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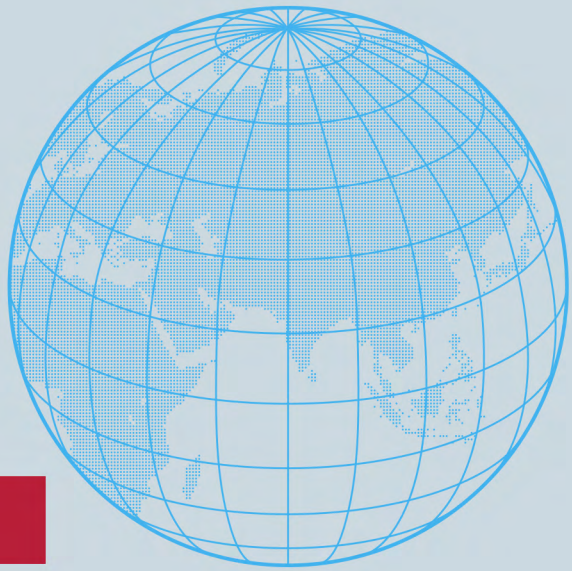
India's Inflation, 2019–2024

Food Shocks and Inflation Targeting

Renu Kohli



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India's Inflation, 2019–2024
Food Shocks and Inflation Targeting

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Abbreviations

BIS	Bank for International Settlements
BPS	Basis Points
CPI	Consumer Price Index
FIT	Flexible Inflation Targeting
GDP	Gross Domestic Product
IGP	Indo-Gangetic Plain
IMD	India Meteorological Department
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
LPA	Long Period Average
MPC	Monetary Policy Committee
MSP	Minimum Support Price
NGFS	Network for Greening the Financial System
RBI	Reserve Bank of India
RHS	Right-Hand Side
T&C	Transport and Communication
WPI	Wholesale Price Index

Executive Summary

This paper documents India's prolonged inflation episode of 2019–2024—the first major test of its flexible inflation targeting (FIT) regime, adopted in 2016. Unlike the global inflationary surge of 2021–2022, which was largely transient and tied to pandemic disruptions and commodity shocks, India's inflation was predominantly driven by persistent, domestically originating food supply shocks that both preceded and outlasted the global episode. The paper reviews this phase and identifies significant changes in climate, food supply, and inflation attributes. It details inflation management, highlighting the sequential deployment of a primary supply-side-led strategy with monetary policy in a delayed, secondary role. The paper also identifies the challenges posed to FIT from increased government dependency, diminishing efficacy of supply measures, and strains upon the central bank's operational autonomy and credibility. The paper serves as a critical examination of the FIT framework's resilience in a climate-vulnerable, food-dependent economy and cautions that the challenges observed may be a precursor to more systemic issues as climate risks intensify.

The Nature of the Inflation Episode (2019–2024)

The analysis documents the distinct characteristics, which include the following:

- **Dominance of Food Inflation:** Unlike in many other parts of the world, where food price surges were concentrated in 2021–2022, India's food inflation both preceded and outlasted global shocks and was the principal driver of headline inflation, which repeatedly crossed the 6 per cent upper tolerance band.
- **Climate-Induced Supply Shocks:** The persistence of food price pressures was directly linked to a series of severe weather anomalies. These included crop failures in vegetables (late 2019), successive heatwaves damaging wheat crops for three years (2022–2024), and deficit rainfall affecting rice production (2023). The paper flags unprecedented events like simultaneous disruptions to both winter and summer crops, amongst others.
- **Departure from Historical Patterns:** Inflation dynamics differed in this period as food supply shocks lost their traditional mean-reverting character: Price spikes did not normalise as before, the magnitude and frequency of price surges rose, and downward corrections were less pronounced, indicating an entrenchment of price pressures.
- **Divergence of Headline and Core Inflation:** After rising mostly due to cost-push and reopening demand pressures, core inflation corrected sharply from mid-2023 to a historic low of around 3 per cent by May 2024, creating a wide gap between headline and core measures, with a difficult choice for monetary policy that was constrained by high food inflation and elevated household inflation expectations.

Inflation Management: A Supply-Side-Led Strategy

The policy response detailing highlights a clear and consequential sequencing:

- **Dominance of Government Interventions:** The primary strategy for inflation control was government-led, with extensive and aggressive supply-side actions, while monetary policy played a secondary and delayed role.
- **Delayed Monetary Policy Tightening:** The Monetary Policy Committee (MPC) initially adopted a "look-through" approach to the food price shocks in 2019–2020. This was followed by an explicitly accommodative stance during the pandemic. A decisive pivot to monetary tightening only came in May 2022, nearly a year after many other emerging economies had begun their tightening cycles and after inflation expectations had become entrenched at high levels.
- **Fiscal Interventions:** Fiscal tools were critical, particularly in mitigating the impact of fuel price shocks with lower levies and a freeze on retail pump prices.
- **Diminishing Returns:** Despite overactive supply management, food inflation remained stubbornly persistent. While these may have prevented sharper spikes, they failed to break the inflationary inertia and, in some cases, created market inefficiencies, increased volatility, and distorted price signals. This points to diminishing returns of the strategy.

Challenges and Strains on the Flexible Inflation Targeting Framework

The core of the analysis focuses on how this episode strained the FIT regime, uncovering some critical vulnerabilities:

- **Weakened Resilience to Shocks:** Tentative econometric evidence suggests that headline inflation became *more*, not less, sensitive to food supply shocks during 2019–2024 compared to the preceding five years. Although inflation expectations remained sticky and did not fully de-anchor, the framework's ability to insulate the economy from supply shocks likely weakened.
- **Credibility Strains:** The framework's credibility was stretched by large and persistent forecast errors, sourced primarily to non-transience of food price shocks and misunderstandings of the transmission process. This, combined with inflation remaining above the tolerance band for three consecutive quarters (triggering a statutory explanation to the government), fuelled perceptions of the central bank falling "behind the curve."
- **Reduced Central Bank Autonomy:** The heavy reliance on government actions to control inflation created a dependency that blurred the lines of operational autonomy. Successive requests for fiscal response to combat the fuel price rise effectively conditioned the success of monetary policy on the efficacy and timeliness of government decisions. The external reliance risks undermining the institutional independence crucial for an effective inflation-targeting central bank.

- **Institutional Strains:** The prolonged period of high food inflation, coupled with low core inflation, led to internal disagreements and reignited public debate about the suitability of headline CPI as the nominal anchor in an economy so susceptible to volatile food prices.

Future Outlook: The Intensifying Climate–Food–Inflation Nexus

The paper concludes by arguing that the 2019–2024 experience should not be viewed as an anomaly but a likely preview of future challenges. It presents evidence of deviating patterns in the climate–food–inflation relationship, characterised by the following:

- More frequent and intense climate events, i.e., rising temperatures and erratic rainfall.
- Simultaneous and overlapping crop failures, creating compound risks to food security.
- An increasingly strained policy environment that relies on restrictive measures with diminishing returns.

This evolving context suggests that climate-linked supply shocks will become a more frequent and systemic driver of inflation, posing a persistent threat to the FIT framework.

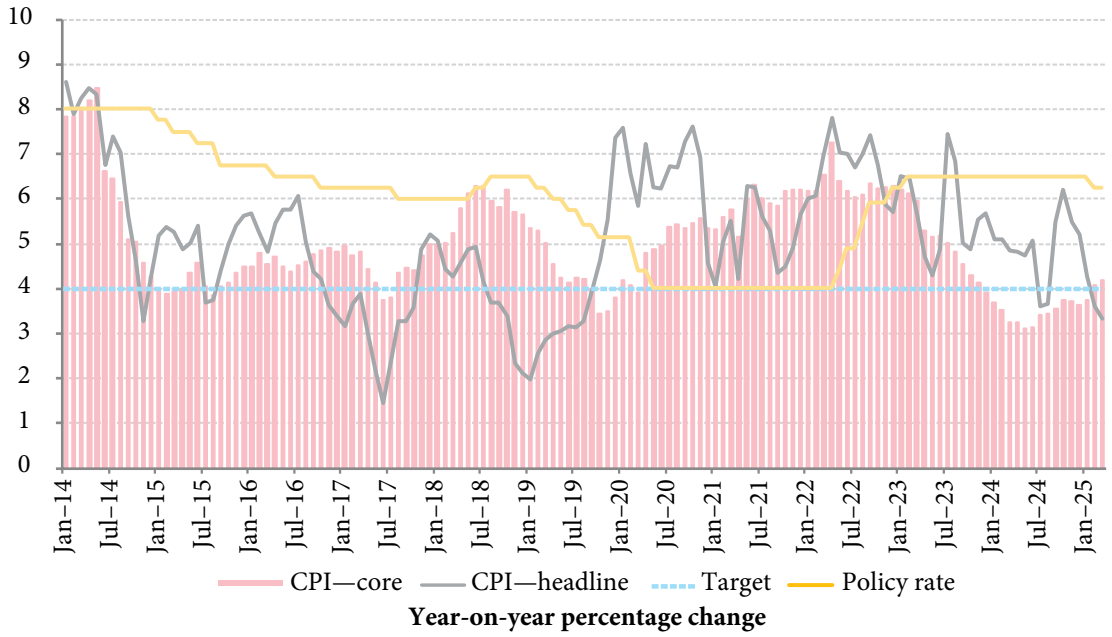
Key Takeaway

The primary lesson from India's 2019–2024 inflation episode is that a monetary policy framework, even a flexible inflation-targeting one, faces profound challenges when confronted with persistent, structurally driven food supply shocks. The paper concludes that the conventional monetary response—to "look through" such shocks—is untenable when they become recurrent and entrenched. Reliance on ad hoc supply-side controls is not a sustainable substitute for fundamental structural reforms in agricultural markets. Looking ahead, the paper argues that the 2019–2024 experience may be a preview rather than an anomaly. Temperatures are rising more frequently to record levels; rainfall anomalies are becoming more regionally differentiated; and simultaneous disruptions to both winter and summer crops—unprecedented in the past two decades—point to a structural intensification of the climate–food–inflation nexus. Unless monetary frameworks are adapted or rethink responses to persistent supply shocks are rethought, alongside lasting changes to agricultural markets that reduce dependence on ad hoc supply controls, the strains observed in this inflation bout could deepen as climate volatility advances.

1. Introduction

India saw a prolonged bout of inflation during 2019–2024 (Figure 1). Inflation repeatedly breached the central bank's target band, and high food prices accounted for most of it. The episode highlighted critical vulnerabilities in the FIT framework, which India adopted in 2016. This experience is of major interest to policymakers and universally significant because of FIT's popularity across advanced and emerging economies. Although FIT allows greater discretion to respond to economic shocks—stabilising both inflation around the target and the real economy (Svensson, 2009)—persistent supply shocks can strain this structure. The 2019–2024 inflation episode is a useful illustration.

Figure 1: India: Headline and Core Consumer Price Inflation



Source: Ministry of Statistics and Programme Implementation; author's calculations.
Note: CPI = Consumer Price Index.

