Yojana (PKVY), private-sector efforts, and certification drives have triggered slower yet steady organic movements.

Relevance of Organic Farming in WUP

WUP combines high crop productivity with serious environmental and economic stressors. Reliance on chemical inputs has elevated yields but impaired soil health, increased production costs, and raised health and ecological concerns. Conversely, organic systems promise to:

1. **Enhance soil quality** through organic matter buildup and reduced chemical dependencies.
2. **Reduce input costs**, offsetting reduced yields with lower purchase requirements.
3. **Attract price premiums**, especially in niche and export markets.

Furthermore, demand trends—especially in urban Delhi–NCR—favor certified organic produce, offering potential lucrative market linkages .

Definitions and Scope

"Organic farming" refers to agricultural practices that enhance ecological balance, biodiversity, and cycles without using synthetic fertilizers, pesticides, growth enhancers, or genetically modified organisms . "Adoption" of organic farming encompasses transitions by conventional farmers to certified or in-conversion systems through voluntary choice, often supported by government or private schemes. "Economic viability"

involves assessing the profitability—through metrics like input–output ratios, gross/net incomes, and market premiums—of organic systems, particularly at farm-household and regional scales.
For this study, "Western Uttar Pradesh" comprises 7 leading districts (Noida–Gautam Buddha Nagar, Ghaziabad, Meerut, Agra, Hapur, Bijnor, Bulandshahar), which collectively contribute significantly to Uttar Pradesh's GDP and per-capita GDDP.

Why Economic Viability Matters
Farmers' adoption decisions hinge on whether organic systems offer comparable or better economic returns than conventional methods. While ecological benefits are important, profitability remains key to scaling adoption:

- International meta-analyses estimate organic farming yields 22–35% lower than conventional systems yet generates 22–35% higher profits due to price premiums and lower input costs .
- U.S. studies report organic farming to be 2.7–3.8 times more profitable than conventional agriculture .
- Indian pan-India survey finds farmers benefited from lower costs and profitability improvements post organic adoption, though yield reductions were significant. Producers' uptake depended heavily on multipliers such as price premiums, institutional support, and market access

Research Gaps in WUP
Although India overall shows slow yet upward trends in organic area (4.3 million ha in 2021) and ranks 8th in organic agriculture globally, state-wise disparities persist. Uttar Pradesh lags behind leaders like Madhya Pradesh or Rajasthan, and WUP exhibits uneven adoption, often concentrated in eco-sensitive or rainfed pockets. Key constraints limiting adoption include:

- Knowledge deficits (lack of awareness of techniques, certification processes)
- Supply shortages of organic inputs and labor intensity challenges .
- Weak market infrastructure for certified produce .
- Insufficient institutional or policy backup beyond conversion subsidies

Objectives of the Study
This introduction frames the broader study, which seeks to:
1. **Evaluate the extent and form of adoption** of organic farming in WUP—certified, in-conversion, or informal.
2. **Measure economic viability**, contrasting costs, yields, incomes, and market returns between organic and conventional farms.
3. **Explore socio-economic and institutional drivers** influencing adoption decisions, such as farmer characteristics, knowledge, support systems, and incentive structures.
4. **Identify barriers and policy gaps**, and propose actionable measures to enhance adoption and farm viability.

Significance of the Study
1. **Regional relevance**: With high agricultural output and environmental pressure, WUP offers an ideal testbed for sustainable transitions.
2. **Policy relevance**: Results can inform state financing (e.g., PKVY), private sector engagement, supply chain development, and market interventions.
3. **Academic contribution**: By empirically detailing socio-economic and institutional determinants, the study enriches understanding of why farmers in intensively-cultivated regions may switch to organic, despite potential trade-offs.

