

The onion paradox

Output falls, but so do prices



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Introduction

India consumes about 13 lakh tonne of onions every month, making it one of the most important vegetable crops for household consumption.

With about 1.4 million hectare under cultivation and production of about 24 million metric tonne (MMT) annually on average (2015-16 to 2021-22), India is the second-largest onion producer globally. The bulk of the supply comes from four states — Maharashtra (13.3 MMT), Madhya Pradesh (4.7 MMT), Karnataka (2.7 MMT), and Gujarat (2.5 MMT) — which together accounted for 75% of India’s production as of 2021-22.

Yet, onion is one of the most volatile agricultural commodities. A sharp increase in price impacts consumer budgets, while a fall in onion prices below the cost of cultivation reduces the income of farmers.

Why these high and low tides in onion prices?

Onion price volatility is led by two factors:

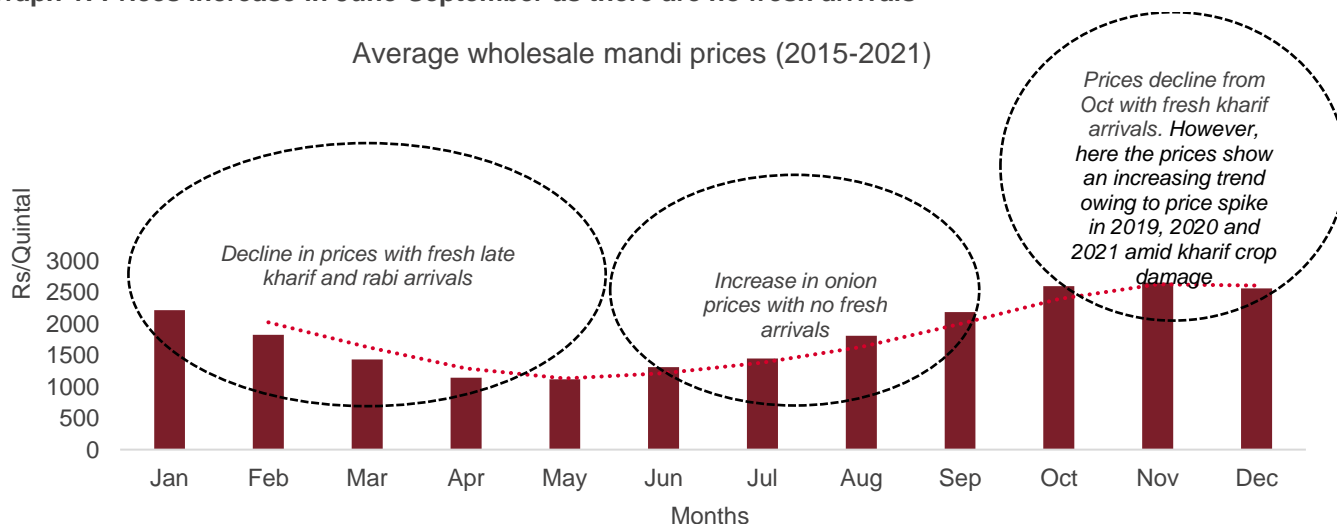
1. **Seasonality:** It results in a cycle of high and low prices as onion is consumed all year round but is not harvested around the year. The rabi crop (harvested in March-May) accounts for 65-70% of the onion output with the kharif and late kharif crop (harvested in Oct-March) contributing the rest. No onion harvesting takes place between June and September (see Table 1), and stored rabi onion is released to meet the supply deficit (Graph 1), leading to price increases during this period.

Table 1: Seasonality in onion crop

Crop season	Transplantation	Harvesting
Kharif	July-August	October-December
Late Kharif	October-November	January-March
Rabi	December-January	March end-May

Source: Ministry of Agriculture and Farmer’s Welfare

Graph 1: Prices increase in June-September as there are no fresh arrivals



Source: Agmarknet

2. Moreover, onion prices are inherently unstable due to high reliance on weather conditions, especially the southwest monsoon, which largely determines the supply and price dynamics of bulbs. In the last three years (2019-20, 2020-21, 2021-22), the vagaries of monsoon have marred the onion crop, especially the kharif crop, which maintains supply during the high-demand October-November period, a major festive season in India. Although overall monsoon was above normal in 2022-23 as well, its temporal and spatial distribution was skewed over the country. As Table 2 shows, while June witnessed a rain deficit, July and September saw excess rains.

