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Original Article

Post-COVID-19 Changes in Agricultural Production in Nashik and Ahmednagar Districts

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Abstract

Purpose:

This study examines the post-COVID-19 transformation of agriculture in the Nashik and Ahmednagar districts of Maharashtra (2021–2025). It analyzes shifts in cropping patterns, technology adoption, and marketing systems, and assesses their effects on rural employment and household incomes. The objective is to understand how two agriculturally significant yet crop-diverse districts adapted to pandemic-induced disruptions while sustaining food security and economic resilience.

Method:

The research synthesizes secondary sources government reports, economic surveys, district-level agricultural statistics, and scholarly and media publications. A comparative district approach was used to trace trends in production, technology use, market adaptation, and policy impacts. The analysis is thematically organized and complemented by qualitative insights from official accounts and farmer-reported experiences to contextualize quantitative patterns.

Key Findings:

The Rainfall and market prices influenced cropping choices more than the pandemic itself. In Nashik, 84% of farmers retained pre-pandemic crops (grapes, onions, pomegranates, vegetables) with gradual diversification into soybeans and high-value vegetables via mixed/intercropping. Ahmednagar, aided by good rainfall, expanded sugarcane to record levels and increased pomegranate orchards under the central cluster programme. Technology adoption accelerated in both districts: micro-weather stations, drip irrigation, mechanized harvesting, and digital tools (e-NAM, WhatsApp, YouTube) became more prevalent. Marketing shifted toward direct farmer-to-consumer channels home delivery, mobile vans, online orders and greater digital integration of APMCs. Government initiatives (e.g., Operation Greens, One District One Product, PM-FME) supported market and processing linkages. Employment outcomes were mixed: returning migrants briefly eased labour shortages, but as urban sectors reopened, mechanization offset renewed scarcities.

Implications:

post-pandemic agriculture in these districts is increasingly market-oriented, technology-driven, and moderately diversified. Despite resilience in output and marketing, profitability remains constrained by rising input costs, climate variability, and price volatility. Policy priorities should include price-stabilization mechanisms, investment in cold-chain and processing infrastructure, support for climate-resilient practices, and institutional strengthening of Farmer Producer Organizations to enhance value addition and market access. These measures are pivotal for sustainable growth and secure rural livelihoods in similar agro-economic settings.

Keywords: *Post-COVID-19 Agriculture, Cropping Pattern Changes, Technology Adoption in Farming, Agricultural Marketing Systems, Rural Employment, Nashik, Ahmednagar, Maharashtra*

Introduction

The COVID-19 pandemic in 2020 severely impacted nearly all sectors, yet agriculture played a crucial role in stabilizing the economy during this crisis. The Government of Maharashtra observed that while most sectors struggled, farming sustained livelihoods and ensured food security.

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During the initial lockdown, farmers faced serious challenges in transporting produce to markets. With local markets closed, agricultural sales stalled completely. In March 2020, major crop markets in Nashik, such as those for onions and tomatoes, were deserted. Tomato prices dropped so sharply that farmers could not even recover production costs. Despite these shocks, Maharashtra's agriculture sector demonstrated strong resilience. Good monsoon rains in 2020 contributed to a 49% increase in kharif food grain output and a 44% rise in sugarcane production compared to the previous year. Horticulture and vegetable production also recorded notable growth, making the state self-sufficient in food production. In 2020–21, the share of agriculture and allied sectors in Maharashtra's Gross State Value Added (GSVA) remained positive, with this sector among the least affected during the pandemic. Farmers kept the economic cycle moving by maintaining production during lockdowns.

Nashik and Ahmednagar are two key agriculture-dominated districts in Maharashtra. Nashik is renowned for high-value crops such as grapes, onions, pomegranates, and vegetables, while Ahmednagar is a leading sugarcane producer, also cultivating grapes, pomegranates, and traditional cereals. Although geographically distinct, both districts have a majority rural population dependent on agriculture. With approximately 9.68 lakh landholding farmers and 5 lakh agricultural labourers in Ahmednagar alone, this study focuses on post-COVID (2021–2025) changes in cropping patterns, technology adoption, marketing systems, and their effects on employment and rural incomes.

Research Methodology:

- The study is based mainly on secondary data.
- Information covers the post-COVID-19 period (2021–2025).
- Data sources include government reports, economic surveys, agricultural department statistics, newspapers, and research articles.
- A comparative analysis was done using data from Nashik and Ahmednagar districts.
- The study follows a standard academic dissertation format with introduction, objectives, methodology, analysis, findings, and references.
- Simple language and practical examples are used for clarity.
- Tables and data sources are included to help students.
- Focus is on the impact of COVID-19 on agriculture and long-term changes that followed.