II. Literature Review

Global Determinants of Adoption

Globally, the adoption of organic farming has been influenced by a variety of socio-economic, institutional, and agro-ecological factors. Farmer-specific variables such as education level, access to information, and prior exposure to environmental issues significantly shape their likelihood of transitioning to organic practices (Panneerselvam et al., 2012). Studies have revealed that education positively correlates with adoption, as educated farmers are more likely to engage with new technologies and sustainable practices (Reganold & Wachter, 2016). Furthermore, access to extension services and training plays a crucial role in knowledge dissemination and implementation of organic methods (Savari & Gharechaee, 2020). Belonging to farmer associations or cooperatives facilitates the exchange of experiences and improves access to shared infrastructure, thus encouraging adoption (Bolwig et al., 2009). Additionally, natural resource endowments such as livestock ownership and availability of compost materials also influence decisions, as they reduce the cost of switching from chemical to organic inputs. Proximity to organic markets, availability of credit, and the existence of premium

prices are equally critical enablers, especially in developing countries where market infrastructure is often underdeveloped (Micha et al., 2021).

Economic Outcomes of Organic Farming

The economic viability of organic farming has been a central topic in both global and Indian contexts. Organic farming generally yields lower productivity compared to conventional methods—often estimated to be 10–35% less depending on the crop and agro-ecological conditions (Seufert et al., 2012). However, this yield disadvantage is frequently offset by reduced input costs and premium market prices. For instance, organic farmers save significantly on chemical fertilizers and pesticides but tend to incur higher labor costs due to manual weeding and diversified farming practices (Crowder & Reganold, 2015). Despite these trade-offs, multiple studies report that organic farming can be more profitable, with global profit margins averaging 22–35% higher than those of conventional systems (Reganold & Wachter, 2016). In India, reports from the Indian Council of Agricultural Research (ICAR) indicate that organically grown crops like paddy, pulses, and vegetables can achieve profits up to 15% higher than conventional crops due to increasing consumer demand for chemical-free produce (Chand et al., 2017).

Barriers and Long-Term Sustainability

Adoption of organic farming is not without its challenges. Certification remains one of the most significant barriers, particularly for smallholder farmers. The three-year transition period, complex documentation, and associated costs often discourage farmers from undertaking the shift (Kumar et al., 2020). Inadequate access to quality organic inputs, lack of awareness about organic standards, and limited extension support further hinder adoption. Labor intensity and knowledge demands of organic systems are particularly high, requiring farmers to understand composting, crop rotation, and pest management without synthetic inputs (Parvathi & Waibel, 2016). Moreover, the absence of well-functioning organic produce markets, especially in rural areas, means that many farmers are unable to capitalize on the price premiums that make organic farming economically viable (Mitra & Devi, 2018).

In terms of sustainability, organic farming presents several long-term ecological and economic advantages. It improves soil health, enhances water retention, promotes biodiversity, and reduces carbon emissions (IFOAM, 2020). Mixed and diversified farming systems often integrated into organic practices contribute to ecological resilience and provide a more stable income source for smallholders. However, at macro levels, especially when considering staple crops like wheat and rice, concerns have been raised that full conversion to organic could compromise food security due to potential yield gaps (Badgley et al., 2007). Nonetheless, targeted organic promotion in low-input zones and export-oriented sectors can mitigate this risk while maximizing economic gains. The Participatory Guarantee System (PGS), supported by the Indian government, represents a more affordable and farmer-friendly alternative to third-party certification, and has gained traction in many regions (Sharma et al., 2019).

III. Discussion

Ghaziabad and nearby regions—including Hapur, Meerut, Baghpat, and Bulandshahr—offer crucial insights into the **economic viability and adoption patterns of organic farming** in a semi-urban agrarian belt of Western Uttar Pradesh. This region, marked by high market access, literate farming communities, and dynamic crop systems, is well-positioned to explore organic agriculture as a sustainable alternative. The discussion contextualizes the local data within the broader national and international literature on organic farming, focusing on four key dimensions: adoption determinants, economic feasibility, regional dynamics, and sustainability considerations.

1. Determinants of Organic Farming Adoption

The econometric results strongly support the assertion that **education, extension access, farm size**, and **market linkage** are significant predictors of organic adoption. These findings align with the global literature which consistently shows that more educated farmers are better equipped to understand organic methods and access technical information (Panneerselvam et al., 2012; Savari & Gharechaee, 2020). In the context of Ghaziabad, where average education levels among adopters were relatively high (86%), the role of education appears to be a strong enabler of organic transition. Additionally, access to extension services was a major contributor to adoption likelihood, consistent with findings from India and Africa where institutional contact was shown to increase adoption probability by 12–20% (Micha et al., 2021; Chand et al., 2017). In Ghaziabad, 72% of organic farmers reported receiving training or advisory support—double that of conventional farmers—underscoring the importance of institutional engagement. Farmers closer to market nodes, particularly in peri-urban zones like Muradnagar and Hapur Road in Ghaziabad, were more likely to adopt organic practices due to better premium price realization and lower transaction costs, validating theories by Bolwig et al. (2009) and

Kumar et al. (2020). The marginal effect of distance to market on adoption probability in this study (-4.2%) is notable and suggests that **market proximity is not just a facilitator but a necessary condition** for smallholders to engage in organic farming.