This paper documents India's experience—the first of its kind since FIT's adoption. This, however, is not the only novelty. The second noteworthy feature is that food prices were the most prominent and enduring driver of this inflation bout, unlike the rest of the world, where food price surges were limited to 2021–2022, fading thereafter. India's food inflation both preceded and outlasted the pandemic and fuel price shocks, while demand factors played a relatively short-lived role with cost-push pressures as the major force.

A third feature is the changed context. This is marked by heightened climate risks, viz., more frequent weather extremities like heatwaves and variable rainfall inflicting continuous damage on crops, notably wheat, and to a lesser extent, rice and vegetables. Food supply shocks were more unpredictable and recurrent, and coincided in 2023, while their timing, distribution, and other attributes deviated significantly from past patterns.

It is unclear if the shifts in weather events are one-off or more structural. However, long-term trends and the projected escalation in force and frequency with advancing climate change (e.g., India Meteorological Department [IMD], 2025; Intergovernmental Panel on Climate Change [IPCC], 2023) point to persistent supply shocks as a prominent inflationary source in the future. India's 2019–2024 episode may be a preview.

The above context prompts this paper. It documents the 2019–2024 inflation episode, the centrality of food price shocks caused by unusual weather extremes, the prominent lead of supply-side policies in its management, and the multiple challenges these posed to the FIT framework. A historical perspective guides the empirical narrative, backed by descriptive analysis and econometric evidence. Based on these insights—together with observed trends in temperature deviations and extreme rainfall, food prices and inflation dynamics, and the comprehensive stabilisation framework—the paper evaluates the portents for FIT's future functioning and success amid rising climate risks.

To our knowledge, this is the first systematic account of the episode that documents the prominence of food supply shocks and their climate-linked drivers, the unusual supply-led policy mix, and the resulting strains on key FIT pillars—credibility, independence, and operational autonomy. Previous accounts have broadly focused on the pandemic, combining the multiple shocks (Bank for International Settlements [BIS] & Reserve Bank of India [RBI], 2023; Patra & Bhoi, 2023). The paper also provides formal evidence that inflation became more, not less, sensitive to food shocks under FIT, while expectations remained sticky but did not de-anchor.

The paper builds on a substantial body of prior research on Indian food inflation (Anand et al., 2014; Anand et al., 2016; Cashin, 2016; Gokarn, 2011; Sonna et al., 2014) and extends it to a structurally transformed monetary policy setting and a climate-altered risk environment, demonstrating how India's longstanding food inflation problem continues to confront monetary policy. It also adds to the emerging literature on rising supply-shock risks confronting monetary policy and inflation-targeting regimes from sources other than climate change (e.g., ageing populations, changes in globalisation, artificial intelligence, geoeconomics, amongst others) (Greene, 2025; Lagarde, 2023).

The paper is organised as follows. Section 2 narrates price developments during 2019–2024, the primary role of food prices and inflation, and their changing characteristics. Section 3 describes inflation management and control, detailing supply-side responses and their sequencing with monetary policy. Section 4 identifies specific challenges posed to the FIT framework. Section 5 presents tentative evidence of changing trends in climate, food, and price behaviour, relating these to the preceding narrative and analysis to assess how a transformed context could strain FIT in the period ahead. Section 6 concludes.

2. Inflation Episode, 2019–2024: Trends, Dynamics, and Historical Perspective

After a subdued first half of 2019, headline CPI inflation displayed a sharp transition to an extended phase of volatility and persistence. Figure 1 illustrates the evolution of headline CPI and core inflation rates, with the target bands and the monetary policy rate, during 2014–2024. Price pressures mounted in the last quarter of 2019 as a severe spike in vegetables triggered by onion crop failure pushed retail inflation above target, reaching 7.6 per cent in January 2020. Although some moderation followed in March, this marked the onset of a high-inflation episode.

The pandemic reinforced these pressures. Lockdowns and supply-chain disruptions kept headline CPI above 6 per cent for 12 consecutive months through late 2020. A brief respite in early 2021 from seasonal and statistical factors gave way to renewed acceleration by May 2021 as the second wave of COVID-19 unfolded. The pass-through of input costs, combined with reopening demand, kept prices elevated.

By early 2022, headline inflation breached the 6 per cent bar again, reflecting both domestic and global shocks. The Russia–Ukraine war in February 2022 sharply escalated global commodity prices. Concurrently, an untimely domestic heatwave damaged the wheat crop, amplifying food price pressures. Headline CPI thus averaged above 6 per cent through 2022, with food and fuel acting as the dominant drivers. There was some moderation in early 2023, but fresh supply shocks—particularly to vegetables—revived inflationary pressures by mid-year, pushing retail inflation to 7.4 per cent in July. Persistent climate extremes, including recurrent heatwaves and rainfall deficits, continued to affect cereal production into 2024. As a result, headline CPI inflation remained above 5 per cent on average during 2019–2024, with instances of repeated breaches of the tolerance band.

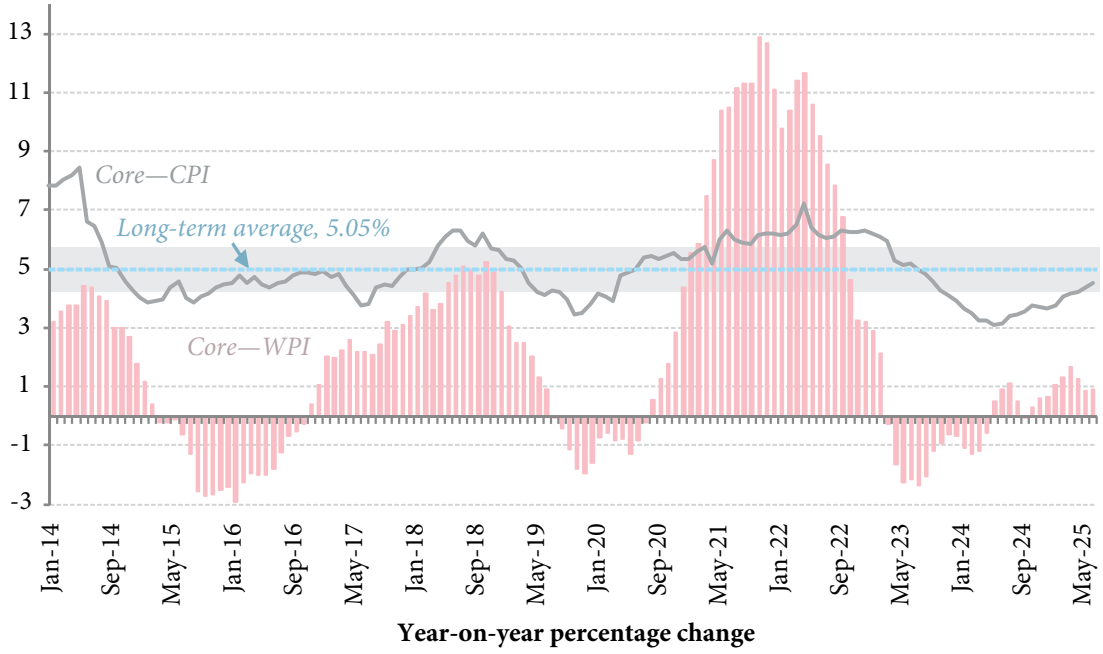
2.1 Food Inflation: The Principal Driver

Food prices were the central driver of India's inflation dynamics during this period. From late 2019, repeated shocks to vegetables and cereals triggered persistent price increases. Food inflation averaged 7–8 per cent in 2022, exceeding headline inflation by nearly 80 bps. Nearly one-fifth of the cumulative food inflation in 2019–2024 is accounted for by cereal prices alone, underlining the dominance of weather-induced disruptions in the inflation process.

The dominance of food prices was again visible in 2023, when sharp corrections in vegetables and edible oils temporarily eased general inflation in the early months. However, fresh supply disruptions soon reversed this moderation, as both wheat and rice yields were affected by extreme climate conditions. By 2024, successive heat waves further curtailed wheat production, contracting public procurement and reserve stocks (Kohli, 2024a). Over the full episode, food inflation averaged 8.4 per cent—well above headline inflation's 5 per cent.

Core inflation, which excludes food and fuel, followed a distinct but related trajectory. From mid-2020 through late 2022, core inflation hovered between 5.5 per cent and 6 per cent, reflecting the pass-through of higher input costs and pent-up demand for services. Historically, core inflation tends to adjust with a lag to headline shocks, primarily through food price spillovers into costs and wage expectations. This pattern was evident, as household one-year-ahead inflation expectations rose steadily from mid-2019, crossing 12 per cent in late 2021 and settling at 10–11 per cent thereafter (Figure 2).

Figure 2: Core Inflation Transmission



Source: Ministry of Statistics and Programme Implementation; author's calculations.
Note: CPI = Consumer Price Index; WPI = Wholesale Price Index.

A striking departure emerged, however, in 2023–2024. As broader economic conditions normalised, core inflation descended rapidly, reaching about 3 per cent by May 2024—a historic low. This disinflation occurred despite inflation expectations remaining in double digits, suggesting a weaker pass-through than in previous episodes. By the end of 2024, core inflation hovered near target, nearly 1.5 percentage points below its long-run average. The widening gap between headline and core inflation—averaging 148 bps in 2024 compared with a historical average of 47 bps—posed new challenges for monetary policy. The steep correction in core inflation from early 2023 also deviates from its past asymmetric behaviour: Core price changes have usually stayed high after a lagged catch-up with headline inflation, reflecting the entrenchment of expectations once cost pressures permeate the economy (Kohli, 2022).

2.2 Role of Supply Shocks: Predominance of Food Prices and Climate Extremities

Supply-Side Dominance in Inflation Dynamics

Approximately two-thirds of the overall price rise during 2019–2024 can be attributed to supply factors, including pandemic-related disruptions, international commodity price shocks, and—most persistently—food inflation. A variance decomposition exercise indicates that post-2019 inflation dynamics were overwhelmingly self-perpetuating, with around 90 per cent of monthly variation explained by past inflation.[1]

While the pandemic and foreign cost shocks were concentrated in 2020–2022, food price pressures endured throughout the entire phase. On average, food inflation accounted for more than half of headline inflation during 2019–2024, adding 250 bps on average each month compared to a percentage point less in the five years before (Figure 3). Retail and producer-level food price growth averaged 5.6 per cent and 6.7 per cent per month, respectively, compared with just 4 per cent in the preceding five-year period (Table 1). This highlights the structural intensity of food-related inflation in the post-2019 episode.

