PRICES AND INFLATION: UNDERSTANDING THE DYNAMICS

CHAPTER 04

In gauging the health of the global economy, understanding the trends in inflation is essential. While global inflation peaked in 2022 due to supply chain disruptions and geopolitical tensions, it has declined since then, aided by policy measures. In India, retail inflation eased in FY25 due to timely interventions by the government and the Reserve Bank of India. Core inflation reached its lowest point in a decade, while food inflation was affected by supply chain disruptions and adverse weather conditions.

Onion and tomato prices are affected by the decline in production, partly due to extreme weather conditions and monsoon-induced supply chain disruptions. On pulses, despite being a major producer, India faces a gap in demand and supply. The government has undertaken several measures to rein in the prices of vegetables like onion and tomato which included procurement and buffer stocking of onion under price stabilisation fund and subsidised sale of onion and tomato. Also, many administrative measures have been taken-up to address the price pressures in pulses such as subsidised retail sale, stock limits and easing imports.

Estimates suggest that India's retail price inflation will align progressively with the target. Global commodity prices are expected to decline, potentially easing core and food inflation. Long-term price stability could be achieved by robust data systems for monitoring prices, developing climate-resilient crops, reducing crop damage and post-harvest losses.

INTRODUCTION

4.1. In the ever-evolving landscape of global economics, understanding the dynamics of inflation is crucial. The persistent inflationary pressures pose several challenges for policymakers and the general public. On the global front, central banks are cautiously unwinding their restrictive policies to balance inflation control with economic recovery. In India, the various government initiatives and monetary policy reviews are helping to keep inflationary pressure at check.

4.2. Global inflation peaked at 8.7 per cent in 2022, driven by supply chain disruptions and geopolitical tensions, to 5.7 per cent in 2024[1]. In India, retail inflation moderated from 5.4 per cent in FY24 to 4.9 per cent in FY25 (April-December) despite challenging food price dynamics. Food items constitute about two-fifths of the consumer price index in India. Hence, the Consumer Food Price Index (CFPI) is a significant determinant of retail inflation. In recent years, food inflation has been a major contributor to headline inflation. However, an increase in prices is not widespread across all food categories. It is primarily driven by a few items.

4.3. Given this context, the chapter is organised into four sections. Section 2 analyse the global inflation, while Section 3 examines the domestic inflation trends and discusses the proximate factors affecting inflation dynamics. The chapter concludes with a set of recommendations in Section 4. The idea behind this presentation plan is to give an overview about inflation dynamics to policymakers and stakeholders to help them navigate the complexities of managing inflation.

GLOBAL INFLATION

Global resilience amid synchronised monetary policy tightening

4.4. Despite the sharp and synchronised tightening of monetary policy across countries, the global economy has demonstrated an unusual level of resilience in output growth throughout the disinflationary process. This resilience is reflected in the steady decline of the headline inflation rate in most countries during FY24 and the current year. The concerted efforts by central banks to curb inflation through increased interest rates and other policy measures have yielded positive outcomes, resulting in a significant reduction in inflationary pressures.

1 International Monetary Fund (2025, January) *World Economic Outlook Update-Global growth: Divergent and Uncertain*. Washington, DC. (https://tinyurl.com/29ussy2x)

Chart IV.1a: Headline inflation eases across countries

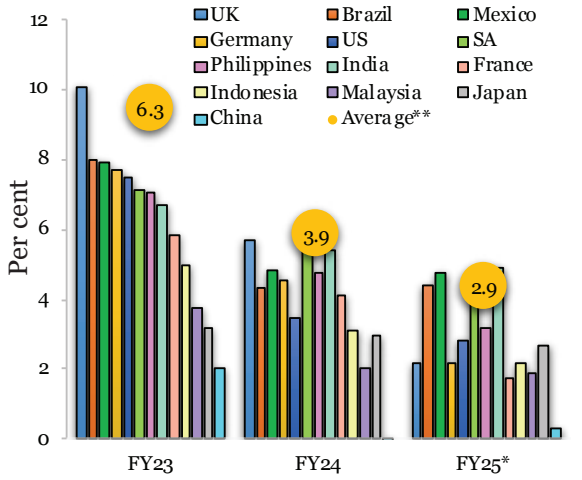
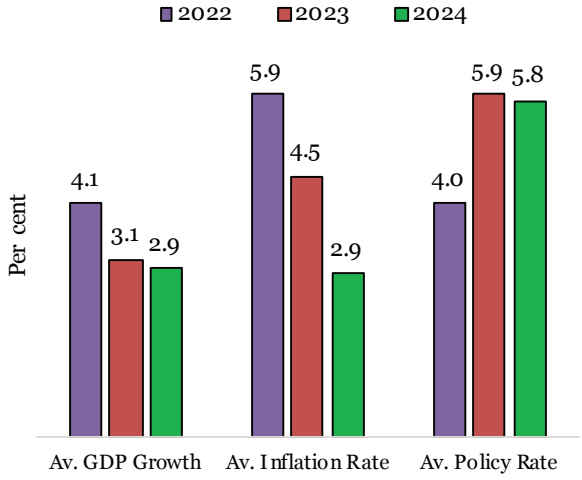


