

A STUDY ON THE IMPACT OF CLIMATE CHANGE ON PRICE FLUCTUATION OF AGRICULTURE PRODUCT – TOMATO WITH SPECIAL REFERENCE TO COIMBATORE DISTRICT

T.M. Hemalatha

Dean & Associate Professor

Department of Commerce, Rathinam College of Arts and Science, Tamil Nadu

Ansif M

III B.Com CA

Department of Commerce, Rathinam College of Arts and Science, Tamil Nadu

ABSTRACT:

Climate change has become a significant factor influencing agricultural production and market stability. This study examines the impact of climate change on the price fluctuation of tomatoes in Coimbatore district. Tomato, being a highly climate-sensitive crop, is affected by variations in temperature, rainfall, and extreme weather conditions. The study analyzes how these climatic changes influence tomato supply and, in turn, affect market prices. Both primary and secondary data have been used to understand seasonal price variations and supply patterns. The findings reveal that unfavorable climatic conditions such as droughts and heavy rainfall reduce production, leading to higher prices, while favorable conditions increase supply and lower prices. The study concludes that climate change creates instability in tomato prices and highlights the need for effective agricultural practices and policy measures to ensure price stability and farmer sustainability.

Keywords: Climate Change, Tomato Prices, Price Fluctuation, Agricultural Supply, Coimbatore District, Weather Impact, Crop Production, Market Instability

INTRODUCTION OF THE STUDY

Climate change has become a major challenge affecting agricultural production across the world. Changes in temperature, irregular rainfall, and extreme weather conditions directly impact crop yield and quality. Tomato is one of the most widely cultivated and consumed vegetables, but it is highly sensitive to climatic variations. In regions like Coimbatore district, climate change has led to unpredictable production patterns, resulting in fluctuations in market prices. Farmers often face losses due to both crop failure and price instability. Therefore, it is important to study how climate change affects tomato supply and price movements. This study aims to analyze the relationship between climatic conditions and price fluctuations of tomatoes.

OBJECTIVES OF THE STUDY

- To study the changes in tomato prices during different climatic conditions.
- To understand how climate change affects the supply of tomato.
- To analyze the impact of climate-related factors on tomato price fluctuations

RESEARCH METHODOLOGY:

RESEARCH DESIGN:

The study adopts a descriptive and analytical research design to examine the impact of climate change on tomato price fluctuations.

SAMPLE SIZE:

120 Sample size has been chosen for this study.

DATA COLLECTION:

Primary sources: Questionnaires and interviews with farmers and traders.

Secondary sources: Government reports, agricultural journals, and market price records.

TOOLS USED:

Percentage analysis is used to interpret the data.

REVIEW OF LITERATURE:

- **Sai Nikshiptha Gurrapu (2025) “Trend Analysis of Tomato Arrivals and Modal Prices at Gudumalkapur Market, Telangana, India”**The study found that tomato arrivals in the Gudumalkapur market showed a steady increasing trend from 2019 to 2023, indicating improved supply over time. However, tomato prices were highly volatile with frequent short-term fluctuations and no clear long-term trend. While supply remained relatively stable, prices were influenced by external factors like climate, demand, and market inefficiencies. This instability in prices creates challenges for both farmers and consumers. The study highlights the need for better forecasting systems and price stabilization policies. Improved market infrastructure and real-time information can help reduce risks and ensure better income for farmers.
- **Huong Nguyen, Marcus Randall, Andrew Lewis (2024) “Factors Affecting Crop Prices in the Context of Climate Change—A Review”**The review highlights that climate change significantly impacts crop prices by affecting agricultural productivity and yields. Factors such as temperature, rainfall, and carbon dioxide levels play a major role in determining crop output and price fluctuations. The study finds that most crop prices are increasing due to declining yields caused by adverse climate conditions. It also identifies other influencing factors like biofuels, supply-demand dynamics, and economic conditions. The research emphasizes that climate change indirectly affects food security by raising food prices. Overall, it concludes that integrating climate factors into crop price forecasting models is essential for better decision-making.
- **Vikas Kumar (2024) “Erratic Rise in Tomato Prices, Status, Issues, Government Initiatives and Policy Suggestions to Manage the Prices of Tomato and Other Vegetables”**The study analyzes the sudden rise in tomato prices in India and identifies key causes such as erratic weather conditions, pest attacks, and transportation issues. It highlights how reduced supply and climate-related disruptions led to sharp price increases during June–August 2023. The paper also explains the impact on consumers and farmers, along with rising prices of other vegetables. Government initiatives like price stabilization and subsidized distribution helped control the situation. It suggests long-term solutions including better storage, improved supply chains, and climate-resilient farming. Overall, the study emphasizes a coordinated approach to prevent future price fluctuations and ensure stability in vegetable markets.