Climate Extremities and the Food Price Surge

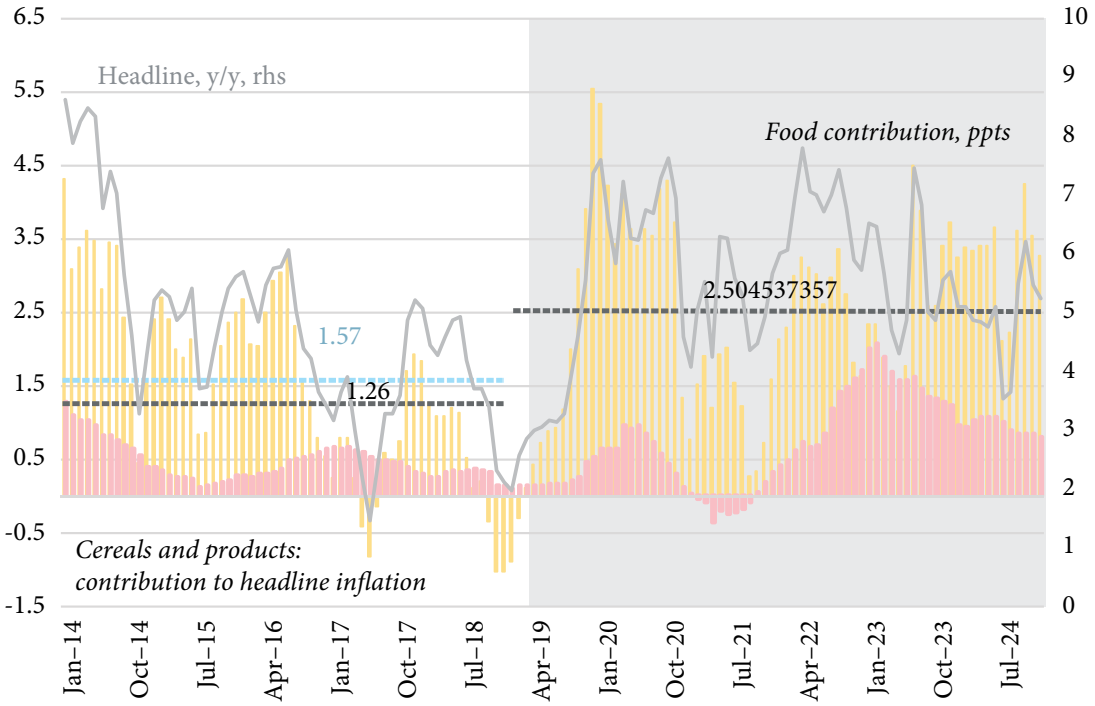
Figure 3 illustrates the prominent role of food price shocks, driven primarily by cereal prices with periodic surges from vegetables. The persistence of these shocks can be traced to successive climate events:

- **Vegetables:** Repeated weather shocks caused output collapses at several points.
- **Wheat (2022–2024):** Heatwaves and untimely temperature spikes reduced yields for three consecutive years.
- **Rice (2023):** Deficit rainfall in the Indo-Gangetic Plain (IGP) compounded the pressures.

Cereals and cereal products (with a 12.35 per cent weight in the CPI basket) contributed almost one-fifth of total inflation between 2022 and 2024, highlighting their disproportionate influence. By contrast, demand-side factors played a secondary role, accounting for about 40 per cent of the price rise during 2020–2023, combining pandemic effects and input-cost pass-through. Core inflation corrected sharply once these pressures receded in mid-2023, revealing the underlying dominance of food inflation, which contributed nearly 60 per cent of headline CPI between July 2023 and December 2024. This was significantly above that in the low-inflation phase (2014–2019).

[1] The Cholesky ordering of variables is based on the Blanchard–Quah framework with the following variables to quantify contributions of supply–demand factors: GDP, oil prices (year-on-year log changes), inflation, the policy rate, and the rupee–dollar exchange rate (first differenced) for 2013M06–2024M12.

Figure 3: Food and Cereals: Contribution to Headline Inflation



Source: Central Statistics Office; author's calculations. Dashed lines are period averages (contributions of food to headline inflation).

Note: y/y = year-on-year; ppts = percentage points; rhs = right-hand side.

Continuity and Departure from Historical Patterns

The prominence of food is not unique to this episode. Historically, food has been a critical driver of India's inflation, particularly in the pre-FIT period. It featured importantly in the adoption of FIT and headline inflation as the anchor because of its strong influence on inflation expectations (RBI, 2014). An existing body of literature has examined its different dimensions and phases (Patra et al., 2024a, 2024b; RBI, 2014). While this steadiness held in this episode as well, there were some characteristic departures from earlier patterns. Table 1 highlights the distinctive changes, as summarised next.

- **Higher Relative Increases:** On average, retail food prices rose 1 percentage point faster than other goods and services, which was a sharper gap than in the earlier low-inflation period. At farmgate levels, the disparity was even wider.
- **Loss of Mean-Reversion:** Historically, food price spikes normalised within a few months. In contrast, following the vegetable-led price spike in mid-2019 and the heatwave-related wheat shock of 2022, food prices did not revert, indicating entrenched persistence, as confirmed by Patra et al. (2024b).
- **Elevated Price Levels:** Index-based measures show that food price levels rose nearly four times compared with 2014–2018, and more than twice as much as in 2012–2018, a period defined by food price surges in its early years.

- **Greater Magnitude and Frequency of Surges:** Food inflation shocks were larger and more frequent. Spikes of more than 1 standard deviation endured for over two years, far exceeding past durations. Episodes of headline inflation overshooting the 6 per cent mark were also more common, despite widespread use of restrictive supply-side interventions.
- **Reduced Reversals:** Downward corrections, once typical of food price cycles, became less pronounced. Peak-to-trough adjustments weakened, suggesting rigidity in upward price movements.
- **Vegetable Price Volatility:** Particularly acute in this period, vegetable inflation drew sustained attention, with recent research linking it to weather anomalies and identifying it as a major contributor to both food and headline inflation (Singh & Shandilya, 2025).

A cautious interpretation is whether these different dynamics represent a structural break or merely a cyclical anomaly. What is clear, however, is that climate-related shocks to food production have emerged as recurrent and potent drivers of inflation.

A critical policy question, in this light, is whether the climate-linked food price shocks are temporary deviations or signify a more fundamental transformation that is affecting the inflation process. There are some pointers in this regard, including the combined stabilisation policy strategy that this entailed in the 2019–2024 episode.

Table 1: Changing Inflation Dynamics

	2012–2018	2014–2018	2019–2024
Headline Inflation *period avg.*			
Wholesale *(Apr'13–Dec'18)*	1.93	1.44	4.54
Retail	6.23	4.77	5.46
Food inflation *period avg.*			
Wholesale *(Apr'13–Dec'18)*	4.55	3.2	6.22
Retail	6.09	4.0	6.4
Typical surge duration*	~21 months	~10 Months	>2 years
	Apr'12 to Dec'13 (more than 1 SD)	*Sep'15 to Jun'16*	*Nov'19 to Oct'20; Jul'23 to Oct'24*
No. of months above trend, 6%	9	5	13
Interval between price spikes			
Distance between peaks	11 peaks, 6 months gap on average	7 peaks, 6.4 months gap on average	13 peaks, 5.2 months gap on average
Volatility of food inflation**	Volatile but flexible	Lower volatility	Higher volatility at all horizons
	i.e., upswings followed by offseting corrections	seasonal spikes predictable, Aug–Nov	bigger trough-to-peak swings
Food price index level rise	21.65	17.65	53.11
	(Dec'18/Jan'12)	*(Dec'18/Jan'14)*	+~53% *(Dec'24/Jan'19)*
Avg. vegetable price inflation			
Wholesale	5.61	0.08	13.63
Retail		2.53	9.87

Source: Consumer Price Index; Wholesale Price Index; author's calculations.

Note:

**Surge is defined as the period of continuous rise in inflation, exceeding more than 1 SD of that period.*

***Volatility is defined as rolling SD at 3- and 6- months, 1- and 2- year horizons, i.e, the extent of fluctuations in inflation over the defined horizons.*

SD = standard deviation; avg. = average.

3. Management of Inflation in 2019–2024

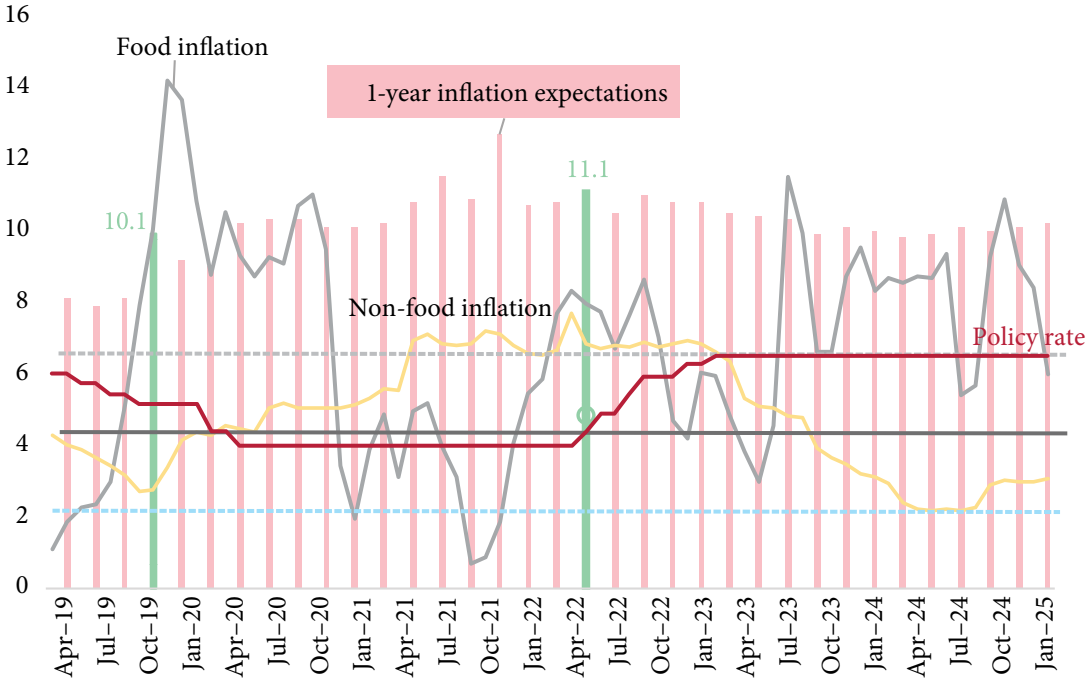
Inflation management in 2019–2024 unfolded under markedly different institutional and macroeconomic conditions compared with earlier episodes. Most notably, the monetary policy settings had changed with the adoption of the FIT framework, which introduced an explicit medium-term inflation goal and accountability provision. This created unique pressures, especially regarding credibility. This period also marked FIT's first sustained encounter with a prolonged sequence of diverse supply shocks that ranged from the pandemic and its disruptions to climate-induced food stress and geopolitical commodity surges.

The common global shocks clouded both inflation understanding and monetary policy decisions across the world. Most emerging economies started raising interest rates from mid-2021, nearly a year before India's pivot in May 2022. Although global shocks amplified price pressures, India's inflation trajectory embodied a distinctively domestic character, with food price shocks entrenched well after global food prices had subsided in late 2022. These dynamics posed new challenges for both forecasting and policy calibration.

