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RISING FOOD INFLATION IN INDIA: IMPLICATIONS OF EL NIÑO AND CURRENT CLIMATE CHANGE ON GDP GROWTH, MIDDLE-CLASS AND LOWER-INCOME HOUSEHOLDS, AND ECONOMIC WELL-BEING IN 2027

Agricultural Economics

D. Lakshmi Lavanya Department of Agriculture & Rural Development Maris Stella College (Autonomous), Vijayawada, Andhra Pradesh, India

S Bhavya Ratna Madhuri Department of Agriculture & Rural Development Maris Stella College (Autonomous), Vijayawada, Andhra Pradesh, India

D. Gouthami Department of Agriculture & Rural Development Maris Stella College (Autonomous), Vijayawada, Andhra Pradesh, India

A. Tejasree Department of Agriculture & Rural Development Maris Stella College (Autonomous), Vijayawada, Andhra Pradesh, India

K. Ravi Teja Department of Agriculture & Rural Development Maris Stella College (Autonomous), Vijayawada, Andhra Pradesh, India

P. Lakshmana Swamy Department of Agriculture & Rural Development Maris Stella College (Autonomous), Vijayawada, Andhra Pradesh, India

ABSTRACT

Food inflation is a major economic and social concern in India because food expenditure represents an essential component of household budgets, particularly among lower-income and economically vulnerable families. The interaction of climate variability, extreme weather events, agricultural supply disruptions, changing input costs, and market conditions may create additional uncertainty for food prices during 2027. El Niño, a phase of the El Niño–Southern Oscillation (ENSO), can influence Indian monsoon rainfall patterns, although its effects vary according to regional climate conditions and interactions with other atmospheric and oceanic systems. Climate change further increases the risks associated with extreme heat, drought, irregular rainfall, floods, and agricultural production losses. These developments may affect food availability, market prices, household consumption, nutrition, savings, and broader macroeconomic stability. [2, 3, 7] This review examines the potential relationship between El Niño, climate change, food inflation, gross domestic product (GDP) growth, and household economic well-being in India, with particular attention to middle-class, lower-middle-class, and low-income populations. It synthesizes evidence from scientific assessments, economic research, official inflation statistics, and institutional reports. The analysis considers how climate-related supply shocks may influence cereal, pulse, vegetable, and other food prices, and how rising food expenditure can reduce discretionary consumption and savings. It also discusses implications for agricultural income, labour productivity, fiscal expenditure, inflation management, and inclusive economic growth. Potential responses include climate-resilient agriculture, improved irrigation and water management, diversified cropping systems, strategic food reserves, efficient supply chains, strengthened public food distribution, and targeted social protection. Since 2027 outcomes remain uncertain, the article uses a risk-based perspective rather than assuming a predetermined increase in prices or a particular GDP growth rate. The review concludes that integrating climate adaptation, agricultural resilience, price monitoring, and household protection is essential for improving India's food security and economic well-being.

KEYWORDS

Food Inflation; El Niño; Climate Change; India; GDP Growth; Household Expenditure; Middle-class Households; Low-income Households; Agricultural Productivity; Food Security; Economic Well-being; Climate Resilience.

1. INTRODUCTION

Food affordability is fundamental to economic security, public health, and social welfare. In India, fluctuations in the prices of essential commodities such as rice, wheat, pulses, edible oils, vegetables, milk, and other food products directly influence household expenditure. Although economic growth can increase aggregate national income, the benefits of growth are not necessarily distributed equally across income groups. When food prices rise faster than household incomes, families may experience a reduction in real purchasing power even when their nominal earnings remain unchanged.

Food inflation is particularly important in developing economies because food constitutes a substantial component of household consumption. An increase in food prices can influence overall consumer price inflation, inflation expectations, wage demands, and monetary policy. Economic research on India has identified the importance of food expenditure in household budgets and the contribution of food prices to aggregate retail inflation [1].

The relationship between food inflation and economic well-being is complex. For a household with a limited monthly income, higher expenditure on essential food items can reduce the amount available for education, healthcare, transport, housing, savings, and other necessities. Families may respond by purchasing cheaper foods, reducing dietary diversity, postponing medical expenses, borrowing money, or drawing down savings. Such responses can affect long-term human development and financial resilience.

Climate conditions are an important part of this economic problem. Agricultural production depends on temperature, rainfall, soil moisture, irrigation, and the timing of seasonal weather. Extreme heat can reduce crop yields and agricultural labour productivity, while droughts, floods, and unseasonal rainfall may damage crops and interrupt transportation and storage. The Intergovernmental Panel on Climate Change (IPCC) identifies climate-related extremes as significant risks to agricultural productivity, food security, livelihoods, and food prices [3].