Chart IV.1b: Monetary targeting lowered inflation and stabilised output globally

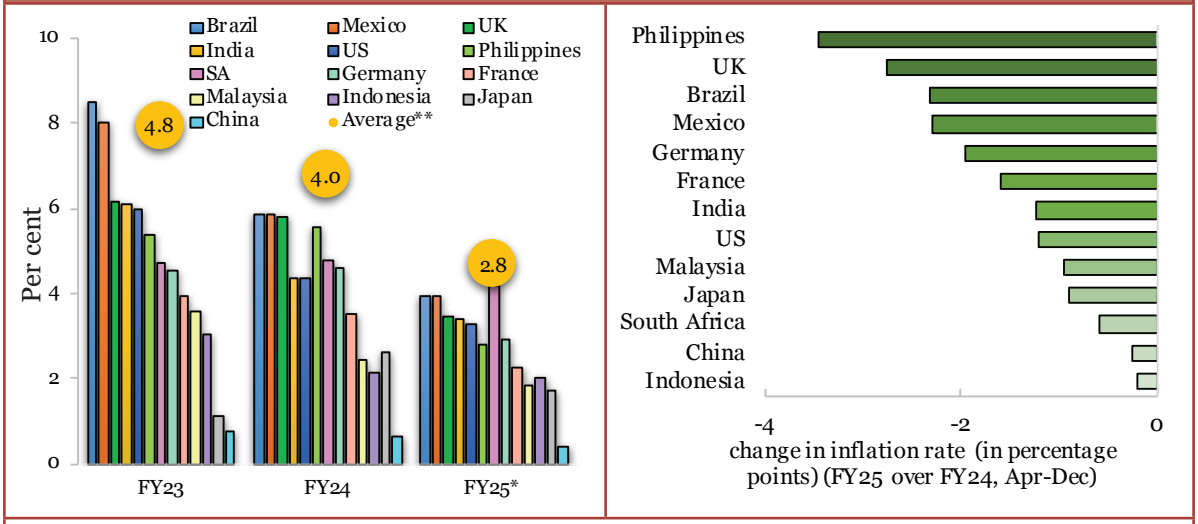


Source: Bloomberg and Consumer Price Indices released by CSO, MoSPI, IMF WEO Database Oct 2024 and Jan 2025 update, Central bank policy rates, BIS
Note: *Inflation rate for FY25 is for April to December 2024, except for Japan, Malaysia and South Africa is until November 2024. ** Simple average of countries presented in chart IV.1a.

Decline in core inflation

4.5. In alignment with the downward trend in headline inflation, core inflation, which excludes volatile food and energy prices has also decreased in most countries. The decline can be predominantly attributed to a moderation in international commodity prices. This trend highlights the effectiveness of policy interventions in stabilising prices across various sectors.

Chart IV.2: Core inflation also moderates



Source: Bloomberg and Consumer Price Indices released by CSO, MoSPI
Note: *Inflation rate for FY25 is for April to December 2024, except for Japan, Malaysia and South Africa is until November 2024. ** Simple average of countries presented in chart IV.2.

Global food inflation eases with divergence in a few EMEs

4.6. Global food inflation is on a downward trend, aligning with the patterns observed in both headline and core inflation. Improving global supply conditions due to solid harvests and favourable growing conditions contributed to the softening of food prices[2]. However, some emerging economies, such as Brazil, India, and China have a contrasting pattern.

Chart IV.3a: Global food inflation declines

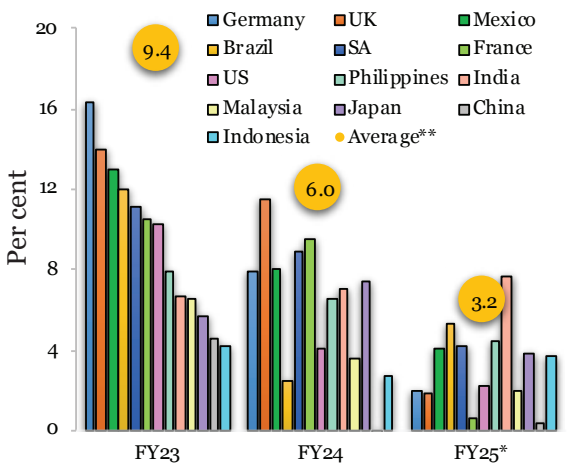
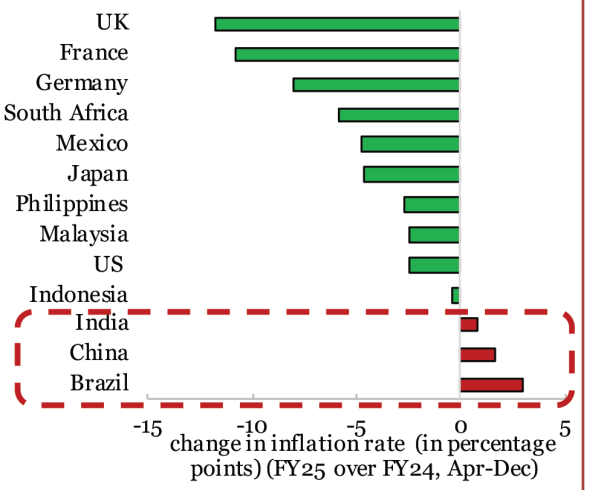


Chart IV.3b: Diverging trend in a few EMEs



Source: Bloomberg and Consumer Price Indices released by CSO, MoSPI
Note: *Inflation rate for FY25 is for April to December 2024, except for Japan, Malaysia and South Africa is until November 2024. ** Simple average of countries presented in chart IV.3a.
EMEs stands for emerging economies

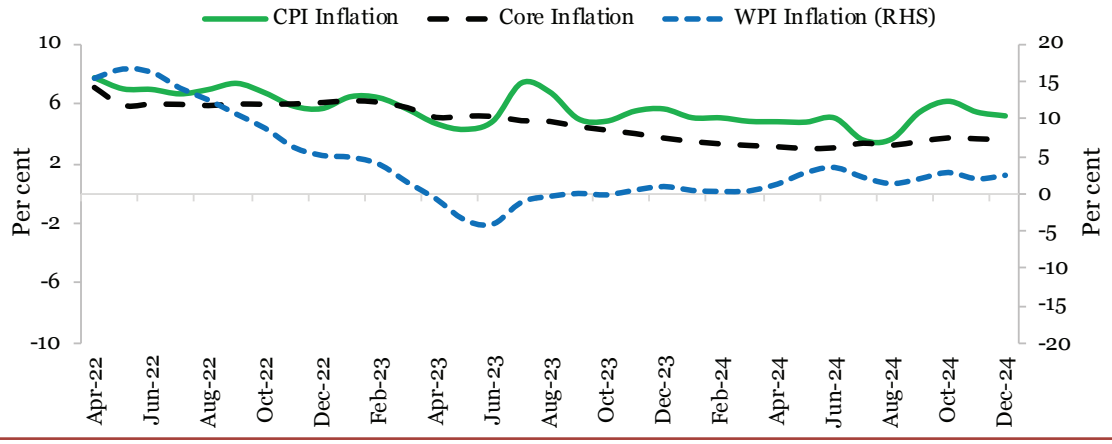
DOMESTIC INFLATION

Softening core inflation cools headline inflation

4.7. India's headline inflation, measured by the Consumer Price Index (CPI), has moderated in FY25 (April-December) compared to FY24. This decline is primarily due to a significant decrease in core inflation, which dropped by 0.9 percentage points between FY24 and FY25 (April-December). The sharp decline in core inflation was largely driven by core services inflation, which was lower than core goods inflation. A decrease in fuel price inflation has also contributed to the moderation in headline inflation, alleviating pressure on household budgets. In general, the decline in retail inflation can be attributed to a reduction in input prices, as reflected in wholesale price inflation, which was in the deflationary zone (-0.7 per cent) in FY24 and remained low in FY25 (April-December).

2 *Commodity Markets Outlook*, World Bank (2024, October) (https://tinyurl.com/dyduh9tu).