3.1 Sequencing of Policy Responses

Table 2 outlines the sequencing of monetary policy responses to inflation during 2019–2024. It highlights a defining feature of this period: Supply-side measures led the inflation-fighting strategy, with monetary policy playing a secondary and delayed role. For better exposition and understanding, Figure 4 plots the evolution of food and non-food inflation rates, one-year-ahead inflation expectations of households, and the policy rate. Specifically, government actions dominated from 2019 to mid-2022, with monetary tightening commencing only after inflation had breached the upper tolerance band for an extended stretch.

Figure 4: Monetary Policy, Inflation Rates, and Inflation Expectations



Source: Ministry of Statistics and Programme Implementation; Reserve Bank of India; author's calculations.

- **Initial Phase (2019–2020):** Monetary policy adopted a "look-through" stance towards food price spikes, expecting mean reversion as supplies normalised. The MPC prioritised output stabilisation given the prevailing negative output gap, while revising up the inflation forecast. On the eve of the pandemic, food and non-food prices increased along with one-year-ahead inflation expectations, while the policy rate and stance remained unchanged.

Table 2: Inflation Management, 2019–2024

Monetary policy		
	Interest rates	**Stance**
Pre-Pandemic, 2019–2020		
Feb–Oct'19	135 bps reduction from 6.5 to 5.15%	From calibrated tightening to neutral, then accomodative.
Dec'19 & Feb'20	Pause	Persevere with accomoodative stance as long as necessary to revive growth.
Pandemic and beyond		
March 27, 2020	75 bps reduction; lockdown begins	Accommodative stance to continue as long as necessary to revive growth and mitigate the impact of coronavirus (COVID-19) on the economy, while ensuring that inflation remains within the target.
May'22–Feb'23	6-step increase to 6.5%	
May 4'22	40 bps increase	Accommodative while focusing on withdrawal of accommodation to ensure inflation remains within target going forward, while supporting growth.
June 8'22	50 bps increase	No change.
Aug 5'22	50 bps increase	Focused on withdrawal of accommodation to ensure inflation remains within target going forward, while supporting growth.
Sept 30'22	50 bps increase	No change.
Dec 7'22	35 bps increase	No change.
Feb'23	25 bps increase	No change.

Supply-side actions			
Agriculture market interventions			
	Number	*Product*	*Type*
2019–2020	5	Onions, pulses (tur)	Minimum export price (MEP), stock limits, export ban.
2020–2021	2	Onions	Export ban, fumigation relaxation for imports.
2021–2022	12	Pulses, edible oil and oilseeds, soya meal	Stock limits & disclosures, import duty reductions, reduction in agri cess.
2022–2023	12	Wheat, pulses (tur), edible oil, oilseeds, sugar	Export ban, open market sales, stock disclosures & limits, import duties.
2023–2024	28	Pulses, wheat, rice, edible oil, sugar, onions	Export ban, open market sales, stock disclosures & limits tightening.
			Import duties, minimum export price & other regulations.

Fuel prices & taxes	
Oct'21	Fuel tax cuts
Mar–Apr 2022	Fuel taxes raised, reversing the reductions in Oct 2021
May'22	Fresh reductions
Jun 2022–Apr 2024	Freeze
End-Apr 2024	Further reduction in duties

Source: Reserve Bank of India; Department of Food & Public Distribution; Food Corporation of India; Press Information Bureau press releases; author's calculations.

Note: bps = basis points; MEP = Minimum Export Price.

- **Pandemic Phase (2020–2021):** An explicitly accommodative stance was combined with exceptional liquidity support of approximately 8.7 per cent of GDP and targeted regulatory relaxations. The operating target was deliberately aligned with the reverse repo rate to maintain easy financial conditions. The pandemic-era responses reflected monetary–fiscal coordination, or joint macroeconomic stabilisation (Patra & Bhoi, 2023).
- **Transition (2021–2022):** Although oil and commodity price surges added to food inflation, monetary policy remained accommodative to support the pandemic recovery and growth, leaving the burden of inflation control on supply-side measures and fiscal instruments.
- **Tightening Phase (from May 2022):** An inter-meeting rate hike marked a sharp pivot in monetary policy as headline and core inflation converged near 8 per cent in April 2022. A rapid tightening cycle followed, but only after food and fuel shocks had already entrenched inflation expectations at high levels.

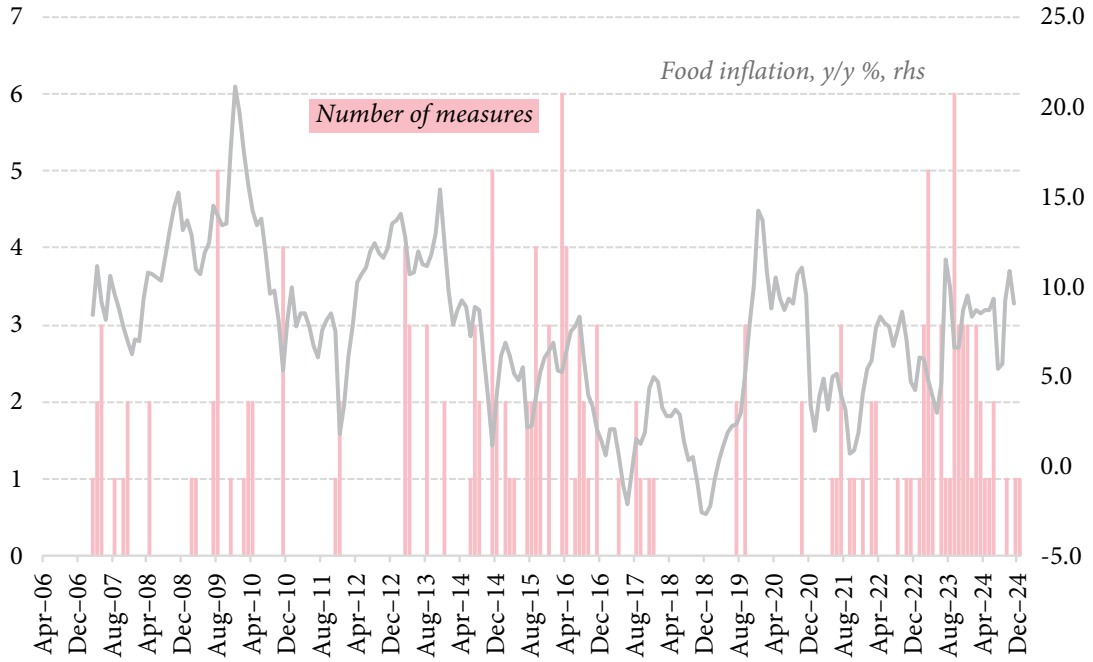
3.2 Supply-Side Interventions: Breadth and Intensification

The second panel of Table 2 outlines the supply-side responses to the food and fuel shocks in this period. The strategy was two-pronged. It combined trade restrictions with targeted substitution in public distribution programmes by shifting the cereal composition to offset shortages and counter sharp relative price changes. Price and stock controls ranged from tariff adjustments and stockholding caps imposed on traders and processors (with frequent reductions) to the aggressive use of reserve grain sales, with continuous market wheat sales from 2020–2021.

Supply management assumed unprecedented scale, frequency, and severity. As Table 2 and Figure 4 document, agricultural interventions rapidly doubled from 12 in 2021–2022 to 28 in 2023–2024. At the peak, these averaged more than two per month. Between June 2022 and March 2023, as food inflation and inflation expectations remained persistently high, there were one or more supply or price control measures every month, with six in September 2023 alone.

The clustered density of the bars in Figure 5 shows the escalation in supply management of inflationary food shocks after 2014–2015. These periods broadly correspond to different monetary regimes—the run-up to the adoption of the FIT framework, followed by its *de facto* and *de jure* phases. Specifically, food inflation episodes in 2015–2016 and 2019–2024 contrast sharply with those in 2009–2010 and 2012–2013, which saw fewer supply checks and actions.

Figure 5: Agriculture Restrictions and Food Price Movements



Source: Various Press Information Bureau releases; Central Statistics Office; author's calculations.
Note: rhs = right-hand side; y/y- year-on-year.

Importantly, this identifies the departure in the policy mix for managing inflationary supply shocks. It is defined by the central bank looking through such price disturbances for which it lacks appropriate tools, shifting the burden to the government, that in turn significantly increased supply responses to check food inflation, its impact on inflation expectations, and its generalisation.

Despite these aggressive measures, the persistence of food inflation in 2019–2024 is telling. The controls prevented sharper spikes but failed to prevent the relative price increases from turning into an enduring inflation problem, widening headline–core inflation gaps, and a prolonged disinflation. This points to diminishing returns and a narrowing policy arsenal over time.

Fuel Tax Cuts and Non-Revision of Energy Prices

The second major supply shock—fuel prices—was mitigated primarily through fiscal tools. Crude oil prices (*Indian Basket*) recovered in 2021–2022 (77 per cent) from pandemic lows with an 18 per cent rise the following year. Reductions in excise duties in 2021, and again in May 2022, combined with a freeze on retail pump prices, substantially tempered the second-round effects. The central bank estimates suggest these measures lowered headline inflation by around 1.5 percentage points relative to a counterfactual without action (BIS & RBI, 2023). Such fiscal interventions proved critical in preventing a more protracted overshoot, although they also raised concerns about fiscal costs and long-term credibility.

Finally, foreign exchange interventions were an important, although less visible, component of inflation management. Gross interventions rose sharply to US$33–

65 billion annually in 2023–2025, quadrupling relative to GDP, compared to the preceding five years.[2] While officially aimed at smoothing volatility, these interventions effectively cushioned imported inflation, particularly for energy, where the pass-through of costs to producers is fast and powerful, with retail transmission following within a short interval.

3.3 Outcomes and Structural Lessons

The sequencing of policies thus reveals a distinctive pattern. The supply-side and fiscal measures were front-loaded and dominant (Das, 2022),[3] while monetary policy tightened with a lag. The strategy can be formalised as an optimal policy rule (see Appendix) embedded within a broader policy mix where food price stabilisation is primarily achieved through supply-side and fiscal instruments, while FIT focuses on anchoring expectations for non-food prices and wages. In 2019–2024, this configuration produced the following outcomes.