El Niño is another factor that requires attention. It involves the periodic warming of sea-surface temperatures in the central and eastern equatorial Pacific Ocean and can influence global atmospheric circulation. In India, El Niño conditions are often associated with an increased risk of deficient southwest monsoon rainfall, but this relationship is not deterministic. The Indian Ocean Dipole, the Madden–Julian Oscillation, regional atmospheric conditions, and other climate drivers can modify monsoon outcomes.

Against this background, the present review examines the potential implications of food inflation, El Niño, and current climate-related risks for India's economic growth and the well-being of middle-class and lower-income households during 2027. Future outcomes are uncertain and should be assessed as scenarios rather than treated as established facts.

2. Objectives of the Review

1. To examine the relationship between food inflation and household economic well-being in India.
2. To review the potential effects of El Niño and climate-related extremes on agricultural production and food prices.

3. To analyse the possible implications of rising food expenditure for middle-class, lower-middle-class, and low-income households.
4. To discuss the pathways through which food inflation may influence GDP growth, consumption, savings, and economic stability.
5. To identify policy measures that could strengthen food security, price stability, climate resilience, and inclusive growth in 2027.

3. Review Methodology

This article adopts a narrative review approach, drawing on peer-reviewed economic and agricultural research, international scientific assessments, government statistics, and institutional reports. The literature is organized thematically around food-price formation, climate-related agricultural risks, El Niño and monsoon variability, household welfare, macroeconomic consequences, and policy responses.

Priority is given to research and data from India, supported by international evidence where relevant. This is a narrative synthesis rather than a systematic review or meta-analysis. It does not claim to have exhaustively searched every relevant publication or statistically estimated the causal effect of El Niño on Indian food inflation. The discussion of 2027 is therefore forward-looking and conditional on climatic, agricultural, market, and policy developments.

4. Food Inflation in the Indian Economic Context

4.1 Concept and Measurement

Food inflation refers to an increase in the prices of food commodities over a specified period. In India, consumer food inflation is monitored through the Consumer Food Price Index (CFPI), while food-related price movements also appear in broader consumer and wholesale price measures. It is important to distinguish the price level, the inflation rate, and affordability. A decline in the inflation rate does not necessarily mean food has become cheaper; prices may continue to rise, but at a slower rate.

For households, the effect depends on which prices increase, the quantity and type of food purchased, income growth, and the availability of affordable alternatives.

4.2 Recent Inflation Developments

Official Indian statistics provide a useful starting point for evaluating the outlook for 2027. Before publication, the author should insert the latest verified Consumer Price Index and Consumer Food Price Index figures from the Ministry of Statistics and Programme Implementation (MoSPI), including the release date and relevant year-on-year rates. A single month's data cannot establish a permanent trend or predict the inflation rate for 2027. Future developments will depend on harvest outcomes, commodity-specific supply conditions, global prices, fuel and fertiliser costs, transport, storage, public procurement, imports, and policy interventions. [4]

4.3 Structural and Temporary Drivers

Food inflation may arise from a combination of temporary shocks and structural constraints. Temporary factors include heatwaves, deficient rainfall, floods, crop disease, sudden transport disruptions, and seasonal shortages of perishable commodities. Structural factors include inadequate storage, post-harvest losses, fragmented supply chains, low investment in some agricultural infrastructure, weak market integration, and limited water availability in vulnerable regions.

Anand et al. [1] examined Indian food inflation through demand and supply factors and highlighted the importance of food prices in aggregate inflation dynamics. These findings suggest that food inflation should not be attributed exclusively to climate change. Climatic events may initiate or intensify a shortage, but market structure, storage, transportation, trade policy, and demand conditions influence how strongly that shortage is reflected in consumer prices.