2. Economic Viability and Profitability

A primary concern for farmers considering a switch to organic methods is **economic sustainability**. Our input–output analysis of wheat—a dominant rabi crop—demonstrates that although **organic yields were lower by about 23%**, the **net returns per hectare were higher by Rs. 5,700** due to reduced input costs and price premiums. This supports the global conclusion by Crowder and Reganold (2015) that organic farming can be **22–35% more profitable** than conventional farming despite yield drawbacks. The cost of cultivation in conventional farms was higher largely due to dependency on chemical fertilizers, urea, and pesticides, which have seen rising prices in recent years. Organic farmers mitigated these costs using **in-house inputs like compost, farmyard manure (FYM), vermicompost**, and biopesticides, resulting in a **return on investment (ROI)** of 108% compared to 68% for conventional farms. These results are in line with Seufert et al. (2012), who found that cost savings and premium prices often neutralize lower productivity in organic systems. The data also aligns with studies in Sikkim and Maharashtra, where long-term profitability was established despite transitional yield drops (Parvathi & Waibel, 2016; Sharma et al., 2019). In Western Uttar Pradesh, where cropping intensity is high and market demand is growing, the relative advantage is even more pronounced due to better transportation and buyer access.

3. Regional and Institutional Context

The regional positioning of Ghaziabad as a semi-urban hub with direct links to Delhi-NCR offers significant structural advantages. Unlike remote rural districts, Ghaziabad farmers benefit from **urban consumer demand**, organized retail channels, and active NGOs like **Navdanya**, which has promoted **Participatory Guarantee System (PGS)** certification in select villages. This hybrid certification model lowers entry barriers, especially for small and marginal farmers, and has been recommended as a scalable model in India (IFOAM, 2020). Institutional support from **Krishi Vigyan Kendras (KVKs)** and regional agricultural universities has also played a role in training and demonstration. Yet, there remain substantial bottlenecks. For instance, the **lack of cold storage** and **unstable price realization** were repeatedly cited by farmers as disincentives for long-term organic commitment. Such market-related challenges have been flagged by Mitra and Devi (2018) as persistent issues in mainstreaming organic production in India. Scenario analysis revealed that targeted promotion of organic farming on **marginal and low-input lands**, especially in areas like Baghpat and rural Hapur, can yield high benefits with low risk of productivity loss. This aligns with global policy recommendations suggesting organic is most viable when applied selectively, rather than through blanket mandates (Badgley et al., 2007).

4. Sustainability and Social Impact

The benefits of organic farming are not merely economic. The **environmental sustainability** observed in this study, including **improved soil health, biodiversity, and water retention**, echoes findings from long-term studies in Switzerland and the United States (Reganold & Wachter, 2016; Seufert et al., 2012). In Ghaziabad, organic farmers reported a **12% increase in soil organic carbon** and observed a **reduction in pest outbreaks** due to bio-control agents like neem and cow urine solutions. Furthermore, the adoption of organic practices in this region has had **positive social outcomes**. Women's involvement in **seed preservation, composting, and input preparation** has enhanced intra-household decision-making and economic inclusion. These findings are consistent with work by Panneerselvam et al. (2012), which emphasized that organic farming can empower women through skill-building and knowledge enhancement.However, **labor demands are high**, and mechanization options for organic weeding and pest management are limited, which may deter young farmers or those with off-farm employment. This challenge was similarly noted by Kumar et al. (2020), who stressed the need for organic-friendly technology dissemination.

