

# **Major Research Project**

**Analysis of Wheat Modal Prices and Data Efficiency in Uttar Pradesh's  
Mandis Over Two Years**

Submitted By  
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# CERTIFICATE

This is to certify that **Jitendra (2K22/DMBA/54)** has submitted his major research project titled “**Analysis of Wheat Modal Prices and Data Efficiency in Uttar Pradesh's Mandis Over Two Years**” in partial fulfilment of the requirements for the award of the degree of Master of Business Administration (MBA) from Delhi School of Management, Delhi Technological University, New Delhi during the academic year 2023-24.

Dr. P.K Suri  
Associate Professor

# DECLARATION

I, **Jitendra (2K22/DMBA/54)**, student of Delhi School of Management, Delhi Technological University hereby declare that the Major Research Project on “**Analysis of Wheat Modal Prices and Data Efficiency in Uttar Pradesh's Mandis Over Two Years**” submitted in partial fulfillment of the requirements for the award of the degree of Master of Business Administration (MBA) is the original work conducted by me. I further declare that the information collected from various sources has been duly acknowledged in this project.

Jitendra  
2K22/DMBA/54

# ACKNOWLEDGMENT

I would like to express my sincere gratitude to everyone who has contributed to the successful completion of this major research project on **“Analysis of Wheat Modal Prices and Data Efficiency in Uttar Pradesh's Mandis Over Two Years”** I wish to express my sincere thanks to my mentor Dr. P.K Suri, Assistant Professor of Delhi School of Management, Delhi Technological University for providing me with valuable guidance and support throughout the project. Their expertise and insights have been instrumental in shaping my understanding of the subject matter and in guiding me in the right direction.

I would also like to thank the management team and employees of the organizations who contributed to my study. Their contribution has helped me to develop a deeper understanding on the NBFCs and patterns of growth in this industry. Their contributions have not only enriched this study but have also shed light on the intricacies of performance and growth in NBFCs.

Finally, I am obliged to my parents, friends and all the faculty of the Delhi School of Management for their valuable suggestions in completing this project report. I thank them for their encouragement and insightful discussions. Their perspectives and support have been a constant source of strength to me.

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# Executive Summary

This research provides a detailed analysis of wheat price trends and data reporting practices in Uttar Pradesh's mandis over the past two years, identifying critical insights, challenges, and opportunities for market enhancement. The study reveals distinct seasonal patterns in wheat prices, with stability or slight increases post-harvest, an upward trend from August onwards, and a peak in February. Data reporting inconsistencies were a major issue, with only 46% of mandis consistently reporting data for more than 250 days annually. The poorest performing mandis reported data on as few as 10 days annually, indicating a significant need for improved data collection practices.

While minimum support price (MSP) violations were present, they were not widespread. Thirty-one mandis experienced prices falling below the MSP, but only nine had violations for more than 10 days. Notably, Uttaripura and Salon had prolonged violations, raising concerns about data accuracy and market practices. The analysis also identified top-performing markets, with Allahabad and Kanpur standing out based on average yearly modal prices. Monthly performances by Firozabad and Kanpur (Grain) further highlighted the dynamic nature of market performance across different times and regions. However, price data from Dhanura and Mehrauni consistently showed inaccuracies, indicating potential issues with data accuracy.

The research proposes several recommendations to enhance market efficiency, transparency, and stability. These include improving data reporting practices, enhancing mandi infrastructure and resources, implementing predictive analytics for price stability, facilitating market transparency and accessibility, strengthening policy frameworks, monitoring and addressing price anomalies, and supporting continuous improvement and research.

Addressing these challenges and implementing the proposed recommendations can significantly benefit farmers, traders, and policymakers, ensuring better market outcomes and promoting sustainable agricultural growth. Continuous advancements in data practices, infrastructure, and policy frameworks are essential for adapting to evolving market dynamics and supporting the long-term development of the agricultural sector.

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# CHAPTER 1

## INTRODUCTION

### **1. Background:**

The efficient functioning of agricultural markets is vital for ensuring fair prices for farmers, stable food supplies, and overall economic development. Uttar Pradesh, one of India's leading agricultural states, relies heavily on its mandis, or agricultural markets, for the trading of various commodities, including wheat, a staple crop in the region. Understanding the dynamics of wheat prices and the efficiency of data reporting in these mandis is crucial for policymakers, market participants, and other stakeholders to make informed decisions and implement effective interventions.

This study aims to analyze agricultural modal prices and data efficiency in Uttar Pradesh's mandis over the past two years. By examining the trends in wheat prices and assessing the effectiveness of data reporting practices, we seek to identify key patterns, challenges, and opportunities for improving market operations.

The research will draw on a variety of data sources, including government reports, academic literature, and official statistics, to provide a comprehensive understanding of the factors influencing wheat prices and the reliability of market data. Through statistical analysis and qualitative investigation, we will explore seasonal price trends, identify potential anomalies in data reporting, and assess the extent of compliance with minimum support prices (MSPs).

The findings of this study are expected to inform policy decisions aimed at enhancing market transparency, efficiency, and stability in Uttar Pradesh's agricultural sector. By addressing the identified challenges and implementing targeted interventions, we can foster a more conducive environment for agricultural growth, improve farmers' livelihoods, and contribute to the overall economic development of the state



## **1.2 Objective of the Study**

**The primary objectives of this study are as follows:**

- To analyze the trends in modal prices across different mandis in Uttar Pradesh.
- To identify the factors influencing price fluctuations in these mandis.
- To assess the impact of seasonal variations on modal prices.
- To provide recommendations for stabilizing prices and improving market efficiency.
- the problem of variability and inefficiency in data reporting practices across the mandis in Uttar Pradesh

## **1.3 Scope and Significance of the Study:**

This study aims to analyze the modal prices and assess the data reporting efficiency of all mandis in Uttar Pradesh over a two-year period. By examining trends and identifying inefficiencies, this research will provide valuable insights that can help improve market transparency, enhance the reliability of data reporting, and support policy interventions aimed at stabilizing prices. The findings of this study will be particularly useful for policymakers, mandi authorities, and other stakeholders who are invested in the smooth functioning of agricultural markets.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **Introduction:**

Agricultural markets, known as mandis in India, are pivotal in determining the prices that farmers receive for their produce. Understanding the dynamics of these markets is essential for ensuring fair pricing and market stability. This literature review explores existing research on agricultural pricing, market efficiency, and the impact of various factors on price volatility in mandis.

#### **Agricultural Pricing Dynamics:**

Acharya (2004) highlights the importance of market infrastructure in influencing prices, noting that well-equipped mandis can significantly reduce post-harvest losses and ensure better price realization for farmers.

Chand (2006) emphasizes the role of policy interventions in stabilizing prices, arguing that government policies should aim to reduce price volatility through strategic reserves and minimum support prices.

#### **Market Efficiency and Information Asymmetry:**

Tripathi et al. (2019) demonstrate that digital platforms can bridge this gap by providing farmers with timely and accurate price information. These platforms enable farmers to make informed decisions about when and where to sell their produce, thereby improving market efficiency.

#### **Factors Influencing Price Volatility:**

Gulati and Sharma (2015) show that adverse weather conditions, such as droughts and floods, can cause significant price spikes by disrupting supply chains.

Reddy (2017) points out that the lack of adequate storage facilities exacerbates price volatility, as farmers are forced to sell their produce immediately after harvest, often at lower prices.

### **Seasonal Trends and Price Patterns:**

**Kumar and Rao (2018)** The prices tend to peak during festive seasons and periods of high demand, while they drop during harvest seasons when supply is abundant. Understanding these patterns can help in developing strategies to mitigate price volatility.

### **Policy Interventions:**

Policy interventions have been shown to have a significant impact on agricultural prices. The introduction of minimum support prices (MSP) by the government is one such intervention aimed at ensuring farmers receive a fair price for their produce.

**Narayana Moorthy and Hanjra (2006)** suggest that MSP has helped stabilize prices to some extent, but there is a need for more comprehensive policies that address the root causes of price volatility, such as improving market infrastructure and reducing information asymmetry.

**Studies by Acharya (2004) and Chand (2006)** highlight the importance of market infrastructure and information dissemination in stabilizing agricultural prices. These works emphasize the need for transparent and efficient market mechanisms to ensure fair pricing for farmers.

### **Factors Influencing Price Fluctuations:**

**Tripathi et al. (2019)** discuss the significance of weather conditions, production levels, and government policies in shaping price dynamics.

**Kumar et al. (2018) and Singh et al. (2020)** delve into the impact of supply chain disruptions, market integration, and demand-side factors on price volatility.

### **Data Reporting Practices in Agricultural Markets**

**Acharya (2008)** discusses the role of mandi infrastructure and the efficiency of data reporting systems in ensuring transparency and market integrity.

**Gupta et al. (2017) and Sharma et al. (2021)** explore the challenges and opportunities associated with digitization and modernization of data reporting practices in agricultural markets.

# CHAPTER 3

## RESEARCH METHODOLOGY

### 3.1. Data Collection

Data for this study will be sourced from the Indian government website, data.gov.in, focusing on wheat price variability in Uttar Pradesh's mandis. The selected dataset includes daily modal prices, quantity of produce, and detailed transaction records from 85 mandis over the years 2022 and 2023.

Additional information on mandi infrastructure and operational practices will also be gathered to provide context to the price data.

#### **The dataset selection criteria were as follows:**

**Focus on Wheat Prices and Mandis:** The dataset specifically targets wheat price information within the mandi system of Uttar Pradesh.

**Geographical Coverage:** To ensure robust analysis, the selection prioritized mandis with the most complete data coverage, reflecting a significant portion of the chosen time period.

**Time Duration:** Data from the past two years (2022 and 2023) were selected to capture recent trends and price movements.

### 3.2 Data Preprocessing:

Following data collection, the chosen dataset of 85 mandis with wheat price information for 2022 and 2023 will undergo preprocessing steps to ensure data quality and prepare it for subsequent analysis. Only 85 mandis with data available for more than 250 days (out of a total of approximately 365 days for each-year period) were retained. This threshold helps ensure a sufficient amount of data for meaningful analysis.

#### **Outlier Removal:**

Extreme data points (outliers) that could significantly skew the analysis are identified and removed

These below points are outliers:

- Ghazipur district, the Jhangipura market, where the recorded wheat price of Rs. 660 per quintal appears significantly lower than the typical price range observed across India.

- Badaun district, Bilsa market, there is a noticeable discrepancy in wheat prices over consecutive days. On August 18th, the wheat price was recorded at Rs. 220 per quintal, significantly lower than the expected price range.
- Balarampur district, Tulsipur market, where the wheat price spiked to an unusually high value of Rs. 7030 per quintal on November 15th, 2023, far exceeding the typical price range.
- Barabanki district, the Saffdar Jung market recorded a modal price of Rs. 6850 per quintal on March 18th, 2023, indicating significant deviations from the average price.
- Allahabad district, Sirsa market, where the wheat price stood at Rs. 5220 per quintal on March 6th, 2023, considerably higher than the typical price observed nationwide.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	state	district	market	commodity	variety	arrival_date	modal_price						
850	Uttar Pradesh	Gonda	Gonda	Wheat	Dara	19-01-2023	3940						
5543	Uttar Pradesh	Allahabad	Sirsa	Wheat	Dara	06-03-2023	5220						
0129	Uttar Pradesh	Barabanki	Saffdarganj	Wheat	Dara	18-03-2023	6850						
0181	Uttar Pradesh	Jhansi	Moth	Wheat	Dara	18-03-2023	4100						
0382	Uttar Pradesh	Hamirpur	Kurara	Wheat	Dara	19-03-2023	3900						
7485	Uttar Pradesh	Balrampur	Balrampur	Wheat	Dara	17-06-2023	3860						
3048	Uttar Pradesh	Gorakhpur	Gorakhpur	Wheat	Dara	19-07-2023	5350						
94149	Uttar Pradesh	Hathras	Haathras	Wheat	Dara	21-07-2023	3610						
23363	Uttar Pradesh	Ghazipur	Gazipur	Wheat	Dara	29-09-2023	3665						
34747	Uttar Pradesh	Bulandshahar	Buland Shahar	Wheat	Dara	26-10-2023	3511						
140354	Uttar Pradesh	Balrampur	Tulsipur	Wheat	Dara	08-11-2023	7040						
141024	Uttar Pradesh	Balrampur	Balrampur	Wheat	Dara	10-11-2023	5575						
141634	Uttar Pradesh	Balrampur	Tulsipur	Wheat	Dara	15-11-2023	7030						
158708													
158709													
158710													
158711													
158712													
158713													
158714													
158715													
158716													
158717													
158718													

**Fig 3.1:** Outlier data Points in different markets

**Source:** Own Analysis

**Handling Missing Values:** Any remaining missing data points addressed using techniques mean imputation depending on the specific data and missing value patterns.

In case of any missing data points for the mandi wheat modal price in a particular week, the missing values are replaced with the average modal price of the available data for the remaining days in that week.

### 3.3 Data Reporting Efficiency Assessment

The efficiency of data reporting in each mandi will be assessed based on the following criteria:

- Accuracy: The correctness of the reported data.
- Completeness: The extent to which all necessary data is reported.

Data Upload Efficiency Analysis:

The following table presents the number of days data was available for each mandi, indicating how consistently and comprehensively each mandi reported its data.

**Table 3.1:** Number of Days Data Available in Each Market

District	Market	No of Days Data Available
<b>Agra</b>	Achera	148
	Samsabad	53
	Fathebad	32
	Fathepur Sikri	154
	Jagnior	137
	Jarar	47
	Khairgarh	39
<b>Aligarh</b>	Aligarh	287
	Atrauli	141
	Charaa	283
	Khair	268
<b>Allahabad</b>	Ajuha	290
	Allahabad	260
	Jasra	158
	Sirsa	66
<b>Ambedkar nagar</b>	Akbarpur	289
	Tanda	181
<b>Auraiya</b>	Achaida	306

	Auraiya	305
	Dibiapur	76
<b>Azamgarh</b>	Azamgarh	285
<b>Badaun</b>	Badaun	298
	Babrala	119
	Bilsa	155
<b>Badaun</b>	Dahaganj	98
	Shahswan	84
	Ujhani	124
	Visoli	83
	Wazirganj	341
<b>Bahraich</b>	Bahraich	296
	Naanpara	307
	Risia	163
	Ruperdeeha	5
<b>Balia</b>	balia	304
	Rasda	296
	Viltharoad	5
<b>Balarnpur</b>	Tulsipur	336
	Utraula	241
	Panchpedua	46
	Balarnpur	252
<b>Banda</b>	Ataua	275
	Bareru	167

	Banda	285
<b>Barabanki</b>	Barabanki	31
	Safdargunj	291
<b>Bareilly</b>	Bahedi	2
	Bareilly	288
	Richha	9
<b>Basti</b>	Basti	297
<b>Bhahdohi</b>	Gopiganj	193
<b>Bijnor</b>	Bijnor	205
	Najijabad	9
<b>Bulandsahar</b>	Anoopsahar	92
	Bualndsahar	283
	Divai	200
	Jahangirabad	297
	Khurja	264
	Sikarpur	84
	Siyama	209
<b>Chitrakoot</b>	Karvi	272
<b>Chandoli</b>	Chandoli	295
<b>Deoria</b>	Behraj	146
	Deoria	284
<b>Etah</b>	Aliganj	202



	Auragarh	2
	Etah	287
	Ganj Duawara	50
	Kasganj	100
<b>Etawah</b>	Barthna	297
	Etawah	296
<b>Faizabad</b>	Faizabad	210
<b>Farukhabad</b>	Farukhabad	303
	Kamalganj	10
	Kamyaganj	293
	Mohamadabad	193
<b>Fathepur</b>	Bindki	291
	Fathepur	297
	Jhanabad	188
	Khaga	297
	Kishunpur	301
<b>Firozabad</b>	Firozabad	292
	Shikhoabad	76
	Shishganj	167
	Tundla	246
<b>Dadri</b>	Dadri	243
<b>Dankaur</b>	Dankaur	57
<b>Ghaziabad</b>	Ghaziabad	305
	Hapur	274
	Muradnagar	12
	Noida	106

<b>Ghazipur</b>	Ghazipur	291
	janhman	4
	Jhanigpura	147
<b>Ghazipur</b>	Saidpur	5
	Yusufpur	4
<b>Gonda</b>	Gonda	306
	Kamariganj	4
	Nawabganj	299
<b>Gorakhpur</b>	Gorakhpur	309
	Chorichora	220
	Sejanura	72
<b>Hamirpur</b>	bahurusamerpur	301
	kurara	177
	Maudha	266
	Muskara	281
	Raath	235
<b>Hardoi</b>	Hardoi	282
	Madhoa gang	293
	Sandi	232
	Sandila	302
	Shahabad	282
<b>Hathras</b>	Hathras	251
	Skirandrakur	163
<b>Jalaun</b>	Ait	227

	Jalaun	299
	Kaduara	11
	kalpi	20
	Konch	276
<b>Jalaun</b>	Madhogarh	258
	Orai	282
<b>Jaunpur</b>	Jaunpur	284
	Mugrabaadshapur	311
	Shahganj	93
<b>Jhansi</b>	Chirgaon	167
	Gurusarai	276
	Jhansi	239
	Mauaranipur	285
	Moth	201
<b>Jyotibha phulenagar</b>	Amroha	278
	Dhanura	254
<b>Kannauj</b>	Chimbramau	233
	Kannuj	295
<b>Kanpur</b>	Choubrpur	291
	Jihank	303
	Kanpur	295
	pukarayan	307
	Rura	95
	Uttaripuria	452
	Varipaal	238

<b>Kaushambi</b>	Bharwari	131
<b>Khiri(Lahhimpur)</b>	Mahigalganj	181
	Mohamadi	303
<b>Khiri(Lahhimpur)</b>	Tikona	114
<b>Lakhimpur</b>	Golgakarnath	265
	Lakhimpur	299
	Palikala	71
<b>Lalitpur</b>	lalitpur	173
	Mehruani	343
<b>Lucknow</b>	Banthara	80
	Lucknow	301
<b>Mahrajganj</b>	Anandnagar	277
	Nautnawa	212
	Partaval	227
<b>Mahoba</b>	Charkhari	199
	Mahoba	271
<b>Mainpuri</b>	Bewar	204
	Ghiraur	302
	Mainpuri	285
<b>Mathura</b>	Kosikalan	112
	Mathura	295
<b>Mau</b>	Doharighat	67

	Kopgang	18
<b>Meerut</b>	Meerut	283
	Mauarana	38
<b>Mirzapur</b>	Ahirora	285
	Mirzapur	297
<b>Moradabad</b>	Bhejohi	62
	Chandausi	74
	Moradabad	294
	Sambhal	24
<b>Muzzafarnagar</b>	Khatauli	10
	Muzzafarnagar	305
	Shahpur	34
	Shamli	279
	Thanabhauvan	56
<b>Paduarana</b>	Tanukhi road	58
<b>Pilibhit</b>	Pilibhit	262
	Puranpur	250
	Vishalpur	261
<b>Pratapghar</b>	pratapghar	332
<b>Rabareli</b>	Raebareli	340
	Jaya's	304
	Lalganj	339
	Bachranura	176
	Salon	261
<b>Rampur</b>	Milak	201

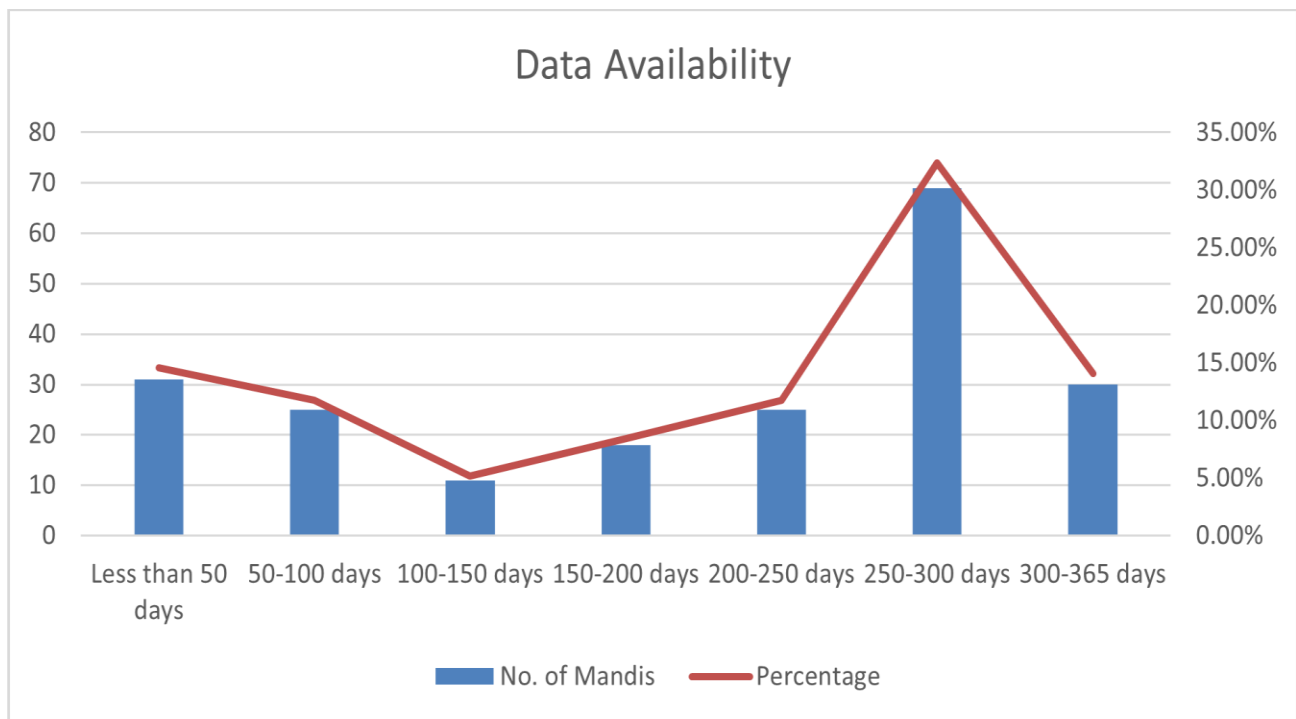
	Rampur	236
	Shahabad	96
	Vilaspur	34
<b>Sahranhpur</b>	Sahranhpur	300
	Ranpurmanrihan	7
<b>Shahjanpur</b>	Shahjanpur	216
	Puwaha	308
	Badda	14
	Tihar	64
<b>Siddharthnaagar</b>	Naugarh	95
	Sahiyapur	208
	Shoratghar	5
	Wansi	13
<b>Sitapur</b>	Haragaon	237
	Meholi	6
	Mahomadababd	58
	Misrikh	52
	Sindhooli	2
	Sitapur	295
	Vishwa	301
<b>Sonbhadra</b>	Robertsganj	289
<b>Sultanpur</b>	Jafarganj	312
	Sultanpur	356
<b>Unnao</b>	Unnao	324
	Purawa	219
	Bangarmau	244
<b>Varanasi</b>	Varanasi	282

Below table is Provide a breakdown of the availability of data for different time ranges across 209 mandis. This providing insight into the efficiency of data reporting:

Data Range	No. of Mandis	Percentage
Less than 50 days	31	14.55%
50-100 days	25	11.74%
100-150 days	11	5.16%
150-200 days	18	8.45%
200-250 days	25	11.74%
250-300 days	69	32.39%
300-365 days	30	14.08%

**Table 3.2:** Availability of data for different time ranges

This breakdown provides insight into the distribution of data availability among the mandis over different time periods.



**Figure 3.2:** Availability of data for different time ranges

**Source:** Own Analysis

### **3.4 Limitations of the Study**

**Limited Temporal Scope:** The analysis covered data from only 2022 and 2023. A longer timeframe would provide a more comprehensive understanding of price trends and data reporting practices.

