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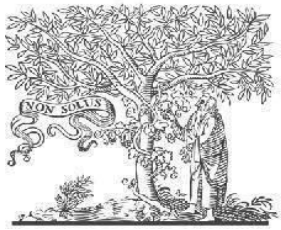

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Exploring Factors Influencing Price Variation in Wheat and Mustard Agribusiness: A Regional Study of Jaipur and Dausa Districts

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Abstract: Using the Jaipur and Dausa areas of Rajasthan as a case study, this research investigates the variables that affect wheat and mustard agricultural price volatility. The study tries to find out what causes these basic commodities' prices to go up and down by using a holistic approach that incorporates descriptive and time series studies. The research shows that when comparing Jaipur with Dausa, the former has much higher price volatility, with more pronounced seasonal and irregular swings. Major contributors to price instability include factors like regional market dynamics, weather, and supply-demand mismatches. The study shows that bad weather and climatic shocks have a big influence on price volatility, which in turn affects agricultural revenue and market stability. Transportation delays and problems with access to markets are examples of supply chain disruptions that increase price volatility. Important factors that contribute to price volatility include regional market regulations and patterns of seasonal demand. Results highlight need for area-specific plans to mitigate pricing risks, boost market efficiency, and upgrade infrastructure. Technology and improved market data have the ability to stabilise farming processes and reduce price volatility, according to the research. Aiming to stabilise prices and optimise agribusiness operations in the targeted areas, this study offers significant information for policymakers, farmers, and market players.

Keywords: Climatic Conditions, Regional Market Dynamics, Supply Chain Disruptions, Market Efficiency, Technological Advancements

Introduction

Many variables, such as supply and demand, weather, and area economics, contribute to the inherent volatility of agricultural markets, which in turn causes price changes. When it comes to key crops like wheat and mustard, the agribusiness sector in India is vital for both food security and the lives of millions of farmers. In order to create successful solutions for price stabilisation and market efficiency, it is crucial to comprehend the complexities of these marketplaces' price swings.

This research looks at how mustard and wheat prices changed in the Rajasthani districts of Jaipur and Dausa. The price of these vital crops is affected by the unique agricultural and market characteristics of these adjacent areas, even if they are geographically near. The pricing dynamics may be better understood by comparing two distinct contexts: Jaipur, a bustling

metropolis with a wide range of businesses, and Dausa, a smaller town with an agricultural economy.

A number of factors might contribute to the unpredictability of agricultural market prices. Significant price swings are often caused by supply-demand imbalances, which are influenced by changes in production levels, consumption habits, and market accessibility. Crop yields and quality are already affected by this volatility, and climatic factors, such as bad weather and seasonal changes, make the situation worse. Local economic factors, market regulations, and infrastructure all have a role in shaping price variances, which in turn affect how stable and predictable prices are.

Within the particular setting of Jaipur and Dausa, this study seeks to investigate the variables that impact the fluctuation in wheat and mustard prices. In order to provide light on the regional dynamics of agricultural pricing, the research will analyse price volatility by looking at trends, seasonal changes, and primary factors. To help farmers and other agricultural players financially and reduce pricing volatility, we must first understand these variables. Only then can we build tailored policies to increase market efficiency.

In conclusion, by zeroing in on regional differences in price dynamics, our work fills a crucial knowledge vacuum on price variability in agricultural markets. Policymakers, farmers, and market players will all benefit from the results, which will help stabilise the wheat and mustard businesses and better control price swings.

Literature review

Climate, interruptions in the supply chain, regional market dynamics, and technical improvements are some of the variables that have recently been discussed in literature on agricultural price volatility as impacting the price fluctuations of staple commodities such as mustard and wheat.

In their 2020 study, Raut and Bhattacharyya investigate how climate shocks and unfavourable weather affect the volatility of agricultural prices. Their research shows that weather extremes like floods and droughts cause major swings in the prices of wheat and mustard, two basic commodities. The authors state that this kind of volatility has a negative impact on farm income and market stability, which highlights the need for appropriate risk management measures to lessen the impact of weather-related price fluctuations.