Chart IV.4: Headline and core inflation under control



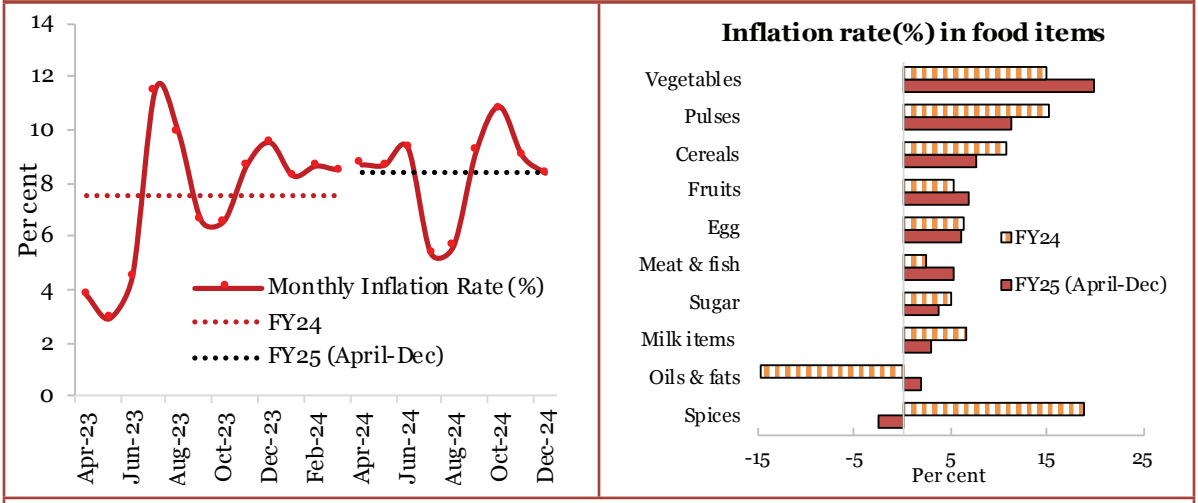
Source: Consumer Price Indices released by CSO, MoSPI

Food Inflation is majorly driven by very few food items

4.8. Over the past two years, India's food inflation rate has remained firm, diverging from global trends of stable or declining food inflation. This can be attributed to factors such as supply chain disruptions exacerbated by extreme weather events and reduced harvest of some food items.

4.9. Food inflation, measured by the CFPI, faced pressures in FY25 (April-December), primarily driven by a few food items such as vegetables and pulses. Vegetables and pulses together holds a total weightage of 8.42 per cent in CPI basket. However, their contribution to the overall inflation stood at 32.3 per cent in FY25 (April to December). When these items are excluded, the average food inflation rate for FY25 (April-December) was 4.3 per cent, which is 4.1 per cent lower than the overall food inflation. Similarly, the average headline inflation would be 3.2 per cent when the vegetables and pulses inflation rate were excluded, 1.7 per cent lower than the actual headline inflation.

Chart IV.5: Food inflation driven by vegetables and pulses



Source: Consumer Price Indices released by CSO, MoSPI

Chart IV.6a: Increased peaks in retail prices of tomato signaling high volatility in 2024

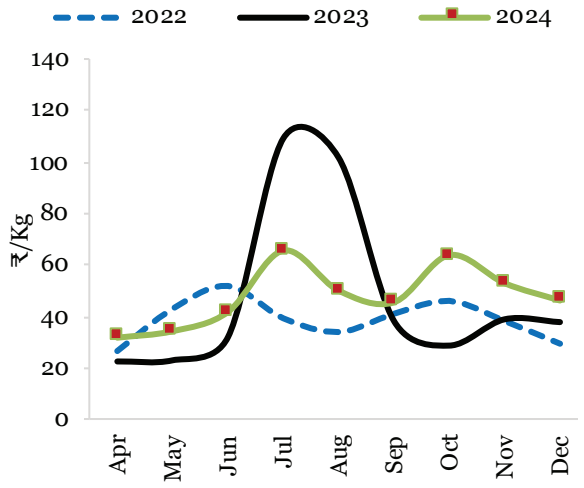
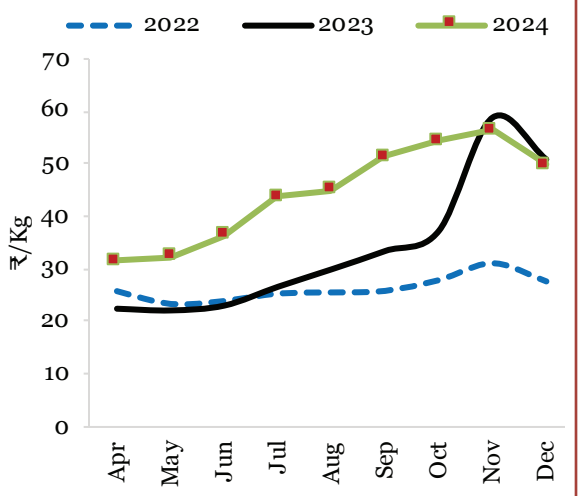


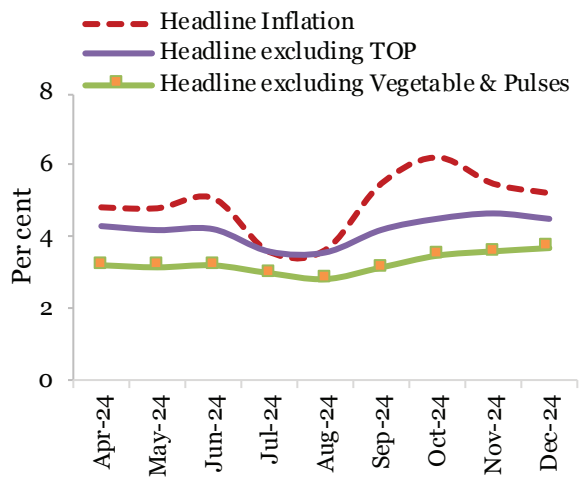
Chart IV.6b: Retail prices of onion remain elevated in 2024