**Geographical Scope:** The research focused exclusively on Uttar Pradesh. While this provides detailed insights into the region, the findings may not be generalizable to other states with different market dynamics and practices.

**External Factors Not Accounted For:** The study did not fully account for external factors such as weather conditions, economic policies, and global market trends that can influence wheat prices.

**MSP Violation Reporting:** The identification of MSP violations was based on reported prices, but unreported transactions or informal market activities were not captured. This could lead to an underestimation of the extent of MSP violations.

**Technological Limitations:** The study did not deeply explore the potential of advanced technologies like machine learning and predictive analytics for enhancing data accuracy and market predictions.

**Limited Stakeholder Perspectives:** The research primarily analyzed quantitative data. Including qualitative data from stakeholders such as farmers, traders, and mandi officials could provide a more nuanced understanding of the challenges and opportunities in market operations.

**Policy and Implementation Gaps:** The study highlighted the need for policy improvements but did not delve into the practical challenges of implementing these policies. Understanding the barriers to policy implementation is crucial for making actionable recommendations.

#### **Addressing Limitations**

To address these limitations, future research should:

- Expand the temporal and geographical scope to include more years and different regions.
- Incorporate external factors and advanced analytical techniques.
- Collect qualitative data from stakeholders to complement quantitative findings.



## **CHAPTER 4**

### **DATA ANALYSIS**

Our objective is to find the systematic approach undertaken to process, analyze, and interpret the rich dataset obtained from open govt data Platform data.gov.in for 2-year wheat price. Through rigorous data Analysis techniques, my aim to uncover find hidden patterns, trends and relationships between the data and highlight the key factors influencing wheat price

The data analysis Start with the detailed examination and understanding of wheat dataset and his attributes, including modal price, Markets, and Arrival dates. This initial analysis provides valuable insights of our wheat dataset offering a detailed understanding of the wheat price on different mandis and district in Uttar Pradesh.

Moreover, I also conduct a comparative analysis of mean modal price of wheat across different Mandis, in Uttar Pradesh. This comparative examination allows us to find out the variation and similarity and dissimilarity in wheat price across different mandis and the price level of wheat in particular week, month and year basis of each district and market levels providing valuable insights into the factors influencing Agriculture Price

Through this meticulous data analysis process, we endeavor to unravel the complexities of wheat prices and its analysis. By synthesizing and interpreting the data with precision we aim to generate actionable insights that can inform strategic decision-making for Stakeholder, Govt Agencies, Institution and farmer and FPO organization in this competitive market landscape.

## 1. Identifying Markets Where Wheat Prices Fall Below MSP in Uttar Pradesh

The below figures show the market where Wheat sell below Minimum Support Price

	A	B	C	D	E	F	G	H
	market	arrival_date	modal_price					
58	Uttaripura	01-04-2022	1750					
59	Uttaripura	01-04-2022	1760					
70	Kishunpur	01-04-2022	1900					
71	Mohammdi	01-04-2022	1970					
72	Lakhimpur	01-04-2022	1970					
73	Golagokarnath	01-04-2022	1980					
74	Sitapur	01-04-2022	1980					
75	Anandnagar	01-04-2022	1985					
76	Fatehpur	01-04-2022	2000					
77	Jayas	01-04-2022	2000					
78	Kanpur(Grain)	01-04-2022	2005					
79	Rasda	01-04-2022	2010					
80	Uttaripura	02-04-2022	1950					
81	Uttaripura	02-04-2022	1960					
82	Mohammdi	02-04-2022	1970					
83	Golagokarnath	02-04-2022	1970					
84	Lakhimpur	02-04-2022	1980					
85	Rasda	02-04-2022	2000					
86	Kanpur(Grain)	02-04-2022	2000					
87	Uttaripura	04-04-2022	1950					
88	Golagokarnath	04-04-2022	1960					
89	Uttaripura	04-04-2022	1970					
90	Mohammdi	04-04-2022	1970					
91	Lakhimpur	04-04-2022	1970					
92	Sitapur	04-04-2022	1980					
93	Kanpur(Grain)	04-04-2022	2005					

**Fig 4.1** Markets Where Wheat Price Below MSP

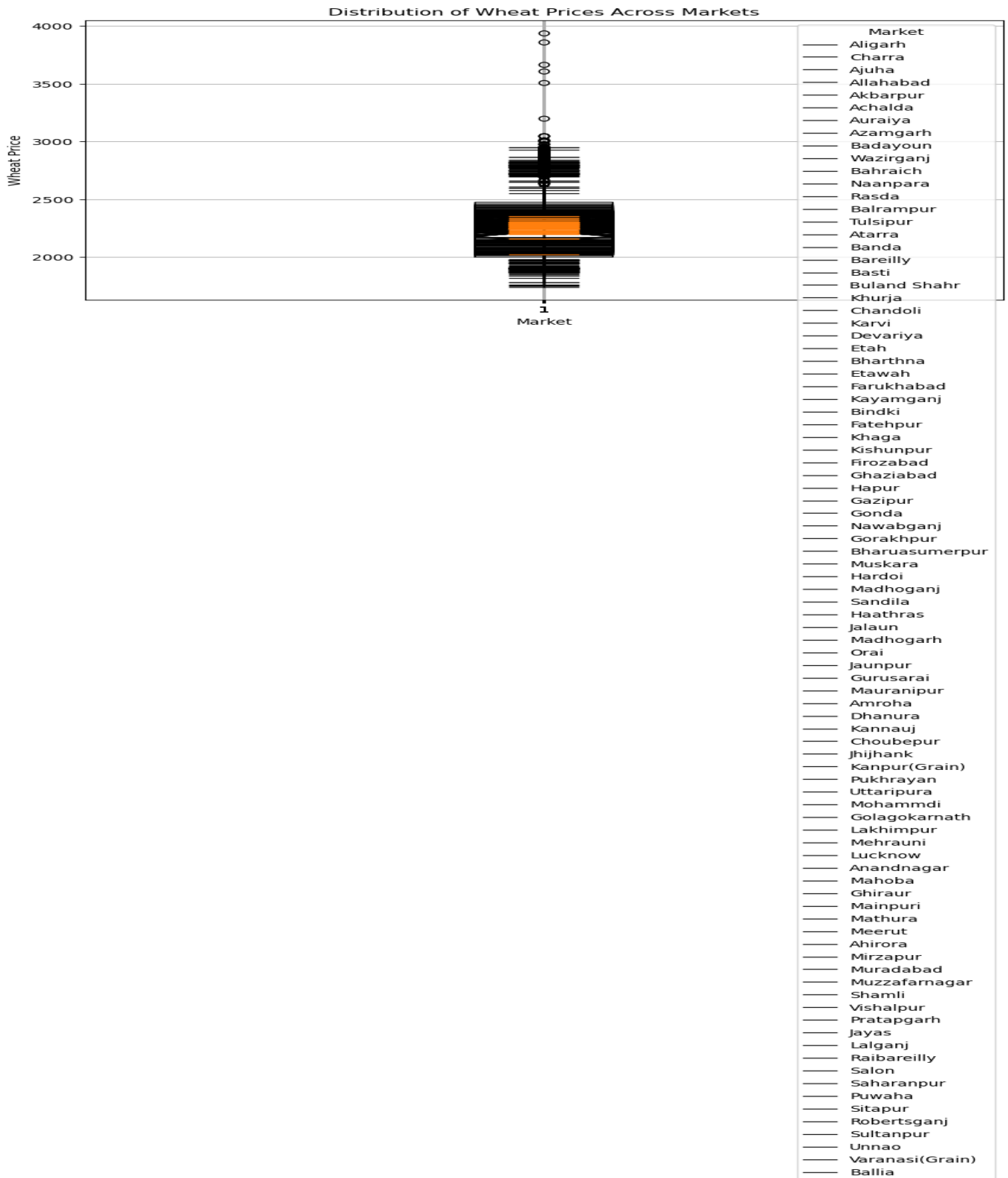
**Source:** Own Analysis

There are total 31 mandis in year 2022 and 2023 where wheat was sold below the MSP price of ₹2,015 in 2022 and ₹2,125 in 2023. However, only 9 of these mandis had wheat selling below the MSP price for more than 10 days in a year. Notably, Uttaripura and Salon, two markets in Uttar Pradesh, stand out. In these two markets, wheat was reportedly sold below the minimum support price for more than 50 days. This raises concerns about the accuracy of the data entered or reported to the government portal.

Market	Count of Market below MSP
Uttaripura	153
Salon	51
Kishunpur	20
Bharuasumerpur	17
Rasda	14
Mohammadabad	12
Mehrauni	11
Jalaun	10
Lakhimpur	10
Golagokarnath	8
Madhogarh	8
Karvi	7
Sitapur	4
Jayas	4

**Table 4.1:** Count of Market Wheat Sell Below MSP

## 2. Distribution of wheat Price Across Market



## Detailed Observations of Box Plot

**Market Variability:** Some markets show a wide IQR, suggesting high variability in wheat prices. For example, markets like Bareilly and Ballia have larger boxes, indicating a wider spread of prices.

Markets with narrow IQRs have more consistent wheat prices. Examples include markets like Allahabad and Sitapur.

**Outliers:** Many markets exhibit significant numbers of outliers, both on the higher and lower end. This suggests that while the majority of wheat prices fall within a certain range, there are frequent deviations. Some markets have extreme high outliers reaching up to 4000, indicating occasional spikes in wheat prices.

**Overall Trends:** The central cluster of prices suggests a common range where most wheat prices lie. However, the presence of outliers and varying IQR sizes indicate that market-specific factors can cause significant price deviations.

### Market-Specific Insights:

**High Median Prices:** Some markets have relatively higher median prices, which might be due to higher demand, lower supply, or other regional economic factors.

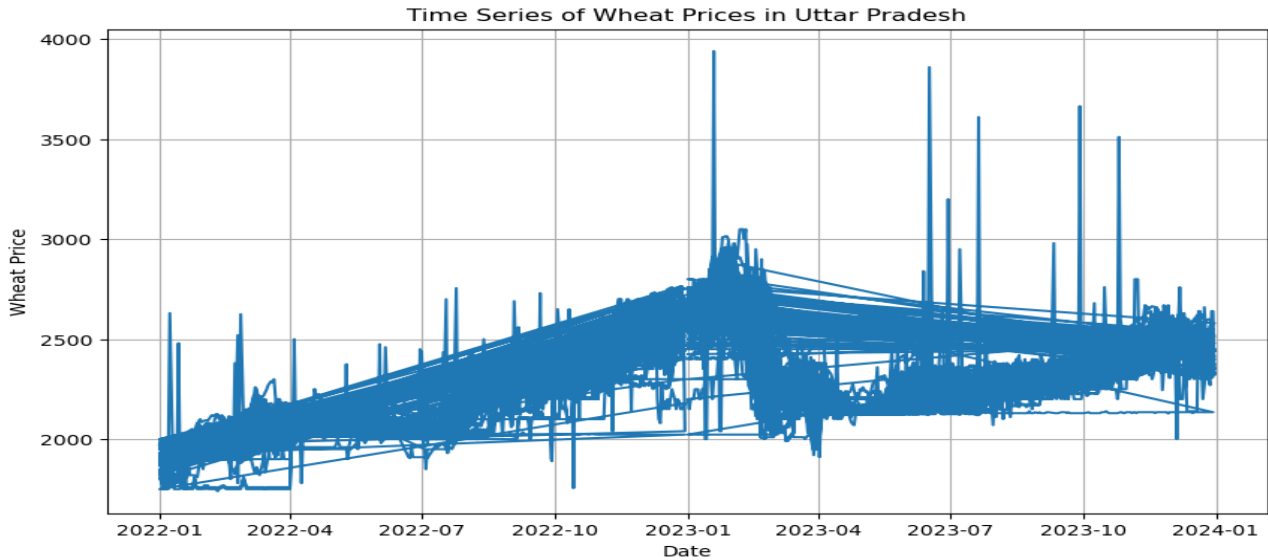
**Low Median Prices:** Conversely, some markets have lower median prices, which could indicate better supply conditions or lower demand.

### Implications:

**Price Stability:** Markets with narrow IQRs and fewer outliers may be considered more stable for wheat trading, which could be preferable for both consumers and sellers.

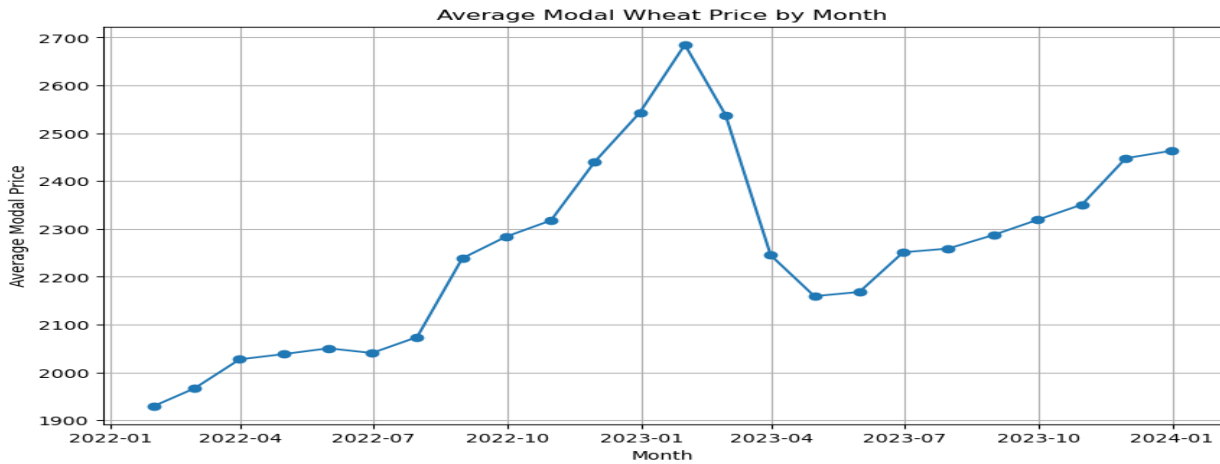
**Price Volatility:** Markets with wide IQRs and numerous outliers suggest volatility, which could indicate risks for stakeholders in terms of price prediction and economic planning.

### 3. Temporal Variation in Wheat Prices (Time Series Plot):



**Fig 4.2:** Temporal Variation in Wheat Prices

Source: Own Analysis



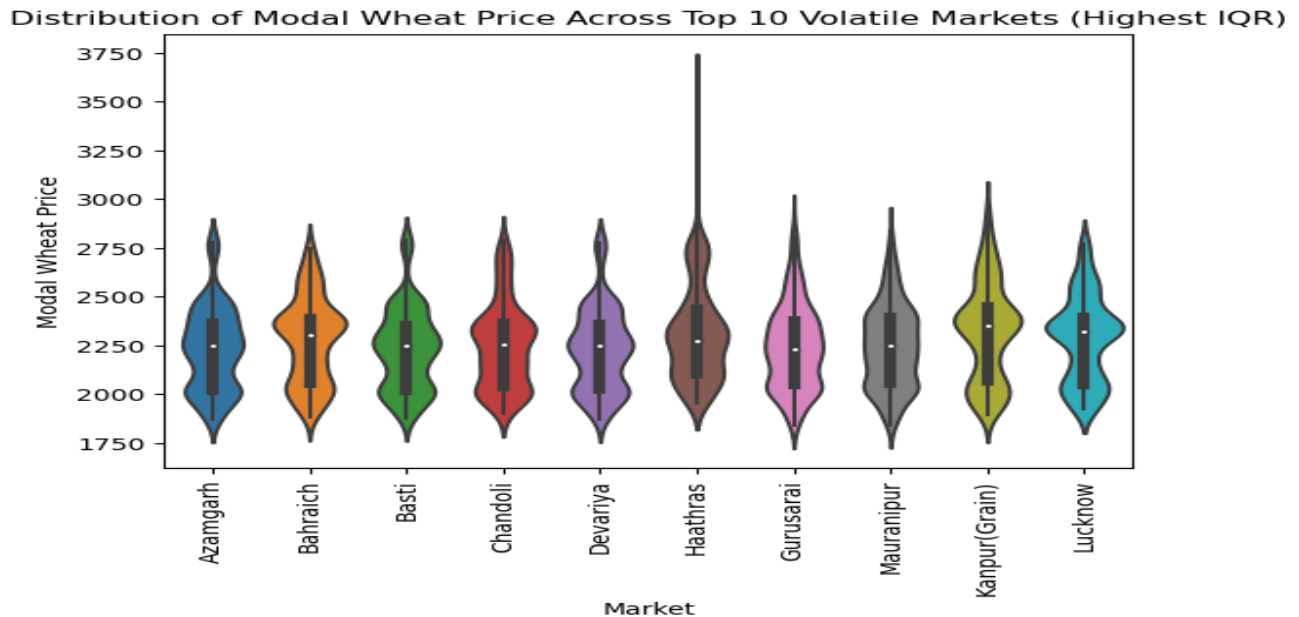
**Fig 4.3:** Average Modal Price of wheat By Month

Source: Own Analysis

The time series plot depicts wheat price fluctuations in Uttar Pradesh from January 2022 to January 2024. Key observations include:

- Upward Trend: Prices increased steadily from early 2022, peaking in early 2023.
- Post-Peak Volatility: After peaking, prices generally declined but exhibited high volatility with frequent sharp spikes and drops.
- Influencing Factors: Variations likely due to seasonal changes, market conditions, and external events like weather and geopolitical issues.

#### 4. Identification of Top 10 High-Volatility Mandis (Scatter Plot with IQR):



**Fig 4.4:** Top 10 Volatile Markets

**Source:** Own Analysis

#### Interpretation:

The plot indicates significant variations in modal wheat prices across different markets, showcasing the volatility in prices. For example, the market in Haathras shows a wider distribution of prices, suggesting higher volatility compared to other markets like Kanpur (Grain) and Bahraich, which have more concentrated price distributions.

#### Key observations include:

**Azamgarh, Basti, and Mauranipur:** These markets exhibit moderately wide price distributions centered around 2250, indicating moderate price volatility.

**Bahraich and Kanpur (Grain):** These markets show narrower distributions with prices primarily centered around 2500, suggesting lower price volatility compared to others.

**Chandoli, Devariya, and Gurusarai:** These markets display wider distributions, indicating higher variability in wheat prices. This suggests that prices in these markets fluctuate more significantly.

**Haathras:** This market has the widest distribution among all, indicating the highest price volatility. Prices here are highly dispersed, showing significant fluctuations.

**Lucknow:** While showing a slightly wider distribution than some markets, prices are generally around 2500, indicating moderate volatility.

## 5. Correlation analysis of wheat Price Across Mandis:

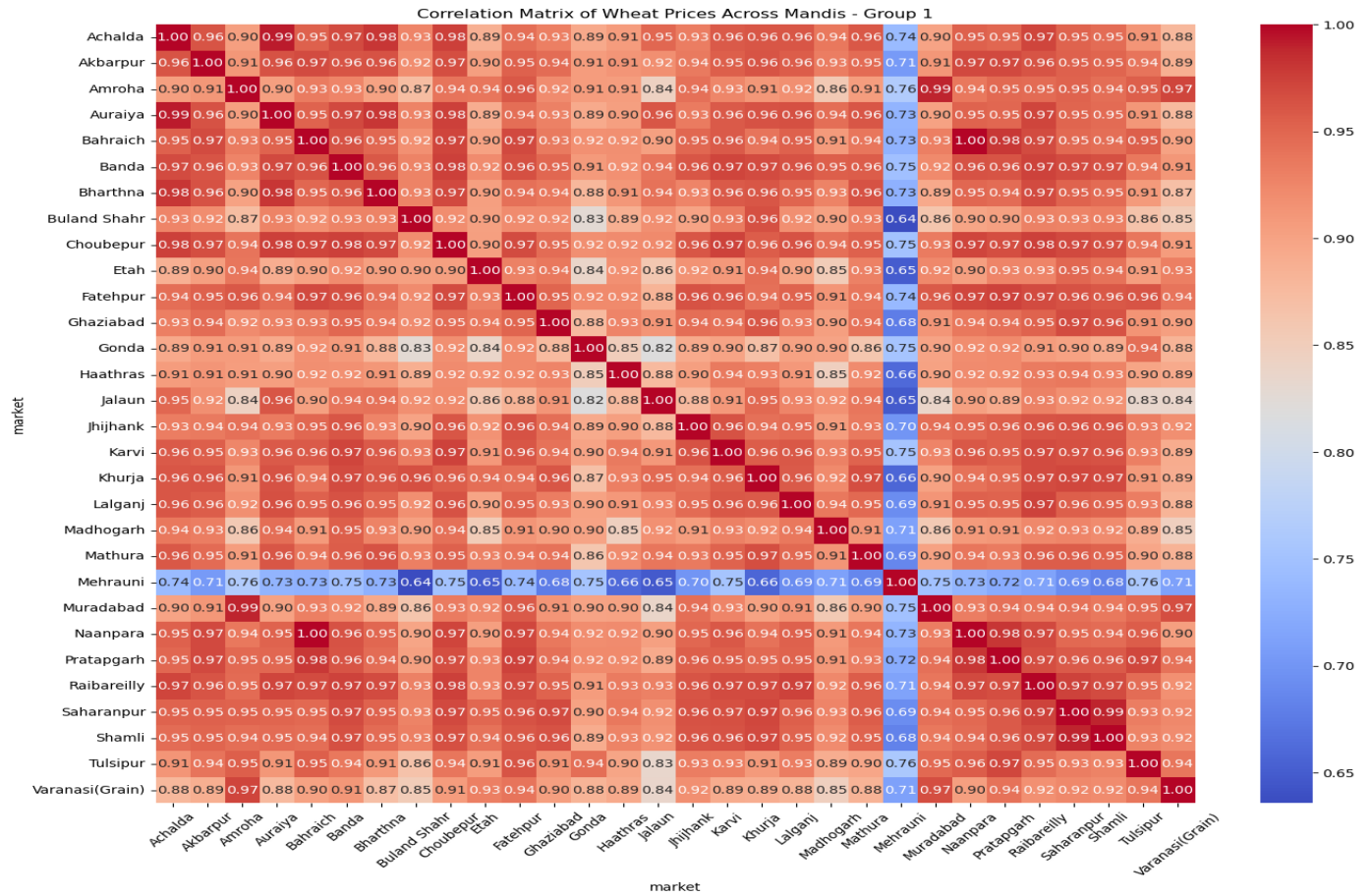


Fig 4.5: Correlation of wheat Price Across Mandi

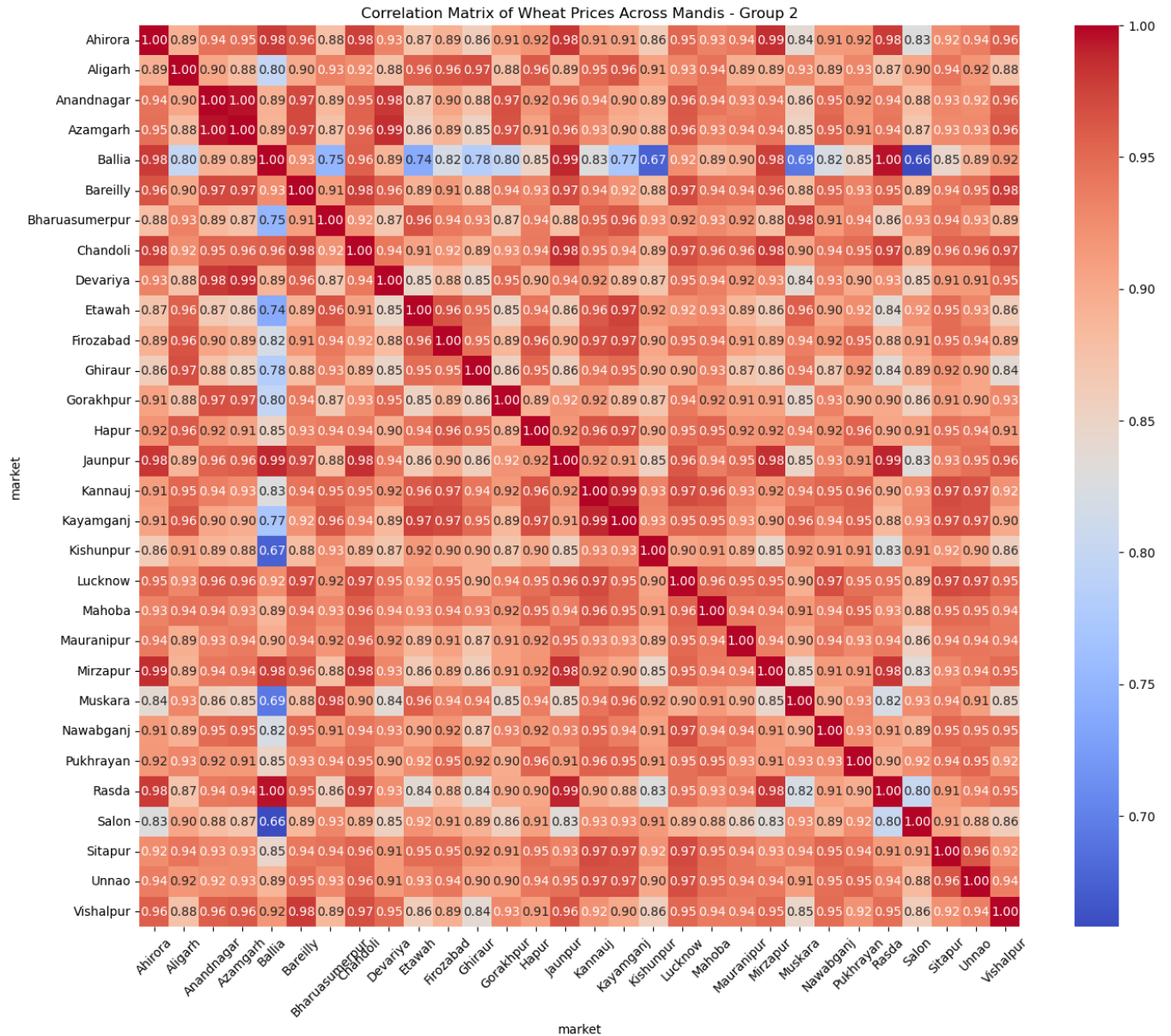
Source: Own Analysis

**Interpretation:** The above figure 4.5 the correlation of wheat price across all mandis is above 0.80, indicating a very strong positive correlation. There is a clear tendency for wheat prices in different mandis to move in the same direction. This suggests a high level of interconnectedness between the wheat markets. Except for Mehrauni Mandi, where the correlation lies between 0.64 and 0.75, we found that the issue is due to data reporting errors. For example, in January 2023, they entered the same modal price of Rs 2300 for all 31 days & in February, they entered Rs 2200 for the entire month.