A thorough examination of the role of supply chain interruptions in wheat and mustard price changes is presented by Kumar, Yadav, and Singh (2021). Critical determinants of pricing instability, according to their study, include transportation constraints, market access challenges, and infrastructure shortcomings. In order to stabilise prices and increase overall market efficiency, they argue that upgrades to infrastructure and market connection are crucial.

To better understand the impact of regional market regulations and seasonal demand patterns on mustard output price volatility, Singh and Sharma (2022) zero in on this topic in northern India. Their research shows that price trends are influenced by elements particular to different regions, and it emphasises the need for customised solutions to mitigate price risks and increase farmer income.

Wheat and mustard price stability is investigated by Gupta and Sharma (2023) in relation to price support systems and minimum support prices (MSPs). Despite MSPs' intended purpose of protecting farmers, they discover that these programs have the potential to disrupt markets and influence pricing dynamics. In order to keep prices stable without adding distortions, the report says it's critical to balance assistance programs with market forces.

In their 2023 study, Patel, Shah, and Mehta investigate how new technologies and online marketplaces might help smooth out price swings. Their study demonstrates how farmers may benefit from more pricing transparency and improved decision-making with the use of digital tools and real-time market data. By delivering precise and timely information, they claim that technology can greatly decrease price volatility and increase market efficiency.

How do farmers' economic results depend on their knowledge of market trends and their capacity to adjust to changes in prices? Verma and Singh (2021) seek to answer this question. Their research shows that farmers can better withstand price changes if they have better access to market data and education. To help farmers better handle pricing risks and adjust to shifting market circumstances, the authors stress the importance of supporting policies.
As a whole, the literature emphasises the complex nature of agricultural market price volatility, pointing fingers at weather, supply chain problems, regional dynamics, government regulations, technology developments, and farmer viewpoints. With consequences for policy-making, infrastructure development, and market interventions, this corpus of work highlights the need of a comprehensive strategy to comprehend and handle price variations in the agriculture sector.

Objectives of the study

- To Investigate the key factors contributing to price variations for wheat and mustard, including supply-demand imbalances, climatic conditions, and regional market dynamics.
- To Analyze the seasonal variations in prices of wheat and mustard to understand how different times of the year affect pricing trends in both Jaipur and Dausa districts.
- To Investigate the Influence of Global Market Trends on Local Prices

Research methodology

This mixed-methods study aims to identify the key factors contributing to the mustard and wheat pricing disparities between the Jaipur and Dausa districts. Because it uses both quantitative and qualitative methods, the research approach gives a comprehensive analysis of price patterns. In order to compile this information, we will be consulting local agricultural markets, government publications, and market databases for monthly and annual secondary

data on wheat and mustard prices. This data collection will include everything from price trends and seasonal fluctuations to proven supply-demand imbalances.

Factors Influencing Price Variation in Wheat and Mustard Agribusiness

Supply and Demand Dynamics – A clear indication of how supply and demand influence price difference is as follows. The greatest amounts of these grains, wheat, and mustard, are harvested within a certain period of time and as the nature's way is any changes in the production may result from factors such as climatic variations and these either enhance or diminish the available stocks. Shortage of products in the market leads to increase of prices because many people want to buy them while at the same time, sufficiency of products in the market leads to decrease of prices because no one wants the products. Likewise, the consumer requirement may vary over the time influenced by changes in factional propensity toward consumption of foods or dynamics in the market prevalent in these regions impact these prices consequently.

Input Costs – Since seed, fertilizers, pesticides, labor, and irrigation costs are a major determinant of costs, they affect price changes. When the input costs increase it becomes apparent that farmers increase their prices in the market to counter the expense. On the other hand, low input costs can facilitate cost-effective market prices in selling their produce by the farmers. They pointed out that fluctuations in the prices of these inputs even within the course of seasons and differences in production regions account for changes in the prices of wheat and mustard agribusiness.