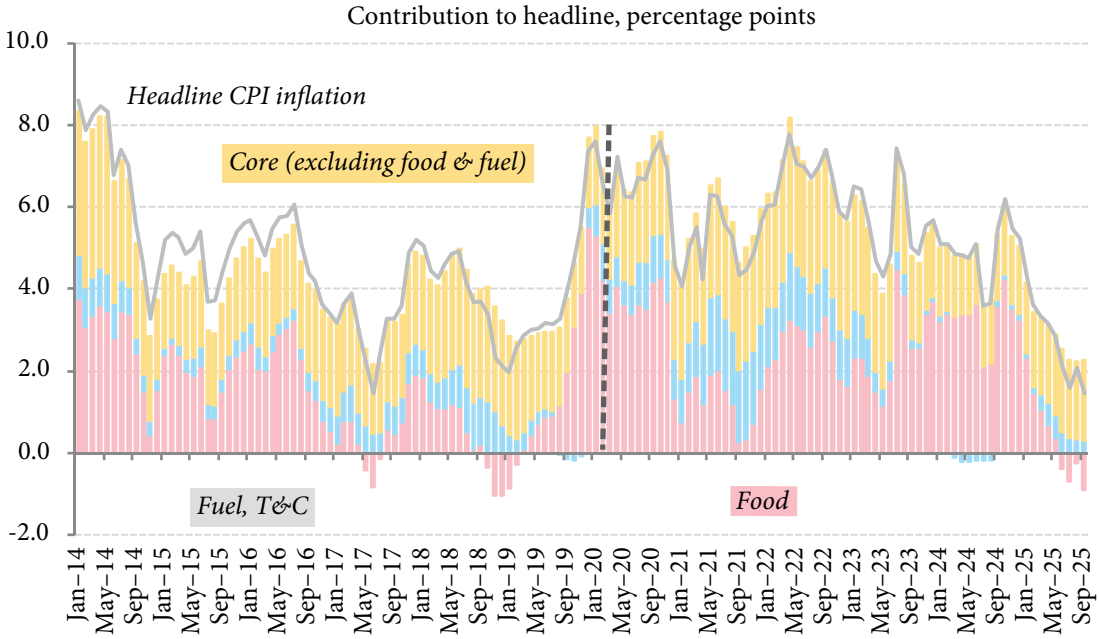
First, energy-led disinflation in 2023 demonstrated the efficacy of fiscal fuel measures, which were critical in suppressing inflation and effectively reversed the previous year's trend (Figure 6). This includes core inflation that rapidly declined towards the target. Central bank estimates show these measures lowered headline inflation by around 1.5 percentage points relative to a counterfactual without action (BIS & RBI, 2023).

Second, food inflation remained stubbornly high. Despite aggressive supply management, food price growth exceeded 6 per cent in most months for over five years from its initial surge, averaging 7 per cent per month until January 2025. Spikes were dampened, but relative price increases hardened into persistent inflation. Third, the continuous supply actions could not prevent this persistence from embedding into expectations (Figure 4), nor could they stem the evolution of relative price shifts into a sustained inflation problem. This underlines the deep inertia of food inflation documented in earlier research (Anand et al., 2014). This was unlike the global easing trend (Economic Survey, 2024–2025).

[2] The IMF's reclassification of India's de facto exchange rate regime as "stabilised arrangement" during 2022–2023 (IMF, 2023) underlines this.

[3] "…the government has now taken action on wheat, on intermediaries and various kinds of intermediaries, raw materials and of course, the big one on petrol and diesels. Now, all this put together will definitely have a sobering impact on inflation. Going forward, the petrol and diesel tax deductions have been announced on the weekend."

Figure 6: India: Disinflation Mostly Energy-led



Note: CPI = Consumer Price Index; T&C = Transport and Communication.

Source: Reserve Bank of India; author's calculations.

The descriptive evidence suggests a framework that was effective at the margins but not at the core of the problem. FIT, operating alongside a heavy government-led stabilisation apparatus, delivered slower and more prolonged disinflation than its design implies. A more formal and cautious examination of inflationary responses to food supply shocks in 2019–2024 tests the framework's resilience to supply shocks in the following section.

4. Challenges to the Flexible Inflation Targeting Monetary Framework

FIT rests on a medium-term inflation goal, usually with a tolerance band, while allowing flexibility to respond to output and financial stability concerns. This discretion becomes critical when central banks face supply shocks such as weather-driven food crop disruptions or commodity price swings. Unlike demand shocks, which move prices and output in the same direction, supply shocks create a difficult trade-off with opposite movements of the two. The 2019–2024 inflation episode provided a stringent real-world stress test for India's FIT regime, revealing important vulnerabilities.

A limited, naïve comparison of the inflationary pass-through of food price changes and expectational responses is also attempted to see if the FIT framework strenghtened across its different phases. Likewise, it is explored whether the supply-side policy response intensity changed fundamentally during the period because of its lead role. The evidence presented is cautious because of the brief comparison window, which limits controlling for simultaneous disturbances (e.g., the pandemic, global commodity shocks, exchange-rate management, and fuel shocks).

4.1 Inflation Responses to Food Supply Shocks

Earlier literature suggests that supply shocks should have a diminished pass-through to inflation under a robust FIT regime (Ball & Sheridan, 2005; Bernanke, 1999). Following this research, a similar methodology has been used to assess the magnitude of inflationary responses to food supply shocks for a tentative insight. A bivariate regression features the supply shock variable—this is the difference between the change in consumer food price index and headline inflation—as an independent determinant of the change in headline inflation to assess the latter's sensitivity. Two five-year intervals are compared, 2014–2018 and 2019–2024, using monthly data.

Table 3 (columns 2–3) presents the bivariate results. These indicate that inflation responded more strongly to food supply shocks in 2019–2024 than before, as implied by the increased size of the supply shock coefficient. *Ceteris paribus*, a 10 per cent rise in the relative price of food—say, from 4 per cent to 4.4 per cent—significantly raised headline inflation by 120 bps (1.2 of 1 percentage points) in 2019–2024, against an insignificant response in 2014–2018 (and over the longer period 2012–2018, not reported here). The enlarged coefficient magnitude, combined with improved significance and explanatory power, indicates that FIT's resilience to supply shocks weakened in 2019–2024, or that it was not effective in tackling these food price disturbances.

Supply shocks also impact inflation expectations. In India, these are crucially shaped by food prices. Expectations are central to anchoring inflation under FIT, so the second regression (columns 4–7, Table 3) examines how one-year-ahead household inflation expectations (drawn from RBI's biannual surveys) reacted to past food inflation. The coefficient on lagged food inflation (monthly year-on-year) indicates a marginal decline—4 bps—in the expectation response relative to the previous five-year period. This dilution holds at a six-month lag with a reduction in coefficient size, significance, and total explanatory strength. The results indicate that although the expectations channel was strained, it was not destabilised.

Taken together and cautiously, there are indications that the sensitivity of headline inflation to food shocks increased while expectations remained sticky in this period. Inflation was more, not less, reactive to supply shocks than before, with a slight weakening of its linkages with future inflation expectations. As underlined above, due to the incomplete analytical foundations, the findings are more interpretable as co-movements across periods. The results reflect a fragile equilibrium rather than a strengthened FIT buffer.

Over the full period, the entrenchment of food inflation needs to be located in the context of the extensive lead of supply-side policies, while monetary policy remained accommodative from the initial supply shock (mid-2019) to May 2022. The final two columns of Table 3 present bivariate estimates of the supply responses to the lagged change in food inflation across two time periods, each embodying high food inflation episodes. The supply response is measured by the actual number of

monthly controls. The coefficient on the two-month lagged change in food inflation increased in magnitude and significance under FIT's first encounter with food supply shocks in 2019–2024. The magnitudes imply that a 10 per cent increase in food inflation would prompt 2.3 supply-side controls (e.g., stockholding caps or export bans) within the next two months, compared to a much longer response time of 12 months that was barely significant in 2009–2015 or before FIT adoption.

Table 3: Inflation Responses to Food Supply Shocks, Inflation Expectations to Inflation

Equation	**1**		**2**				**3**	
Dependent Variable	***Change in Headline Inflation***		***Inflation Expectations (1 year)***				***Agricultural Restrictions (number)***	
Explanatory Variable	**2014–2018**	**2019–2024**	**2015–2018**	**2019–2024**	**2015–2018**	**2019–2024**	**2009–2015**	**2019–2024**
Change in Consumer Food Price Index—Headline Inflation	**0.04**	**0.12*** **						
	0.05	*0.03*						
Food Inflation (-1)			**0.40*** **	**0.36*** **				
			0.11	*0.07*				
Food Inflation (-6)					**0.14*** **	**0.11*** **		
					0.04	*0.03*		
Change in Food Inflation (-2)								**0.23** **
								0.10
Change in Food Inflation (-12)							**0.19***	
							0.11	
R-sq	**0.013**	**0.17**	**0.23**	**0.29**	**0.17**	**0.18**	**0.13**	**0.13**
Adj R-sq	**-0.004**	**0.16**	**0.21**	**0.28**	**0.15**	**0.17**	**0.08**	**0.10**
Number of Observations	**59**	**72**	**48**	**72**	**48**	**72**	**22**	**34**

Source: Author's work.

*Note: Standard errors are in italics. ***,**, and * indicate significance at 1, 5, and 10 per cent, respectively. Ordinary least squares estimates with monthly data.*

Taken together with the previous bivariate regressions, the evidence points to FIT being less effective in insulating inflation dynamics from food-driven supply shocks compared to before, notwithstanding 80 per cent faster supply responses with increased force.

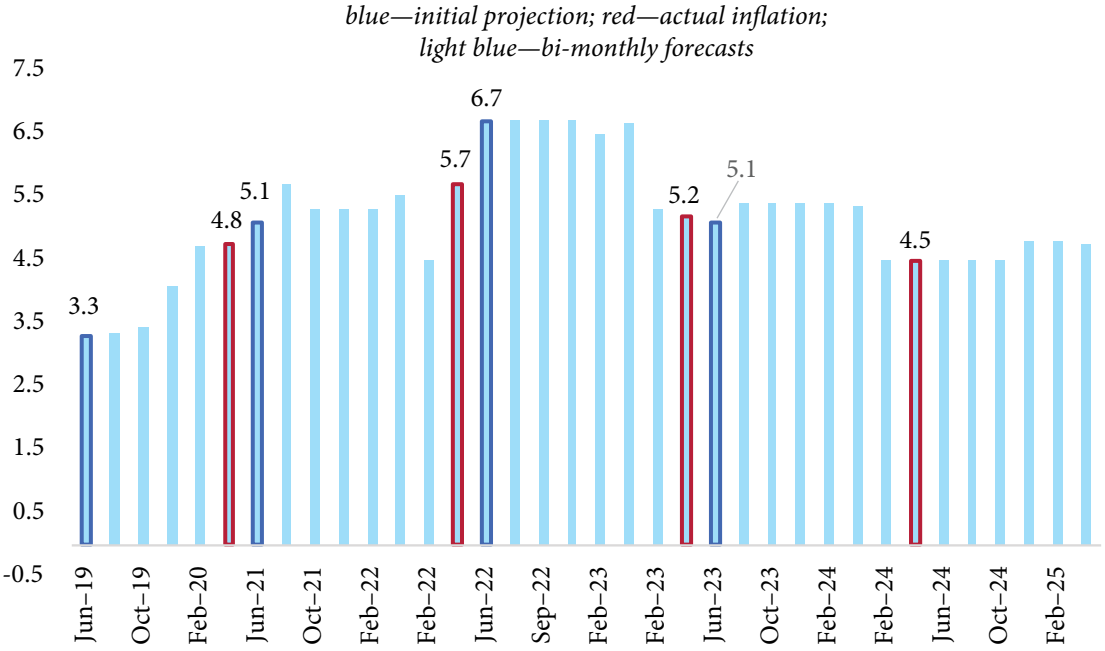
Supply shocks and their handling also raised other challenges, notably uncertainty and credibility risks. While some arose from the unpredictable weather disturbances, policy-induced distortions and inefficiencies also played a role, as discussed next.