5. El Niño and Its Potential Effects on Indian Agriculture

5.1 Understanding El Niño

El Niño is the warm phase of the El Niño–Southern Oscillation (ENSO), a naturally occurring climate pattern involving interactions between the tropical Pacific Ocean and the atmosphere. It can influence rainfall, temperature, and atmospheric circulation across different parts of the world. In India, El Niño is frequently associated with an increased risk of below-normal southwest monsoon rainfall. Nevertheless, the strength of this relationship varies from one event to another. A particular El Niño event does not guarantee a drought across India, nor does it establish that food inflation will necessarily increase. [5, 7]

For a 2027 outlook, the author should cite the latest official forecast from the India Meteorological Department (IMD), Ministry of Earth Sciences, and/or the World Meteorological Organization (WMO), including its issue date. Seasonal forecasts are updated and should not be presented as certain outcomes. [5, 7]

5.2 Effects on Rainfall and Crop Production

India's agricultural system includes rainfed and irrigated production. Rainfed agriculture is especially sensitive to rainfall timing, distribution, and intensity. A delayed monsoon onset, long dry spells, or inadequate rainfall during critical crop-growth stages may reduce yields and increase production uncertainty.

- Reduced soil moisture and water availability.
- Delayed sowing or changes in crop area.
- Lower yields in climate-sensitive crops.
- Increased irrigation demand and energy expenditure.
- Reduced fodder availability and livestock productivity.
- Higher production costs and greater income uncertainty for farmers.

The consequences will differ across regions, crops, soil types, and irrigation systems. Irrigated farms may be better protected against rainfall deficits, although they can remain vulnerable to heat stress, groundwater depletion, and reservoir shortages. [3]

5.3 Possible Effects on Food Prices

If adverse weather reduces the supply of a food commodity while demand remains relatively stable, market prices may increase. This mechanism can be particularly important for vegetables and other perishable commodities, which have limited storage lives and may experience rapid price fluctuations. The magnitude and duration of these effects depend on the commodity, the geographical distribution of the crop, market integration, existing stocks, imports, and government intervention. [3, 5]

The review should draw on verified empirical studies of Indian food-price responses to weather shocks and should avoid claiming that El Niño alone causes a specific increase in food prices.

6. Climate Change and Current Climatic Problems

6.1 Increasing Exposure to Climate Extremes

Climate change creates long-term risks for agriculture through rising temperatures, changes in precipitation patterns, more frequent or intense heat extremes in many regions, and altered water availability. The IPCC's Sixth Assessment Report identifies heat stress, drought, flooding, and other climate-related extremes as important threats to agricultural productivity, food security, and livelihoods. Vulnerable populations, including low-income households and small-scale food producers, face disproportionately high risks [3].

6.2 Heatwaves and Crop Productivity

High temperatures can affect crop growth, flowering, pollination, grain formation, and the duration of crop development. Extreme heat can also reduce agricultural labour productivity by increasing fatigue and heat-related health risks. Farmers may face higher costs for irrigation, livestock cooling, and crop protection. When heat stress occurs alongside water shortages, the effects may be more severe. [3]

6.3 Drought, Irregular Rainfall, and Floods

Drought can reduce crop yields, restrict water supplies, and increase competition for irrigation. Irregular rainfall may delay agricultural operations or damage crops at sensitive stages. Flooding and excessive rainfall can destroy standing crops, damage roads and storage facilities, and disrupt access to markets. The effects are not uniform; depending on the event, location, and supply-chain response, prices may rise or fall. [3]

6.4 Interaction Between El Niño and Climate Change

El Niño and human-induced climate change are distinct phenomena. El Niño is a natural pattern of ocean–atmosphere variability, whereas climate change refers to longer-term changes in climate, including warming caused by greenhouse-gas emissions. Their effects can overlap. An El Niño event may influence seasonal rainfall while elevated background temperatures increase heat exposure. However, individual droughts, heatwaves, or food-price increases should not be

attributed to El Niño or climate change without examining the relevant evidence.

7. Implications for Middle-Class and Lower-Income Households

7.1 Reduced Purchasing Power

Food inflation affects households according to their income, consumption patterns, and ability to adjust expenditure. When food prices increase faster than household income, real purchasing power declines. Lower-income households often have limited flexibility because food and other essential expenses already absorb much of their budgets. Middle-class households may have more resources in absolute terms but can still experience financial pressure when food, rent, transport, education, healthcare, and loan repayments rise simultaneously.

7.2 Illustrative Household Budget Analysis

Consider a hypothetical household with a monthly income of ₹30,000 and food expenditure of ₹9,000. If its food costs increase by 10% while income remains unchanged, monthly food expenditure rises to ₹9,900.

Budget Measure	Before increase Rs.	After 10% increase
Monthly income	30,000	30,000
Monthly food expenditure	9,000	9,900
Income remaining after food	21,000	20,100
Additional monthly food cost	-	900
Additional annual food cost	-	10,800

This is an illustrative calculation, not a forecast for India in 2027. It assumes that food expenditure rises by 10% and household income remains constant. The actual effect will differ according to household size, dietary preferences, location, food subsidies, and changes in income.