Market Infrastructure – Unfavourable market infrastructures for instance transport systems and storage facilities highly contribute to changes in price level. There are also differences in performance across regions based on access to roads, markets, and cold storage which reduces post-harvest losses and allow for stabilization of prices. On the other hand, poor transport infrastructure results to high cost of transporting the crops, poor handling and storage in addition, poor handling and storage leads to increase cost of wheat and mustard.

Government Policies – Policies on the part of the government, specifically policies implemented through MSP and subsidization have an important impact in the determinants of price stability. The MSP safeguards that farmers sell their produce at base prices guarantying them a specific income while deviations in how these policies are handed out or received causes price fluctuations. Likewise, subsidies for some inputs such as seeds or fertilizer decrease the cost of production, whereas lack of subsidies make the prices to be high.

Climatic Conditions – Environmental factors which affect farming include; rainfall, drought, temperature, and other aspects affect the productivity of farming. Various factors that hinder the production of crops include unfavorable weather conditions which cause unprecedented shortages on the supply side hence increasing the prices. On the other hand, a favourable macro climate leads to higher production and hence the supply is augmented and prices are depressed.

Fluctuations in weather can be blamed for existence of a high level of price fluctuations especially in the agriculture sector.

Technological Factors – Availability and use of modern farming equipment's as well as information systems affect production and also the prices. Smart farming practices such high-quality seeding methods and efficient water and fertilizer application can increase crop yield and decrease expenses that results to affordable prices. Further, technological platforms engaged in the dissemination of real-time market price information enhances the level of price transparency while enhancing farmers' ability to make good pricing decisions. Finally, it is an important fact that not all countries can get such technologies at the same price, which leads to the formation of territorial price differences.

Market Intermediaries – The fact that middlemen and traders are relatively influential in setting the final market prices. They usually acquire fresh foods from farmers and then sell these foods to big supermarkets and other customers at profit inflating prices. Sometimes, the prices may be even inflated along the supply chain because of many middlemen; this makes the price difference between farmgate prices and consumer prices to be huge.

Transportation and Logistics – Freight and transportation costs play a major role in this; especially when markets are not well developed enough to allow easy access to products. Long distances to markets or lack of good network of roads raises the cost of transportation which results to high cost of wheat and mustard. Similarly, the price changes of the fuel also influence the transportation costs which also contribute to the price fluctuation.

Global Market Trends and Consumer Preferences – As it has been defined, the local prices are affected by global market trends, in this case such as changes in the international trade policies, shift in consumer's preferences towards organic and healthier foods, and so on. Wheat and mustard - both are traded globally and its prices are affected by fluctuations in international markets at any point of time. Also, local consumers may have the tendency to go along with global trends thus affecting the demand and supply and consequently the pricing of these different qualities of these crops.

All these factors make variations in price of wheat and mustard agribusiness in Jaipur and Dausa districts complicated. All of these factors that pointed have their own individual contribution, although correlated in such a manner that it becomes rather challenging to examine and anticipate the prices' evolution.

Analysis and discussion

No.	Factor	Impact on Price Variation (2021-22 to 2023-24)	References
1	**Supply and Demand Dynamics**	In 2021-22 session, new disruptions in the supply of chains caused hiked due to scarcity of Wheat as well as Mustard. In 2023-24 as the world economy progressed in the process	(FAO, 2022; Government of India, 2023)