4.2 Credibility Pressures: Forecast Errors, Dependency, Institutional Design Strains

Persistent food supply shocks amplified forecast errors, intensifying credibility risks during 2019–2024. Figure 7 illustrates the sizeable bi-monthly revisions: by 150 bps before the pandemic in 2019–2020, without any noise, and 115 bps in 2022–2023. The lead-up to the sharp turn in monetary policy (May 2022) is an important illustration: It was only a month before, in April 2022, that inflation was projected to fall from 6.3 per cent in the quarter by 50, 40, and 30 bps in each subsequent quarter and to 5.7 per cent in the year (2022–23) without monetary action. Actual March–April headline inflation, however, accelerated to 7.0 per cent and 8 per cent, with core inflation at 6.5 per cent and 8 per cent. Two months later, in June 2022, the upward quarterly forecast revisions were a staggering 120, 160, and 80 bps, while the annual forecast was raised by 100 bps, or to 6.7 per cent.

The scale of the revision, made within two months of projecting a steady quarterly decline, indicates beyond normal forecast uncertainty. It hints that the supply-side interventions, which were then the sole stabilisation lever, were being credited with more disinflationary power than they possessed, and that the persistence of food shocks was being underweighted in the baseline.

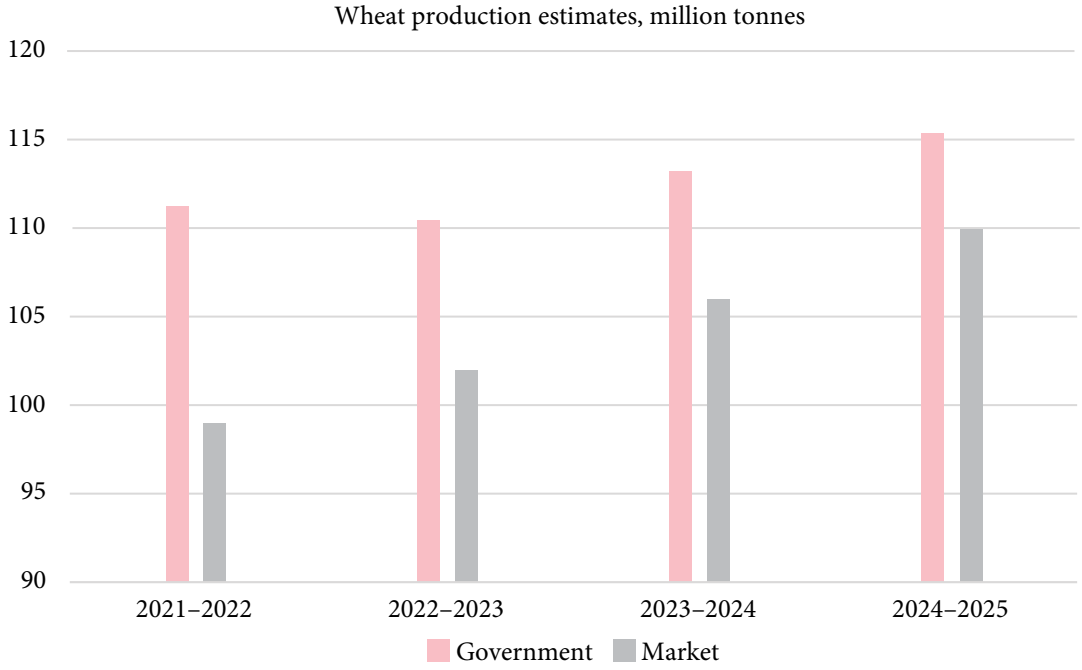
Figure 7: Inflation—Forecasts Versus Actuals



Source: Monetary policy statements; Reserve Bank of India; Central Statistics Office; author's calculations.

Note: Pandemic year 2020–2021 missing due to absence of forecasts.

Figure 8: Divergent Supply Estimates a Fresh Source of Uncertainty



Source: Second Advanced Estimates; Ministry of Statistics and Programme Implementation; Flour Miller Association.

This substantially weakened one of FIT's primary transmission channels, viz., forward-looking guidance grounded in a stable, credible model of inflation dynamics. Although globally, supply disruptions widened forecast distributions during the pandemic, in India, food prices and misunderstanding of the transmission process appear to be the major sources of error variances. For example, the collective impact of supply measures and potential second- and third-order effects from unprecedented strictness and duration.

The credibility challenge deepened when inflation exceeded the 6 per cent tolerance band for three consecutive quarters, requiring the RBI to issue a statutory explanation to the government. While similar breaches occurred in other countries (e.g., the Bank of England, and the US Fed in 2021–2022), the Indian context was distinct: inflation had domestic, supply-side origins even before the pandemic; demand-side pressures and transmission risks were limited by slack labour markets; monetary tightening lagged emerging economy peers; and food-price-driven inflation endured after global food inflation had ebbed in mid-2022 (World Bank, 2024).

Finally, the counterfactual is not known. In other words, had demand been more robust or recovery more equal, what might have been the inflation outcomes? Consider that for most of the episode, real wages were either stagnant or depressed—due to oversupply related to lockdown-era migrations, a non-linear recovery, compression of farm margins from higher input costs until mid-2023 (RBI, 2023b), and the income squeeze from high food prices (RBI, 2024c, 2025a).

4.3 Amplification of Volatility and Market Inefficiencies

Volatility intensified during this episode. Food inflation became more erratic, and not merely from weather variability but likely also from the heavy-handed interventions (Tables 1 and 4). Although supply-side measures have traditionally had a stabilising effect (Kiley, 2025), their effectiveness in continued extremities has rarely been tested. Nor are the second-order effects and the precise role of extended trade and price controls in propagating volatility accurately known. A preliminary bivariate examination shows no significant causality in either direction, although at peak intensity (May 2021 to December 2024), supply controls did influence food inflation volatility at a six-month interval, with marginal significance.[4]

Market inefficiencies compounded these problems. For example, continuous stockholding caps amid tight supplies raised transaction costs and weakened trader participation at price-stabilising auctions (Athrady, 2023), with market exits (Press Trust of India, 2023) and shallower participation (Jadhav & Bhardwaj, 2024; The Wire, 2023) indicating disrupted market functioning. This persistence—alongside reports of excess storage, stockholding caps, and shallow market participation—pointed to distorted price signals and diminishing efficiency. Divergences between official and private assessments of cereal supplies (e.g., wheat in 2023–2024, Figure 7) likely fuelled uncertainty and inflation expectations. Altogether, there are hints of diminishing returns to prolonged controls, indicating such a strategy may be unsustainable for addressing food supply shocks.

4.4 Heavy Reliance on Government Action

While FIT allowed for some accommodation of temporary or one-off relative price changes from the initial shock (2019), the persistence of food inflation—with reinforced supply pressures in 2022–2023—compelled increasing reliance on government actions during 2019–2024. Food price stabilisation actions, fuel subsidies, import and export controls, etc., are indeed appropriate responses to supply-induced inflation and helped anchor expectations in the short run.

However, their prolonged deployment forces external dependency on the central bank, blurring operational autonomy. For example, the MPC's requests for fiscal adjustments such as fuel duty cuts and quicker responses to control price rises and keep inflation expectations anchored (RBI, 2021a); the price acceleration in April 2022 and the inter-meeting rate hike in May 2022, with urging of further tax cuts[5]

[4] Granger causality tests show no significant two-way causality at six-month, one-year, or two-year horizons, though three-month volatility appears to Granger-cause restrictions. Bivariate regression of the number of restrictions upon food inflation volatility at six-month lag shows slightly significant impact (coefficient 0.48, t-12%). This is not observed in any other sub-period of the full sample from 2012.

[5] "Input prices are rising across manufacturing and services…, but weak demand and. . .cost cutting are tempering the pass-through. With crude oil prices at elevated levels, a calibrated reduction of the indirect tax component of pump prices by the Centre and states can help to substantially lessen cost pressures." (Para 8). "With core inflation persisting at an elevated level, measures to further ameliorate supply side and cost pressures, including through calibrated cuts in indirect taxes on petrol and diesel by both Centre and States, would contribute to a more durable reduction in inflation and anchoring of inflation expectations." (Para 11).

including by state governments (The Hindu, 2022); and political hesitation around incurring fiscal costs and burden-sharing concerns, since state governments impose separate fuel levies.

In effect, and in large part, the RBI's success and credibility were conditional on the responsiveness and efficacy of government interventions—essentially trade and fiscal policy decisions—for anchoring inflation expectations. The credit in successive MPC resolution statements and minutes (August and December, 2021; February and June, 2022) and limited extension surveys of household inflation expectations conducted by the central bank following tax cuts (October 2021; May 24–28, 2022; MPC minutes, RBI, June 2022) underline both dependency and shared credibility with role diffusion. Delays and policy frictions can also weaken credibility if inflation overshoots and monetary policy is seen as lagging (e.g., Kohli, 2021; Nomura, 2022; Subramanian & Felman, 2022).

It must be flagged, however, that despite these pressures, the presence of forecast errors during unusual supply shocks does not universally equate to lost credibility, and policy coordination does not automatically imply compromised autonomy. That said, while the institutional context has structurally changed, there are important similarities with past work, which has documented how agricultural supply shock persistence has continually compelled monetary policy to wait for, or coordinate closely with, government interventions—in turn, affecting the central bank's credibility and perceived autonomy during prolonged periods of inflation overshoot (Anand et al., 2014).

4.5 Institutional Strains and Design Questions

The prolonged persistence of food inflation in 2022–2024 deepened disagreement within the MPC as headline inflation stayed high while core inflation slipped to historic lows, and high food inflation and inflation expectations compelled policy restraint notwithstanding demand conditions (RBI, 2024c).[6] Differences over the output gap sharpened, and the urgency to ease monetary policy in order to arrest the mounting growth sacrifice intensified (RBI, 2024).[7] The low core inflation corresponded to the stagnation and depression in real wages, highlighting the costly adjustment (RBI, 2024c, 2025a).

[6] "The speed of the easing of inflation has been disappointing so far, even from a cross-country perspective. Food prices are persisting for too long as the principal impediment to a faster disinflation. . .Food prices are holding back any consideration of possible changes in the monetary policy stance." (Statement by Deputy Governor M.D. Patra, MPC minutes, June 21, 2024.)

[7] "This unwarrantedly high real rate imposes significant costs on the economy because of the short run Phillips curve. The fact that economic growth in 2024–2025 is projected to slow. . .is a reminder that high interest rates entail a growth sacrifice. Monetary policy should try to reduce this sacrifice. . ." (Para 40, MPC minutes, J.R. Varma, April 19, 2024.) "It now appears that the maintenance of restrictive policy for unwarrantedly long will lead to a growth sacrifice in 2025–2026 as well. . . This is an unacceptably high growth sacrifice." (MPC minutes, June 21, 2024.) "For the last several meetings, I have been expressing concerns about the unacceptable growth sacrifice induced by a monetary policy that is excessively restrictive." (Para 50, MPC minutes, August 2024.)