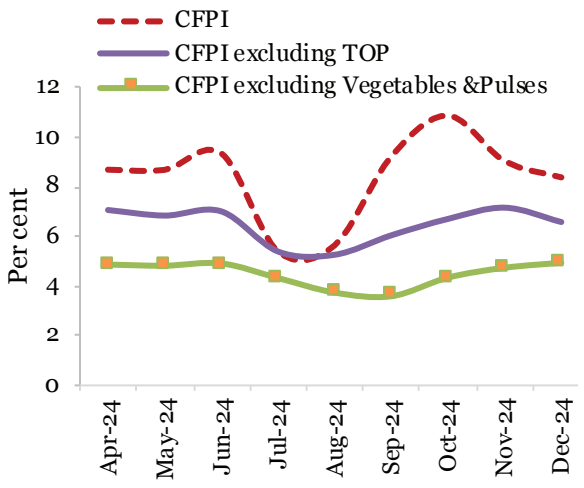


Source: Price Monitoring Division, D/o Consumer Affairs

4.10. Uneven monsoon-induced supply disruptions in certain regions caused price pressures, mainly in tomatoes and onions, contributing to higher inflation rates in vegetables and overall food inflation. When we exclude the three most price-sensitive vegetables (tomato, onion and potato (TOP)) from the CPI basket, the average food inflation rate in FY25 (April-December) was 6.5 per cent, which is 1.9 per cent lower than the current food inflation. Similarly, average headline inflation is 4.2 per cent when excluding TOP, which is 0.7 per cent lower than the current headline inflation. Given that tomato and onion prices have been drivers of food inflation, and consequently headline inflation in recent months, the next section will explore the causes of price pressure in these vegetables.

Chart IV.7: Headline and food inflation driven by few food items





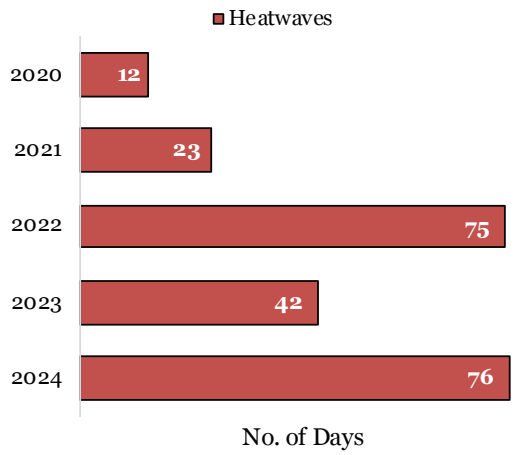
Source: Consumer Price Indices released by CSO, MoSPI

Extreme weather conditions impact vegetable production and prices

4.11 Vegetables are more susceptible to uneven weather compared to food grains, as highlighted by various studies. Extreme weather events such as cyclones, heavy rains, floods, thunderstorms, hailstorms, and droughts impact vegetable prices. Further, evidence indicates that inflationary pressure in horticultural commodities in 2023-24 was driven by unseasonal rainfall during the pre-monsoon season, which damaged crops in major horticulture-producing states[3]. The coexistence of good areas sown coupled with greater price volatility suggests that extreme weather events significantly impact production and supply chains, thereby affecting retail prices.

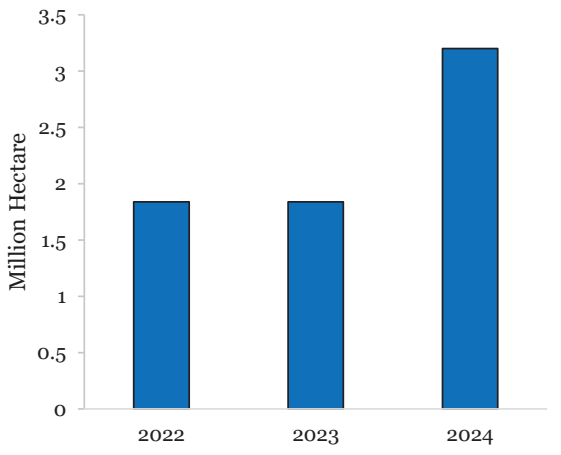
4.12. The data accessed from the India Meteorological Department (IMD), Ministry of Earth Sciences indicates a notable increase in the frequency of extreme weather conditions, particularly heatwaves. On an average, during 2022-2024, India experienced heatwaves on 18 per cent of days compared to 5 per cent of days in 2020 and 2021.

Chart IV.8: Heatwaves increased in last three years



Source: IMD, Ministry of Earth Sciences

Chart IV.9: Rise in crop area damaged due to weather conditions



Source: India's database of weather disasters dashboard by CSE DTE Data[4].

4.13. Data published by the Centre for Science and Environment (CSE) and Down to Earth (DTE)[5,6] finds that the total crop area damaged in 2024 was higher compared to the last two years due to extreme weather events.

3 *Raya, D,. & Roy, R.* (2023). Unseasonal Rainfall and Price Rise in Horticulture Crops. *Climate-roofing Agriculture. Agri-Food Trends and Analytics Bulletin Vol 3. Issue-1. (https://tinyurl.com/yyr8fzek)*

