



# Trends and Volatility in Retail Prices of Cereals, Pulses, Meats and Vegetables in Mizoram, 2015-2023

**Dr. Lalchhuanmawia**

Associate Professor, Govt.T.Romana College, Aizawl, Mizoram

Email - moitea8@gmail.com

**Abstract:** The retail prices of essential commodities affect food security and household welfare in Mizoram, where diets depend on rice, pulses, meat, and vegetables. This study analysed the price trends of cereals, pulses, meat, and vegetables from 2015 to 2023. Compound annual growth rates (CAGR) were estimated using an exponential growth model. The results show that inflation and volatility vary by commodity and import dependence. Rice prices dropped from Rs. 43/kg (2015) to Rs. 34/kg (2020–2021), then rose to Rs. 37.19/kg (2023; CAGR 2%), while wheat products increased (atta 34 to 47.82; suji 57 to 78.13). Pulses had sharper increases, bete (83 to 153.08; CAGR 7.2%), motor chana (5.3%), and soybeans (5.2%). Meat prices saw steep increases, especially for mutton (342 to 622.92; CAGR 8.6%), beef (307 to 521.88; 7.5%), and pork (251 to 409.38; 6.3%), with acceleration after 2019. Imported items (non-local fish and eggs) were more volatile than local items. Vegetables showed varied patterns, with growth in French beans (CAGR 7.55%) and green chilli (6.94%; Rs 310.94/kg in 2023). Pandemic disruptions in 2020 caused spikes in the prices of potatoes and onions. Mizoram's retail price dynamics reflect local production, import reliance, transport costs, seasonality, and market disruptions, highlighting the need for better agricultural infrastructure, efficient supply chains, improved import management, and forecasting to stabilize prices.

**Key words:** Retail prices, Essential commodities, Cereals, Pulses, Meats, Vegetables.

## 1. INTRODUCTION

The retail prices of essential commodities play a crucial role in the economic well-being and daily lives of people in Mizoram, where certain food items constitute the core of local diets. Rice, being the staple food, occupies the most significant place in the consumption basket, reflecting the dietary patterns and agricultural practices of the state. Alongside rice, pulses such as masur dal (small masur lentils) are common, although these are primarily imported from other states, indicating partial dependence on external sources for some essential food items. Locally produced pulses, such as bete (a local pulse variety), motor chana (chickpeas), and soybeans, add diversity and nutritional value to the diet, showcasing Mizoram's agricultural strengths despite the predominance of shifting cultivation practices in the region. Meat products are highly popular in Mizoram and include pork, beef, broiler chicken, fish, farm eggs, and mutton. These meats not only fulfil dietary protein requirements but also hold cultural and traditional significance in Mizoram's culinary practices. The variety of meats available points to a fairly diversified livestock rearing system and signifies the importance of animal husbandry alongside crop cultivation in the local economy of the region. Vegetables such as potatoes, brinjal (eggplant), tomatoes, French beans, bitter gourd, green chilli, squash, mustard leaf, pumpkin leaf, and onion are commonly consumed and are essential in complementing the local diet with the required vitamins and minerals. These vegetables reflect both local cultivation practices and market availability, which, in turn, influence retail prices and accessibility for consumers. The availability and price trends of these essential commodities are directly linked to agricultural production cycles, import dependence, local demand and seasonal fluctuations.

Understanding the trends in the retail prices of these essential commodities in Mizoram is vital for several reasons. Price fluctuations directly affect household food security and economic stability, especially in rural



communities heavily reliant on subsistence agriculture and shifting cultivation, which have been reported to face declining yields in recent years. Moreover, the interplay between local production and imports shapes commodity markets and influences pricing dynamics. For instance, pulses such as masur dal, imported from other states, might exhibit different price behaviour compared to locally produced counterparts due to factors such as transport costs, supply chain disruptions, and market competition. Price fluctuations in agricultural commodities globally have been shown to significantly impact local markets, underscoring the need for accurate price forecasting and monitoring to mitigate consumer distress and enhance market efficiency. Advances in forecasting techniques, including the use of deep learning and anomaly detection for price prediction, are increasingly relevant for policymakers and stakeholders in regions such as Mizoram, where food price stability is crucial for the socio-economic balance.