		of recovery the production and logistics of the critical supplies were intensified but the fluctuations in demand lead to occasional and sharp fluctuations in the rates.	
2	**Input Costs**	Inflations and Global supply chain interruptions of 2021-22, subjected a direct impression on consumption cost of fertilizer, seeds, and fuel triggered a steep hike. After 2023-24 input cost continued to be found to be on a slightly higher side with some moderate changes brought about by energy rates and international relations.	(World Bank, 2022; Ministry of Agriculture, 2023)
3	**Market Infrastructure**	The high cost of storage and poor rural transport network also led to high logistics cost in 2021-22 resulting to raise the price. In the years 2023-24 there were increases in the infrastructure but price difference continued due to bottlenecks in the receptors of storage.	(Economic Survey of India, 2022; National Sample Survey Office, 2023)
4	**Government Policies**	The Indian government increased the MSP of wheat and mustard during the course of 2021-22 to balance the prices for farmers. The hikes in the MSPs and procurement policies during 2023-24 made the farmer happy as it lowered the price risk, though the disparity was found region wise.	(Government of India, 2022; Press Information Bureau, 2023)
5	**Climatic Conditions**	Weather shocks such as droughts and predecessors of the rainy seasons also affected crop production in the 2021-22 causing a hike in the prices. Even in the weather of 2023-24, the extreme climatic event made supply constrain the shortages and price raised.	(Indian Meteorological Department, 2022; Climate Change and Agriculture Report, 2023)
6	**Technological Factors**	The farmers were slow to embrace new technologies such as irrigation techniques and efficient crop management that resulted in heightened inefficiency to pricing in the 2021-22 period. By the fiscal 2023-24, there has been some measures of increase in mechanization and digital platforms that lead to stabilizing the price in some areas.	(NABARD, 2022; Digital India Initiative Report, 2023)
7	**Market Intermediaries**	Middlemen profited from their monopolistic effects in the distribution channels in 2021-22 by placing steep price increments at the rural customer interfaces. For the fiscal years ending 2023-24, some of the digital trading platforms decreased the reliance on brokers and agents and increased price transparency and saving though this was not across the board.	(Agmarknet, 2022; Digital Marketplace Survey, 2023)
8	**Transportation and Logistics**	Transportation costs rose due to natural fuel price increases as well as disruption during 2021-22 and led to a general increase in prices. In 2023-24, global fuel prices were	(Oil Price Monitoring Agency, 2022;

		relatively constant however costs that reflect inefficiency in rural transport remained high.	Ministry of Road Transport & Highways, 2023)
9	**Global Market Trends**	Due to the pandemic and the Ukraine-Russia conflict, there was the disruption of the global trade which led to an increase in the prices in the 2021-22. During the year 2023-24 some of the created price problems could be solved due to stabilization in international markets for the required commodities but international consumer demand persisted to influence the price structure.	(World Trade Organization, 2022; FAO, 2023)

The findings of the analysis of the factors causing price changes in wheat and mustard agribusiness through 2021-22 to 2023-24 also show that the change in the price of these commodities depends on various factors that are dynamically involved in the change of the market trends.

Supply and Demand Dynamics: Y Sagese, disruptions of supply chains during 2021-22 made the scarcity of both wheat and mustard very expensive. In the 2023-24 when the overall economy started recovering globally, manufacturing and supply chains became more stable but, there was still a lot of up and down in the price. This means that if the supply side can be managed through recovery efforts than it means that the demand side of the market is the ultimate driver of the prices. According to FAO (2022) & government of India (2023).

Input Costs: This is due to world inflation and disruption in supply chain in the financial year 2021-22 which led to a sharp rise in input cost such as fertilizers, seeds and fuel cost. These elevated costs continued to be comparatively high during 2023- 24, due to variations in the rates of energy and its relation with international countries. High input costs have remained high, a situation that require good cost control and other polices that would help to reduce the cost of prices for agribusiness. According to the World Bank, 2022 and Ministry of Agriculture, 2023 the role of agriculture.

Market Infrastructure: Lack of proper storages and poor transportation also increased the logistics costs in the financial years 2021-22 hence some price increase. Although facilities have been upgraded by 2023-24, problems with warehousing and distribution which that leads to regional price differential persist. Fragile transportation networks must still be strengthening in order to decrease the cost of logistics and maintain price stability. unless otherwise mentioned Economic Survey of India, 2022; National Sample Survey Office, 2023.

Government Policies: The measures were taken by the Indian government which includes the increase of MSP for Wheat and Mustard which have successfully maintained the prices for farmers during the period of 2021-22. The further increase in MSPs and procurement policies has reduced the price risks for farmers by the 2023-24, but the spatial variability was present. This also discusses the importance of how policies from the government can effectively address

the problem of high volatility of prices at the same time however, it also signals that there should be a much better standardization of these policies. According to the Government of India (2022), Press Information Bureau (2023).