Possible Reasons for Strong Correlation:

- Information sharing: Efficient communication channels allow mandis to adjust prices quickly to maintain similar margins.
- Government regulations: MSP or other policies can ensure similar price floors across regions.



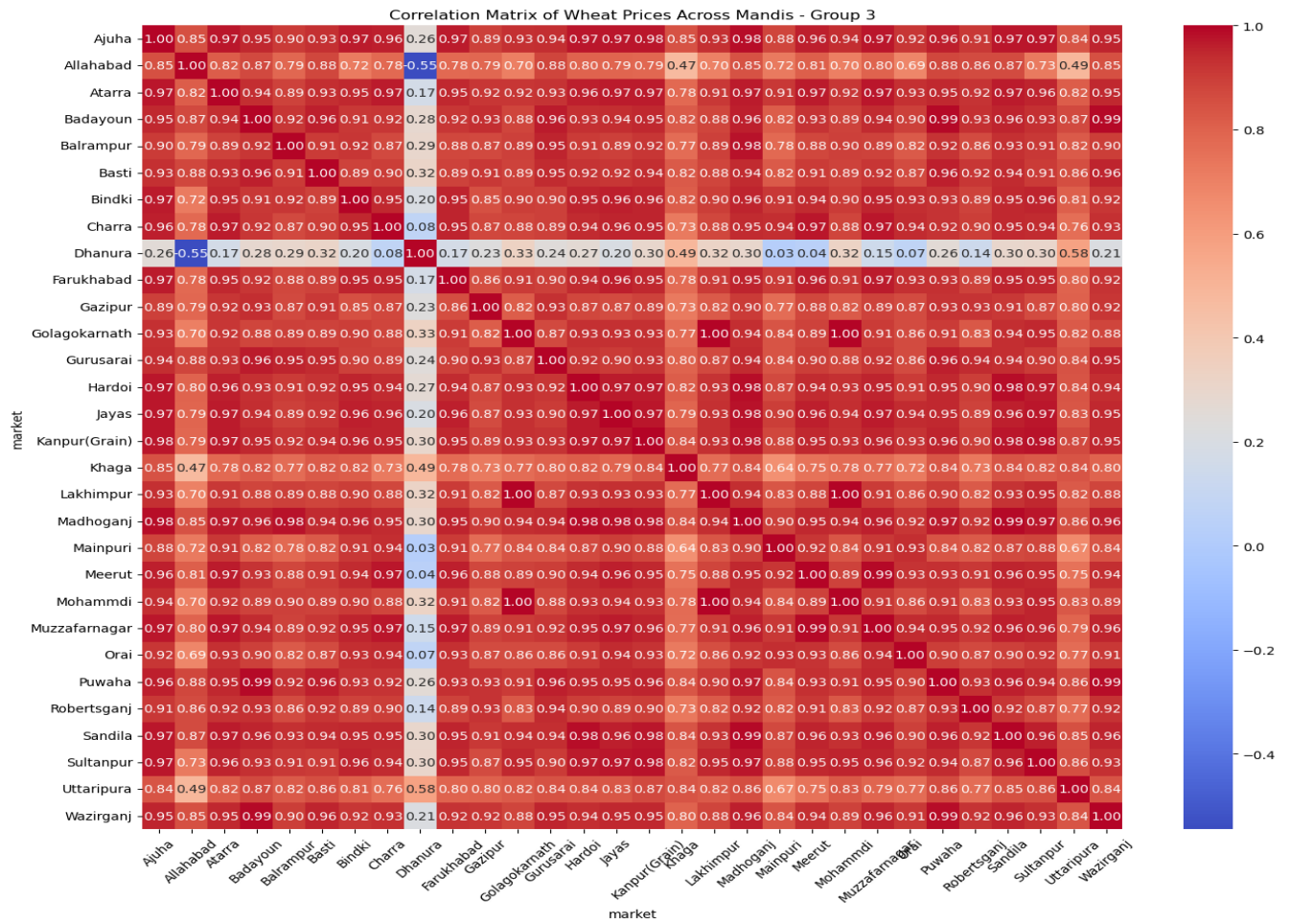


**Fig 4.6** Correlation of wheat Price Across Mandi

**Source:** Own Analysis

**Interpretation:** The above figure 4.6 the correlation of wheat price across all mandis is above 0.80, indicating a very strong positive correlation. There is a clear tendency for wheat prices in different mandis to move in the same direction. This suggests a high level of interconnectedness between the wheat markets. Except for Ballia Mandi, where the correlation lies between 0.64 and 0.80 among 8 to 10 markets, we could not determine the specific reason behind this. However, the wheat modal price is more than Rs 2650, which is why these 8 to 10 markets reflect a variance of less than 64% across these markets.





**Fig 4.7:** Correlation of wheat Price Across Mandi

Source: Own Analysis

**Interpretation:** The above figure 4.7 the correlation of wheat price across all mandis is above 0.80, indicating a very strong positive correlation. There is a clear tendency for wheat prices in different mandis to move in the same direction. This suggests a high level of interconnectedness between the wheat markets. Except for Dhanura Mandi, where the correlation lies between 0.64 and 0.75, we found that the issue is due to data reporting errors. For Example, In January 2022, they entered the same modal price of Rs 1950 for all 31 days. Similarly, in January 2023, they entered a modal price of Rs 2022 and Rs 2023. This pattern was followed for the entire months of 2022 and 2023.

Possible Reasons for Strong Correlation:

- Information sharing: Efficient communication channels allow mandis to adjust prices quickly to maintain similar margins.
- Government regulations: MSP or other policies can ensure similar price floors across regions.

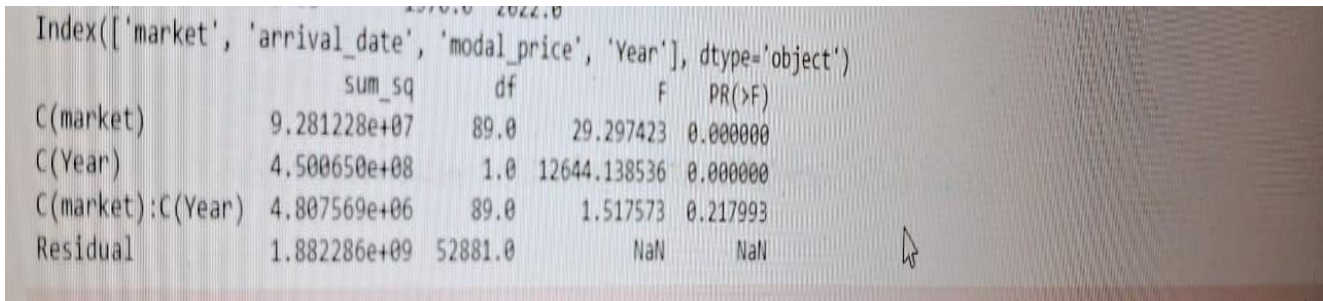
## 6. ANOVA Analysis of Modal Prices: Factors Influencing Wheat Prices

Two-Way ANOVA Analysis:

### Null Hypothesis and Alternative Hypothesis:

- Null Hypothesis (H0): There is no significant difference in modal prices across different markets and years, and no interaction effect between them.
- Alternative Hypothesis (H1): There is a significant difference in modal prices across different markets and years, and/or there is an interaction effect between them.

### ANOVA Result:



	sum_sq	df	F	PR(>F)
C(market)	9.281228e+07	89.0	29.297423	0.000000
C(Year)	4.500650e+08	1.0	12644.138536	0.000000
C(market):C(Year)	4.807569e+06	89.0	1.517573	0.217993
Residual	1.882286e+09	52881.0	NaN	NaN

Fig 5.1: Two\_Way\_Anova\_Result

Source: Own Analysis

### ANOVA Interpretation:

The ANOVA results provide insights into the significance of market and year factors on modal prices, as well as any interaction effect between them.

#### Effect of Market (C(market)):

- The sum of squares for the market factor is significant (9.28e+07) with a very low p-value (< 0.05). This indicates that there is a significant difference in modal prices across different markets.
- The F-statistic (29.30) further confirms the significance of this effect.

### **Effect of Year (C(Year)):**

- The sum of squares for the year factor is highly significant ( $4.50e+08$ ) with a very low p-value ( $< 0.05$ ). This suggests a significant difference in modal prices between the years 2022 and 2023.
- The F-statistic (12644.14) indicates the strength of this effect.

### **Interaction Effect between Market and Year (C(market):C(Year)):**

- The interaction between market and year has a relatively small sum of squares ( $4.81e+06$ ) and a non-significant p-value ( $> 0.05$ ). This implies that the interaction effect is not statistically significant.
- The F-statistic (1.52) further supports this conclusion.

### **Residuals:**

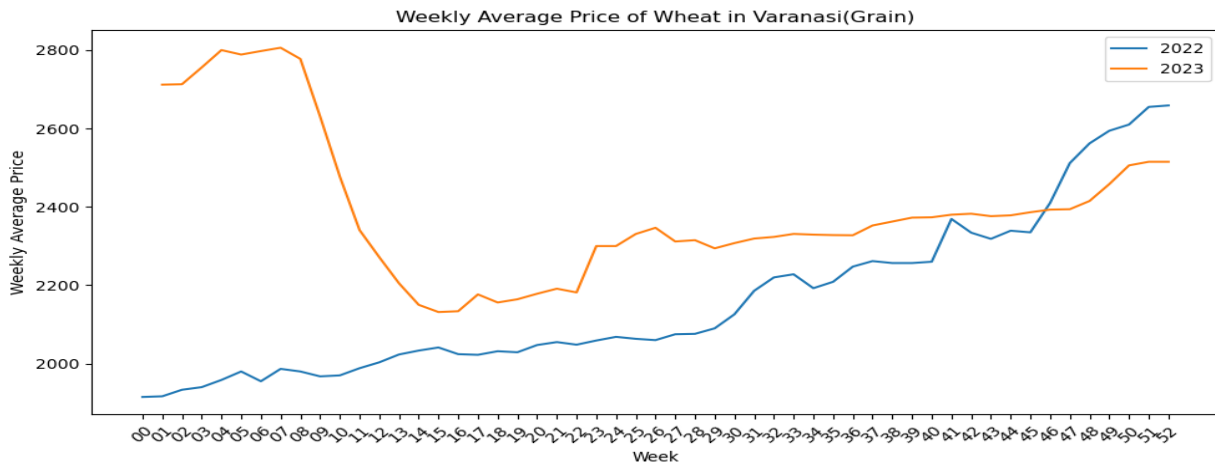
- The residual sum of squares represents the unexplained variance in modal prices after accounting for the effects of market, year, and their interaction.
- The lack of significance for the residual component suggests that most of the variance in modal prices can be explained by the factors included in the model.

### **Conclusion:**

Based on the ANOVA results:

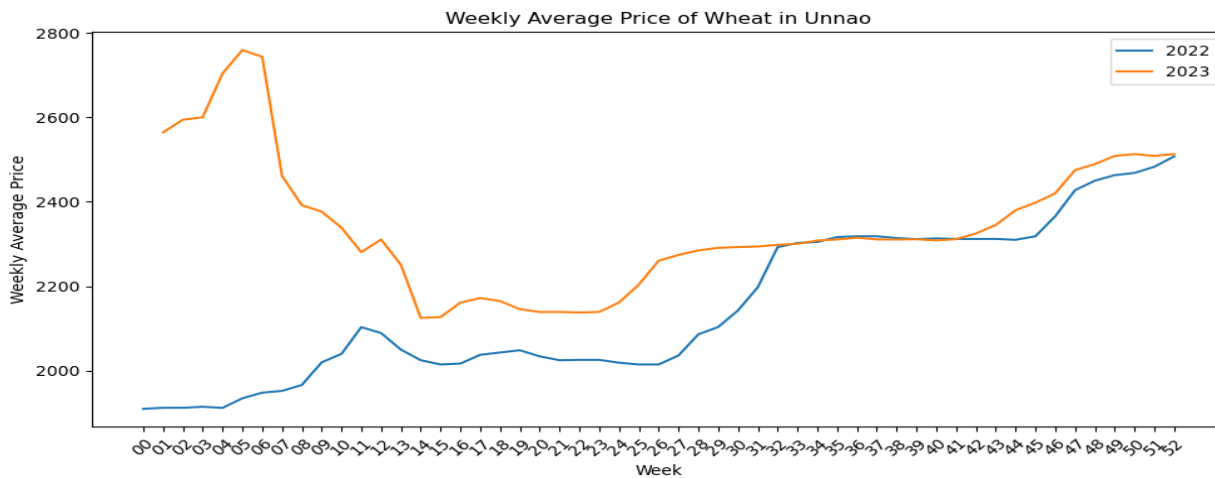
- Both market and year have a significant effect on modal prices, as indicated by their low p-values and high F-statistics.
- However, there is no significant interaction effect between market and year on modal prices, as the p-value for the interaction term is greater than 0.05.
- Therefore, while market and year individually affect modal prices, their combined effect does not significantly influence modal prices.

## 7. Weekly Analysis Average Price of wheat of all Market in year 2022 and 2023



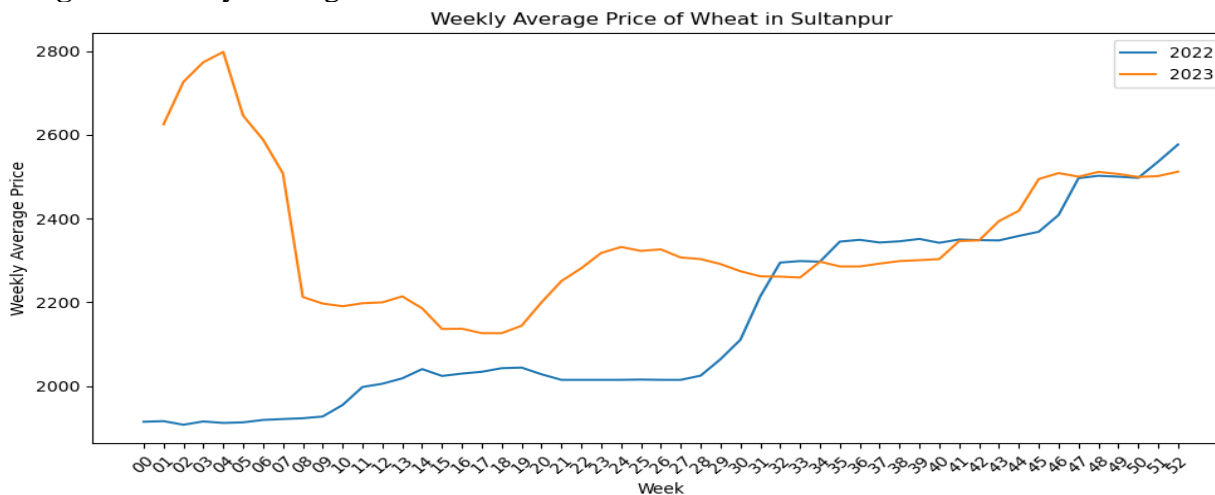
**Fig 4.8:** Weekly Average Price Varanasi

**Source:** Own Analysis



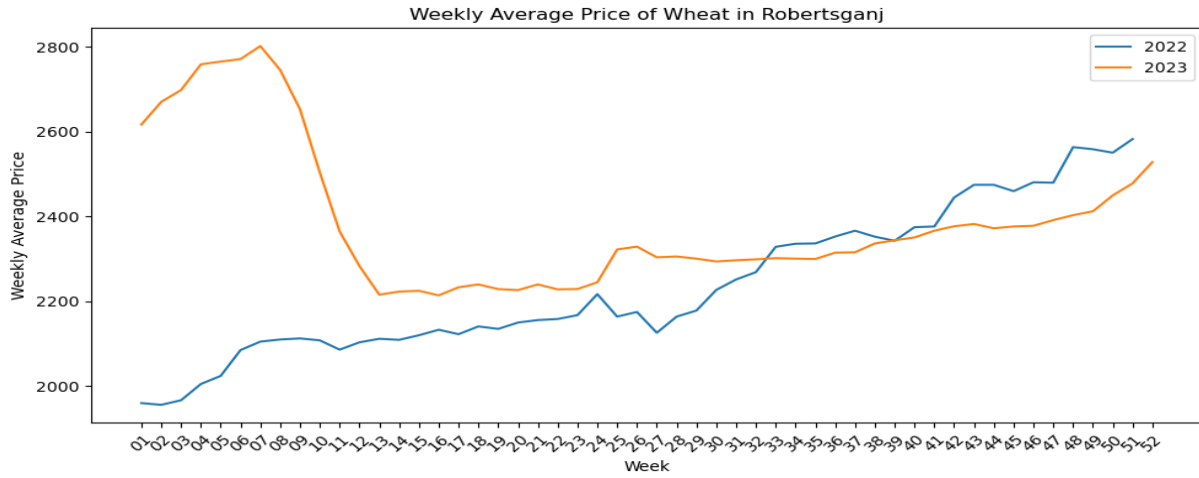
**Fig 4.9:** Weekly Average Price Unnao

**Source:** Own Analysis



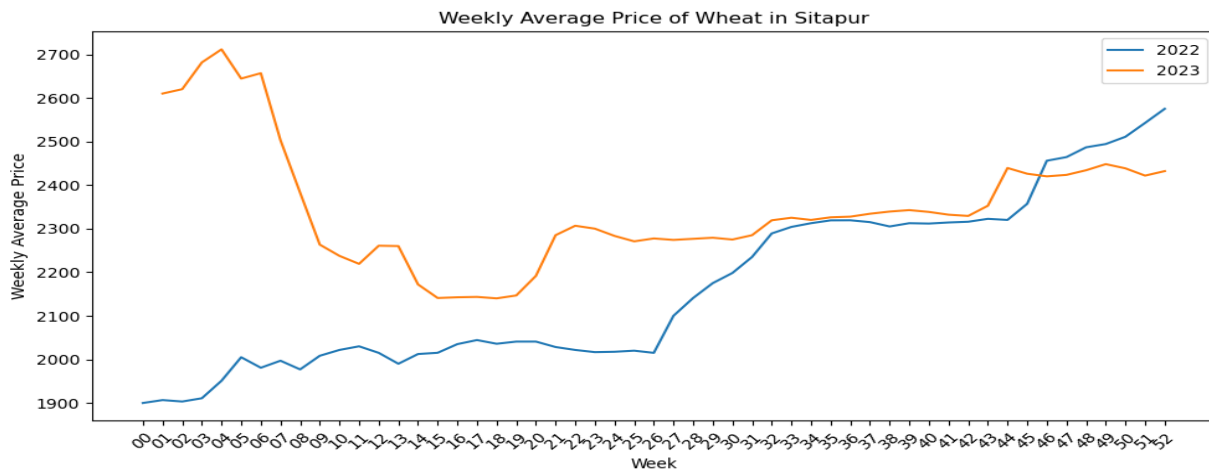
**Fig 4.10:** Weekly Average Price Sultanpur

**Source:** Own Analysis



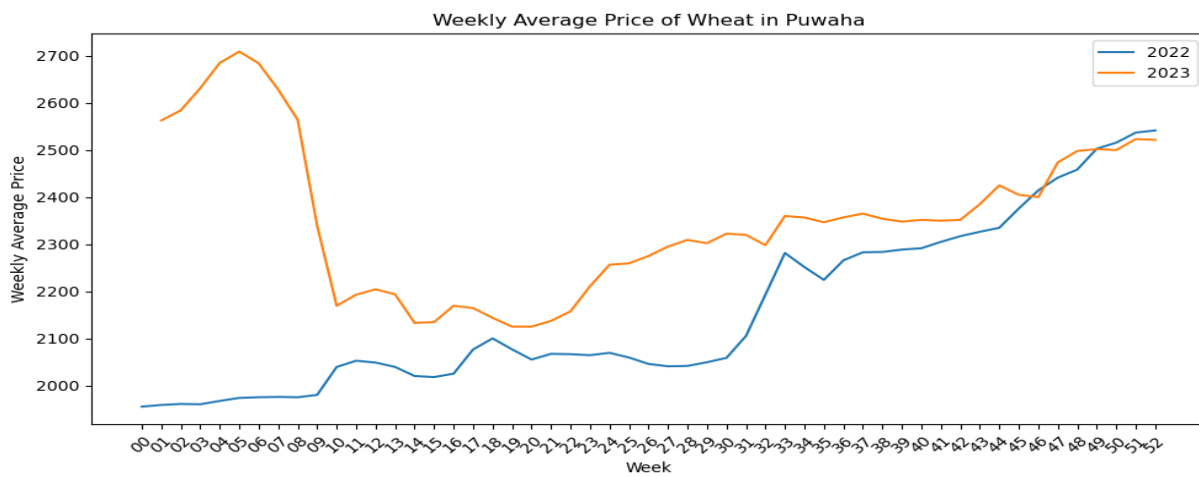
**Fig 4.11: Weekly Average Price Roberts Ganj**