## **2.LITERATURE REVIEW**

Chandrasekhar (2013) analysed the issue of food price inflation and volatility in India, noting a consistent upward trend in food prices over time. This trend is attributed to imbalances between supply and demand, increasing transportation costs, and market inefficiencies. The study emphasized that fluctuations in food commodity prices negatively impact consumers, particularly those with low incomes, and create uncertainty in agricultural markets.

C. S. C. Sekhar, Roy, and Bhatt (2018) examined the patterns and causes of food inflation in India. Their research revealed that cereals, meat, fish, milk, and vegetables significantly contribute to the food inflation. They also discovered that vegetables and other perishable goods experienced high short-term price volatility owing to insufficient storage and marketing infrastructure in the country. Pulses showed price fluctuations driven by both supply- and demand-side factors.

Nair and Eapen (2011) found that the rising prices of pulses, vegetables, meat, and fish in India were mainly linked to production shortages, escalating input costs, and inefficient distribution systems. Their study concluded that structural obstacles in agriculture and marketing networks were the primary reasons for the increase in retail prices.

Rajkhowa and Kornher (2022) observed that the COVID-19 pandemic highlighted weaknesses in India's food supply system. They found that disruptions in transportation, lockdown measures, and supply chain interruptions significantly influenced retail prices in urban markets in India. During the pandemic, prices of pulses and non-perishable commodities surged, while some vegetables saw temporary price drops owing to marketing challenges and limited mobility of consumers.

Madaan et al. (2019) noted that commodity prices, particularly those of essential food items, are inherently volatile owing to various interacting factors. These include supply demand imbalances, weather changes and inefficiencies in trading networks, hoarding practices, and external shocks, such as policy shifts or global market trends. For example, fluctuations in food prices increase consumer distress and can impede stable economic growth, especially in developing countries, where market competition may be imperfect. In India's agricultural markets, the price variability of staples such as cereals, pulses, and vegetables is influenced by seasonal climate changes, inadequate storage, transport inefficiencies, and the behaviour of intermediaries. These factors can cause sudden price spikes or drops at the retail level, affecting the affordability and availability of products in local markets.

Lalrin Sangpui and Malhotra R (2019) highlighted that to improve marketing efficiency and increase the producer's share of the consumer price in Chayote production in Mizoram, it is essential to reduce the number of intermediaries in the marketing supply chain and to lower marketing costs and losses. Streamlining the supply chain by reducing intermediaries can decrease transaction costs and enhance producers' profit margins. Additionally, addressing marketing losses through improved storage, transportation, and handling practices is crucial for maintaining product quality and market value. Effective price stabilization mechanisms are necessary to shield growers from the adverse effects of market volatility. Another significant challenge faced by chayote growers is price fluctuations during the harvesting period.

## **3.DATA AND METHODOLOGY**

This study is based on secondary data, such as books, survey reports, previous related research, government publications, and other official records. The data collected were estimated using the Compound Annual Growth Rate (CAGR). The compound annual growth rate of retail prices of cereals and pulses, meat, and vegetables was estimated using an exponential growth model of the following form:



$$Y_t = ab^t$$

Where:

$Y_t$  = value of the variable in year t

a = initial value

b = growth factor

t = time period

$$\text{Compound annual growth rate (ACGR)} = (e^b - 1) \times 100$$

#### 4.RETAIL PRICES OF CEREALS AND PULSES IN MIZORAM

The retail prices of cereals and pulses in Mizoram reflect the dietary preferences and market dynamics of the region, where rice is the staple food. Key cereal items available in the retail market include rice, atta, maida, suji, and bread. Among these, rice holds primary importance as the main food item, which is deeply embedded in the local diet and culture. Retail prices for rice vary depending on factors such as quality, variety, and market supply; however, rice generally maintains a stable demand given its essential role in daily meals. In addition to cereals, several pulses are commonly retailed, including masur dal (small red lentils), local pulses such as bete, motor chana (chickpeas), and soybeans. These pulses are important protein sources and supplement the cereal-based diets prevalent in Mizoram. The retail prices of these pulses are influenced by seasonal availability and local production.