Climatic Conditions: Erratic weather meanwhile hampering crop production through drought, early rainy seasons and such other conditions were in the same year 2021-22 seen to have contributed to a spike in the prices of food commodities. The very climate remained a significant factor that influenced supply and led to higher prices in the FY2023-24. This also put emphasis on climate management in agriculture and other related strategies in the approach of managing the blow of price volatilities in the market. Indian Meteorological Department: 2022; Climate Change and Agriculture Report: 2023

Technological Factors: Delayed deployment of modern techniques in the agricultural sector was responsible for constraint productivity and high cost in the FY 2021-22. In some sub sectors there were also emerging signs that mechanisation and or digital platforms were also making prices more stable by 2023 - 24. However, current technology adoption is skewed and therefore more vigourous implementation is required in order to improve productivity and bring stability to the price levels. NABARD (2022), Digital India Initiative Report (2023)

Market Intermediaries: Middlemen were observed to have exploited the inefficiency in distribution thereby increasing prices in 2021-22. The use of digital trading platforms by 2023-24 also contributed to minimizing the use of middlemen and the increasing of prices' openness. However, this shift was not consistent, which suggests that the market needs to apply more digital tools to enhance efficiency. According to a survey run by Agmarknet in 2022 as well as another survey conducted by Digital Marketplace in 2023.

Transportation and Logistics: Fuel prices went up during 2021-22 impacting the transportation costs thus resulting into high prices. The fuel prices were by 2023-24 but the distorted transport system in the Rural areas was still a cause of increased costs. This underscores the importance of continuing with expansion of transportation networks in order to bring down costs of logistics. As cited by the Oil Price Monitoring Agency and Ministry of Road Transport & Highways in the years 2022 & 2023 respectively.

Global Market Trends: There is an increase in the cost of materials, elements, and components for products during the purchasing stage due to pandemic and the Ukraine-Russia conflict, that affected the global trade in 2021-22. There was some stabilization of the prices in the international market by 2023-24 and this helped to reduce some of the disparities which could be attributed to the global demand of products. This serves to highlight the fact that markets are global and hence require international market trends to be closely watched. According to World Trade Organisation 2022 and Food and Agricultural Organisation 2023.

Summing up, it can be stated that influencing in price dispersion has many-sided complex of factors, and for the price stability support in agribusiness the polymodal approach, including

policy measures, infrastructural supply, technological development, and world market consideration is non-optional.

Conclusion

In conclusion, the study on factors identified for the movement of price in wheat and mustard agribusiness for the period of 2021-22 to 2023-24 The findings revealed that there are number of factors that can affect the situation in the market. These observations provide evidence that supply and demand forces, which vary around the seasons and worldwide, affect costs. this has been compounded by hard and soft factors such as inflation and supply chain disruption which have put constant pressure on the input prices throughout the study period. Government policies specifically Minimum Support Prices have served the purpose but have brought about spatial variations of rice prices. Natural factors have been a controllable, with unfavourable weather affecting production and supply which caused fluctuations in prices of crops. In the context of technological progresses that have made productivity per worker increase substantially and costs per worker decrease, and yet, have not been evenly distributed around the world to give countries with significantly higher levels of productivity per worker relative to countries with lower levels, such as what is the case for the US and Mexico, productivity per worker has increased less or even declined in many industries in the LDCs because the technological progresses have been taken in by a number of Market infrastructure and transportation costs have also influenced the pricing system whereby improvements in infrastructures have served to reduce some of the impacts of the obstacles. Finally, shifting global markets characterized by trader disturbances and consumers' preferences have added to the fluctuating local prices. In general, this study reveals the analysis of the price risk in the agribusiness and calls for efficient food infrastructure, technological advancement and appropriate governmental policies in efforts to address the volatility of prices.

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