**Source: Own Analysis**



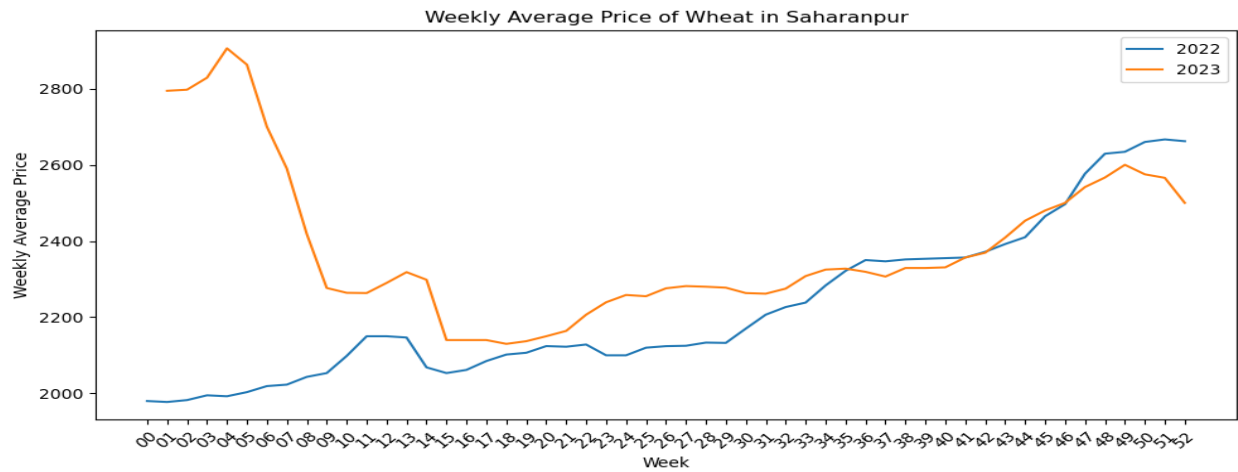
**Fig 4.12: Weekly Average Price Sitapur**

**Source: Own Analysis**



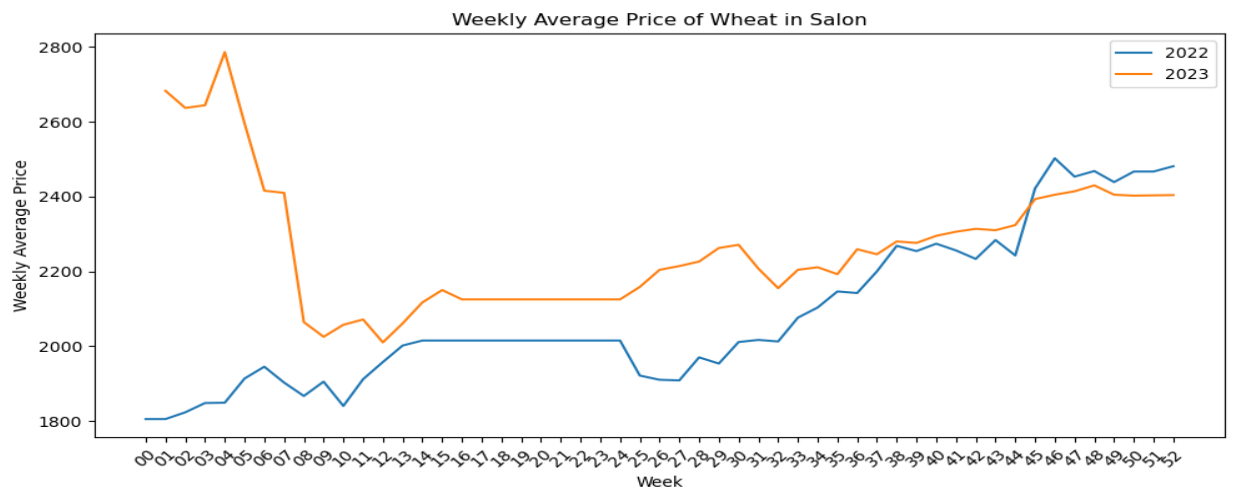
**Fig 4.13: Weekly Average Price Puawha**

**Source: Own Analysis**



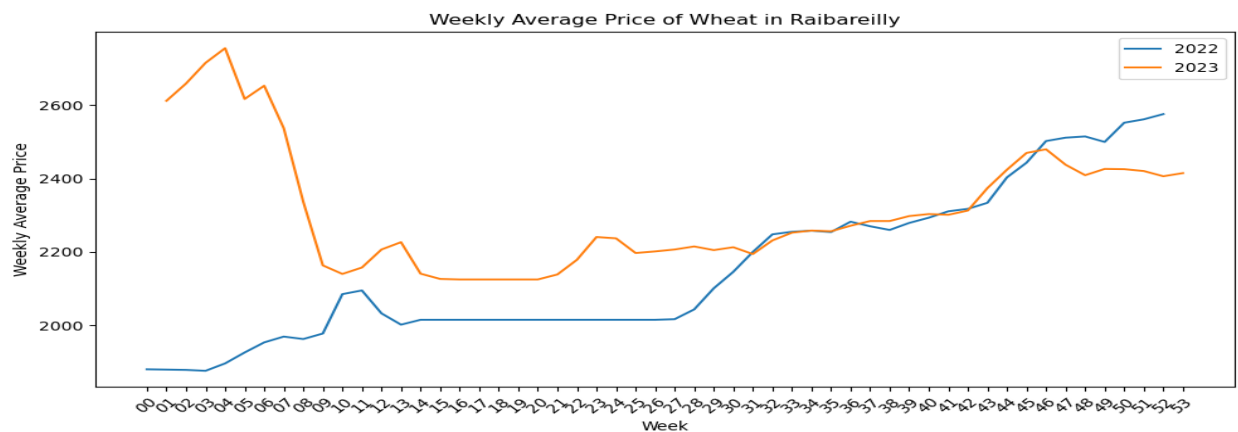
**Fig 4.14:** Weekly Average Price Saharanpur

**Source:** Own Analysis



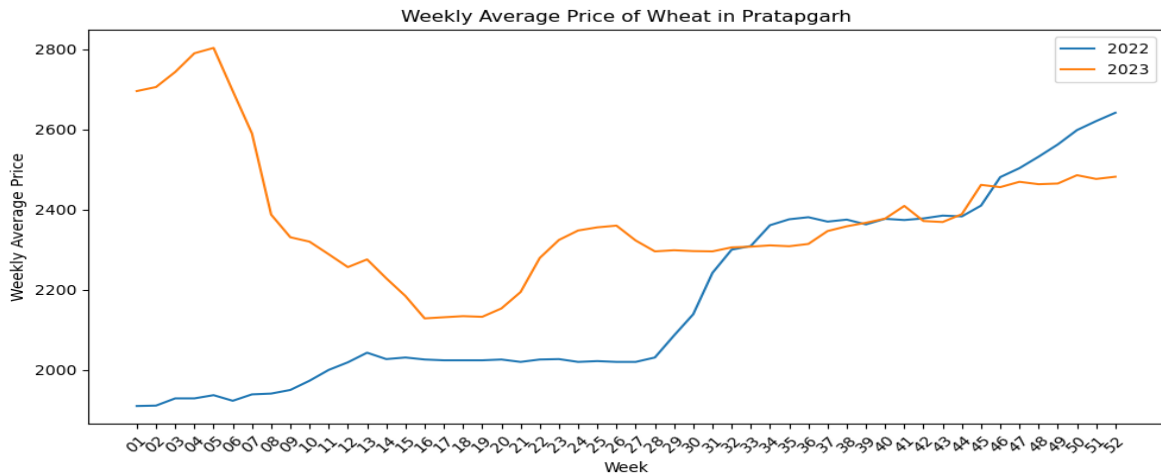
**Fig 4.15:** Weekly Average Price of wheat

**Source:** Own Analysis



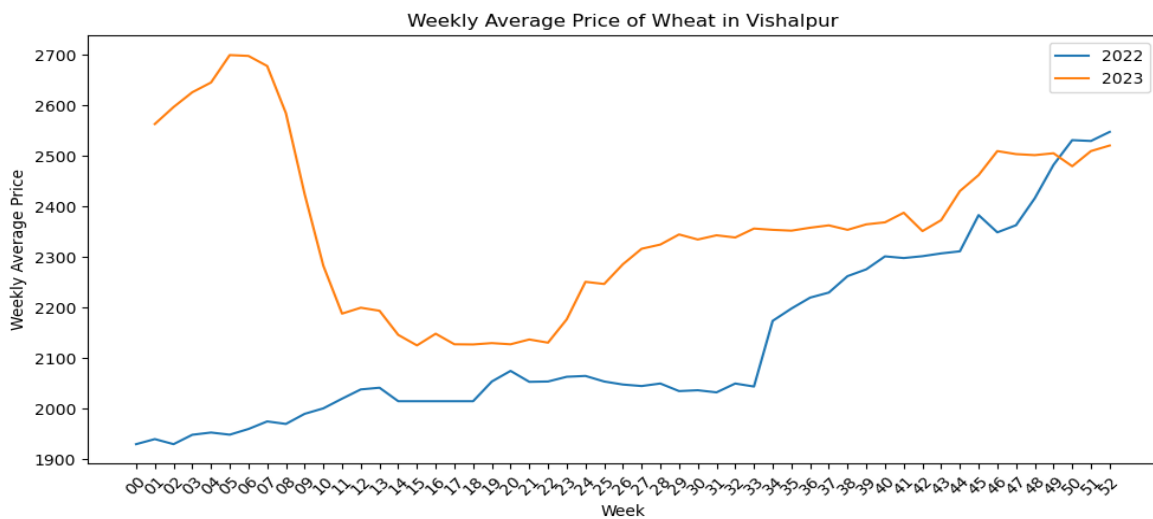
**Fig 4.16:** Weekly Average Price Raibareilly

**Source:** Own Analysis



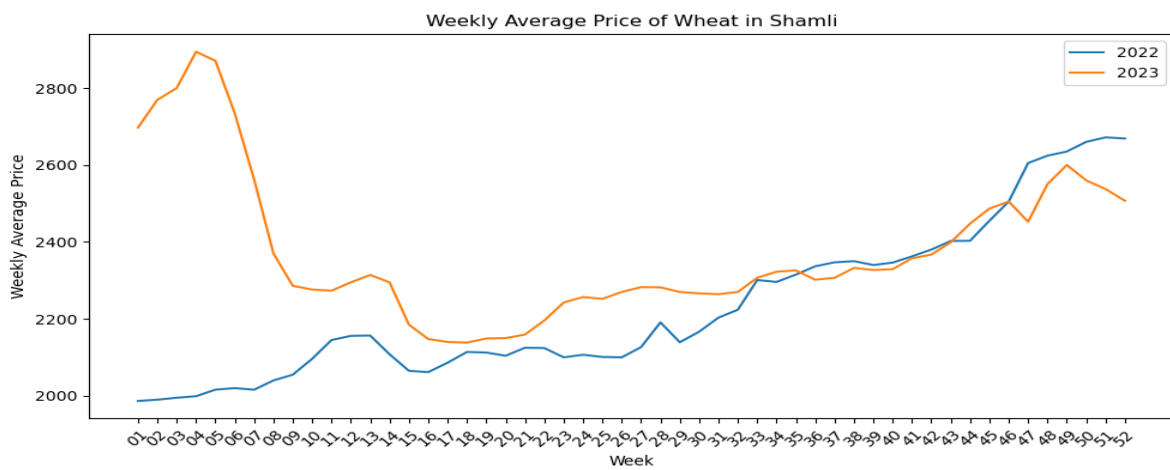
**Fig 4.17:** Weekly Average Price Pratapgarh

**Source:** Own Analysis



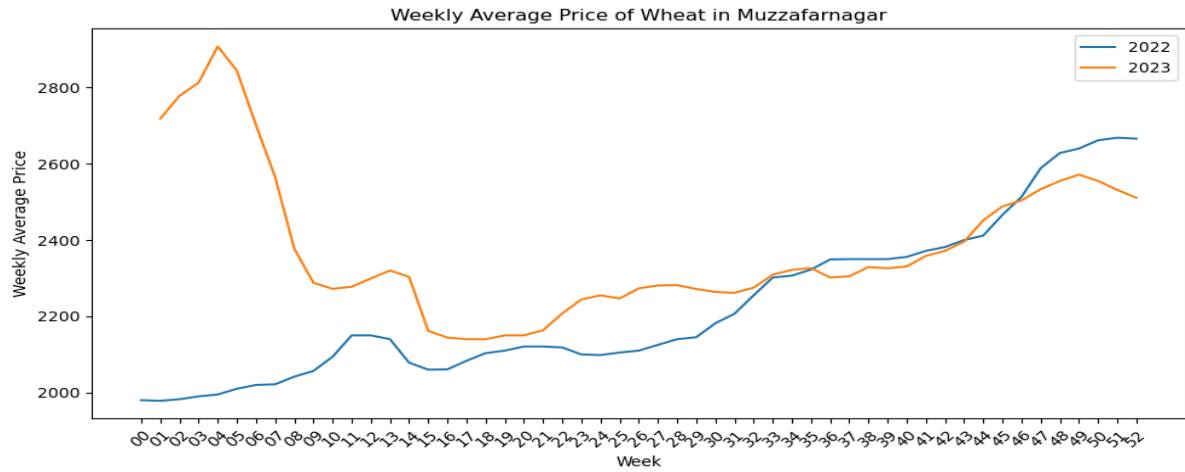
**Fig 4.18:** Weekly Average Price Vishalpur

**Source:** Own Analysis



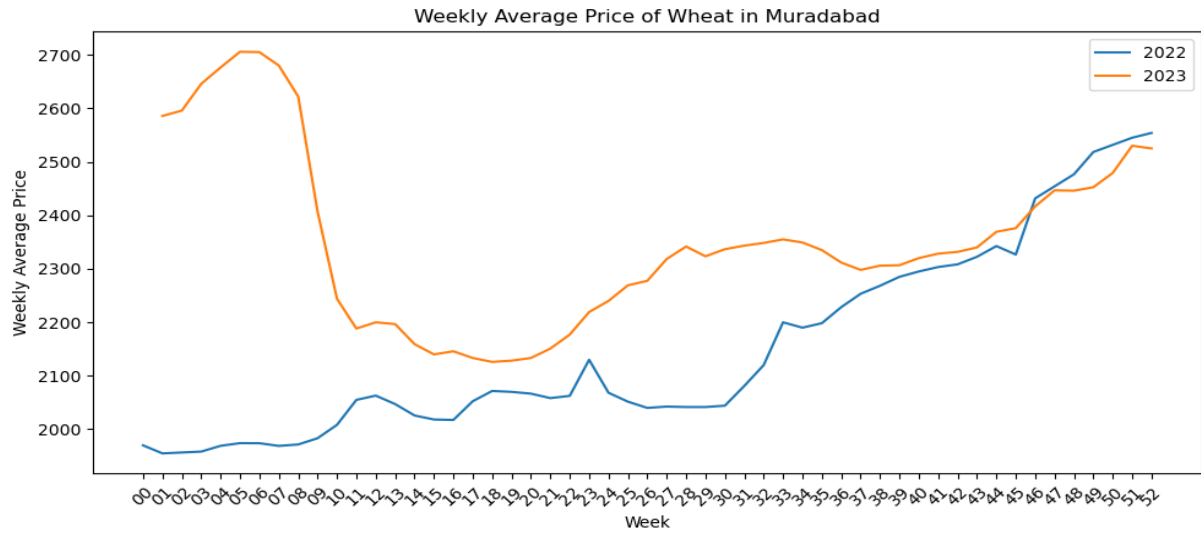
**Fig 4.19:** Weekly Average Price Shamli

**Source:** Own Analysis



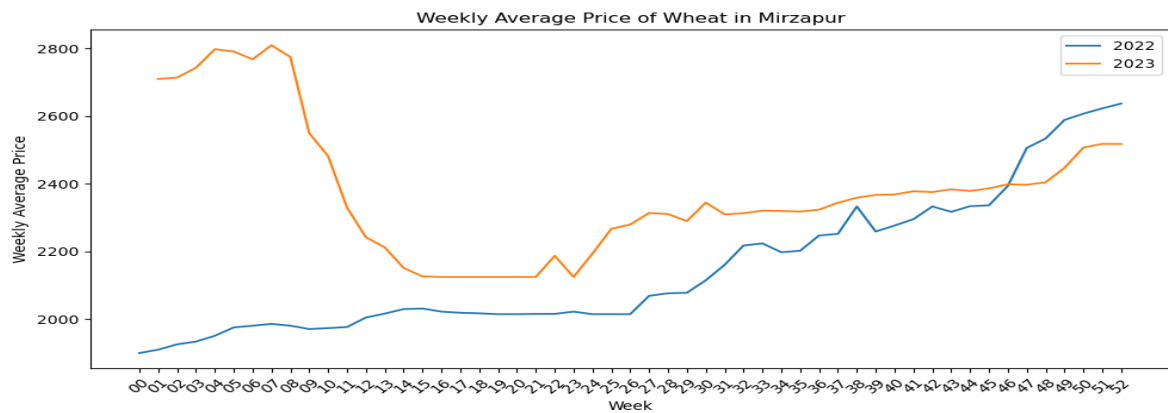
**Fig 4.20:** Weekly Average Price Muzaffarnagar

**Source:** Own Analysis



**Fig 4.21:** Weekly Average Price Moradabad

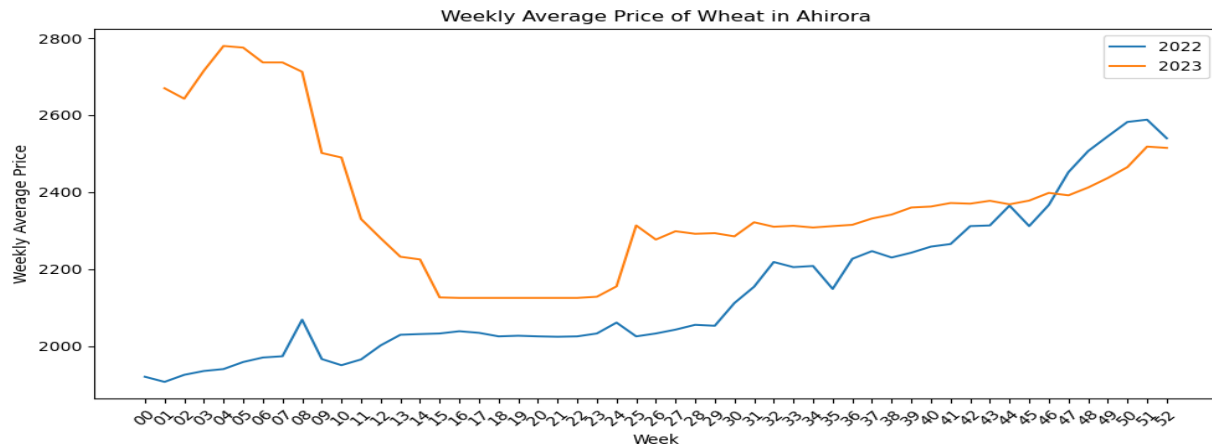
**Source:** Own Analysis



**Fig 4.22:** Weekly Average Price Mirzapur

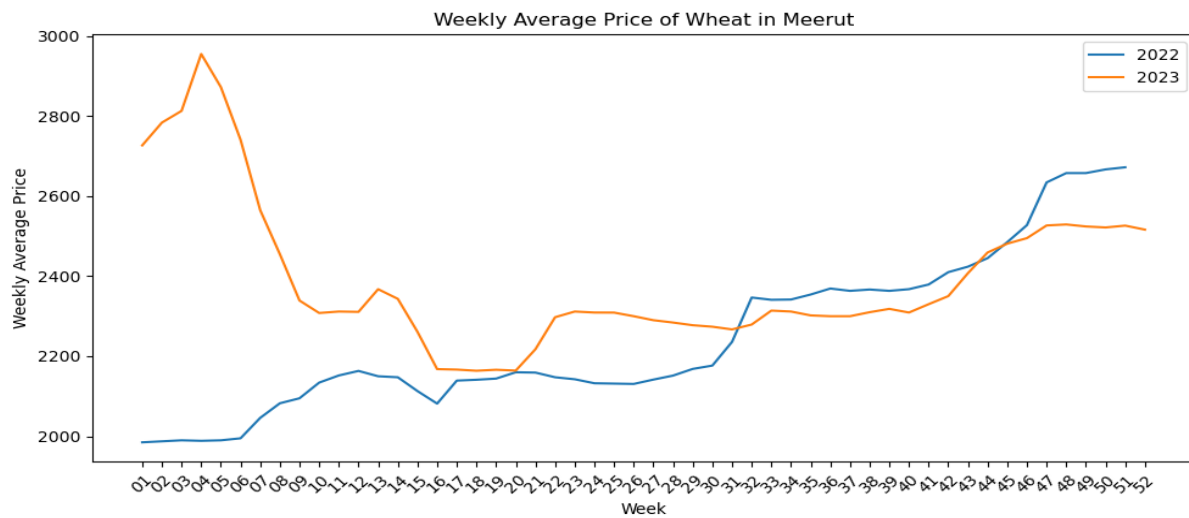
**Source:** Own Analysis





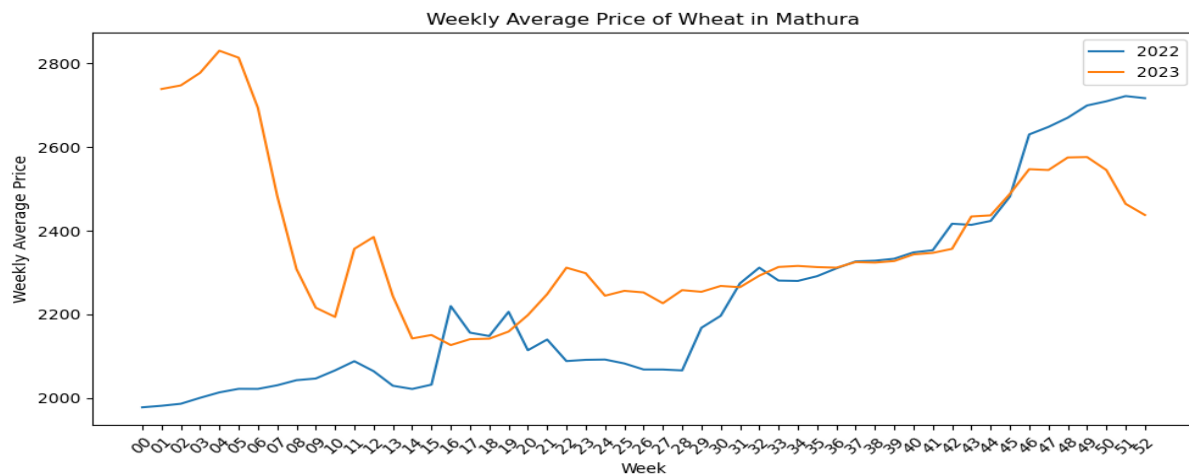
**Fig 4.23:** Weekly Average Price Ahirora