7.3 Effects on Savings and Debt

When essential expenditure rises, families may reduce savings, postpone purchases, borrow money, or use existing savings to meet routine expenses. A temporary food-price shock may therefore have effects that continue after prices stabilize. Households with irregular earnings, informal employment, or limited access to affordable credit may be particularly exposed.

7.4 Nutrition and Health Consequences

Higher food prices can change not only how much households spend but also what they eat. Families may substitute less expensive foods for vegetables, fruit, pulses, dairy products, and other nutrient-rich foods. Such adjustments can reduce dietary diversity and may increase the risk of nutritional deficiencies, especially among children, pregnant women, older adults, and people with existing nutritional vulnerabilities [2, 3].

7.5 Rural and Urban Differences

Rural households may experience a dual effect. Households that sell agricultural produce could benefit from higher prices if their own production remains strong and market access is reliable. However, farmers affected by drought or crop failure may face reduced harvest income while also paying more for food and agricultural inputs. Urban households are generally more dependent on market purchases. The overall impact depends on whether a household is a net buyer or net seller of food, its income source, and access to public distribution programmes.

8. Potential Implications for India's GDP Growth

8.1 Household Consumption

Private consumption is an important component of India's aggregate economic activity. When food prices rise faster than incomes, households may allocate more money to essential food purchases and reduce spending on non-food goods and services. A sustained decline in discretionary consumption could affect businesses, employment, and local economic activity. However, food inflation does not automatically reduce GDP growth; the final outcome depends on income growth, agricultural output, government expenditure, exports, investment, and policy responses.

8.2 Agricultural Production and Value Added

Climate-related crop losses may reduce agricultural output and agricultural gross value added. Farmers may also face increased expenditure on irrigation, electricity, crop protection, and replacement of damaged crops. Reduced farm income can affect rural demand for manufactured goods and services, transmitting agricultural shocks to other parts of the economy. Conversely, favourable weather, improved irrigation, resilient seeds, and better market access can support output and moderate price pressures.

8.3 Inflation and Monetary Policy

Food inflation can contribute to headline consumer inflation and influence inflation expectations. If food-price increases persist or spread to wages, transport, restaurants, and other services, the inflationary effects may become broader. Monetary policy can help manage broader inflationary pressures, but agricultural supply measures and effective market management are also necessary because interest-rate changes cannot directly restore a failed harvest or immediately increase vegetable supply. [6]

8.4 Fiscal Implications

Severe food-price shocks can increase pressure on governments to expand food assistance, provide disaster relief, procure commodities, support farmers, or intervene in markets. These interventions may protect vulnerable households and stabilize essential supplies, but can also create fiscal costs and administrative challenges.

8.5 GDP Growth and Distributional Welfare

GDP measures the value of economic production; it does not directly measure how comfortably households can afford food, healthcare, education, and housing. An economy can record positive GDP growth while some families experience declining real purchasing power. An assessment of India's economic well-being in 2027 should therefore consider real household consumption, food affordability, nutrition, poverty, employment, and income distribution alongside aggregate growth.

9. Potential Food Inflation Scenarios for 2027

Scenario 1: Favourable Rainfall and Adequate Production

If monsoon conditions and regional rainfall distribution support agricultural production, reservoir levels remain adequate, and supply chains function effectively, food-price pressures may moderate. Adequate public stocks, efficient transport, and stable input costs could further reduce volatility.

Scenario 2: Localized Climatic Stress and Commodity-specific Inflation

If adverse weather affects particular crops or regions but the overall harvest remains reasonably stable, inflation may concentrate in selected commodities such as vegetables or pulses. Market integration, storage, imports where appropriate, and timely releases of public stocks could help reduce the impact.

Scenario 3: Widespread Agricultural Stress

If deficient rainfall, extreme heat, or other weather shocks significantly reduce production across important agricultural regions, food supply may tighten. Food prices could rise, household purchasing power could weaken, and agricultural income could fall in affected areas. The consequences would depend on the severity and duration of the shock, initial food stocks, import availability, global commodity prices, and government responses.

Scenario 4: Compound Climate and Economic Shocks

A combination of agricultural losses, high energy or fertiliser costs, transport disruptions, and international market volatility could intensify inflationary pressures. Under such circumstances, low-income households may face particularly strong pressure on food affordability, while broader consumption and policy costs may also be affected.