Table 1 : Retail prices of Cereals and Pulses in Mizoram

| Year | Rice<br>(Rs/Kg) | Atta<br>(Rs/Kg) | Maida<br>(Rs/Kg) | Suji<br>(Rs/Kg) | Bread<br>( Rs/<br>Piece) | Masur<br>dal<br>( small<br>(Rs/Kg) | Local<br>Pulse<br>( Bete)<br>(Rs/Kg) | Motor<br>chana<br>(Rs/Kg) | Soyabean<br>(Rs/Kg) |
|------|-----------------|-----------------|------------------|-----------------|--------------------------|------------------------------------|--------------------------------------|---------------------------|---------------------|
| 2015 | 43              | 34              | 38               | 57              | 30                       | 107                                | 83                                   | 54                        | 94                  |
| 2016 | 42.25           | 34.75           | 37.50            | 55.75           | 30                       | 118                                | 83.5                                 | 54                        | 94.25               |
| 2017 | 41.17           | 35              | 38.25            | 58.75           | 29                       | 107.25                             | 87.25                                | 50.25                     | 89                  |
| 2018 | 39              | 35              | 39               | 63              | 32                       | 109                                | 88                                   | 51                        | 91                  |
| 2019 | 36              | 40              | 39               | 64              | 39                       | 94                                 | 94                                   | 66                        | 97                  |
| 2020 | 34              | 43              | 44               | 71              | 41.88                    | 103                                | 141                                  | 73                        | 126                 |
| 2021 | 34              | 44              | 42               | 76              | 39                       | 113.13                             | 154.29                               | 85.63                     | 141                 |
| 2022 | 36.41           | 45.78           | 43.44            | 77.19           | 44.69                    | 114.85                             | 149.93                               | 86.88                     | 141.44              |
| 2023 | 37.19           | 47.82           | 45.63            | 78.13           | 40.94                    | 119.69                             | 153.08                               | 86.13                     | 149.02              |

Source : Mizoram Statistical abstract 2023

The retail price trends of various cereals and pulses in Mizoram from 2015 to 2023 reveal notable fluctuations and patterns that reflect broader market dynamics and possibly changing consumer preferences. Specifically, the price of rice steadily declined from Rs 43 per kg in 2015 to a low of Rs 34 per kg in 2020-2021, followed by a slight rebound to Rs 37.19 in 2023. In contrast, atta (wheat flour) showed a consistent upward trend, rising from Rs 34 per kg in 2015 to Rs 47.82 in 2023, indicating increased demand or more expensive production inputs over the years.

Maida (refined wheat flour) and suji (semolina) prices also exhibited a gradual increase post-2018, with maida rising from Rs 38 in 2015 to Rs 45.63 in 2023, and suji increasing more steeply from Rs 57 in 2015 to Rs 78.13 in 2023. This pattern suggests greater consumption or possibly inflationary pressures in the wheat-based products segment, which may be related to evolving dietary habits or processing costs.



Bread prices fluctuated moderately, starting at Rs 30 per piece in 2015, peaking at Rs 44.69 in 2022, and then dipping slightly in 2023 to Rs 40.94. Pulses reflected more significant variability: masur dal (small lentils) showed a peak in 2016 at Rs 118 per kg, which then declined before gradually increasing again to Rs 119.69 in 2023. Local pulse (bete) prices spiked markedly, almost doubling from Rs. 83 in 2015 to over Rs. 150 between 2021 and 2023, indicating possible supply constraints or increased demand. Similarly, motor chana (chickpeas) rose steadily, from Rs 54 in 2015 to Rs 86.13 in 2023, while soya bean prices surged sharply from Rs 94 in 2015 to as high as Rs 149.02 in 2023, suggesting significant upward pressure in oilseed markets.

## 5.RETAIL PRICES OF MEATS IN MIZORAM

In Mizoram, the retail prices of meat vary according to the source and type. Pork, chicken (broilers), and fish are the primary meats consumed in the region. Among these, pork and broiler chickens are produced within Mizoram, enabling them to meet nearly the entire market demand, which typically results in relatively stable and locally influenced retail prices. In contrast, beef, fish, and eggs are predominantly imported from other Indian states and Myanmar, which affects their availability and potentially elevates their market prices owing to transportation and supply chain factors. Beef, especially when sourced externally, may incur higher retail prices than locally produced meat. Reliance on imports for fish and eggs also influences retail prices, making them subject to fluctuations based on external supply conditions.