Finally, the divergence between headline and core inflation reignited debates over whether headline CPI was an appropriate target for an economy dominated by volatile food shocks. The tug between demand-side weakness and food-driven persistence provoked questioning of its virtue given the temporariness of food shocks, with suggested alternatives like core inflation, including by the government's chief economist (Nageswaran, 2024; summarised in RBI, 2025b). Such questioning of the FIT framework's design during a prolonged inflation episode risked undermining its institutional legitimacy.

The experience of 2019–2024 provides three interrelated lessons. First, persistent supply shocks raise the probability of forecast and policy errors: distinguishing temporary from permanent shifts is difficult, and a misreading can lead to excessive accommodation initially, endangering inflation persistence and unsettling expectations. Second, the extensive use of supply-side actions can muddle readings of the future inflation path and affect monetary policy decisions; the gains can turn counterproductive with extreme and extended use, as the inefficiencies associated with a more controlled economy set in. Third, heavy dependence on fiscal actions blurs central bank autonomy and independence, conditioning the success and credibility of monetary policy on the speed and efficacy of government interventions; delay can result in inflation overshoot.

Such reliance is understandable in the case of passing supply shocks, in times of crisis, but when food supply shocks take on a repetitive, intense character, a constant use may not be sustainable (outlined in the next section). Or worse, if the leaning substitutes for structural reforms are either unforthcoming or delayed, thereby impinging upon the independence and autonomy of the central bank. The risk is high for India with its unreformed agricultural markets and difficult political economy that prevents structural reforms. The next section outlines why these challenges could magnify in future.

5. Why the Supply Shock Challenges to Flexible Inflation Targeting Could Persist or Magnify Ahead?

The wider context of climate change–induced weather extremes underlying the food supply shocks has importance for the future. The clustering of intense heat, erratic rainfall, and crop stress in 2021–2024 has few historical parallels. It is helpful to view the food inflation persistence in 2019–2024 within this context. Compared with earlier agri-climatic disruptions in 2009–2010 and 2015–2016, four major departures are visible—in climate severity, crop outcomes, supply-side responses, and price behaviour. Table 4 summarises these.

Table 4: Why Food Supply Shocks May Increasingly Drive Inflation?

	2009–2010, 2010–2011	2015–2016, 2016–2017	2021–2022, 2022–2023, 2023–2024
Climate Change-Related Shocks			
Heatwave days			
percentage increase, y/y	414, 51 1/	-40.2, 74.4 1/	555.2, -41.6*
duration	Apr–Aug, Apr–Jun	Mar–Jun, Apr–July	Mar–May, Mar–Jun, Mar–Jun
Temperature			
absolute, °C	26.05, 26.04	25.93, 26.21	25.93, 26, 26.15
percentage increase	1.92, -0.04	0.74, 1.08	0.58, 0.27, 0.58
Rainfall deficiency			
*percent deviation from long period average***			
National	19.8, -6.11	9.6, 11.6	-1.67, -7.5, 4.7
Indo-Gangetic Plains	16.8, 18.1	11.3, 5.9	17.1, 19.8, 15.6
Production, Procurement, Stocks			
Wheat			
change in output, million tons	0.12, 6.1	5.8, 6.2	1.7, 2.6, 2.1
period change in procurement, %	-0.44	-9.7	-38.8
period change in stocks, %	14.2	-53.2	-69.6
Rice			
change in output, million tons	-10.1, 6.9	-1.1, 5.3	5.1, 6.3, 0.9
period change in procurement, %	0.29	19.1	-16.8
period change in stocks, %	30.6	35	-6.5
Supply Management			
Number of restrictions			
year 1	11	16	12
year 2	6	20	12
year 3		6	28
Prices***			
Wheat			
y/y percent, cum	10.37, -1.47	10.6	35.4
change in index	10.05, -1.46	13.6	52
Rice			
y/y percent, cum	10.80, -0.43	6.5	30.2
change in index	10.63, -0.44	8.4	44.1
Food			
y/y percent, cum	25.3	7.3	21

Source: Foodgrain Bulletin; Ministry of Statistics and Programme Implementation; Environstats; author's calculations.

Note:

**When actual maximum temperature remains 45°C or more irrespective of normal maximum.*
***Long Period Average (LPA) rainfall in specific region, interval over 30–35 years. Current LPA (All India southwest monsoon, 2004–05 to 2023–24 average, 860.26 mm). Large excess, excess, normal, deficient, and large-deficient rainfall =≥60, 20-59, -19-19, -59 to -20, -99 to -60% of LPA (IMD), respectively.*
****2009–2011—CPI (industrial workers).*

5.1 Climate Dynamics

The topmost panel shows that record-breaking temperatures are becoming both more intense and more frequent. Simultaneously, rainfall anomalies are increasingly becoming regionally differentiated, with the rice-growing IGP standing out for its volatility. National and regional rainfall anomalies are less synchronised than before. Unlike past shocks, which were relatively isolated, recent years have seen overlapping and sustained stress episodes: Simultaneous crop failures in both winter (wheat and rice) and summer (rice) in 2023 were unprecedented in the past two decades. Moreover, hotter years in 2014–2024 correlate more strongly with weaker monsoons (a correlation of 0.31 versus 0.17 over 1901–2024), pointing to compounding risks. These patterns suggest that climate change is raising the likelihood of "trifecta" events.

5.2 Agricultural Outcomes

The second panel highlights that earlier shocks typically affected either cereals or a single growing season. In contrast, during 2021–2024, wheat and rice—the twin pillars of food security and price policy—suffered simultaneous disruptions. Although wheat output volumes partly recovered, procurement collapsed, and public stocks eroded sharply. In 2023, official wheat purchases fell dramatically just as rice procurement shortfalls emerged in 2022–2023, leading to steep declines in reserves. The cumulative wheat stock decline by late 2023 (110 per cent) exceeded earlier drawdowns. The widening "output–procurement gap" could portend systemic vulnerabilities tied to climate volatility.

5.3 Policy Responses

Panel 3 underlines the escalation in policy response intensity. This reflects mounting pressure on food management and a policy environment under strain. Unlike in earlier episodes, imports have not always been the first option; they are item-specific and governed by global price trends. Instead, policymakers increasingly rely on restrictive tools such as export bans. While these measures provide short-term relief, they narrow the policy arsenal, leaving fewer instruments to cushion against persistent and unpredictable disturbances. The rising intensity of interventions also points to diminishing marginal returns in sustaining food security and stabilising prices.

5.4 Inflation Outcomes

The final panel compares the magnitudes of price level shifts and growth rates in the two cereals and overall food. Despite increasingly aggressive interventions, inflation remained sticky in the current phase. What began as a one-off relative price shift in 2019 hardened into persistent food inflation. Wheat and rice indices rose by 52 and 44 points, respectively—about four to five times the increases seen in 2009–2011. Importantly, while international prices corrected after 2022–2023, domestic cereal prices remained elevated, highlighting the predominance of domestic supply constraints. These patterns suggest that interventions only muted, rather than

reversed, the inflationary process. They also indicate diminishing marginal returns to the interventionist strategy. It also raises questions about the sustainability of such measures under prolonged climate stress.

Taken together, these developments point to more than just heightened volatility; they hint at a possible shift in the climate–food–inflation nexus. Although it is premature to confirm structural change, there are several pointers in this direction. For example, the RBI's explicit recognition of climate-linked inflation risks in policy statements, the related difficulties in forecasting, and "climate risk" as a key uncertainty in recent policy statements (e.g., RBI, 2024a). A growing divergence between core and headline inflation, with food inflation increasingly persistent rather than mean-reverting, suggests that food inflation in India now reflects more than transient disruptions and may signal a climate-linked structural shift, though certainty remains premature (Kohli, 2020, 2023, 2024b; Patra et al., 2024a, 2024b).

6. Conclusion

This paper documents India's high inflation experience in 2019–2024, the first such under the FIT monetary regime. The narrative account, backed by empirical evidence and analysis, emphasises the challenges that persistent supply shocks pose for FIT frameworks. Several insights emerge from this episode.

First, food prices were the dominant driver of inflation. A systematic analytical account establishes the characteristic deviations and dynamics, set within a historical perspective. Unlike global patterns, India's food inflation both preceded and outlasted pandemic and commodity shocks, reflecting repeated climate extremes. Successive years of poor weather impacted crops, keeping supplies tight. Supply shocks that were once transitory became persistent, defying the mean-reverting dynamics that underpinned earlier monetary reaction functions.

Second, inflation management relied heavily on government-led supply interventions and fiscal tools. The paper details the sequence of policy responses, bringing out the lead role of supply-side actions. It shows that these prevented sharper price spikes, but their unprecedented frequency and duration were also associated with diminishing returns, increased volatility, and market distortions.

Third, empirical analysis reveals that inflation became more sensitive to food shocks under FIT, while expectations remained sticky and elevated. Forecast errors and repeated target breaches strained credibility, while the delayed tightening cycle deepened perceptions of a central bank falling behind the curve. Importantly, reliance on such measures conditioned the success of monetary policy on the speed and efficacy of fiscal action, diluting perceptions of central bank autonomy.

Fourth, institutional strains surfaced as persistent food inflation widened the headline–core inflation gap. This fuelled debate over the appropriateness of headline CPI as the policy anchor, while discomfort and disagreement within the MPC arose as disinflation stretched on.

Fifth, these developments point to a deeper transformation in the climate–food–inflation linkages. The paper identifies the changing patterns, their endurance, and the potentially critical policy concerns they raise.

The key lessons are as follows. First, if the clustering of extreme weather events points towards climate-linked supply shocks becoming more frequent and systemic, and if food price inflation becomes entrenched with rigidities in inflation formation, then forecasting and policy under FIT will face greater difficulty. The strains observed over 2019–2024 may therefore deepen, challenging both the effectiveness and sustainability of the monetary framework under prolonged climate stress.

Second, an extensive reliance on blunt controls is a poor policy substitute for fundamental changes in agricultural markets, storage, and infrastructure. Despite a different monetary regime and a remarkable step-up in supply-side actions displaying strong government commitment, a decade down the line, perhaps the risks may have even risen as structural rigidities in India's food markets slow down the speed of relative price adjustment even further. Additionally, reforms for flexible prices and faster elimination of asymmetries remain elusive. As central banks can neither directly influence supply capacities nor effectively mitigate structural constraints, there is an increased likelihood of adverse outcomes, i.e., tighter interest rates for longer to protect credibility. Costly adjustments thus remain a political challenge.

Third, the persistence of food inflation endorses past learnings and the view that the central bank cannot "look through" food supply shocks indefinitely. Fourth, improving communication and institutional coordination frameworks—making them more explicit and transparent so that the corresponding triggers and roles are well understood—could help reduce uncertainty and credibility risks (Hernández de Cos, 2025).