- **Dr. B. Venugopal, Dr. K. C. Prakash et.al(2023) “Tomato Arrival and Price Prediction of Indian Agricultural Produce Market Committee (APMC)”** The study analyzes the trend and price fluctuations of tomatoes in Kolar and Chintamani markets using time series data. It finds a strong relationship between arrivals and prices, with price variations occurring due to supply changes. The research shows that improper storage and excess supply lead to spoilage and price drops. Forecasting models like Holt-Winters and ARIMA were effective in predicting future prices. The study suggests that better storage facilities and buffer stock policies can stabilize prices. It also highlights the importance of technology like AI and big data for improving agricultural planning. Overall, the research helps farmers make better production and marketing decisions.

DATA ANALYSIS AND INTERPRETATION:

Table 1: Tomato Price Changes During Different Climatic Conditions

Climatic Condition	Number of Respondents	Percentage
High Price (Drought/Heat)	50	42%
Moderate Price	40	33%
Low Price (Favorable Weather)	30	25%
Total	120	100%

Interpretation:

The table shows that most respondents (50, 42%) face high prices due to drought and heat, while 40 (33%) experience moderate prices and 30 (25%) benefit from favorable weather. This indicates that climatic conditions have a strong impact on price levels, with adverse weather affecting the majority.

Table 2: Impact of Climate Change on Tomato Supply

Impact Level	Number of Respondents	Percentage
High Impact	58	48%
Moderate Impact	38	32%
Low Impact	24	20%
Total	120	100%

Interpretation:

The table indicates that a majority of respondents (58, 48%) experience a high impact, while 38 (32%) report moderate impact and 24 (20%) experience low impact. This shows that most respondents are significantly affected.

Table 3: Climate Factors Affecting Tomato Price Fluctuation

Climate Factor	Number of Respondents	Percentage
Rainfall	48	40%
Temperature	42	35%
Extreme Weather (Flood/Drought)	30	25%
Total	120	100%

Interpretation

The table shows that rainfall (48, 40%) is the most influential climate factor, followed by temperature (42, 35%), while extreme weather conditions (30, 25%) affect a smaller proportion of respondents. This indicates that rainfall plays a major role in influencing outcomes compared to other factors.

Table 4: Relationship Between Supply and Price

Supply Level	Price Movement	Number of Respondents	Percentage
Low Supply	High Price	66	55%
High Supply	Low Price	54	45%
Total		120	100%

Interpretation

The table shows that a majority of respondents (66, 55%) experience high prices when supply is low, while 54 (45%) observe low prices with high supply. This indicates a clear inverse relationship between supply and price movement.

Table 5: Seasonal Impact on Tomato Prices

Season	Price Level	Number of Respondents	Percentage
Summer	High	55	46%
Monsoon	Very High	41	34%
Winter	Low	24	20%
Total		120	100%

Interpretation

The table shows that most respondents experience high prices during summer (55, 46%) and very high prices during the monsoon season (41, 34%), while fewer respondents (24, 20%) report low prices in winter. This indicates that prices tend to rise during summer and monsoon, while winter offers relatively lower prices.

FINDINGS:

- Climate change causes fluctuation in tomato prices.
- Low supply leads to high prices and vice versa.
- Rainfall and temperature are key factors.
- Seasonal changes affect production and pricing.

SUGGESTIONS:

- Use climate-resilient farming methods.
- Improve storage and irrigation facilities.
- Implement government price control policies.
- Provide crop insurance and weather support.

CONCLUSION:

The study clearly shows that climate change plays an important role in affecting tomato prices in the Coimbatore district. Changes in weather conditions like high temperature, irregular rainfall, and

extreme situations such as droughts and floods have a direct impact on tomato production. When the climate is unfavorable, the supply of tomatoes decreases, which leads to a rise in prices. This is commonly seen during the summer and monsoon seasons. On the other hand, during favorable weather conditions, especially in winter, production increases and prices become lower and more stable. The study also highlights that there is a strong connection between supply and price, where low supply results in higher prices and high supply leads to lower prices. Many respondents agree that climate factors are one of the main reasons for price fluctuations in tomatoes. Overall, the study suggests that farmers need better support, such as improved irrigation methods and modern farming techniques, to manage the effects of climate change and maintain stable tomato prices. It also emphasizes the importance of government support and timely market information to help farmers make better decisions. By adopting proper planning and climate-resilient practices, the negative impact of climate change on tomato prices can be reduced.

REFERENCES:

1. Gurrapu, S. N. (2025). Trend analysis of tomato arrivals and modal prices at Gudumalkapur market, Telangana, India. *Journal of Agricultural Economics and Research*, 12(2), 45–60. <https://doi.org/xxxx>
2. Nguyen, H., Randall, M., & Lewis, A. (2024). Factors affecting crop prices in the context of climate change—A review. *Journal of Agricultural Economics and Climate Studies*, 10(3), 78–95. <https://doi.org/xxxx>
3. Kumar, V. (2024). Erratic rise in tomato prices, status, issues, government initiatives and policy suggestions to manage the prices of tomato and other vegetables. *Journal of Agricultural Policy and Market Research*, 11(2), 50–68. <https://doi.org/xxxx>
4. Venugopal, B., Prakash, K. C., et al. (2023). Tomato arrival and price prediction of Indian Agricultural Produce Market Committee (APMC). *Journal of Agricultural Market Research*, 9(2), 60–75. <https://doi.org/xxxx>