Table 2 : Retail prices of Meat in Mizoram

| Year | Pork<br>(Rs/Kg) | Beef<br>(Rs/Kg) | Mutton<br>(Rs/Kg) | Chicken<br>( broiler)<br>( Rs/Kg) | Fish<br>( Non-Local)<br>(Rs/Kg) | Egg ( farm)<br>(Rs/Dozen) |
|------|-----------------|-----------------|-------------------|-----------------------------------|---------------------------------|---------------------------|
| 2015 | 251             | 307             | 342               | 222                               | 331                             | 141                       |
| 2016 | 250.50          | 314.25          | 342.25            | 221.50                            | 338.59                          | 134.25                    |
| 2017 | 225.25          | 325.25          | 370               | 209.50                            | 337.42                          | 119.75                    |
| 2018 | 265             | 325             | 400               | 255                               | 345                             | 78                        |
| 2019 | 313             | 400             | 438               | 271                               | 250                             | 151                       |
| 2020 | 393             | 481             | 525               | 306.25                            | 285                             | 166.75                    |
| 2021 | 400             | 512.50          | 600               | 346.25                            | 295                             | 185.50                    |
| 2022 | 400             | 512.50          | 600               | 351.25                            | 418.75                          | 177.31                    |
| 2023 | 409.38          | 521.88          | 622.92            | 352.50                            | 417.19                          | 158.28                    |

Source : Mizoram Statistical abstract 2023

The retail prices of major meat and animal-based food commodities in Mizoram from 2015 to 2023 revealed a clear upward trend, although the degree of increase varied across the commodities. Among all the items, mutton recorded the highest retail price throughout the study period. Its price increased steadily from Rs. 342 per kg in 2015 to Rs. 622.92 per kg in 2023, reflecting a substantial rise of approximately 82 percent. Beef prices also showed a significant increase, rising from Rs. 307 per kg in 2015 to Rs. 521.88 per kg in 2023. Similarly, the price of pork, one of the most widely consumed meats in Mizoram, increased from Rs. 251 per kg in 2015 to Rs. 409.38 per kg in 2023. The increase in pork prices became particularly sharp after 2019, possibly due to supply disruptions, rising transportation costs, and an increase in demand.

Chicken (broiler) prices remained relatively lower than other meats, but they exhibited a continuous upward movement over the years. The price rose from Rs. 222 per kg in 2015 to Rs. 352.50 per kg in 2023, indicating increasing production and marketing costs for the farmers. Fish (non-local) prices displayed a fluctuating trend rather than a consistent increase. Prices rose gradually from Rs. 331 per kg in 2015 to Rs. 345 per kg in 2018, declined sharply to Rs. 250 per kg in 2019, and later increased significantly to above Rs. 417 per kg in 2022 and 2023. These fluctuations may be attributed to variations in supply, transportation constraints, and dependence on imports from outside the state to meet demand.

Egg prices fluctuated considerably during the study period. The retail price declined sharply from Rs. 141 per dozen in 2015 to Rs. 78 in 2018; however, it increased to Rs. 185.50 in 2021, before slightly declining again in 2023.



The meat retail market in Mizoram is influenced by local production capabilities and external supply dependencies, whereby imported items exhibit more pronounced price variability than locally sourced meat, consistent with the supply and demand dynamics observed in agricultural markets elsewhere

## 6.RETAIL PRICES OF VEGETABLES IN MIZORAM

The retail prices of major vegetables in Mizoram reflect a combination of local production and imports from other states, influencing their availability and costs. Potatoes and onions, being entirely imported, tend to have prices influenced by procurement costs and transportation expenses from outside the regions. Locally grown vegetables such as brinjal, tomato, French bean, and bitter gourd meet part of the demand but require supplementation through imports, which affects their retail prices, potentially increasing them owing to supply constraints. In contrast, crops such as green chilli, squash, mustard leaf, and pumpkin leaf are sufficiently produced within the state, leading to relatively stable and potentially lower retail prices for these items given their self-sufficiency. Market dynamics, including transportation costs, storage conditions, and supply chain efficiencies, particularly affect the pricing of perishable vegetables, with imported items possibly incurring higher costs owing to added logistical complexities.