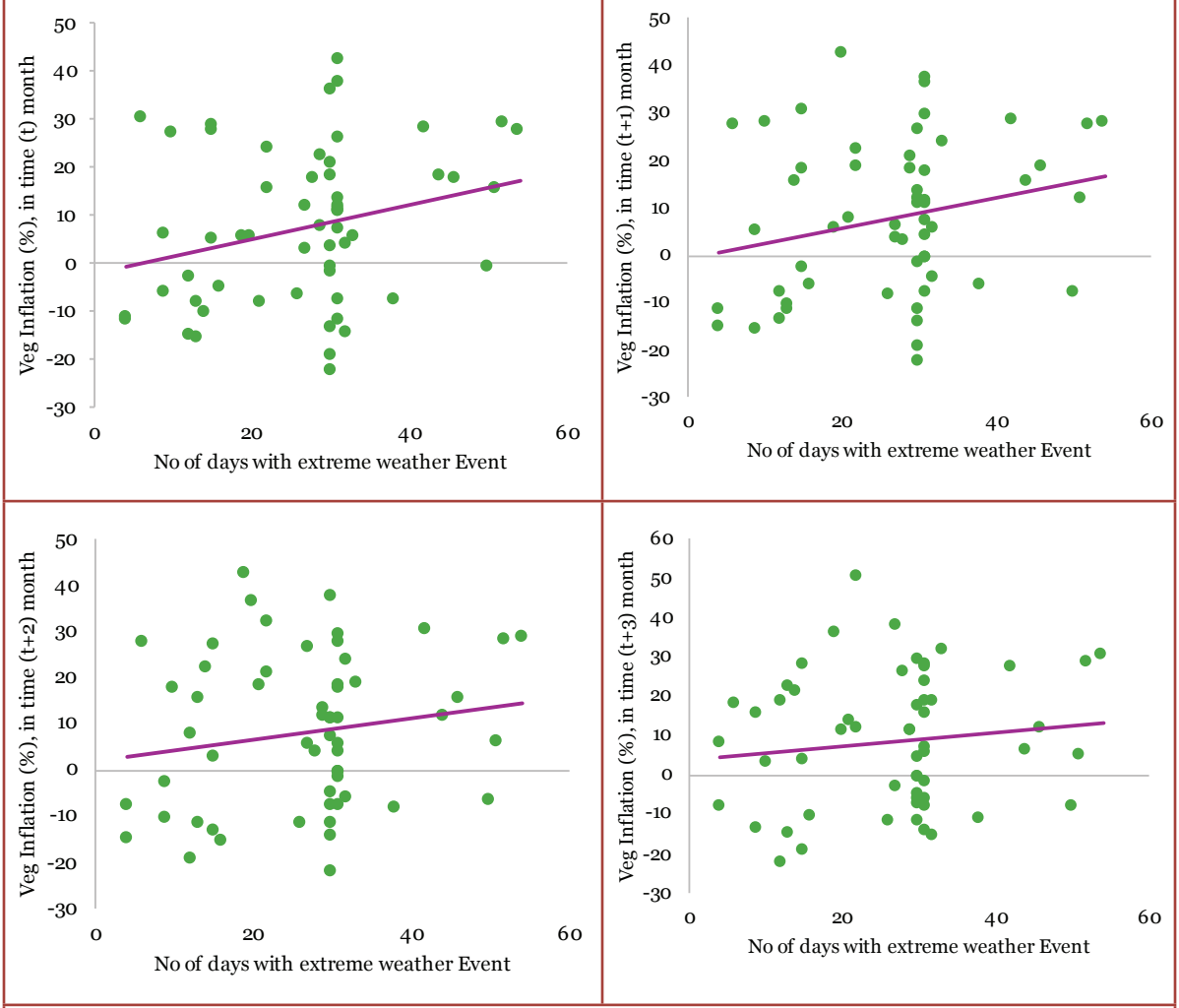
4 Data sourced from the Disaster Management Division Union Ministry of Home Affairs, India Meteorological Department and media reports

5 Centre for Science and Environment and Down to Earth. (2024). *Climate India 2024: An assessment of extreme weather events*. November. https://tinyurl.com/2r5r85dw.

6 CSE/DTE tracks each day's report from the IMD website and maps out the events by state and Union Territory (UT) and event type.

4.14. The increasing frequency of extreme weather events—specifically uneven and unseasonal rainfall and heat waves - impacts vegetable production, thereby increasing prices. These adverse weather conditions also present significant challenges to storage and transportation, resulting in temporary disruptions to the supply chain and causing an increase in vegetable prices. This phenomenon is also corroborated by a positive correlation between the frequency of extreme weather events occurring within a given month and the vegetable inflation rates observed in the subsequent months, with notable effects evident for up to three months following such events.

Chart IV.10: Higher frequency of extreme weather events driving inflation in subsequent months during April 2020-Dec 2024

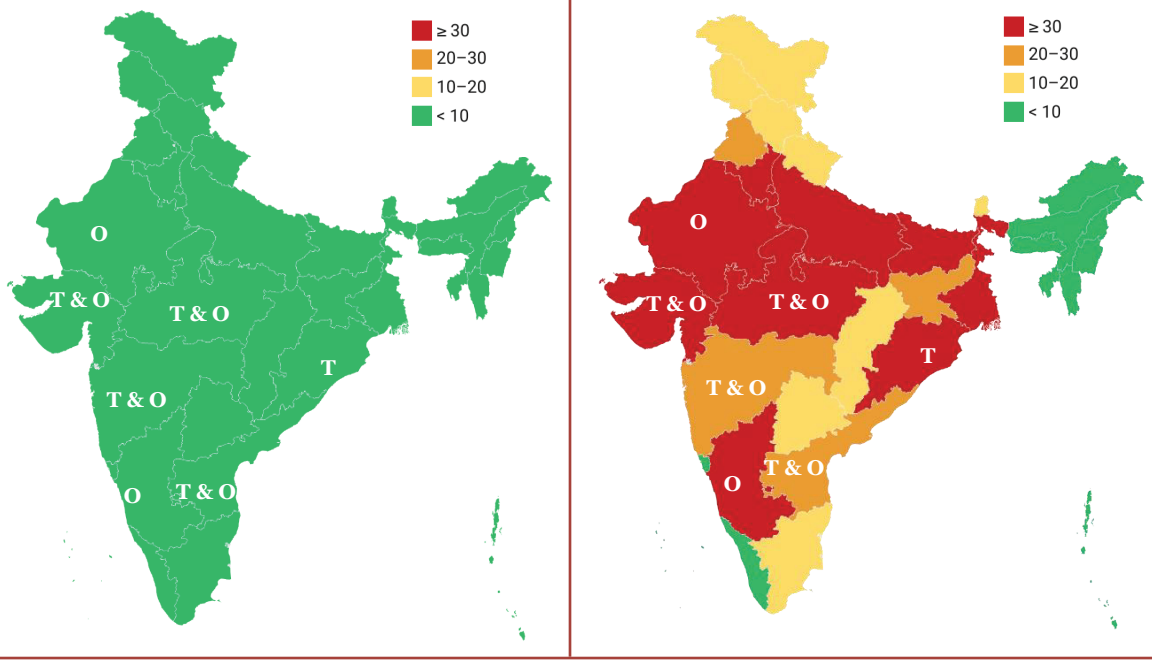


Source: Ministry of Earth Sciences and Consumer Price Indices released by CSO, MoSPI
Note: No. of days with extreme weather events (horizontal axis in chart IV.17) = No. of days with heavy rainfall +no. of days with heatwaves

4.15. Furthermore, the fall in onion and tomato production in the last two years can be partially explained by higher extreme weather events in major producing states compared to other regions.