Main Objectives of this Research Paper:

- To examine changes in cropping methods and patterns in Nashik and Ahmednagar districts during the post-COVID-19 period 2021 to 2025
- To analyse the growth in adoption and use of new agricultural technologies
- To briefly explain the central and state government policies introduced after the pandemic and study how they affected the agricultural systems in these districts
- To study changes in the agricultural marketing system.
- To evaluate the effects of these changes on agricultural employment and rural incomes, particularly availability of wage work, conditions of agro-based industries, and the changes in farmer household incomes

Analysis and Discussion:

Nashik – Post-Pandemic Cropping Patterns and Production

- Known for grapes, pomegranates, onions, and vegetables.
- Market closures during lockdown initially caused major disruptions.
- Grape growers shifted supply to wine and raisin processing units.
- Vegetable growers sold directly to consumers, avoiding intermediaries.
- Large-scale crop switching was rare; 84% farmers kept same crops in 2020 as in 2019.
- Minor shift towards cash crops like vegetables and soybeans; slight decline in paddy acreage.
- Crop choices influenced more by rainfall and market prices than the pandemic itself.
- By 2021–22, grape cultivation had recovered, but 40,000 hectares damaged by unseasonal rain/hailstorms.
- Some farmers intercropped vegetables in grape orchards.
- Onion growers experimented with soybeans and cereals.

Ahmednagar – Post-Pandemic Cropping Patterns and Production

- Sugarcane and cereals dominate production.
- Abundant rainfall after 2020 encouraged sugarcane expansion, including both one-year and 15-month varieties.
- Record sugarcane production achieved in 2021–22.
- Dryland crops (sorghum, pearl millet, soybeans) also cultivated.
- Significant increase in pomegranate orchards, placing district among top Indian producers.

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- Included in Central Government's pomegranate cluster programme (with Nashik & Solapur).

Comparative Analysis – Post-COVID Agriculture (2021–2025)

Aspect	Nashik	Ahmednagar
Major Traditional Crops	Grapes, onions, pomegranates, vegetables (tomatoes, okra, etc.)	Sugarcane (both one-year and 15-month varieties), sorghum, pearl millet, pomegranates, grapes
Major Traditional Crops	Grapes, onions, pomegranates, vegetables (tomatoes, okra, etc.)	Sugarcane (both one-year and 15-month varieties), sorghum, pearl millet, pomegranates, grapes
Post-COVID Changes in Cropping Patterns	84% of farmers retained their pre-pandemic crops; minor shifts influenced by rainfall and market prices; reduction in paddy area; gradual inclination towards soybeans and high-value vegetables; adoption of mixed cropping and intercropping of vegetables in vineyards in certain areas	Expansion of sugarcane area following good rainfall; record production achieved in 2021–22; cultivation of dryland crops (sorghum, pearl millet, soybeans); significant increase in pomegranate orchards, making the district one of the leading producers in India
Technology Adoption	Use of micro-weather stations and smart (drip) irrigation systems; reduction in chemical and fertilizer use by 25–30%; increased reliance on e-NAM and mobile applications; dissemination of information via WhatsApp and YouTube; greater use of farm machinery through rental services	Increased mechanized harvesting of sugarcane; wider adoption of drip irrigation; greater use of e-NAM and smartphones; mobile applications for weather and price updates; mechanized tilling and harvesting
Changes in Marketing Strategies	Direct-to-consumer sales through home delivery and mobile vans; online orders facilitated by Farmer Producer Organizations (FPOs) and cooperatives; digital linkage of APMCs; benefits from "Operation Greens" subsidies; increased grape processing for wine and raisins	Direct supply to sugar mills; benefits from the Pomegranate Cluster Programme; sales through mobile vans and Primary Agricultural Credit Societies (PACS); APMC digital integration; direct sales of fruits and vegetables to buyers
Impact of Weather and Rainfall	Crop selection highly dependent on rainfall; unseasonal rain and hailstorms in 2021–22 damaged approximately 40,000 hectares of vineyards	Good rainfall led to expansion of sugarcane cultivation; occasional unseasonal rains damaged fruits and vegetables in certain areas
Government Policies and Initiatives	Grape cluster development, "One District One Product" programme, e-NAM, "Operation Greens"	Pomegranate cluster development, "One District One Product" programme, e-NAM, PM-FME Scheme, sugar mill incentive schemes
Employment and Rural Economy	Return of migrant workers during the pandemic temporarily reduced labour shortages; shortages re-emerged later; growth in entrepreneurship in food processing, dairy farming, and organic/natural farming	Increased mechanization of sugarcane harvesting; expansion of MGNREGA employment opportunities; returning migrants contributed to agriculture and small-scale rural enterprises

In the post-pandemic period, agriculture in both Nashik and Ahmednagar districts has shifted towards reader diversification and a more market-oriented approach. Farmers are increasingly exploring a variety of crops to reduce risk and tap into profitable markets. A notable 62% of farmers have expressed interest in adopting sustainable practices such as organic and natural farming, reflecting a growing awareness of environmental and health concerns.