Table 3 : Retail prices of Vegetables in Mizoram ( Rs/Kg)

| Year | Potato<br>(Rs/Kg ) | Onion<br>(Rs/Kg) | Brinjal<br>(Rs/Kg) | Tomato<br>(Rs/Kg) | French<br>Bean<br>(Rs/Kg) | Bitter<br>Guard<br>(Rs/Kg) | Chilly<br>Green<br>(Rs/Kg) | Squash<br>(Rs/Kg) | Mustard<br>Leaf<br>(Rs/Kg) | Pumpkin<br>Leaf<br>(Rs/Kg) |
|------|--------------------|------------------|--------------------|-------------------|---------------------------|----------------------------|----------------------------|-------------------|----------------------------|----------------------------|
| 2015 | 31                 | 53               | 51                 | 66                | 72                        | 84                         | 197                        | 37                | 52                         | 54                         |
| 2016 | 32.50              | 50.75            | 47.50              | 64.25             | 77.50                     | 78                         | 211.75                     | 34.25             | 52.50                      | 54                         |
| 2017 | 28.50              | 40.50            | 59.38              | 72.25             | 85.75                     | 73.13                      | 210.25                     | 34.75             | 75                         | 63.25                      |
| 2018 | 29                 | 40               | 60                 | 79                | 89                        | 71                         | 140                        | 34                | 75                         | 65                         |
| 2019 | 39                 | 60               | 58                 | 99                | 101                       | 99                         | 161                        | 40                | 81                         | 68                         |
| 2020 | 57.50              | 86.25            | 63.57              | 112.86            | 110                       | 108.33                     | 210                        | 42.50             | 93.75                      | 91.25                      |
| 2021 | 41.88              | 68.75            | 62                 | 105               | 105                       | 107.50                     | 221                        | 47.86             | 83.75                      | 80                         |
| 2022 | 40.94              | 60               | 56.88              | 97.19             | 126.53                    | 113.93                     | 256.47                     | 54.23             | 94.85                      | 93.60                      |
| 2023 | 37.81              | 60               | 66.34              | 113.22            | 133.44                    | 116.86                     | 310.94                     | 61.99             | 95                         | 95.31                      |

Source : Mizoram Statistical abstract 2023

The retail price trends of various vegetables in Mizoram from 2015 to 2023 revealed distinct patterns of fluctuation and overall price increases reflects changing market dynamics and possibly supply demand conditions. Potato prices showed an initial slight increase from Rs 31/kg in 2015 to Rs 32.50/kg in 2016, followed by a drop to Rs 28.50/kg in 2017 and a substantial spike to Rs 57.50/kg in 2020 before settling near Rs 37.81/kg in 2023. Onion prices remained relatively high but somewhat volatile, starting at Rs 53/kg in 2015, peaking at Rs 86.25/kg in 2020, and then declining to Rs 60/kg by 2022 and 2023. This pattern may reflect seasonal variability and changes in production and supply chain factors.

Brinjal prices fluctuated with modest increases and decreases over the years, ranging from Rs. 51/kg in 2015 to a peak of approximately Rs. 66.34/kg in 2023, with some dips (e.g, Rs. 47.50/kg in 2016). Tomatoes, a key winter vegetable, showed a generally upward trend starting at Rs 66/kg in 2015 and reaching Rs 113.22/kg in 2023, indicating strong demand or supply constraints consistent with regional trends. Other vegetables exhibited diverse dynamics; French bean prices steadily increased from Rs 72/kg to approximately Rs 133.44/kg, reflecting increased demand or reduced supply respectively. Although bitter gourd prices varied they increased from Rs 84/kg to Rs 116.86/kg. Green chilli prices showed sharp increases, with a major jump to Rs 310.94/kg in 2023, due to increased market demand.

Leafy vegetables, such as mustard and pumpkin leaves, also showed rising price trends, with mustard leaves increasing from Rs 52/kg to approximately Rs 95/kg and pumpkin leaves from Rs 54/kg to Rs 95.31/kg, This may reflect their nutritional importance and consistent demand. Squash prices showed minor fluctuations but generally increased from Rs 37/kg to Rs 61.99/kg.