**Source:** Own Analysis



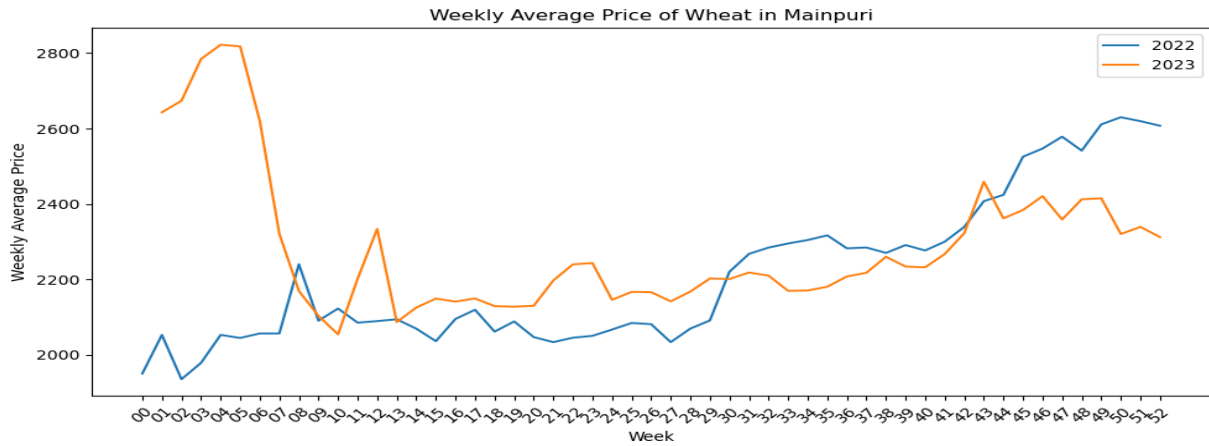
**Fig 4.24:** Weekly Average Price Meerut

**Source:** Own Analysis



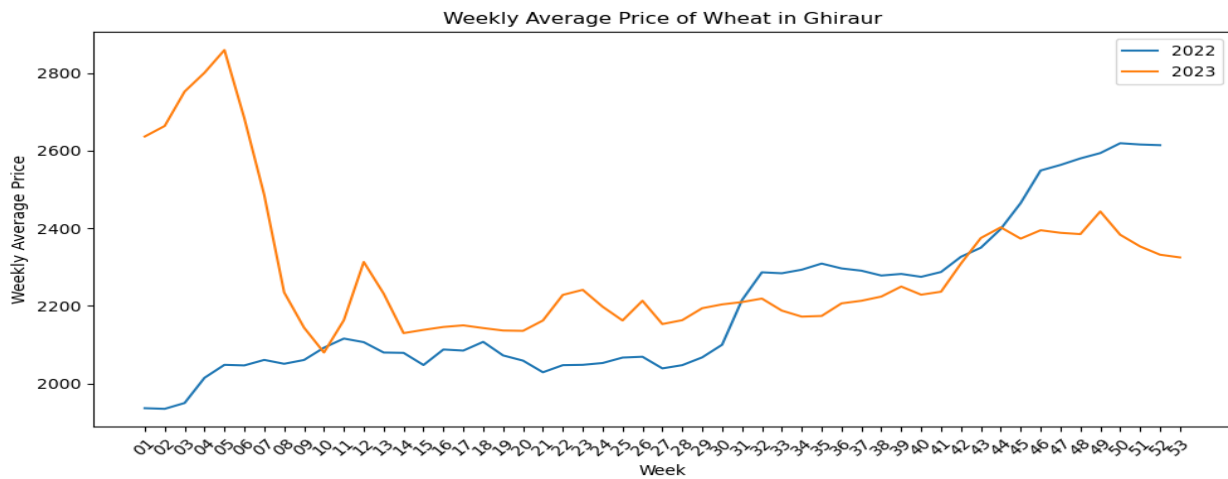
**Fig 4.25:** Weekly Average Price Mathura

**Source:** Own Analysis



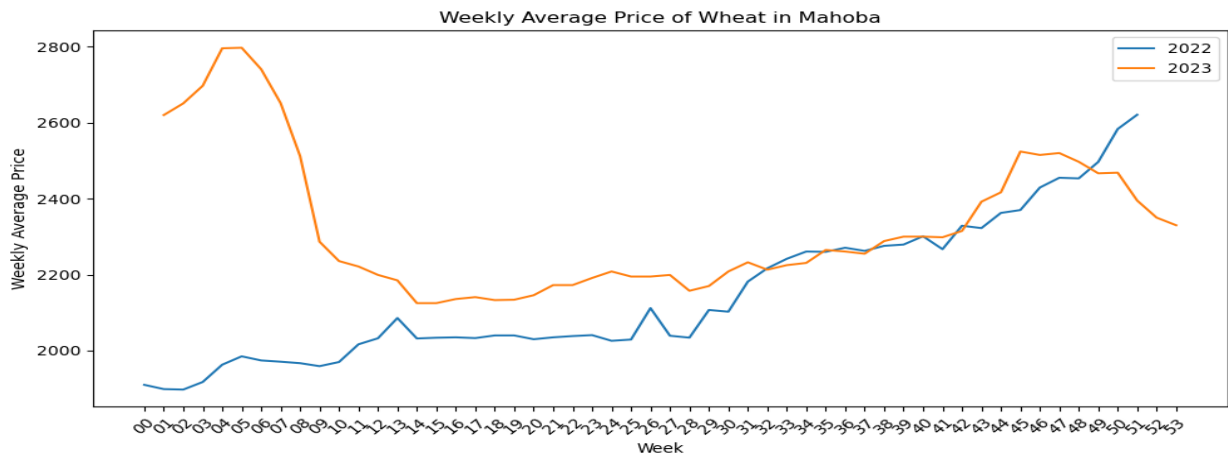
**Fig 4.26:** Weekly Average Price Mainpuri

**Source:** Own Analysis



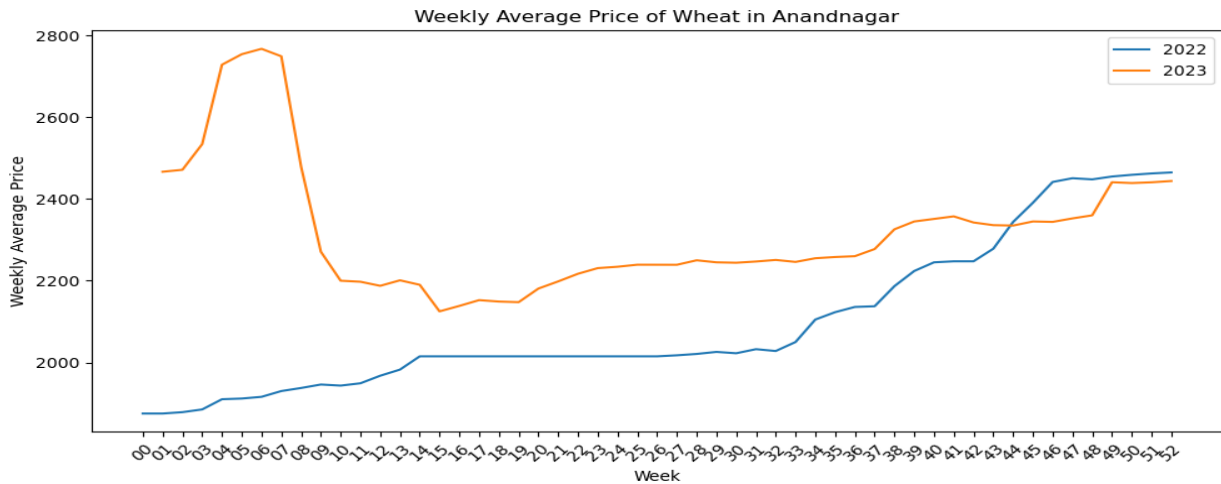
**Fig 4.27:** Weekly Average Price Ghiraur

**Source:** Own Analysis



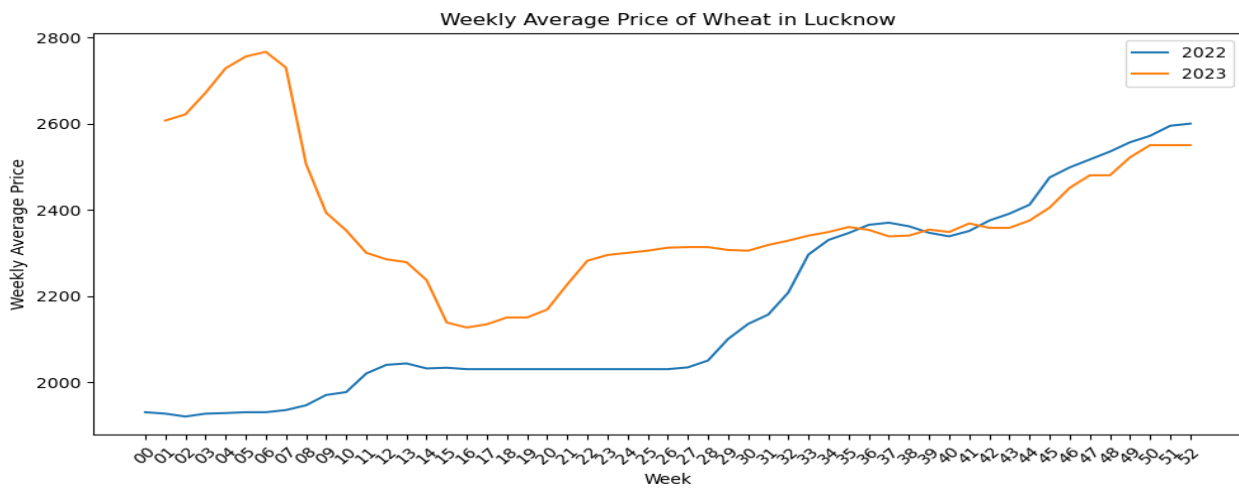
**Fig 4.28:** Weekly Average Price Mahoba

**Source:** Own Analysis



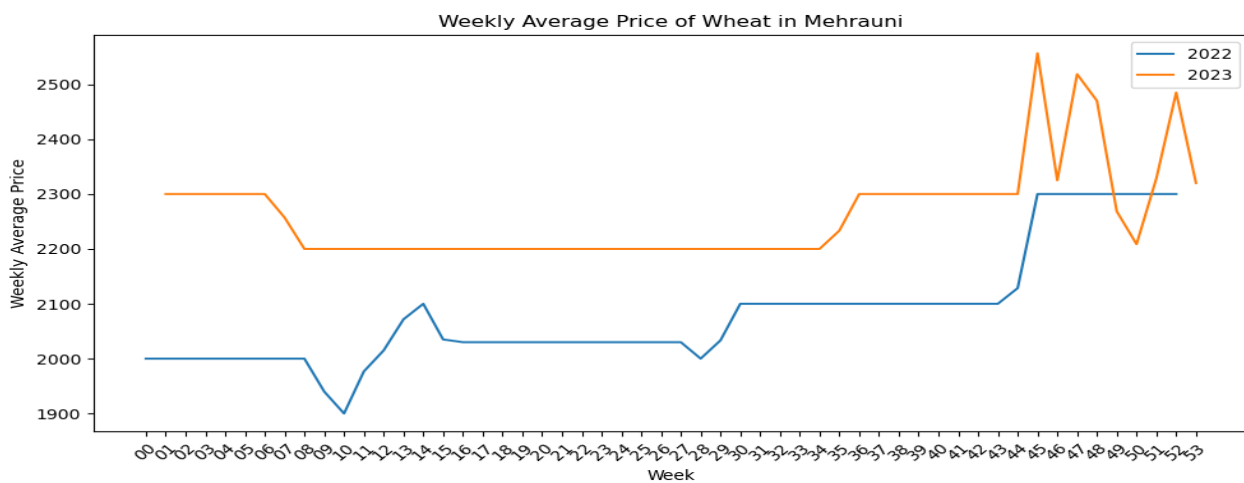
**Fig 4.29:** Weekly Average Price Anandnagar

**Source:** Own Analysis



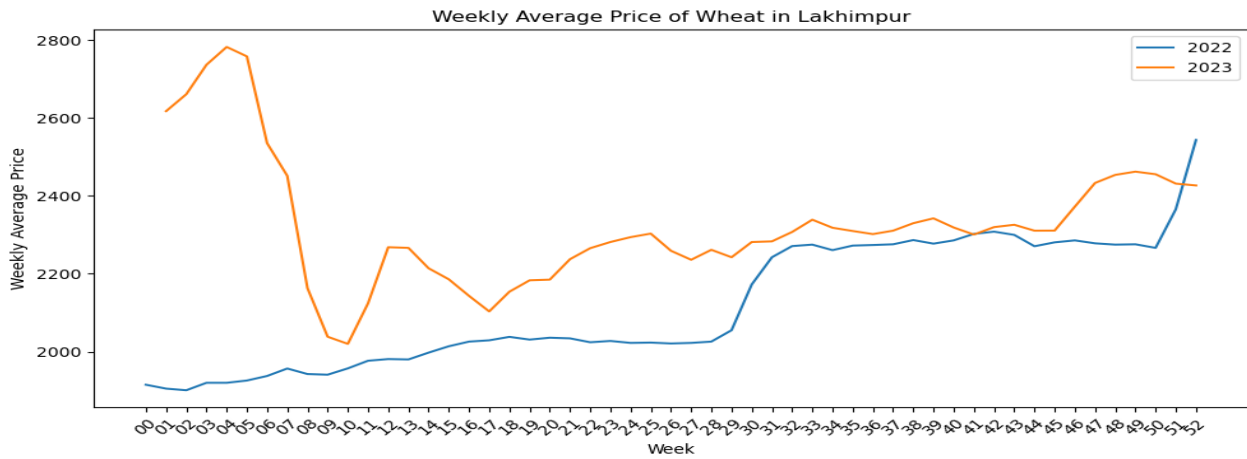
**Fig 4.30:** Weekly Average Price Lucknow

**Source:** Own Analysis



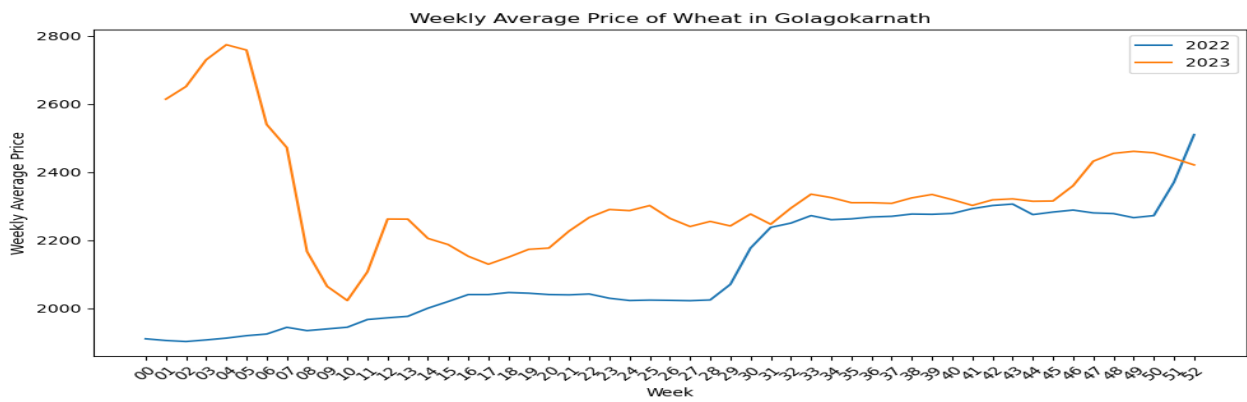
**Fig 4.31:** Weekly Average Price Mehrauni

**Source:** Own Analysis



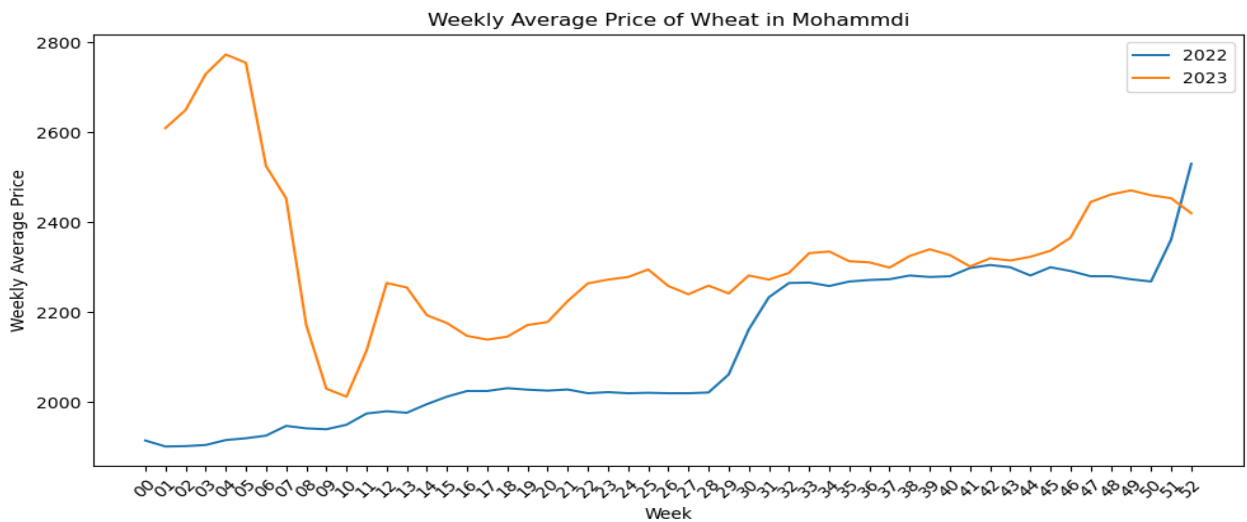
**Fig 4.32:** Weekly Average Price Lakhimpur

**Source:** Own Analysis



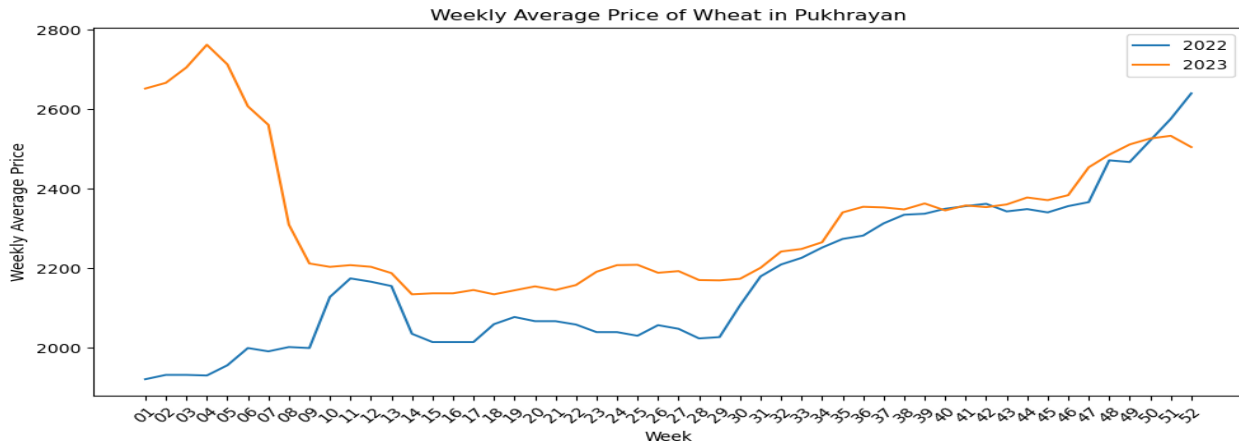
**Fig 4.33:** Weekly Average Price Golagokarnath

**Source:** Own Analysis



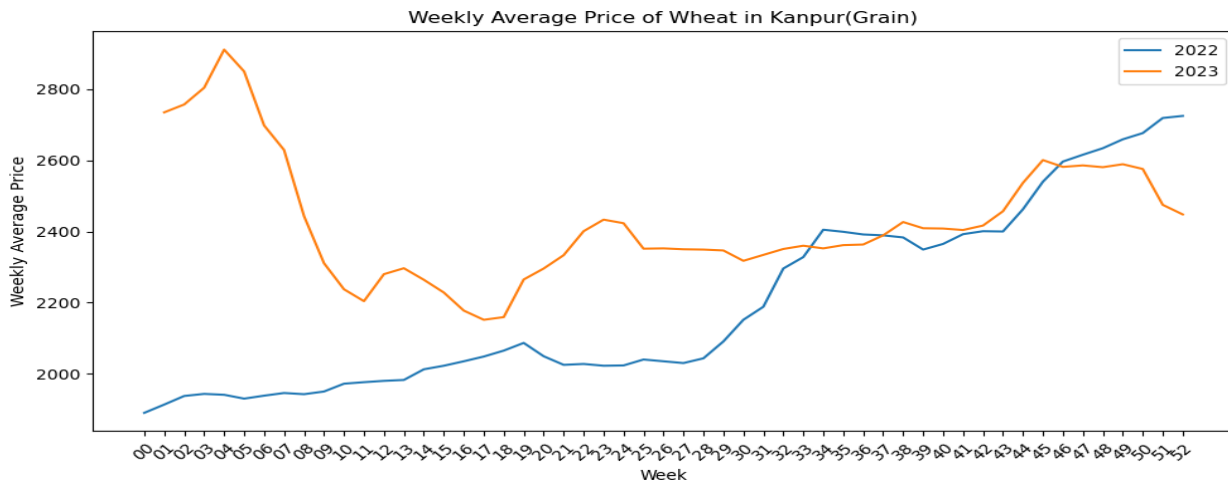
**Fig 4.34:** Weekly Average Price Mohammdi

**Source:** Own Analysis



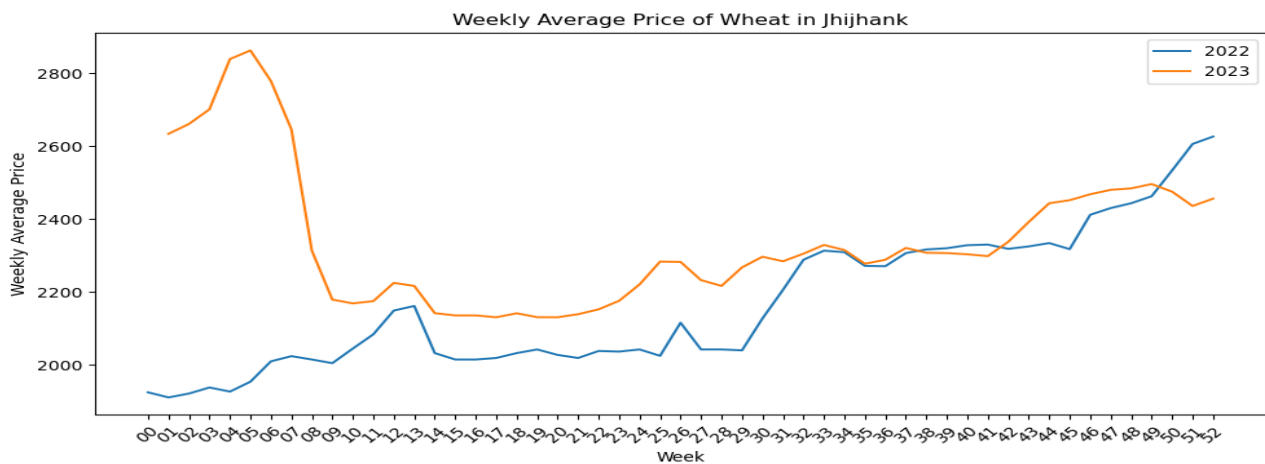
**Fig 4.35:** Weekly Average Price Pukhrayan

**Source:** Own Analysis



**Fig 4.36:** Weekly Average Price Kanpur

**Source:** Own Analysis



**Fig 4.37:** Weekly Average Price Jhijhank

**Source:** Own Analysis

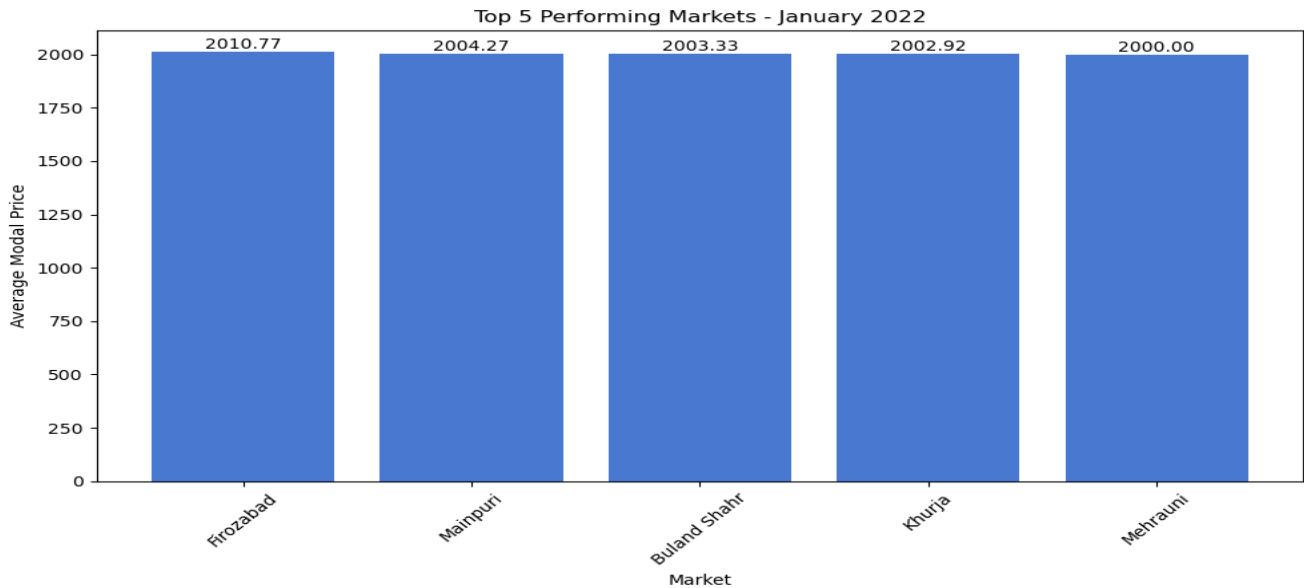
## **Weekly Comparative Analysis of Wheat Prices in All Mandis for 2022 and 2023**

Based on our observations of the line charts for each mandi, we can discern clear trends in wheat prices over the two-year period. In 2022, wheat prices consistently hovered around ₹2,000, which is close to the minimum support price. However, in 2023, wheat prices experienced a notable increase across all mandis, with some prices surpassing ₹2,500.