Table 2: Excess rains affected productivity of kharif onion crop

South West monsoon, % departure from normal	2019-2020	2020-2021	2021-2022	2022-23	Stage of crop	Impact of deficit/excess rains on various stages of onion crop
June	-32%	17%	10%	-8%	Establishment	Both deficit and excess rains negatively impact the crop establishment
July	5%	-10%	-7%	17%	Vegetative	Excess moisture in soil may dampen or shunt root growth
August	16%	27%	-24%	4%	Bulb initiation	Both deficit and excess rains lead to stunted growth of bulb
September	52%	5%	34%	12%	Bulb development and maturation	Excess rains lead to bulb rot
Overall southwest monsoon	10%	9%	-1%	6%		Overall, onion is a shallow rooted crop which gets severely impacted owing to excess rains.
Impact on yield	2019-2020	2020-2021	2021-2022	2022-23, (E)		
Growth in on-year kharif onion yields, %	-3% (18.2 ton/ha)	-10% (16.4 ton/ha)	-1% (16.2 ton/ha)	0% (16.2 ton/ha)		

Source: IMD and CRISIL Research

Note: 1. The % departure of monsoon in the table above has been colour coded as per the following legend



2. The numbers in bracket are yield in tonne per hectare and (E) denotes estimated

Weather fluctuations affect crop yield and erratic rains damaged the kharif onion crop in the last three years, leading to a decline in crop yields and price rise. Year 2022-23 as well is estimated to be no different in terms of crop damage. Both deficit and excess rains have damaged the crop in all key kharif onion-producing regions, i.e., Maharashtra, Karnataka and Andhra Pradesh (~60% share in the country's kharif onion production).

In Maharashtra and Karnataka, deficient rains in June, followed by largely excess rains in July and August, affected crop sowing. While onion nurseries in Maharashtra were damaged in July, Karnataka farmers in rainfed areas could not grow onion amid deficient rains in June. As a result, Maharashtra onion farmers have reportedly shifted towards crops such as maize and Karnataka farmers towards cotton in rain-fed areas and sugarcane in irrigated areas. In Andhra Pradesh too, excess rains led to field inundation, making transplanting of onion difficult. Hence, CRISIL estimates yields will not improve this season and will be on a par with the 2021-22 season.

As a result, yields are estimated to be about 11%, 10% and 19% lower in Maharashtra, Karnataka and Andhra, respectively, compared with their average over 2016-17 to 2020-21.

Further, this season is estimated to have seen a decline in sown area. The area under onion crop is estimated to decline by almost 13%, from 6.7 lakh hectare in 2021-22 to 5.8 lakh hectare in 2022-23, following negative sentiment among farmers due to the 2021-22 rabi onion price crash. Rabi onion prices declined ~27% on-year in May 2022 to about Rs 8 a kg amid bumper rabi production of about 20 MMT. On average, the rabi output is about 16 MMT (average of the 2015-16 to 2021-22 period). Further, in all the three key growing regions, the erratic monsoon affected sowing of the crop.

Given the decline in acreage and lack of improvement in crop yields, the overall onion output for the 2022-23 kharif season is expected to be ~13% lower on-year.

Table 3: State-wise monsoon and its estimated impact on kharif 2022-23 onion crop sowing and yields

SW monsoon, % departure from normal, 2022-23	Maharashtra	Karnataka	Andhra Pradesh
1 June-30 June	-30%	-18%	12%
1 June-27 July	35%	23%	21%
1 June- 31 August	18%	33%	14%
1 June- 30 September	23%	30%	10%
Impact on kharif crop sowing and yield, 2022-23	Maharashtra	Karnataka	Andhra Pradesh
Onion area, % change over kharif 2021-22 (estimated)	-15%	-15%	-8%
Average onion yields (kharif 2016-17 to 2020-21)	16 tonne/ha	13 tonne/ha	20 tonne/ha
Onion yield, % change over kharif 2021-22 (estimated)	0% (14.3 tonne/ha)	0% (11.7 tonne/ha)	0% (16.2 tonne/ha)

Source: IMD and CRISIL Research

Note: The % departure of monsoon in the table above has been colour coded as per the following legend



Twist in the tale — no price spike despite decline in output

Agriculture commodity prices typically escalate with supply shortages. In 2019-20, 2020-21 and 2021-22, onion prices had skyrocketed as kharif crop was damaged owing to vagaries of the monsoon. As seen in Table 4, onion mandi prices spiked to as high as Rs 46 a kg during 2019-2020, a 131% increase compared with the four-year average price of 2015-16 to 2018-19. Similarly, prices in 2020-21 and 2021-22 were way above the average price of Rs 20 a kg logged in the 2015-16 to 2018-19 period.