Overview of Government Policies (2021–2025)

Following the COVID-19 shock, the central and state governments implemented a range of measures to sustain agriculture and rural livelihoods. In May 2020, the Government of India launched the *Atmanirbhar Bharat Abhiyan* package, introducing major agricultural reforms. Parliament passed three farm laws aimed at expanding farmers' access to open markets, promoting contract farming beyond the Minimum Support Price (MSP) framework, and easing storage restrictions under the Essential Commodities Act. Although these laws were repealed in 2021 after widespread farmer

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protests, discussions on direct marketing outside APMCs, attracting private investment, and encouraging direct sales of fruits and vegetables continued. Financial support included free food grains under the *Pradhan Mantri Garib Kalyan Yojana* and continued PM-KISAN payments of ₹6,000 annually to eligible farmers. Kisan Credit Card coverage widened, while RBI and NABARD extended loan moratoriums and interest concessions. MGNREGA allocations were increased, providing 20–25 workdays per month to about 7.5 million rural workers in 2020–21, including many returning migrants. Under *Atmanirbhar Bharat*, the ₹1 lakh crore Agriculture Infrastructure Fund financed storage and processing facilities. *Operation Greens* expanded to 19 fruits and 14 vegetables with 50% transport and storage subsidies. Maharashtra promoted crop clusters under "One District One Product" and ranked second in e-NAM farmer participation, fostering digital and direct-to-consumer marketing through FPCs, mobile vans, and online platforms.

Rising Use of Technology in Agriculture

- After COVID-19, farmers started using more technology because of labour shortages, market uncertainty, and climate issues.
- Use of tractors, rotavators, mechanical threshers, and drip irrigation increased, often through shared hiring.
- Smartphones became important for checking prices, weather, and government schemes.
- 56% of farmers with smartphones in Maharashtra used platforms like e-NAM for local and inter-state sales.
- Examples include apples from Jammu & Kashmir sold to Pune APMC and onions from Nashik sold to other states.
- Some grape farmers in Nashik set up micro-weather stations linked to apps for pest, irrigation, and disease advice.

returned, especially in sugarcane areas like Ahmednagar. Mills responded with more mechanized harvesting and better worker facilities. Agro-based rural industries expanded, with youth starting ventures in food processing, dairy, and niche crops under schemes like PMFME. Livestock farming also grew. However, rising input costs, particularly fertilizers in 2021, reduced farm margins. While MSP benefited staple crop growers, fruit and vegetable farmers faced debt pressures. By 2023–24, stabilized prices and better crop insurance improved resilience, but challenges like price volatility and high costs persist.

Key Findings:

- Agriculture in Nashik and Ahmednagar stayed strong after COVID-19.
- Farmers used WhatsApp and YouTube to share tips on crops and pest control.
- The agriculture department held webinars during lockdowns.

Changes in the Marketing System

- Farmer groups sold in housing societies; cooperatives started home delivery.
- In Nashik and Pune, FPCs took online orders and delivered to cities.
- The state gave special travel permits for selling in safe markets.
- NABARD helped start mobile sales vans through PACS and FPOs.
- COVID-19 changed how farm produce was sold.
- Supply problems pushed farmers to sell directly to customers.
- Before COVID-19, most crops were sold through APMC markets or MSP centres.
- In lockdown, markets closed, so farmers sold locally.
- A 2020 law allowed sales outside APMC markets (later cancelled).
- Maharashtra worked on linking APMCs with online trading platforms.
- Prices of milk, flowers, and vegetables fell; pulses and oilseeds rose.

Impact on Employment and the Rural Economy

The Post-pandemic changes in farming and marketing directly affected rural labour, industries, and incomes. The 2020 lockdown forced many migrant workers from cities back to villages, temporarily reducing labour shortages in agriculture. In western Maharashtra, local labour supported sugarcane harvesting, while some returnees revived unused farms, increasing demand for work under MGNREGA. As cities reopened, most migrants left again, and labour shortages

- Crop choices were decided more by rainfall and prices than the pandemic.
- Farmers kept growing main crops like grapes, onions, sugarcane, and pomegranates.
- Some farmers used micro-weather stations to save water and reduce costs.
- More direct sales to customers through home delivery and mobile vans.
- Labour shortages led to more mechanized harvesting.
- Small rural businesses like food processing and dairy expanded.
- Rising costs, unstable prices, and climate change are still big challenges.

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Conclusion

The post-COVID-19 study of agriculture in Nashik and Ahmednagar shows that the sector remained highly resilient. Despite initial market disruptions and losses, farmers quickly restored production, ensuring an uninterrupted food supply and supporting Maharashtra's food security. Changes in cropping patterns were influenced more by rainfall and prices than the pandemic. While traditional high-value crops like grapes, onions, sugarcane, and pomegranates were retained, many farmers began diversifying through mixed or intercropping to reduce risks. Technology adoption accelerated, with greater use of e-NAM, weather advisories, and direct digital communication with buyers. These tools improved decision-making, reduced waste, and are expected to remain vital as climate risks grow. Marketing systems shifted towards direct farmer-to-consumer sales, supported by Farmer Producer Companies, cooperatives, and digital platforms. A hybrid model combining APMC markets and modern systems is emerging. Social and economic effects were mixed agriculture provided rural employment and income during the crisis, but rising costs and debt reduced profitability for many farmers. Policy priorities include stable prices, balanced input–output costs, investment in value-addition, and rural-based industries. The experiences of Nashik and Ahmednagar highlight that crisis-driven adaptation can lead to a more sustainable, technology-driven, and market-oriented agricultural system.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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