Chart IV.11: Major tomato and onion producing states experienced more heatwaves in 2024

Number of days with heatwaves in 2020	Number of days with heatwaves in 2024



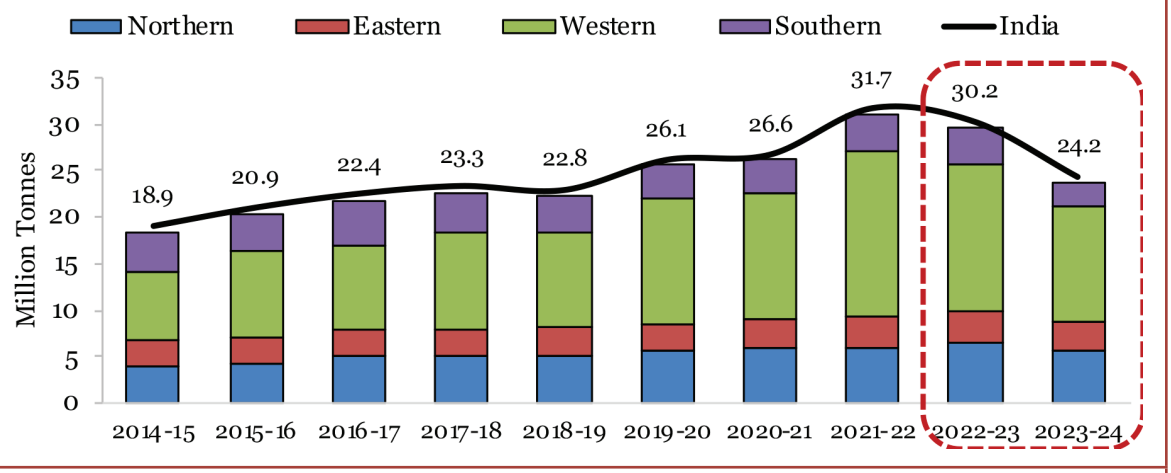
Source: IMD, Ministry of Earth Sciences
Note: (i) T denotes the major tomato-producing state, and O denotes the major onion-producing state
(ii) To arrive at state-wise heatwaves data, the relevant subdivisions for each state were added.

Trends in onion and tomato production and prices

4.16. The inflationary pressures in onion remained firm in FY24 and the current year, despite prompt measures by the government to contain prices due to constrained supply resulting from reduced production. Onions are grown in both the Kharif and Rabi seasons, with around 70 per cent of production occurring during the Rabi season[7]. Fresh onions generally last about 2-3 months when stored in a cool, dry, and well-ventilated place, with their shelf life further extendable under a dehumidified environment. Thus, onions produced in one year - specifically Rabi onions harvested from March onwards are typically available for consumption in the following year, influencing inflation dynamics in that year.The lower production in 2022-23 and 2023-24 has consequently led to inflationary pressures in onions for FY24 and FY25 (April-December)(Chart IV.6b).

7 Ministry of Consumer Affairs, Food & Public Distribution (2024, July 5). *Kharif sowing area for onion set to be 27% higher than last year; 30% sowing completed in Karnataka* [PIB Release]. (https://pib.gov.in/PressReleseDetailm.aspx?PRID=2031043&reg=3&lang=1)

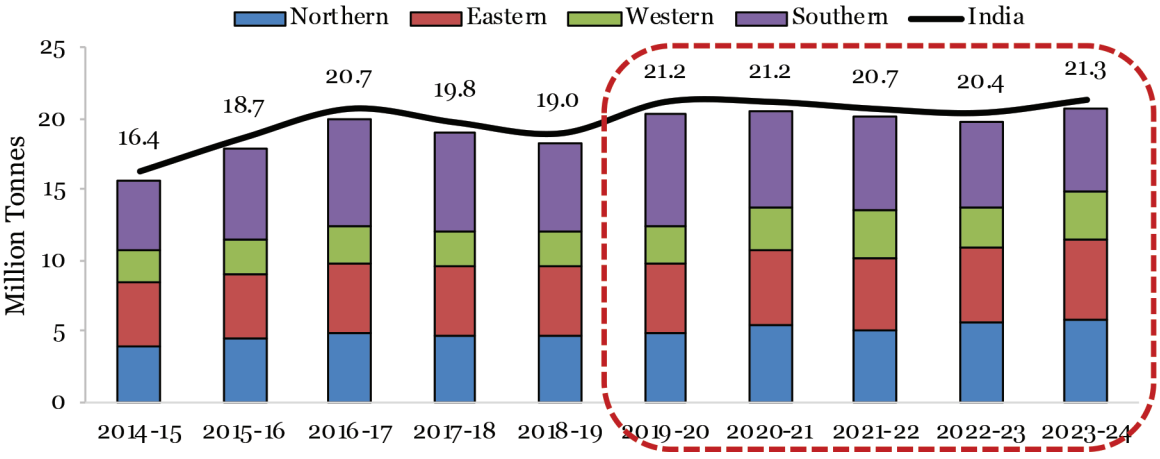
Chart IV.12: Trends in onion production across regions



Source: Horticulture Statistics Unit, Economics, Statistics & Evaluation Division, M/o A&FW

4.17. The price pressures in tomatoes remained intermittently high since FY23 due to constrained supply (Chart IV.6a). This occurred despite earnest efforts by the government to improve supply conditions in deficient regions by procuring from producing regions. The inflation dynamics of tomatoes are influenced by multiple factors. Unlike onions, tomatoes have short crop cycles and are highly perishable, creating challenges in storage and transportation and leading to supply shortages and price spikes. Fresh tomatoes have a shelf life of only about 1-2 weeks when stored properly. Tomato production is mainly concentrated in states such as Madhya Pradesh, Andhra Pradesh, Karnataka, Gujarat and Odisha. This regional concentration makes the supply chain vulnerable to disruptions in any of these areas. Similar to onions, a major portion of tomato production - more than 65 per cent[8] - occurs in the Rabi season.

Chart IV.13: Trends in tomato production across regions



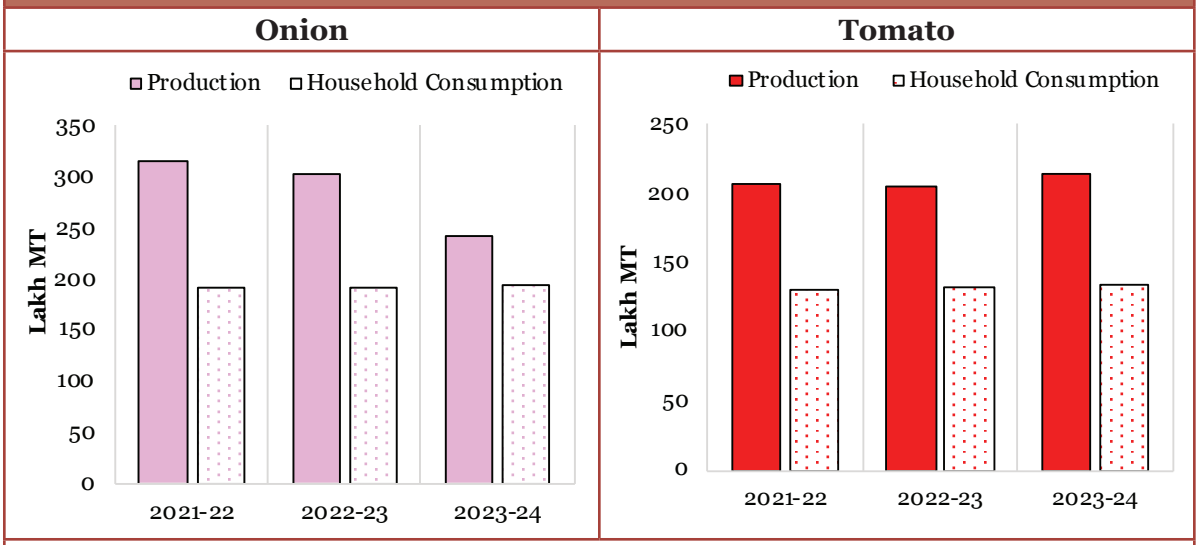
Source: Horticulture Statistics Unit, Economics, Statistics & Evaluation Division, M/o A&FW