In the broader context of supply-side-driven inflation—this is increasingly a hallmark due to many other sources such as energy prices, geopolitics, geoeconomics, ageing, and deglobalisation (Greene, 2025; Lagarde, 2023; Powell, 2023; Reichlin et al., 2024)—the conventional "accommodation" response is under serious re-examination due to its persistence. This points towards more forceful tightening when shock distinction is difficult, and there is uncertainty about the degree of inflation persistence (Greene, 2025; Network for Greening the Financial System [NGFS], 2024). FIT's current dominance could also become increasingly ineffective, especially in low-income developing countries, according to findings of differential inflation effects from the persistence of supply-induced climate shocks (e.g., Kabundi et al., 2022).

Monetary policy frameworks may thus have to adapt towards more explicit incorporation of climate risks and other supply disturbances that are not exceptions but structural features of the macroeconomic landscape. The 2019–2024 experience is an early illustration of a challenge that will only sharpen with the growing frequency of non-demand-driven inflation.

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Appendix

A Simple Theoretical Model With Food Shocks*

Consider a small open economy with two consumption blocks: food (f) and non-food/core (c). Headline CPI inflation is a weighted average: $\pi_t = \alpha\pi_t^f + (1-\alpha)\pi_t^c$, where α is the food share in the CPI (around 0.4–0.5 for India).

1. Supply Side

- Food inflation is driven mainly by exogenous shocks:
  $\pi_t^f = \rho_f \pi_{t-1}^f + u_t^f$, with $|\rho_f| \leq 1$, u_t^f i.i.d. weather/commodity/Minimum Support Price (MSP) shocks.
- Core inflation follows a New-Keynesian Phillips curve:
  $\pi_t^c = \beta E_t \pi_{t+1}^c + \kappa x_t + u_t^c$,
  where x_t is the output gap, $\kappa > 0$, and u_t^c is an idiosyncratic cost-push shock.

2. Demand (Investment–Savings [IS] Curve)

- Aggregate demand responds to the real interest rate:
  $x_t = E_t x_{t+1} - \sigma(i_t - E_t \pi_{t+1}) + \varepsilon_t$,
  where i_t is the policy rate, $\sigma > 0$, and ε_t is a demand shock.

3. Policy Rule under Headline Flexible Inflation Targeting

- Under India-style FIT, the central bank follows a Taylor-type rule in terms of headline inflation:
  $i_t = r^* + \phi_\pi(\pi_t - \pi^*) + \phi_x x_t$,
  with $\pi^* = 4\%$, $\phi_\pi > 1$, $\phi_x \geq 0$.

Where r^* is the natural rate of interest. Substituting π_t into the rule shows that a positive food shock $u_t^f > 0$ raises π_t^f, and hence π_t, triggering an increase in i_t proportional to $\alpha\phi_\pi$. But u_t^f does not depend on x_t or i_t, so higher interest rates mainly depress x_t and, via the Phillips curve, reduce π_t^c, while leaving π_t^f largely unaffected in the short run.

With persistent food shocks (ρ_f close to 1), the central bank must maintain tight policy for several periods to push headline inflation back to target, causing a prolonged negative output gap and undershooting of core inflation.

Modifying the Rule for Persistent Food Inflation

The literature on small, open and food-intensive economies suggests several ways to adapt the framework:

- Put less weight on contemporaneous food inflation in the policy rule and more on expectations and core: $i_t = r^* + \phi_c(\pi_t^c - \pi^*) + \phi_x x_t + \phi_f \Delta\pi_t^f$, with $\phi_f < \phi_c$,

*This section owes to Shreekant Gupta, Visiting Senior Fellow, CSEP.

- Maintain headline CPI as the official target for accountability and welfare reasons but internally orient the reaction function toward a measure of "sticky-price" or core inflation and medium-term forecasts, explicitly tolerating temporary food-driven breaches of the band.
- Embed the monetary rule in a broader policy mix where food price stabilisation is primarily achieved through supply-side and fiscal instruments, while FIT focuses on anchoring expectations for non-food prices and wages.

Within such a model, the "problem" with FIT in India under persistent food inflation is that an unmodified headline-based Taylor rule generates excessive volatility in the output gap and core inflation relative to the limited gain in controlling food-dominated headline CPI; a welfare-maximising modification requires asymmetrically treating food shocks and relying on non-monetary instruments for their containment.

This model draws on the following works:

Cashin, P. (2016). Inflation and monetary policy in small open economies. In P. Cashin & R. Anand (Eds.), *Taming Indian Inflation* (Chap. 10). Rawat Publications.

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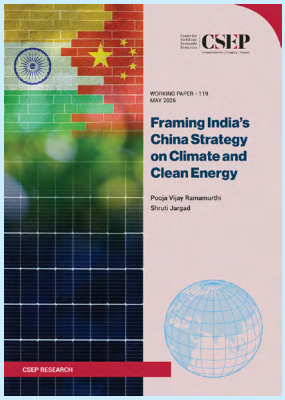
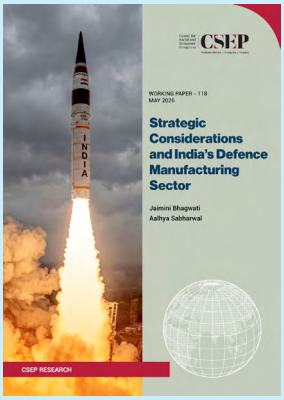
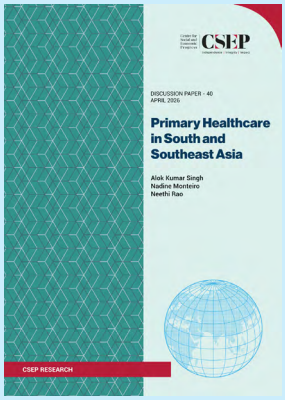
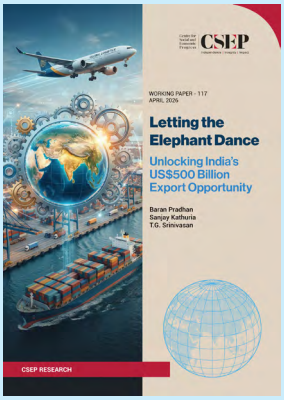
Renu Kohli is an economist with research and practitioner experience on macroeconomic policies and issues. She has previously worked with the RBI, the IMF, and other think tanks. Her work has focused on capital account and financial liberalisation, exchange rate management, monetary policy, international macroeconomic coordination, sovereign debt resolution, G20, climate change, and macroeconomic impacts including food security and inflation. She has published widely in refereed journals such as the Review of Development Economics, Journal of Development Studies, Journal of Asian Economics, Oxford University Press, IMF Working Papers, RBI Staff papers, and contributed to several edited volumes. She writes regular opeds on monetary policy, macroeconomic policy, and other economic matters in prominent Indian newspapers. She has exposure to IMF multilateral surveillance and training missions as short-term expert (IMF Institute) in financial programming & policies and macroeconomic diagnostics. Dr. Kohli has wider engagement with the private financial sector and investors through talks, presentations, and consultation on Indian macroeconomic policies. She serves as an independent director on the boards of Catholic Syrian Bank, NCML Ltd, and NFIN Ltd.

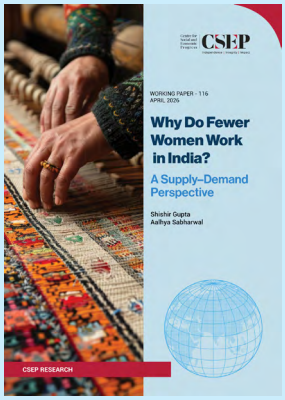
Other publications

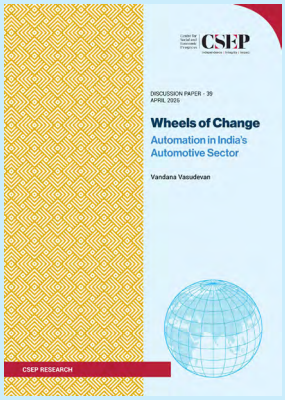


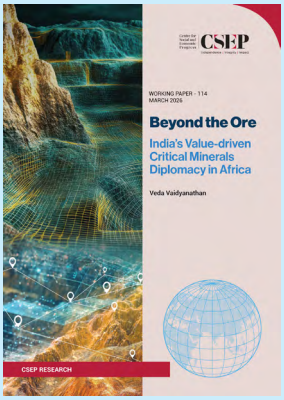


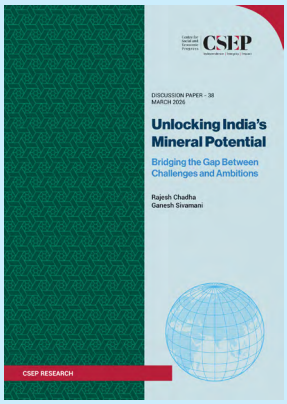


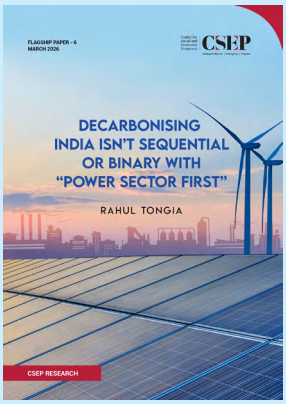


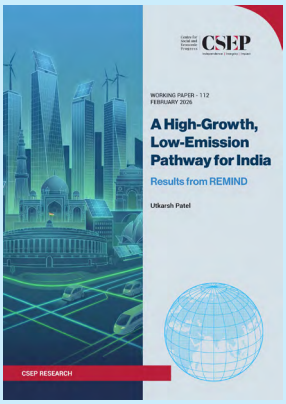


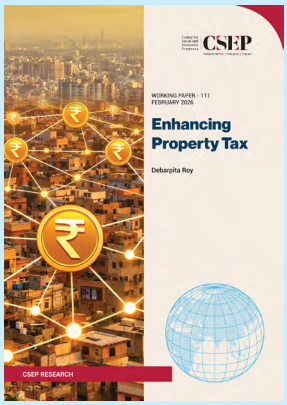


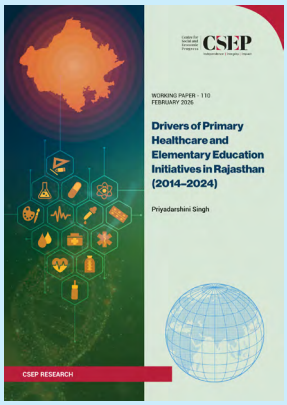


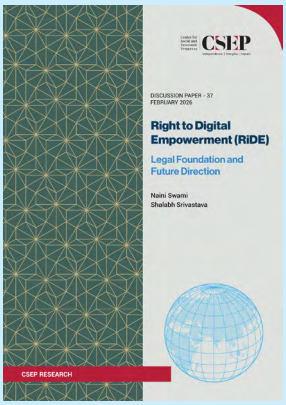


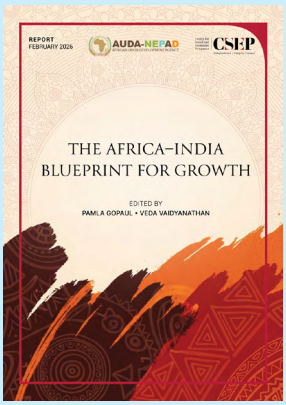












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