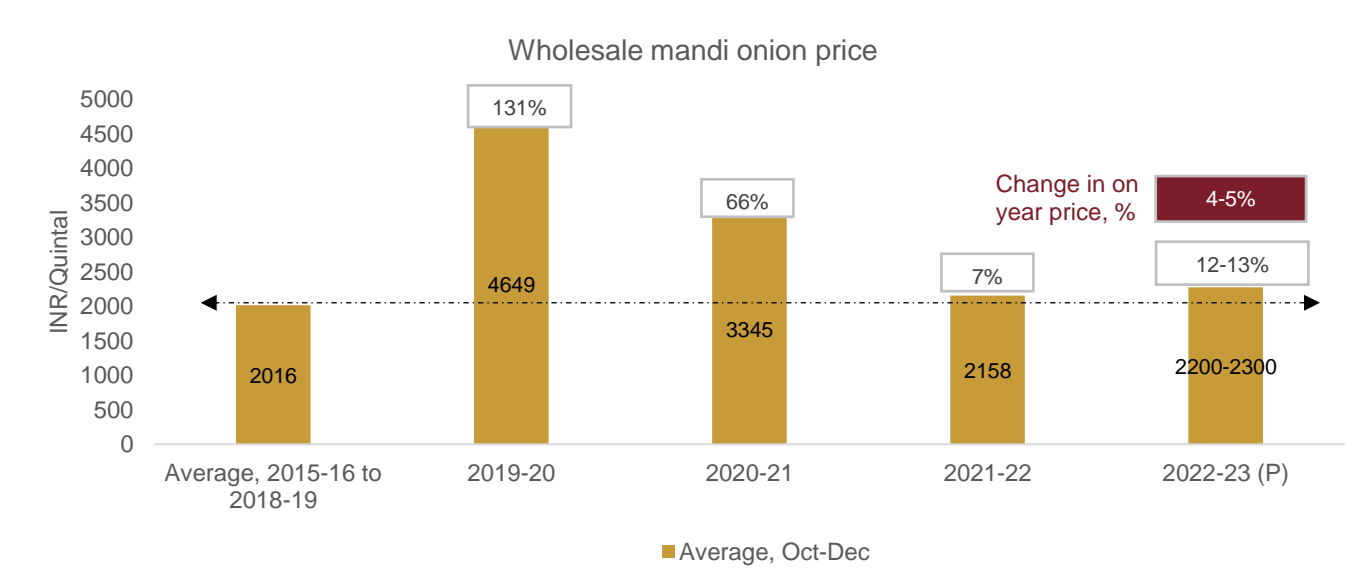
This season, kharif onion output is estimated to decline ~13%, which should have led to a spike in onion mandi prices to the tune of Rs 30 a kg. However, price escalation is expected to be contained due to ample availability of rabi onion stocks. The rabi 2021-22 season witnessed bumper production to the tune of 20 MMT, an increase of ~17% on-year.

As per the trend, rabi stocks get fully consumed by September and thereafter fresh kharif arrivals take up market shelves. But as per CRISIL's on-ground interactions currently, about 20%, 25% and 15% of rabi stocks are estimated to be available in Madhya Pradesh, Maharashtra, and Rajasthan, respectively. This rabi stock is expected to compete with fresh kharif arrivals.

Further, NAFED procured about 2.5 lakh metric tonne of rabi onion — an increase of 25% on-year — to keep the prices in check for kharif season 2022-23. As per traders in Azadpur mandi, currently 25-30% of the arrivals are from NAFED. This, too, will prevent any significant price rise.

Hence, CRISIL estimates a moderate price rise to the tune of 4-5% on-year in October-December 2022.

Table 4: Despite steep decline in kharif output, prices to rise only 4-5% on year in Oct-Dec 2022 period



Source: Agmarknet

Note: Figures in the box % indicate the increase in onion prices (in %) over the average prices in the 2015-16 to 2018-19 period; figures in the box % indicate the expected increase in onion price in 2022-23; (P) denotes projected

Overall, CRISIL estimates 2022-23 kharif acreage for onion to be lower (~13%) with production decreasing ~13% on-year. Although onion supply from all the key producing regions is expected to decline, ample rabi stocks and NAFED buffer stocks will prevent any significant spike in kharif onion prices.

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