8 Roy, R., et al. (2024). *Vegetables Inflation in India: A Study of Tomato, Onion and Potato (TOP)*. Department of Economic and Policy Research, RBI Working Paper Series No. 08. (https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=22723)

Consumption and seasonality in production of onion and tomato

4.18. Analysis of production and consumption trends over the past three years shows that domestic household consumption is lower than production for both tomatoes and onions. Horticultural Statistics at Glance 2021[9], indicates that approximately 15 per cent of production is used for bulk consumption in hotels, marriages etc. Even while treating this as a net additionality to household consumption, the production is still higher. Therefore, it turns out that price pressures are not fundamentally due to a shortfall in production but to post-harvest losses, seasonal production, and regional dispersion in production. Also, onion exports averaged more than 6 per cent of domestic production during FY20 to FY24.

Chart IV.14: Household consumption is lower than the production



Source: Horticulture Statistics Unit, Economics, Statistics & Evaluation Division, M/o A&FW, HCS, 2022-23, MoSPI, Population Projections for India and States 2011 – 2036, Ministry of Health & Family Welfare
Note: Annual Household Consumption is calculated from the Report of HCS, 2022-23 of MoSPI

4.19. For instance, tomato prices typically rise from July to September, the lean production season coinciding with the monsoon, adding to challenges related to distribution and increased transit losses. Onion prices tend to increase from October to December, representing a lean season for onion production. India's status as the major producer and consumer of onion and tomato significantly limits the potential to import during times of seasonal supply and demand imbalances. Given that India and China contribute about half of the total production of onion[10], the import options for India during periods of demand-supply imbalances are quite limited. The next eight major producing countries only contribute around 18 per cent of the production. Also, the highly perishable nature of tomatoes restricts import options from neighbouring countries, which are not significant producers of tomatoes. Consequently, India faces challenges in importing these essential commodities.

9 Horticultural Statistics at Glance, 2021, Horticulture Statistics Division Department of Agriculture & Farmers Welfare, Ministry of Agriculture & Farmers Welfare

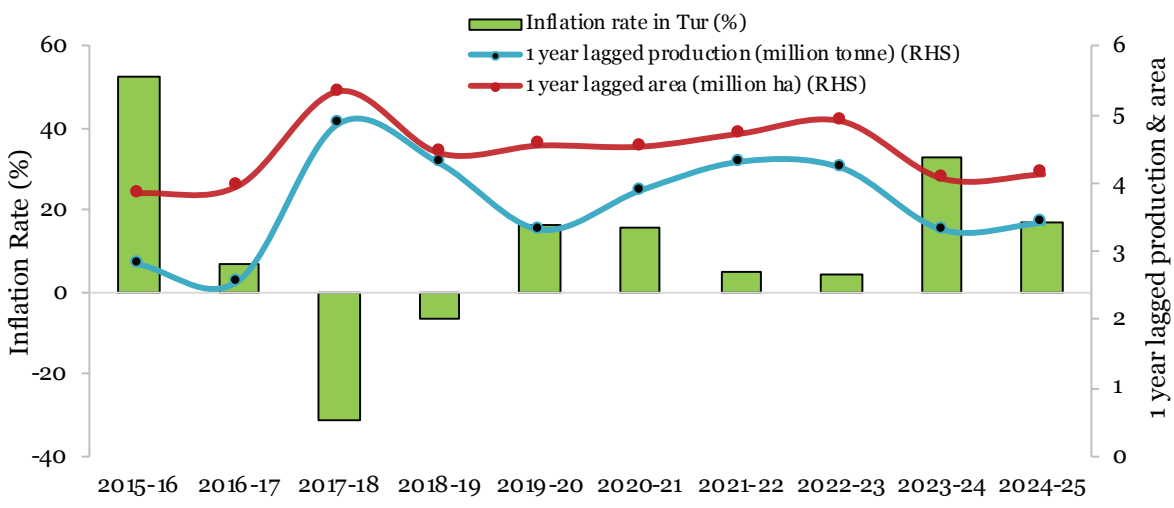
10 Food and Agricuture Organisation of United Nations. (2023). FAOSTAT statistical database. Rome:FAO.

Table IV.1: Onion and tomato crop calendar				
Vegetable	**Share in Production**	**Season**	**Transplanting**	**Harvesting Period**
Onion	30%	Kharif	Jul-Aug	Oct-Dec
		Late Kharif	Oct-Nov	Jan-Mar
	70%	**Rabi**	**Dec-Jan**	**End of Mar to May**
Tomato	33%	Kharif	May-Jul	Jul- Sept
	67%	**Rabi**	**Oct-Nov, Jan-Feb**	**Dec-Jun**
Source: PIB releases, Ministry of Consumer Affairs, Food & Public Distribution[11]				

Trends in production and inflation rate of tur

4.20. In addition to tomato and onion, tur dal also contibuted to food inflation in India. The deficient production of tur in 2022-23 and 2023-24 has indeed led to high price pressures in tur dal during FY24 and FY25 (April-December), despite various measures by the government to shore up the supply in consuming regions. Production declined by 13.6 per cent in 2022-23 and 10.8 per cent in 2023-24 compared to the last 5-year average, affecting the supply. Over the past decade, there has been a strong negative correlation (-0.8) between the annual inflation rate and the 1-year lagged production, indicating that lower production in one year typically results in higher inflation in the following year. As a major Kharif pulse, tur is harvested from November to January, with its price impact mainly observed in the subsequent financial year.