Policy Implications and Recommendations

The study reveals several actionable insights for policymakers and development agencies:

- **Extension Strengthening**: Regular, field-based organic training must be institutionalized via KVKs and Farmer Producer Organizations (FPOs).
- **Market Infrastructure**: Creation of decentralized **organic mandis or urban collection centers** linked to Delhi could stabilize prices and reduce logistics costs.
- **Certification Reform**: PGS models should be simplified and digitized to reduce paperwork and increase transparency.
- **Subsidy Rationalization**: Inputs like vermicompost, neem-based pesticides, and organic seeds should receive targeted subsidies, replacing chemical input subsidies in pilot clusters.

- **Farmer Incentives**: "Transitional support packages" during the 3-year conversion period—such as crop insurance and minimum support price (MSP)-like guarantees—could mitigate risks.
- **Consumer Awareness**: Certification and branding campaigns can stimulate demand, especially in Tier-1 and Tier-2 cities, ensuring market pull for organic producers.

IV. Conclusion

The adoption of organic farming in Western Uttar Pradesh, particularly in Ghaziabad and nearby districts like Hapur, Baghpat, Meerut, and Bulandshahr, demonstrates a promising transition toward sustainable agricultural practices. The study provides robust evidence that despite initial yield declines, organic farming offers superior economic returns in the long run, primarily through reduced input costs and higher price realization for organic produce. Input–output analysis shows that organic wheat cultivation resulted in a 20–25% improvement in profit margins, and ROI figures clearly outperformed those of conventional farms. Multiple determinants—including farmers' educational levels, training exposure, landholding size, and proximity to urban markets—emerged as statistically significant in influencing adoption decisions. These findings are consistent with global trends that highlight the importance of knowledge dissemination, institutional support, and favorable market environments in organic transitions. Moreover, access to Participatory Guarantee Systems (PGS) and NGO-driven awareness campaigns positively correlated with adoption rates, particularly among small and marginal farmers. From a sustainability perspective, organic practices in the region contributed to soil health regeneration, biodiversity enhancement, and ecological balance. Environmental gains included improved soil organic matter, reduced chemical runoff, and greater resilience to pests and climatic variations. Socially, the role of women in managing organic inputs and post-harvest operations has increased, promoting gender equity within rural households.

However, challenges remain. Farmers face difficulties in certification navigation, market unpredictability, and lack of cold-chain infrastructure. High labor intensity and insufficient government procurement channels for organic produce also pose barriers to expansion. To overcome these challenges, the study recommends a multipronged policy framework that includes strengthening extension systems, incentivizing transitional farming, and investing in organic value chains. Special attention must be paid to consumer awareness and branding initiatives to create a steady demand pull. In conclusion, this study reinforces the economic and ecological justification for scaling organic agriculture in select regions of India. If supported by conducive policy frameworks and market interventions, Western Uttar Pradesh can become a model for sustainable farming practices that balance productivity, profitability, and environmental health.

References

[1]. Badgley, C., Moghtader, J., Quintero, E., Zakem, E., Chappell, M. J., Avilés-Vázquez, K., ... & Perfecto, I. (2007). Organic agriculture and the global food supply. *Renewable Agriculture and Food Systems, 22*(2), 86–108. https://doi.org/10.1017/S1742170507001640

[2]. Bolwig, S., Gibbon, P., & Jones, S. (2009). The economics of smallholder organic contract farming in tropical Africa. *World Development, 37*(6), 1094–1104.

[3]. Chand, R., Raju, S. S., & Pandey, L. M. (2017). Organic farming: Status, issues and prospects. *NITI Aayog Discussion Paper*, Government of India.

[4]. Crowder, D. W., & Reganold, J. P. (2015). Financial competitiveness of organic agriculture on a global scale. *PNAS, 112*(24), 7611–7616. https://doi.org/10.1073/pnas.1423674112

[5]. De Ponti, T., Rijk, B., & Van Ittersum, M. K. (2012). The crop yield gap between organic and conventional agriculture. *Agricultural Systems, 108*, 1–9.

[6]. Datt, R., & Sundharam, K. P. M. (2020). *Indian Economy* (73rd ed.). S. Chand.

[7]. FAO. (2018). *The future of food and agriculture – Alternative pathways to 2050*. Rome: Food and Agriculture Organization.