Throughout 2023, prices remained elevated from the first week of January until the last week of March, with the highest prices observed in January. After reaching this peak, prices gradually declined through March. From April to July, prices stabilized around a certain level before beginning to rise again towards the end of the year, culminating in another upward trend in December.

This analysis is based on line charts that consider the first week of the year starting from January 1st. These observations highlight the significant fluctuations and seasonal trends in wheat prices across the mandis.

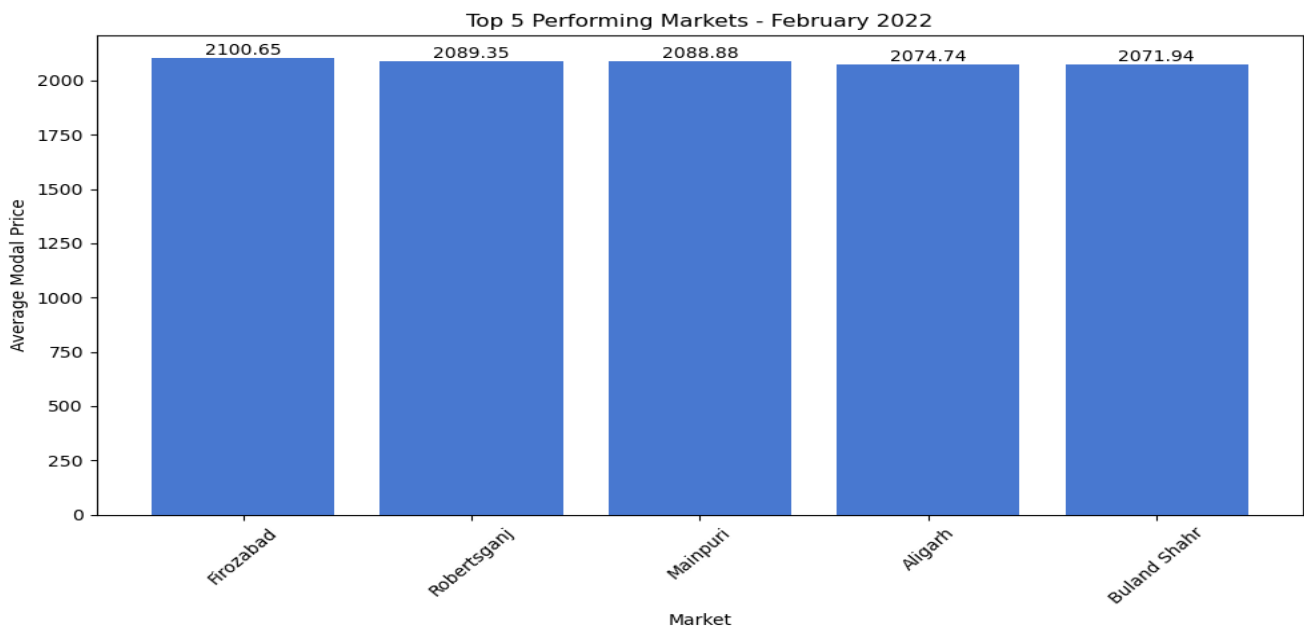
**8. Monthly Analysis of the Top 5 Performing Markets Based on Average Modal Prices (Jan 2022- Dec-2023)**



**Fig 4.38:** Top 5 Performing Markets in January\_2022

**Source:** Own Analysis

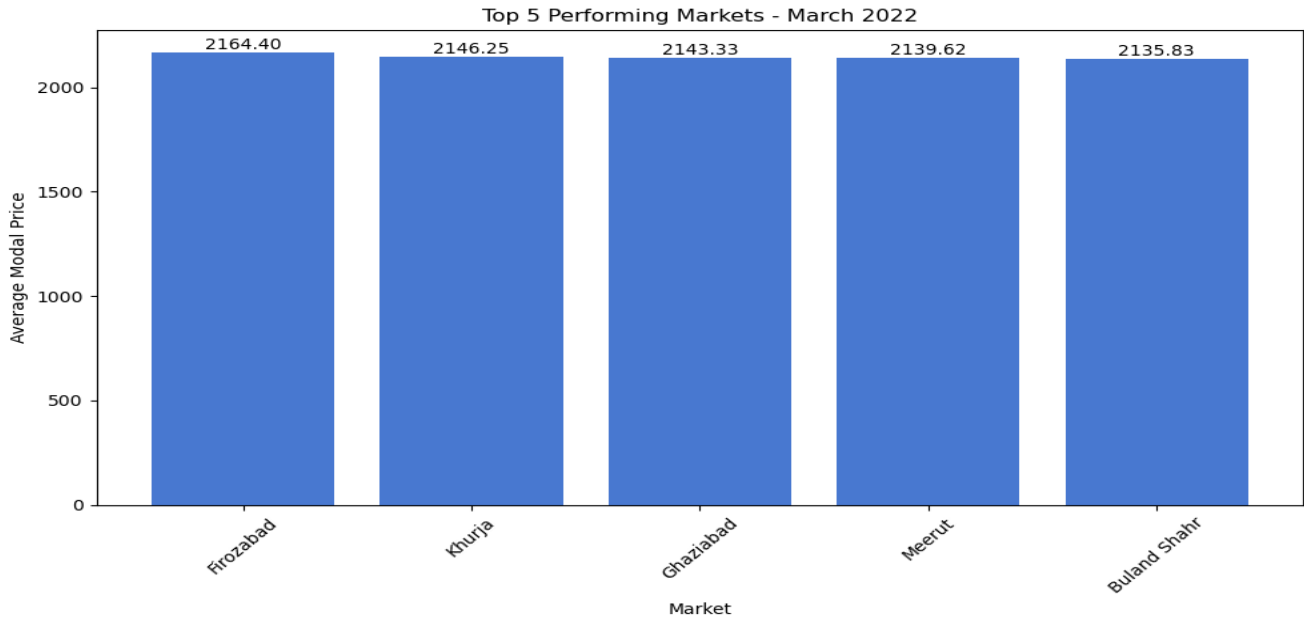
According to this figure the average modal price of wheat for the top 5 markets in January 2022 is highest in Firozabad.



**Fig 4.39:** Top 5 Performing Markets in February\_2022

**Source:** Own Analysis

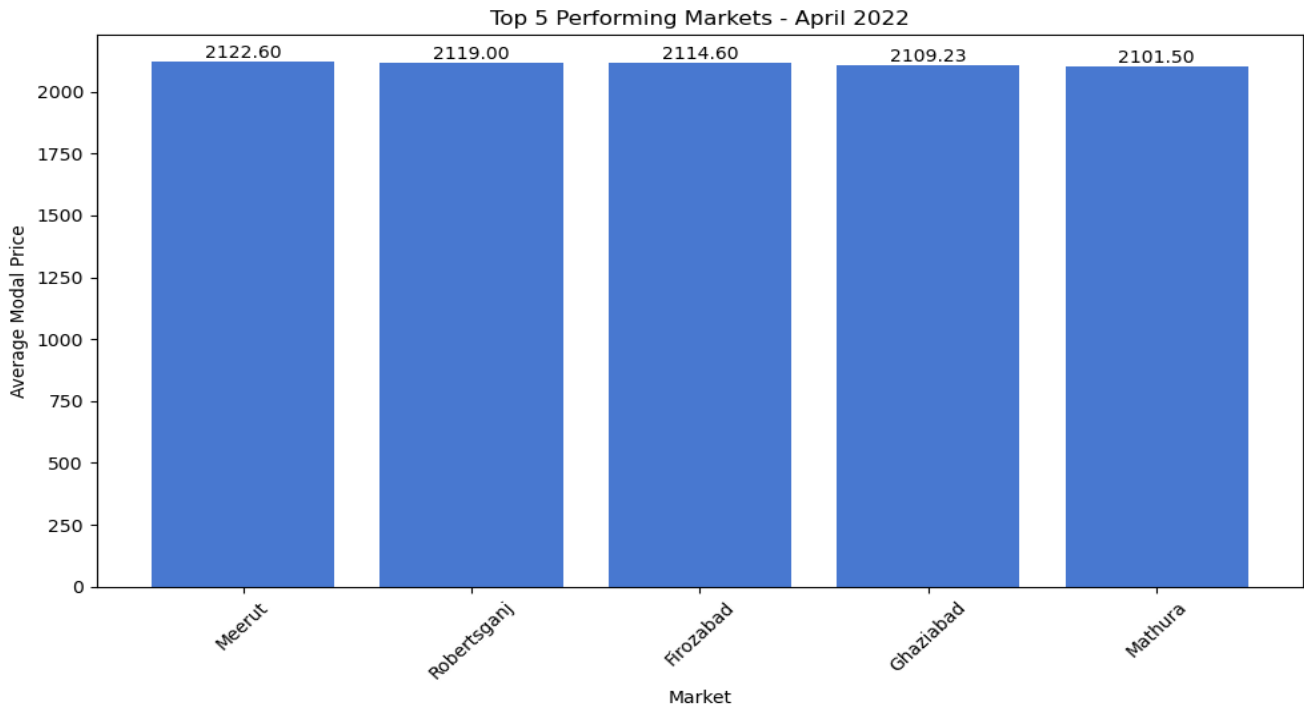
According to this figure, the average modal price of wheat for the top 5 markets in February 2022 is highest in Firozabad.



**Fig 4.40:** Top 5 Performing Markets in March\_2022

**Source:** Own Analysis

According to this figure, the average modal price of wheat for the top 5 markets in March 2022 is highest in Firozabad.

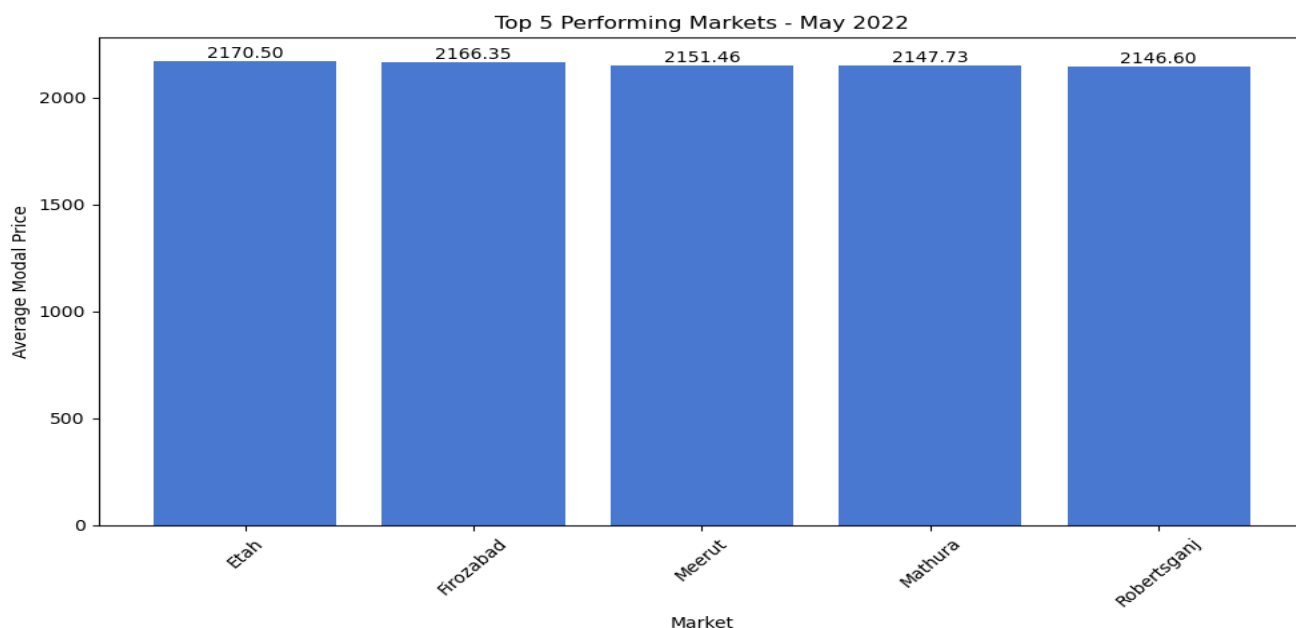


**Fig 4.41:** Top 5 Performing Markets in April\_2022

**Source:** Own Analysis

According to this figure, the average modal price of wheat for the top 5 markets in April 2022 is highest in Meerut.

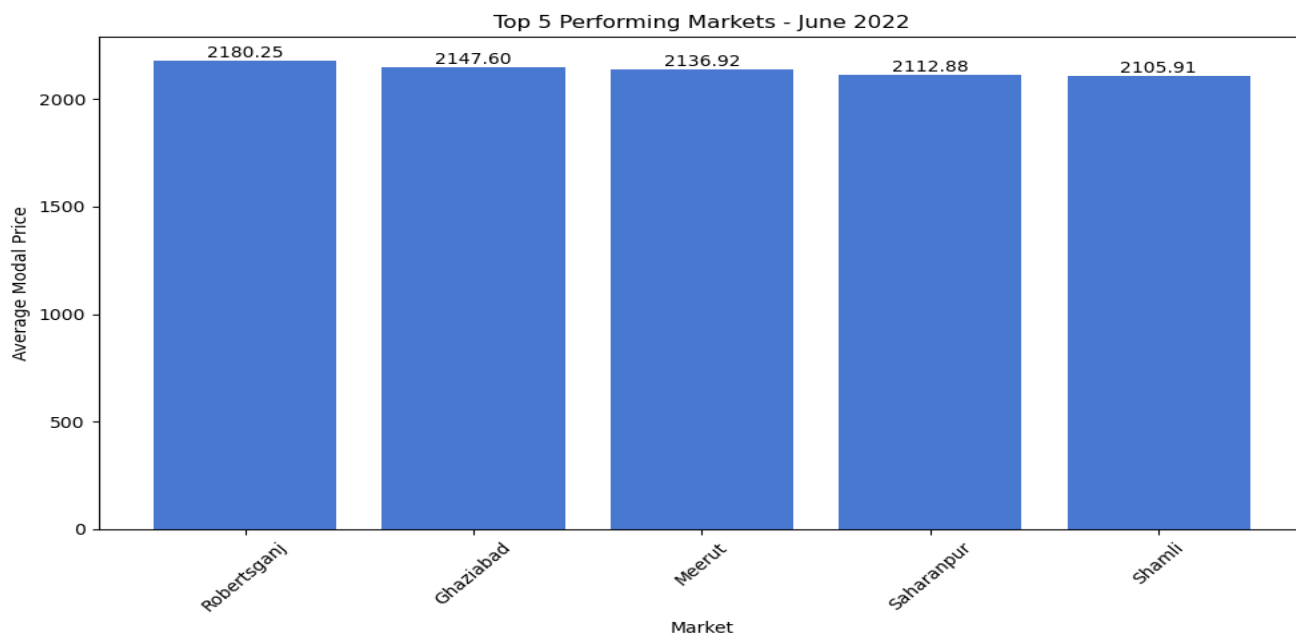




**Fig 4.42:** Top 5 Performing Markets in May\_2022

**Source:** Own Analysis

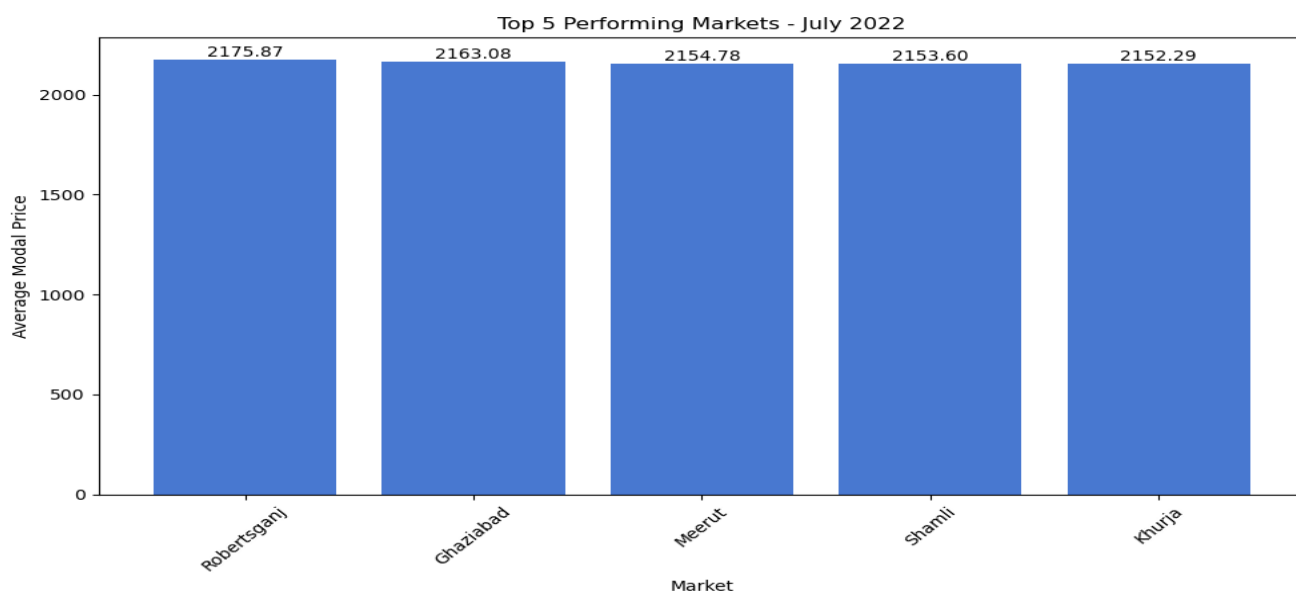
According to this figure, the average modal price of wheat for the top 5 markets in May 2022 is highest in Etah.



**Fig 4.43:** Top 5 Performing Markets in June\_2022

**Source:** Own Analysis

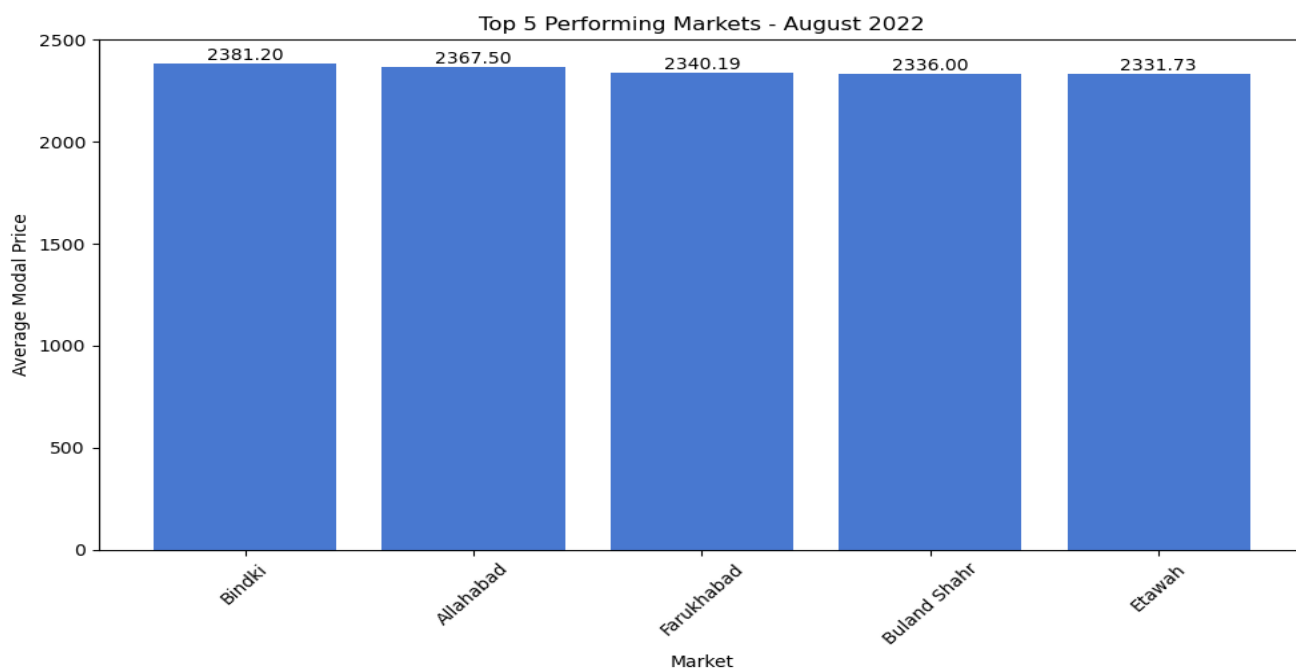
According to this figure, the average modal price of wheat for the top 5 markets in June 2022 is highest in Roberts Ganj Mandi.



**Fig 4.44:** Top 5 Performing Markets in July\_2022

**Source:** Own Analysis

According to this figure, the average modal price of wheat for the top 5 markets in July 2022 is highest in Roberts Ganj Mandi.



**Fig 4.45:** Top 5 Performing Markets in August\_2022

**Source:** Own Analysis

According to this figure, the average modal price of wheat for the top 5 markets in August 2022 is highest in Bindki Mandi.