These scenarios are analytical possibilities, not predictions. Preparedness should focus on monitoring several indicators rather than relying on a single El Niño forecast. [5, 7]

10. Policy Measures for Food-Price Stability and Household Protection

10.1 Climate-resilient Agriculture

Investment in climate-resilient agriculture is essential for reducing production risks. Priorities include drought-tolerant and heat-tolerant crop varieties, improved soil moisture management, crop diversification, integrated farming systems, and locally appropriate sowing decisions. Agricultural extension services should provide farmers with timely weather information and practical guidance.

10.2 Water Conservation and Irrigation Efficiency

Efficient irrigation, rainwater harvesting, watershed development,

groundwater management, and restoration of local water bodies can improve resilience to rainfall variability. Irrigation programmes should be supported by sustainable groundwater management.

10.3 Crop Diversification and Resilient Food Systems

Appropriate diversification into millets, pulses, oilseeds, horticultural crops, and other locally suitable products may improve resilience and nutrition. Diversification should reflect agroclimatic suitability, farmer profitability, consumer demand, processing capacity, and market access.

10.4 Better Storage and Supply Chains

Improved warehouses, cold storage, packhouses, refrigerated transport, processing facilities, and market information systems can reduce post-harvest losses and improve the movement of food from surplus to deficit areas.

10.5 Strategic Food Reserves and Market Monitoring

Public food stocks can support food security and help governments respond to supply disruptions. Their use should be timely and transparent, based on reliable information about production, stocks, prices, and demand. Trade measures should be assessed carefully for their effects on availability and farmer incentives.

10.6 Strengthening Public Food Distribution

The Public Distribution System and other nutrition-support programmes can protect eligible households from severe food-affordability shocks. Priorities include reliable delivery, accurate beneficiary identification, adequate food quality, reduced exclusion errors, and coordination with nutrition programmes.

10.7 Targeted Support for Vulnerable Households

Temporary, targeted assistance may help low-income families manage sudden increases in essential expenditure. Possible measures include strengthened food assistance, social protection, employment support, and targeted cash assistance where delivery systems and local market conditions permit.

10.8 Climate Information and Early-warning Systems

Seasonal forecasts, district-level weather monitoring, crop assessments, reservoir information, and commodity-price data can help authorities anticipate potential shortages. Forecast uncertainty should be communicated clearly, and warnings should be linked to practical decisions about sowing, irrigation, procurement, storage, transport, and household support. [4, 5, 7]

11. Research Gaps and Future Directions

Several research gaps deserve attention. First, more India-specific studies are needed to quantify the causal effect of El Niño on individual crop yields, regional food prices, and household consumption. Because the relationship between ENSO and Indian rainfall varies across events, studies should distinguish El Niño effects from other climate drivers.

Second, research should examine how food inflation differs across income groups and regions. Household consumption surveys, price data, and income information could help estimate changes in affordability and nutritional quality. Third, more evidence is needed on the indirect effects of food inflation on savings, household debt, education expenditure, healthcare access, and small-business activity.

Fourth, studies could combine climate projections with agricultural production models, commodity-market data, and household expenditure information to construct transparent scenarios for 2027 and subsequent years. Finally, future research should evaluate the effectiveness of climate adaptation, public food distribution, strategic reserves, market interventions, and targeted household assistance.

12. CONCLUSION

Food inflation in India is an economic and social issue that extends beyond changes in the consumer price index. Its consequences depend on the relationship between food prices, household incomes, agricultural production, market efficiency, public policy, and the distribution of economic growth.

El Niño may influence India's monsoon and agricultural conditions during 2026–2027, while climate change increases the risks associated with extreme heat, drought, irregular rainfall, and other climatic stresses. These factors can affect crop production, food supply, and market prices. However, their effects are neither uniform nor predetermined, and the actual outcome will depend on regional weather conditions, agricultural adaptation, public stocks, supply chains, and policy decisions.

Middle-class and lower-income households may face reduced purchasing power when food costs rise faster than their incomes. Potential consequences include lower discretionary consumption, reduced savings, increased financial stress, and reduced dietary diversity. These pressures can also influence aggregate demand, agricultural income, inflation management, and economic performance.

The central policy priority should therefore be to strengthen food-system resilience while protecting household affordability. Climate-smart agriculture, sustainable water management, diversified production, improved storage and transport, effective public food distribution, timely price monitoring, and targeted social protection can reduce vulnerability to future shocks. India's economic well-being in 2027 should be assessed not only through GDP growth but also through food affordability, nutrition, household financial security, and the capacity of vulnerable populations to maintain an adequate standard of living.

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