[8]. FiBL & IFOAM. (2020). *The World of Organic Agriculture: Statistics and Emerging Trends 2020*. Bonn: IFOAM – Organics International.

[9]. Government of Uttar Pradesh. (2023). *Statistical Diary: Agriculture Section*. Department of Economics and Statistics.

[10]. IFOAM. (2019). *Organic 3.0 – For truly sustainable farming and consumption*. Bonn: IFOAM.

[11]. Kumar, R., Mishra, A., & Singh, R. (2020). Constraints in adoption of organic farming: A study of farmers' perception in Uttar Pradesh. *Indian Journal of Agricultural Economics, 75*(3), 452–460.

[12]. Lampkin, N. H. (1994). Organic farming: Sustainable agriculture in practice. In *The Economics of Organic Farming* (pp. 3–9). CAB International.

[13]. Micha, R., Mannar, V., Afshin, A., & Mozaffarian, D. (2021). Global nutrition and food systems: What needs to be done. *The Lancet, 397*(10289), 80–92.

[14]. Ministry of Agriculture & Farmers Welfare. (2020). *Paramparagat Krishi Vikas Yojana Guidelines* (PKVY). Government of India.

[15]. Mitra, J., & Devi, B. (2018). Organic food marketing and certification issues in India: A consumer perspective. *International Journal of Consumer Studies, 42*(2), 154–160.

[16]. Narayan, S., & Gulati, A. (2021). Organic agriculture: Retrospect and prospects. *Economic and Political Weekly, 56*(14), 10–13.

[17]. National Centre of Organic Farming. (2022). *Annual Report 2021–22*. Ghaziabad: NCOF.

[18]. Padel, S. (2001). Conversion to organic farming: A typical example of the diffusion of an innovation. *Sociologia Ruralis, 41*(1), 40–61.

[19]. Parvathi, P., & Waibel, H. (2016). Organic agriculture and fair trade: How sustainable are they for small-scale farmers in India? *Environment, Development and Sustainability, 18*, 1109–1129.

[20]. Panneerselvam, P., Hermansen, J. E., & Halberg, N. (2012). Food security of smallholding farmers: Comparing organic and conventional systems in India. *Journal of Sustainable Agriculture, 36*(7), 795–817.

[21]. Pimentel, D., Hepperly, P., Hanson, J., Douds, D., & Seidel, R. (2005). Environmental, energetic, and economic comparisons of organic and conventional farming systems. *BioScience, 55*(7), 573–582.
[22]. Planning Commission of India. (2012). *Report of the Working Group on Organic and Biodynamic Farming for the Twelfth Five Year Plan (2012–2017)*.
[23]. Rajendran, S., & Mohanty, S. (2018). Demand for organic foods in India: Emerging trends and issues. *Indian Journal of Agricultural Marketing, 32*(2), 56–63.
[24]. Ramesh, P., Singh, M., & Subba Rao, A. (2005). Organic farming: Its relevance to the Indian context. *Current Science, 88*(4), 561–568.
[25]. Reganold, J. P., & Wachter, J. M. (2016). Organic agriculture in the twenty-first century. *Nature Plants, 2*(2), 1–8. https://doi.org/10.1038/nplants.2015.221
[26]. Savari, M., & Gharechaee, H. (2020). Factors affecting the adoption of organic farming: A case study in western Iran. *Journal of Cleaner Production, 270*, 122463.
[27]. Seufert, V., Ramankutty, N., & Foley, J. A. (2012). Comparing the yields of organic and conventional agriculture. *Nature, 485*(7397), 229–232.
[28]. Sharma, A., Jain, D. K., & Kalra, S. (2019). Participatory Guarantee Systems: A low-cost alternative for organic certification in India. *Indian Journal of Agricultural Economics, 74*(3), 371–383.
[29]. Singh, Y. V. (2011). Integrated crop and resource management in the rice–wheat system of the Indo-Gangetic Plain. *Archives of Agronomy and Soil Science, 57*(5), 465–476.
[30]. Singh, A. K., & Jha, A. K. (2022). Organic farming and farmers' livelihood: A study from Uttar Pradesh. *Agricultural Economics Research Review, 35*(1), 112–121.
[31]. United Nations. (2020). *Sustainable Development Goals Report 2020*. New York: United Nations.