**Fig 4.46:** Top 5 Performing Markets in September\_2022

**Source:** Own Analysis

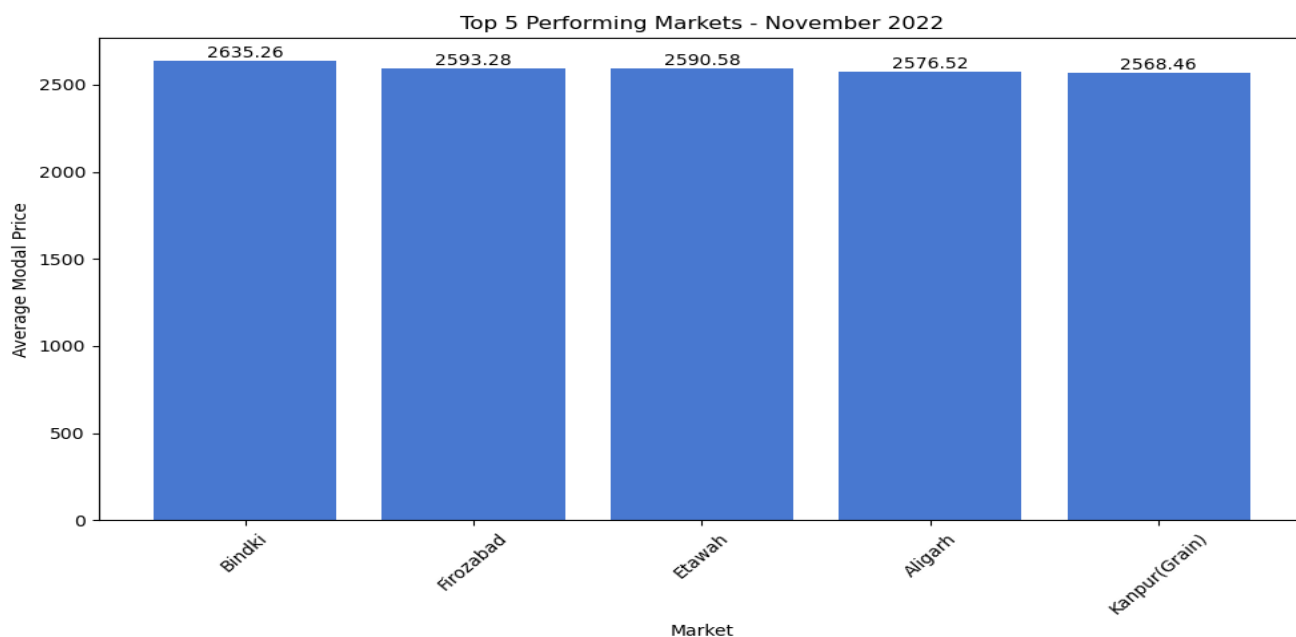
According to this figure, the average modal price of wheat for the top 5 markets in September 2022 is highest in Firozabad Mandi.



**Fig 4.47:** Top 5 Performing Markets in October\_2022

**Source:** Own Analysis

According to this figure, the average modal price of wheat for the top 5 markets in October 2022 is highest in Firozabad Mandi



**Fig 4.48:** Top 5 Performing Markets in November\_2022

**Source:** Own Analysis

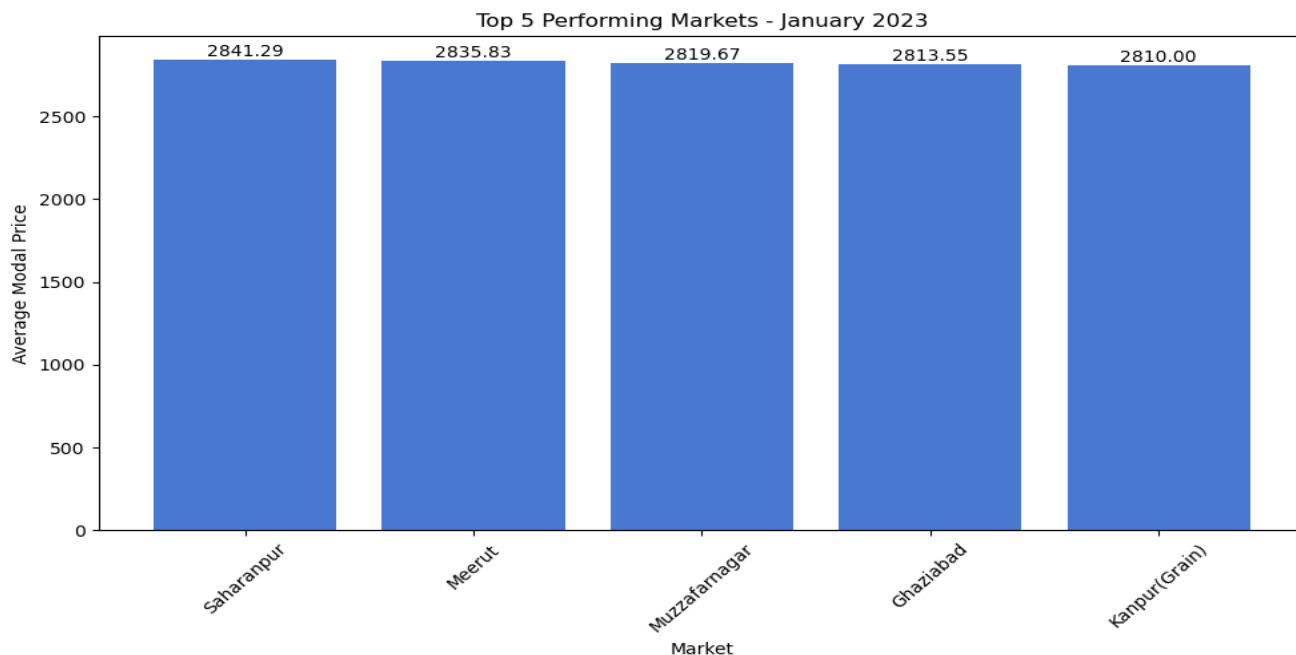
According to this figure, the average modal price of wheat for the top 5 markets in November 2022 is highest in Bindki Mandi.



**Fig 4.49:** Top 5 Performing Markets in December\_2022

**Source:** Own Analysis

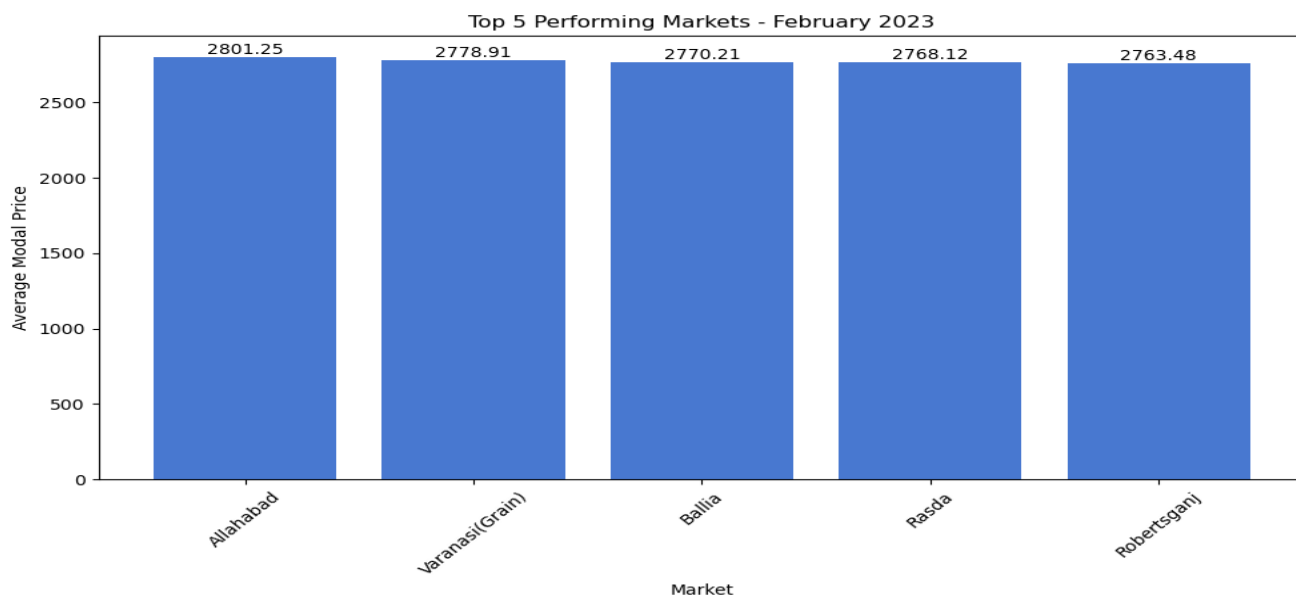
According to this figure, the average modal price of wheat for the top 5 markets in December 2022 is highest in Etah Mandi.



**Fig 4.50:** Top 5 Performing Markets in January\_2023

**Source:** Own Analysis

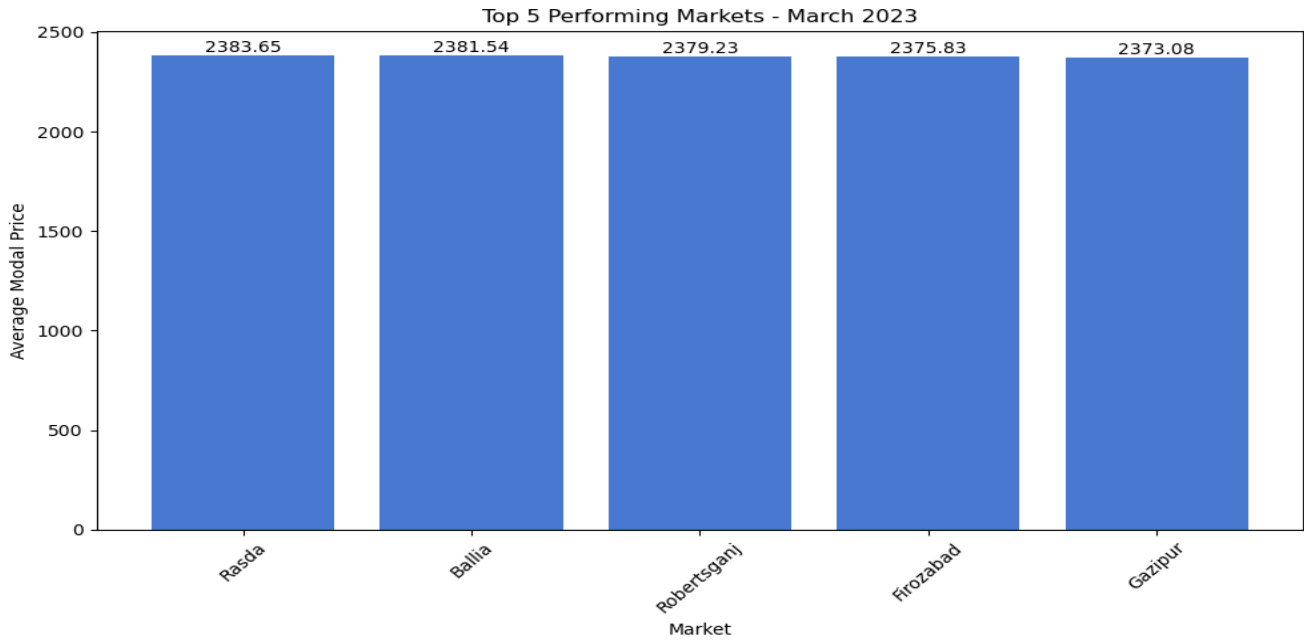
According to this figure, the average modal price of wheat for the top 5 markets in January 2023 is highest in Saharanpur Mandi.



**Fig 4.51:** Top 5 Performing Markets in February\_2022

**Source:** Own Analysis

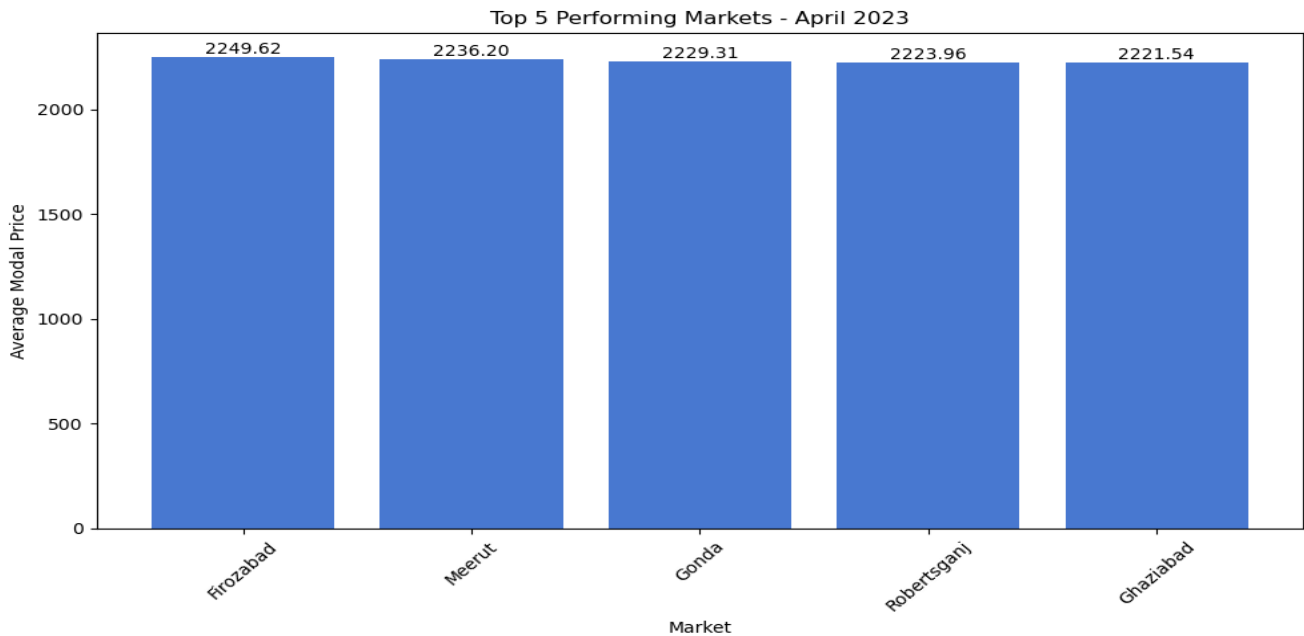
According to this figure, the average modal price of wheat for the top 5 markets in February 2023 is highest in Allahabad Market.



**Fig 4.52:** Top 5 Performing Markets in March\_2023

**Source:** Own Analysis

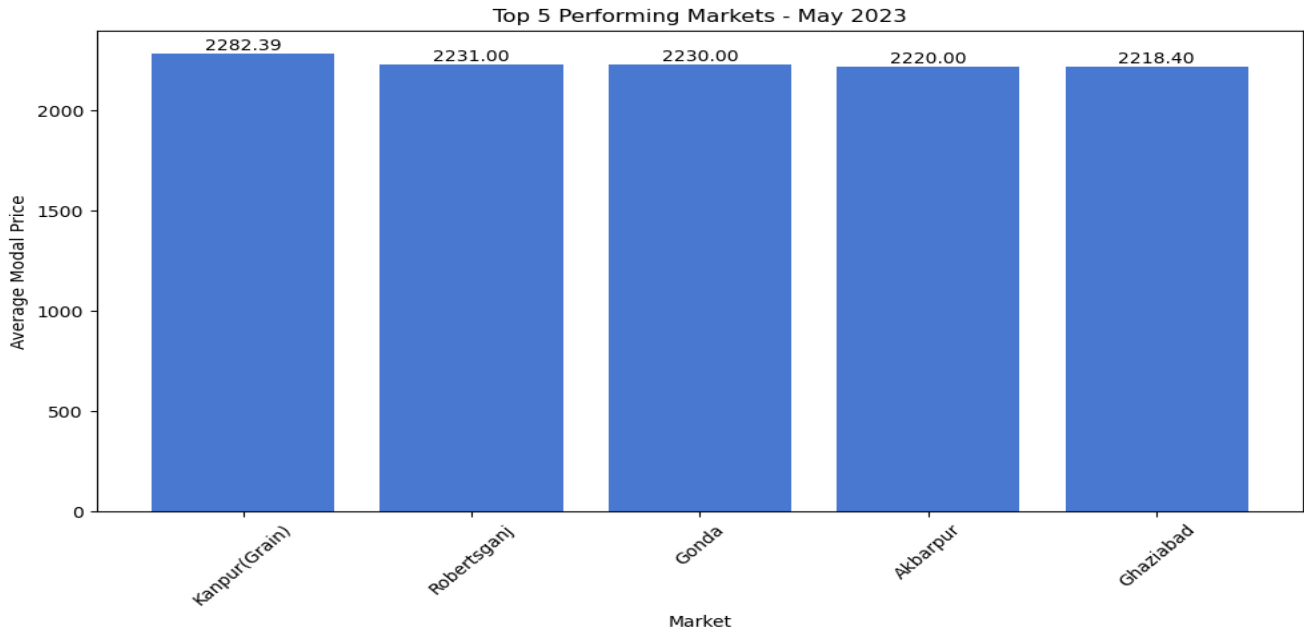
According to this figure, the average modal price of wheat for the top 5 markets in March 2023 is highest in Rasda Mandi



**Fig 4.53:** Top 5 Performing Markets in April\_2023

**Source:** Own Analysis

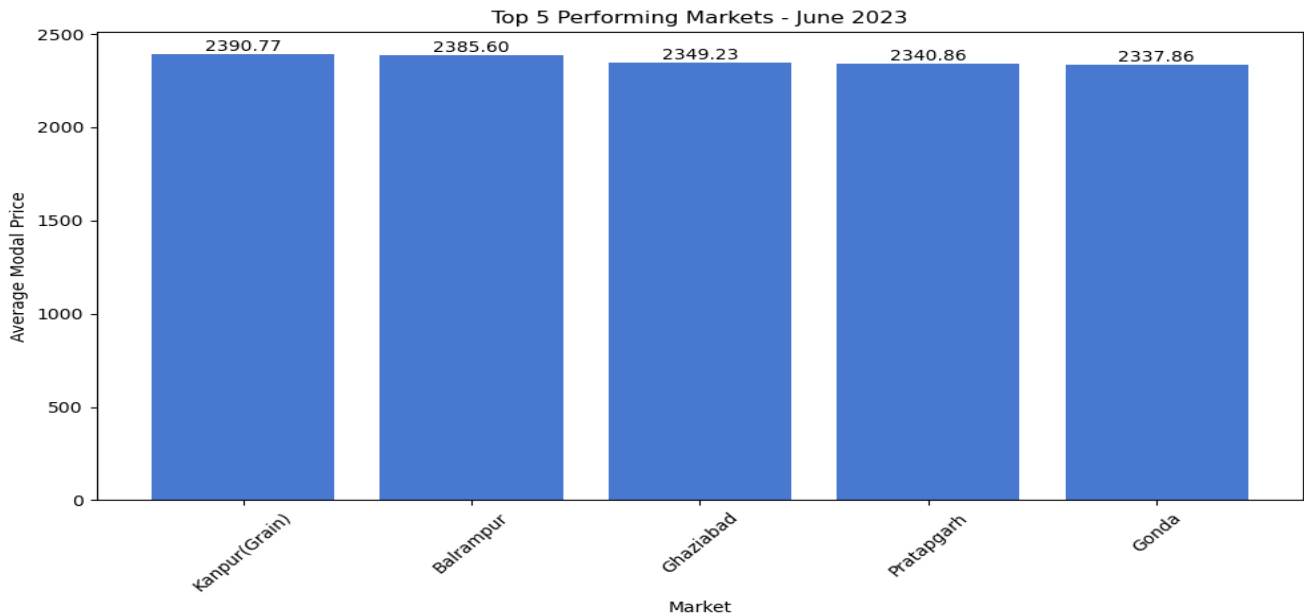
According to this figure, the average modal price of wheat for out of the top 5 markets in April 2023 is highest in Firozabad Mandi



**Fig 4.54:** Top 5 Performing Markets in May\_2023

**Source:** Own Analysis

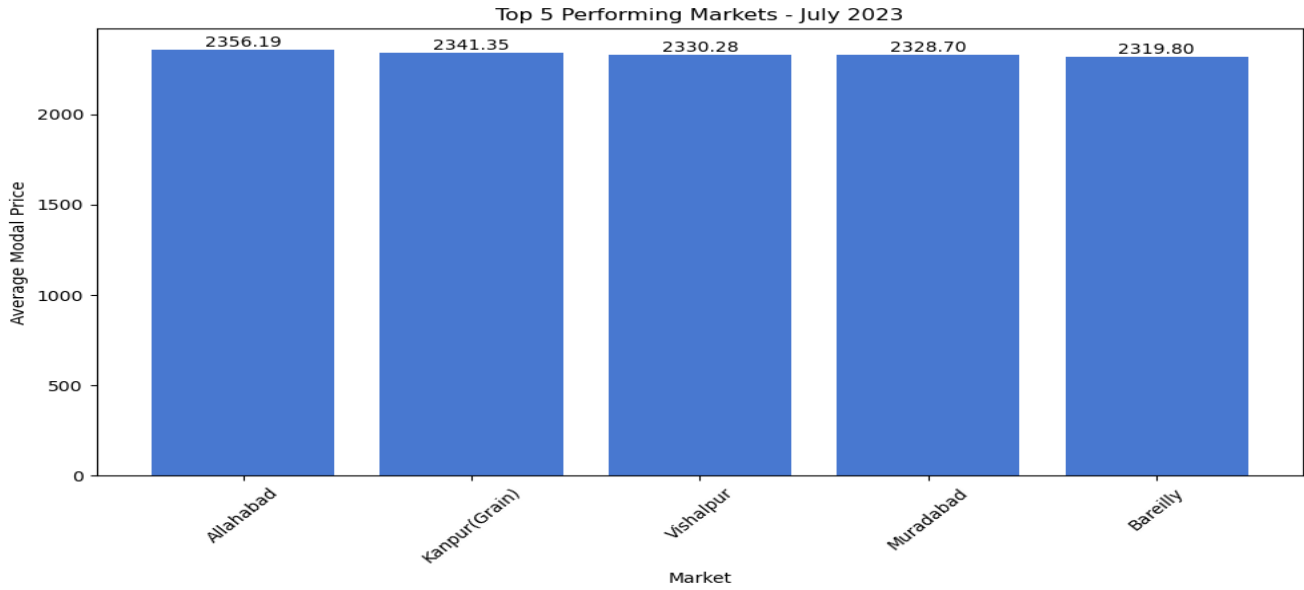
According to this figure, the average modal price of wheat for out of the top 5 markets in May 2023 is highest in Kanpur Mandi.