Chart IV.15: Trends in tur production and inflation



Source: Ministry of Agriculture and Farmers Welfare, Consumer Price Indices released by CSO, MoSPI

11 https://pib.gov.in/PressReleasePage.aspx?PRID=2074016.
https://pib.gov.in/PressReleseDetailm.aspx?PRID=2031043&reg=3&lang=1

4.21. Despite these challenges, the government is actively working to ensure an adequate supply of tur dal to consumers. To ensure that the produced quantity reaches the market and to prevent stockpiling, the government is taking proactive measures by periodically imposing stock limits for tur, and active monitoring through the stock disclosure portal. Further, to meet the demand for tur, the country imported 7.7 lakh tonnes of tur in FY24, mainly from Mozambique, Tanzania, Malawi, and Myanmar.

Box IV.1: Administrative measures to control food inflation

Food items	Measures undertaken
Cereals	• Stock limits on wheat from 24 June 2024 to 31 March 2025. • Open Market Sale Scheme: Offloaded wheat and rice from the central pool • Sale of wheat flour and rice under Bharat brand
Pulses	• Sale of chana dal, moong dal and masur dal under Bharat brand • Stock limits on tur and desi chana from 21 June 2024 to 30 September 2024 • Allowed duty-free import of desi chana, tur, urad and masur until 31 March 2025. • Allowed duty free import of yellow peas until 20 February 2025.
Vegetables	• Buffer Stock of Onion: A total of 4.7 lakh MT of rabi onion has been procured under Price Stabilisation Fund. • 20 per cent export duty on onion since 13 September 2024. • Subsidised sale of onion at ₹35 per kg from September -December 2024. • Subsidised sale of Tomato at ₹65 per kg in October 2024

Source: Various PIB releases

OUTLOOK AND WAY FORWARD

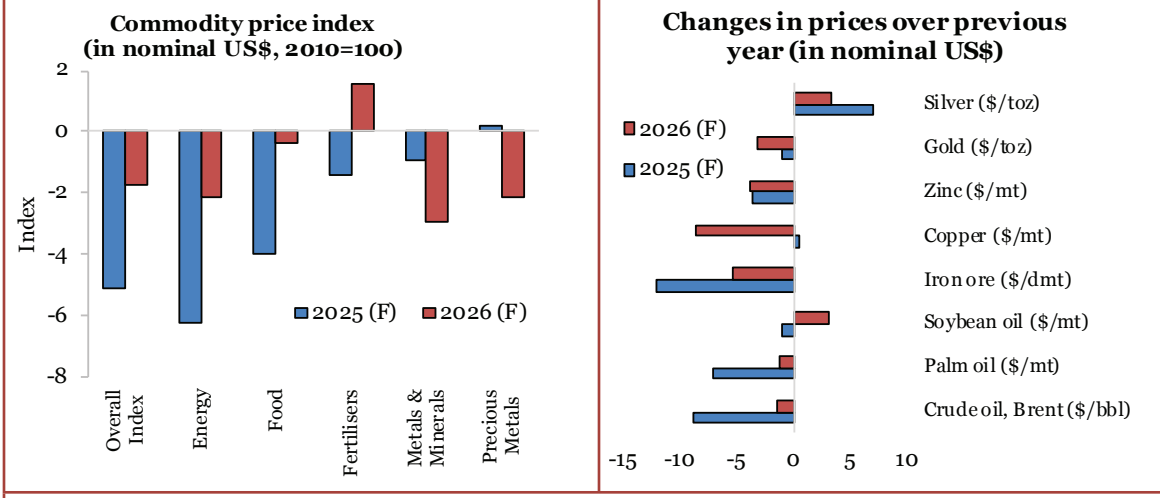
4.22. The RBI and the IMF have projected that India's consumer price inflation will progressively align towards the inflation target in FY26. In the December 2024 RBI's Monetary Policy Committee report revised its inflation projection from 4.5 per cent to 4.8 per cent in FY25. Assuming a normal monsoon and no further external or policy shocks, the RBI expects headline inflation to be 4.2 per cent in FY26. IMF has projected an inflation rate of 4.4 per cent in FY25 and 4.1 per cent in FY26 for India.

4.23. As per World Bank's Commodity Markets Outlook[12], October 2024, commodity prices are expected to decrease by 5.1 per cent in 2025 and 1.7 per cent in 2026. The projected declines are led by oil prices but tempered by price increases for natural gas and a stable outlook for metals and agricultural raw materials. Among precious metals, gold prices are expected to decrease while silver prices are expected to increase. Prices for metals and minerals are expected to decline, primarily due to a decrease in iron ore

12 Commodity Markets Outlook, World Bank, October 2024, (https://tinyurl.com/dyduh9tu)

and zinc prices. In general, the downward trend movement in the prices of commodities imported by India is a positive for the domestic inflation outlook.

Chart IV.16: Commodity prices to soften in the next two years



Source: World Bank Commodity Market Outlook, October 2024

4.24. A normal southwest monsoon in 2024 has improved the water levels in reservoirs, ensuring sufficient water for irrigation during the rabi crop production. As per the first advanced estimates of agricultural production for 2024-25, Kharif food grain production is expected to increase by 5.7 per cent. The production of rice and tur, the most important Kharif food grains, is expected to increase by 5.9 per cent and 2.5 per cent, respectively, as compared to 2023-24. This could lead to softening of food inflation pressures over the course of the year. However, rising international vegetable oil prices may pose an upside risk to food inflation. The government has focused on controlling food inflation through various supply side measures, which include strengthening the buffer stock of essential food items and periodic open market releases, subsidised retail sale of essential food items in specified outlets, easing imports of the essential food items through rationalisation of duties, prevention of hoarding through imposition/ revision and monitoring of stock limits. The budget 2024-25 has envisaged measures like large-scale clusters for vegetable production, promotion of farmer-prodcuer organisations, cooperatives and start-ups for vegetable supply chains and measures for achieving self-sufficiecny in pulses and oilseeds.

4.25. The following options may be worth considering from the perspective of ensuring long-term price stability.

- India faces a persistent deficit in the production of pulses and oilseeds, along with frequent fluctuations in tomato and onion production, leading to price pressures. To address this, focused research is needed to develop climate-resilient crop varieties, enhancing yield and reducing crop damage. Efforts to expand the area under pulses in rice-fallow regions are likely to help.

- Promoting extension activities is crucial. Farmers should receive training on best practices, the use of high-yield and disease-resistant seed varieties, and targeted interventions to improve agricultural practices in the major growing regions for pulses, tomatoes, and onions.
- Implementing robust data collection and analysis systems to monitor prices, stocks, and storage and processing facilities is essential in various tiers of government. This data should be used to identify areas for improvement and make informed policy decisions. High-frequency price monitoring data for essential food items collected by various agencies within the country may be linked to quantify and monitor price build-up at each stage from the farm gate to the final consumer.

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