**Fig 4.55:** Top 5 Performing Markets in June\_2023

**Source:** Own Analysis

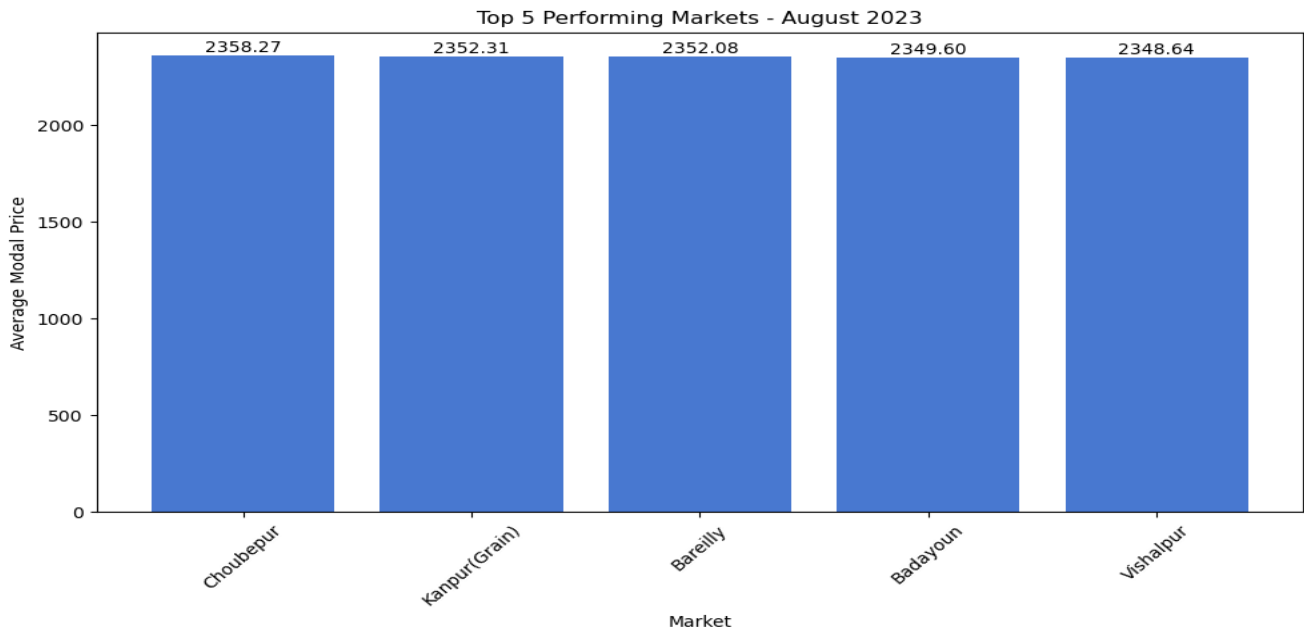
According to this figure, the average modal price of wheat for out of the top 5 markets in April 2023 is highest in Kanpur Mandi.



**Fig 4.56:** Top 5 Performing Markets in July\_2023

**Source:** Own Analysis

According to this figure, the average modal price of wheat for out of the top 5 markets in April 2023 is highest in Allahabad Mandi.



**Fig 4.57:** Top 5 Performing Markets in August\_2023

**Source:** Own Analysis

According to this figure, the average modal price of wheat out of the top 5 markets in August 2023 is highest in Choubepur Mandi.

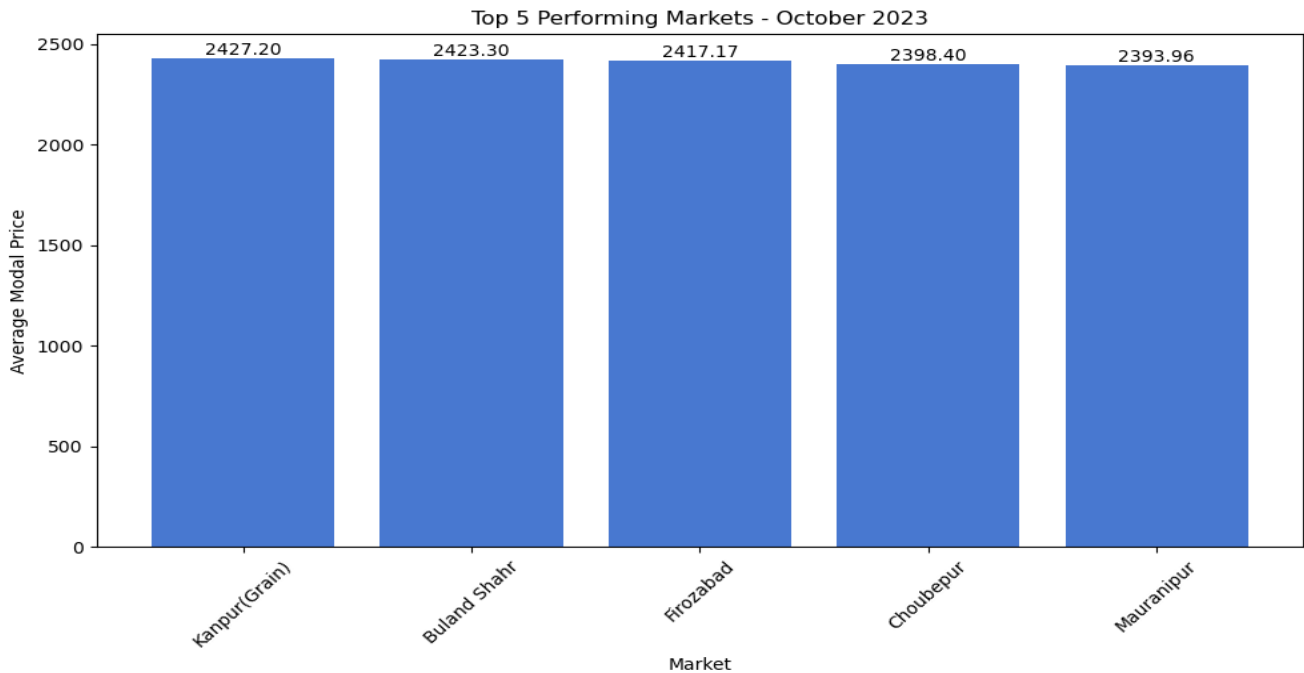




**Fig 4.58:** Top 5 Performing Markets in September\_2023

**Source:** Own Analysis

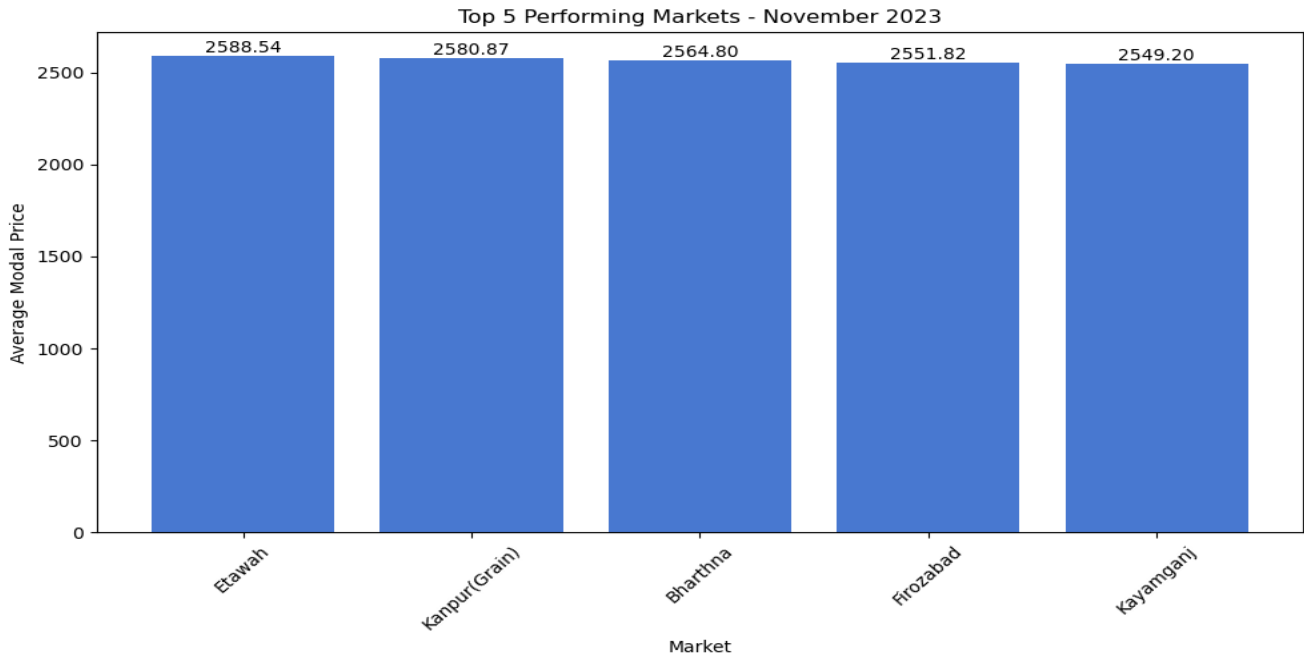
According to this figure, the average modal price of wheat for out of the top 5 markets in September 2023 is highest in Gazipur Mandi.



**Fig 4.59:** Top 5 Performing Markets in October\_2023

**Source:** Own Analysis

According to this figure, the average modal price of wheat out of the top 5 markets in October 2023 is highest in Kanpur Mandi.



**Fig 4.60:** Top 5 Performing Markets in November\_2023

**Source:** Own Analysis

According to this figure, the average modal price of wheat out of the top 5 markets in November 2023 is highest in Etawah Mandi.



**Fig 4.61:** Top 5 Performing Markets in December\_2023

**Source:** Own Analysis

According to this figure, the average modal price of wheat for out of the top 5 markets in December 2023 is highest in Firozabad Mandi.

## **Interpretation:**

In January 2022, Firozabad emerged as the top mandi with an average modal price of ₹2010.77, followed by Mainpuri (₹2004.27), Buland Shahr (₹2003.33), Khurja (₹2002.92), and Mehrauni (₹2000.00). This trend highlighted Firozabad's strong market position at the start of the year.

In February 2022, Firozabad continued to dominate with an increased average price of ₹2100.65. Robertsganj (₹2089.35) and Mainpuri (₹2088.88) followed, indicating a consistent demand or potentially lower supply in Firozabad compared to other regions.

March 2022 saw Firozabad maintaining its lead with an average price of ₹2164.40. Close competitors included Khurja (₹2146.25), Ghaziabad (₹2143.33), Meerut (₹2139.62), and Buland Shahr (₹2135.83). This sustained high pricing suggested advantageous trading conditions in Firozabad.

April 2022 marked a shift as Meerut took the lead with an average price of ₹2122.60. Robertsganj (₹2119.00) and Firozabad (₹2114.60) followed. This change indicated possible seasonal influences or local market dynamics affecting pricing in Meerut.

In May 2022, Etah emerged on top with an average modal price of ₹2170.50, surpassing Firozabad (₹2166.35) and Meerut (₹2151.46). This indicated a potential temporary supply-demand imbalance or advantageous local conditions in Etah.

June 2022 saw Robertsganj leading with an average price of ₹2180.25, followed by Ghaziabad (₹2147.60) and Meerut (₹2136.92). This highlighted Robertsganj's significant role in the wheat market during this period.

In July 2022, Robertsganj continued to lead with an average price of ₹2175.87. Ghaziabad (₹2163.08) and Meerut (₹2154.78) remained close competitors, showing consistent demand in these regions.

August 2022 marked a substantial shift with Bindki leading at an average price of ₹2381.20, followed by Allahabad (₹2367.50) and Farukhabad (₹2340.19).

In September 2022, Firozabad regained the top position with an average modal price of ₹2413.65, followed closely by Bindki (₹2386.54) and Kanpur (Grain) (₹2381.54). This suggested strong market conditions in Firozabad during this period.

October 2022 saw Firozabad continuing its dominance with an average price of ₹2455.19. Robertsganj (₹2417.05) and Ghaziabad (₹2409.62) followed, indicating sustained demand or limited supply in Firozabad.

In November 2022, Bindki took the lead with an average modal price of ₹2635.26, followed by Firozabad (₹2593.28) and Etawah (₹2590.58). This suggested a significant shift in market conditions favoring Bindki.

December 2022 saw Etah emerging as the top mandi with an average price of ₹2709.23, closely followed by Mathura (₹2705.42) and Aligarh (₹2704.00). This indicated a strong finish to the year for Etah in terms of wheat prices.

In January 2023, Saharanpur led with an average modal price of ₹2841.29, followed by Meerut (₹2835.83) and Muzzafarnagar (₹2819.67). This suggested strong demand or limited supply in Saharanpur at the beginning of the year.

February 2023 saw Allahabad taking the lead with an average price of ₹2801.25, followed by Varanasi (Grain) (₹2778.91) and Ballia (₹2770.21). This indicated a shift in market dynamics favoring Allahabad.

March 2023 marked a substantial change with Rasda leading at an average price of ₹2383.65, followed by Ballia (₹2381.54) and Robertsganj (₹2379.23). This indicated possible seasonal influences or local conditions affecting prices in Rasda.

In April 2023, Firozabad led with an average modal price of ₹2249.62, followed by Meerut (₹2236.20) and Gonda (₹2229.31). This suggested a consistent demand for wheat in Firozabad.

May 2023 saw Kanpur (Grain) taking the lead with an average price of ₹2282.39, followed by Robertsganj (₹2231.00) and Gonda (₹2230.00). This indicated strong market conditions in Kanpur during this period.

In June 2023, Kanpur (Grain) continued to lead with an average price of ₹2390.77, followed by Balrampur (₹2385.60) and Ghaziabad (₹2349.23). This highlighted Kanpur's significance in the wheat market.

July 2023 saw Allahabad leading with an average modal price of ₹2356.19, followed by Kanpur (Grain) (₹2341.35) and Vishalpur (₹2330.28). This suggested favorable market conditions in Allahabad.

In August 2023, Choubepur took the lead with an average price of ₹2358.27, followed closely by Kanpur (Grain) (₹2352.31) and Bareilly (₹2352.08). This indicated strong demand or limited supply in Choubepur.

September 2023 marked Gazipur as the top mandi with an average price of ₹2396.00, followed by Kanpur (Grain) (₹2394.04) and Mauranipur (₹2388.75). This suggested a strong market for wheat in Gazipur.

In October 2023, Kanpur (Grain) led with an average modal price of ₹2427.20, followed by Buland Shahr (₹2423.30) and Firozabad (₹2417.17). This indicated favorable trading conditions in Kanpur.

November 2023 saw Etawah leading with an average price of ₹2588.54, followed by Kanpur (Grain) (₹2580.87) and Bharthna (₹2564.80). This suggested strong market conditions in Etawah.

Finally, in December 2023, Firozabad emerged as the top mandi with an average modal price of ₹2596.73, followed by Saharanpur (₹2565.80) and Shamli (₹2553.04). This highlighted Firozabad's strong finish to the year in terms of wheat prices.

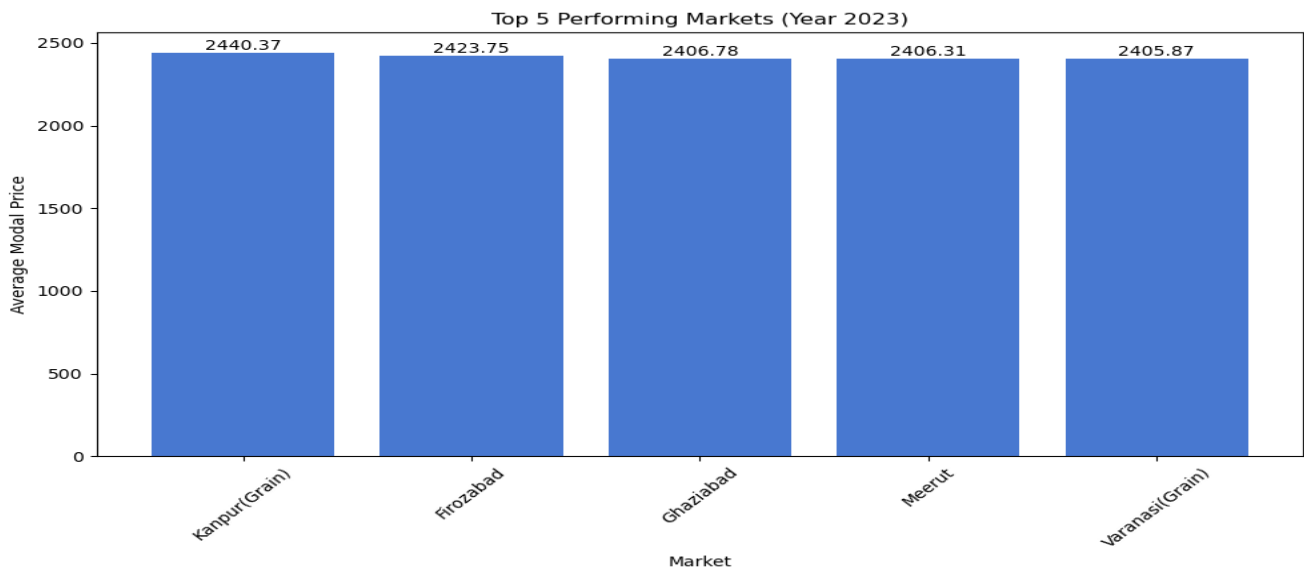
## 8. Yearly Analysis of the Top 5 Performing Markets Based on Average Modal Prices



**Fig 4.62:** Top 5 Markets based on Yearly Average modal price (2022)

**Source:** Own Analysis

In Uttar Pradesh, the top 5 mandis based on the highest average price of wheat in the year 2022 were Allahabad, Firozabad, Meerut, Ghaziabad and Bulandshahar



**Fig 4.63:** Top 5 Markets based Yearly Average modal price (2023)

**Source:** Own Analysis

In Uttar Pradesh, the top 5 mandis based on the highest average price of wheat in the year 2023 were Kanpur, Firozabad, Ghaziabad, Meerut, and Varanasi

# CHAPTER 5

## FINDINGS AND RECOMMENDATIONS

### Findings:

#### Seasonal Price Trends:

Our analysis revealed a distinct seasonal pattern in the modal wheat price (the most frequently observed price) across 2022 and 2023.

- **Post-Harvest (2-3 Months):** Prices typically remain stable or experience a slight increase following harvest.
- **August Onwards:** Prices generally exhibit an upward trend from August onwards.
- **Peak:** Prices often reach their peak in February.

#### 2. Data Availability Challenges:

- A significant challenge identified in this research is the limited data reporting in Uttar Pradesh mandis. Only 46% (99 out of 209) of mandis consistently reported data for more than 250 days per year.
- The 10 worst mandis in terms of data reporting out of 209 in Uttar Pradesh are: Bahedi, Auragarh, Sindhooli, Janhman, Yusufpur, Kamariganj, Ruperdeeha, Viltharoad, Saidpur, and Shoratghar. These mandis have only reported the wheat price on the government portal for 10 days throughout the year.

#### 3. Minimum Support Price (MSP) Violations:

- Our analysis revealed a pattern of **limited MSP violations**. While 31 mandis witnessed wheat prices falling below the MSP of ₹2,015 (2022) and ₹2,125 (2023), only 9 mandis had such violations for more than 10 days. This suggests that MSP violations, although present, were not widespread or long-lasting in most cases.
- However, two mandis, **Uttaripura and Salon**, stand out as outliers. These markets reportedly sold wheat below the MSP for a significantly longer duration (exceeding 50 days). This raises concerns about the data accuracy reported for these specific mandis.

#### **4. Top Performing Wheat Markets in India (2022-2023) based on Average Modal Price (Yearly)**

- The Allahabad marketing performing best among all other 98 Markets basis of Yearly Average modal price of wheat in Year 2022
- The Kanpur marketing performing best among all other 98 Markets basis of Yearly Average modal price of wheat in Year 2023

#### **5. Top Performing Wheat Markets Month wise based on Average Modal Price (2022-2023)**

- Firozabad emerged as a strong contender, topping the charts in several months (Jan, Feb, Sep, Oct 2022 & Apr, Dec 2023).
- Kanpur (Grain) saw a significant rise in 2023, leading the market in May, June, July, October, and coming a close second in several other months.

#### **6. Anomaly Detected:**

The modal prices of Dhanura and Mehrauni markets consistently report inaccurate data, as they remain unchanged throughout each month and year in both 2022 and 2023.

#### **Recommendations:**

Based on the comprehensive analysis of agricultural modal prices and data efficiency in Uttar Pradesh's mandis over the past two years, the following recommendations are proposed to enhance market efficiency, transparency, and stability:

##### **1. Improve Data Reporting Practices:**

- **Standardize Reporting Protocols:** Mandis should adopt standardized reporting protocols to ensure consistency in data collection and reporting. This includes training personnel on accurate and timely data entry.
- **Leverage Technology:** Implement digital tools and mobile applications for real-time data reporting. This can reduce delays and errors associated with manual data entry.
- **Regular Audits and Feedback:** Conduct regular audits of mandi data reporting practices. Provide feedback and corrective measures to mandis with poor reporting efficiency to enhance overall data quality.



## **2. Enhance Infrastructure and Resources:**

- **Upgrade Mandi Infrastructure:** Invest in modernizing mandi infrastructure, including storage facilities, weighing systems, and digital transaction platforms. This can improve the overall efficiency and reliability of market operations.
- **Capacity Building:** Provide training and capacity-building programs for mandi staff and stakeholders to enhance their understanding of market dynamics and data management practices.

## **3. Implement Predictive Analytics for Price Stability**

- **Develop Predictive Models:** Utilize advanced statistical techniques and machine learning algorithms to develop predictive models for wheat prices. These models can help forecast future price trends and provide early warnings of potential price volatility.
- **Integrate Weather and Policy Data:** Incorporate external factors such as weather patterns and agricultural policies into predictive models to improve their accuracy and reliability.

## **4. Facilitate Market Transparency and Accessibility:**

- **Public Data Access:** Make mandi price data publicly accessible through government portals and mobile applications and private agencies. This can empower farmers, traders, and policymakers with timely and accurate market information.
- **Stakeholder Engagement:** Engage with stakeholders, including farmers, traders, and policymakers, to disseminate market insights and predictive analytics. This can help them make informed decisions and mitigate risks.

## **5. Strengthen Policy Frameworks:**

- **Review Support Policies:** Reassess minimum support prices and other agricultural policies to ensure they align with current market realities and provide adequate support to farmers.
- **Promote Cooperative Models:** Encourage the formation of farmer cooperatives and producer organizations to enhance bargaining power and collective decision-making.

## **6. Monitor and Address Price Anomalies:**

- **Outlier Analysis:** Continuously monitor mandi price data to identify and investigate significant price anomalies. Implement corrective measures to address market distortions and prevent exploitation.
- **Seasonal and Regional Insights:** Utilize the analysis to provide insights into seasonal and regional price variations. This can help in planning and resource allocation to manage supply chain disruptions effectively.

## **7. Continuous Improvement and Research**

- **Ongoing Research:** Support ongoing research initiatives to study market dynamics and price determinants. This can help in refining predictive models and developing new strategies for market stabilization.
- **Feedback Loop:** Establish a feedback loop with stakeholders to gather insights on the effectiveness of implemented measures and make necessary adjustment

## **CHAPTER 6**

### **CONCLUSION**

This research has provided a detailed analysis of wheat price trends and data reporting practices in Uttar Pradesh's mandis over the past two years, revealing critical insights, challenges, and opportunities for market enhancement. The study identified clear seasonal patterns in wheat prices, with stability or slight increases post-harvest, an upward trend from August onwards, and a peak in February. Data reporting inconsistencies were a major issue, with only 46% of mandis reporting data consistently for more than 250 days per year. Additionally, the poorest performing mandis reported data on as few as 10 days annually, indicating a significant need for improved data collection practices.

While minimum support price (MSP) violations were present, they were not widespread. Thirty-one mandis experienced prices falling below the MSP, but only nine had violations for more than 10 days. Notably, Uttaripura and Salon had widespread violations, raising concerns about data accuracy and market practices. Top-performing markets included Allahabad and Kanpur, based on average yearly modal prices, with Firozabad and Kanpur (Grain) showing strong monthly performances. However, price data from Dhanura and Mehrauni consistently showed inaccuracies, indicating potential issues with data accuracy.

To enhance market efficiency, transparency, and stability, recommendations include improving data reporting, enhancing mandi infrastructure, using predictive analytics for price stability, increasing market transparency, strengthening policy frameworks, addressing price anomalies, and supporting ongoing improvement and research.

By addressing these challenges and implementing the proposed recommendations, Uttar Pradesh can significantly improve the efficiency, transparency, and stability of its agricultural markets. These measures will benefit farmers, traders, and policymakers, ensuring better market outcomes and promoting sustainable agricultural growth. Continuous improvement in data practices, infrastructure, and policy frameworks will be crucial to adapting to evolving market dynamics and supporting the long-term development of the agricultural sector.

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