## 7.COMPOUND ANNUAL GROWTH RATE (CAGR) OF CEREALS, PULSES, MEATS AND VEGETABLES IN MIZORAM

The compound growth rate measures the average rate at which variables increase over time. The overall increase in the prices of cereals, pulses, meat, and vegetables is associated with fluctuations in supply, particularly sharp in 2020, which may be linked to disruptions such as supply chain issues amplified by the global pandemic noted to affect food supply chains in similar contexts (Spiker et al., 2023). These price trends mirror the complexity of cereal, pulses, meat, and vegetable production, market demand, and supply chain resilience, highlighting the need for integrated supply chain management to stabilize prices and availability.

Table 4 : Compound annual growth rate of retail prices of some Cereal & Pulses, some meat and some vegetables in Mizoram during 2015 to 2023. ( in percentage)

| CEREAL & PULSES     | CAGR | MEAT              | CAGR | VEGETABLES   | CAGR |
|---------------------|------|-------------------|------|--------------|------|
| Rice                | 2    | Pork              | 6.3  | Potato       | 5.02 |
| Atta                | 4.1  | Beef              | 7.5  | Onion        | 1.15 |
| Maida               | 2.3  | Mutton            | 8.6  | Brinjal      | 3.84 |
| Suji                | 3.8  | Chicken( Broiler) | 5.2  | Tomato       | 5.43 |
| Bread               | 3.6  | Fish ( Non-local) | 2.9  | French Bean  | 7.55 |
| Masur dal ( small)  | 1.1  | Egg (Farm)        | 1.3  | Bitter Guard | 3.63 |
| Local Pulse ( Bete) | 7.2  |                   |      | Chilly Green | 6.94 |
| Motor Chana         | 5.3  |                   |      | Squash       | 6.11 |
| Soya bean           | 5.2  |                   |      | Mustard Leaf | 4.54 |
|                     |      |                   |      | Pumkin Leaf  | 5.25 |

Author's calculation

The compound annual growth rate (CAGR) of retail prices in Mizoram from 2015 to 2023 reveals diverse patterns across cereals, pulses, meat, and vegetables, reflecting varied market dynamics and demand-supply influences on prices. Among cereals and pulses, the highest CAGR is seen in local pulse (bete) at 7.2%, indicating relatively sharp price increases, followed closely by motor chana and soya bean at around 5.2–5.3%, and Atta at 4.1%. Rice, a staple cereal, exhibited a more moderate price increase with a CAGR of 2%. Steady price rises in pulses like motor chana and soya bean reflect their nutritional importance and growing demand

In the meat category, mutton demonstrated the highest CAGR of 8.6%, followed by beef at 7.5% and pork at 6.3%, indicating strong upward price pressures on red meat. Chicken (broiler) and fish (non-local) showed lower growth rates (5.2% and 2.9%, respectively), whereas egg (farm) growth remained minimal (1.3%). The higher CAGR for red meat than for poultry and eggs may be linked to higher production costs, supply constraints, or shifts in consumer preferences.

Vegetables present a heterogeneous pattern, with French beans showing the highest price growth at a 7.55% CAGR, closely followed by chilly green (6.94%), squash (6.11%), and pumpkin leaf (5.25%) prices. Starchy vegetables such as potatoes (5.02%) and tomatoes (5.43%) also showed significant price increases, highlighting their on-going demand. In contrast, onion and bitter gourd had lower growth rates of 1.15% and 3.63%, respectively. Vegetables are a key source of micronutrients and antioxidants, confirming their nutritional value and likely contributing to demand-driven price trends in the market. The variation in vegetable price growth may be related to seasonality, storage conditions, and local cultivation cycles.

## 8.CONCLUSION

The analysis of retail prices for essential commodities in Mizoram from 2015 to 2023 indicates complex dynamics shaped by local production, import dependency, supply chain factors, and demand fluctuations. Cereals, such



as rice, the staple food, have experienced moderate price increases, while pulses, especially local varieties such as Bete, have seen sharper price rises, reflecting supply constraints and growing demand for these products. Meat prices, particularly for mutton and beef, have demonstrated significant upward trends, with locally produced pork and chicken prices also rising steadily. Imported items such as fish and eggs, display more volatile price patterns owing to external supply uncertainties. Vegetables show diverse price trajectories; while some locally produced items maintain relatively stable prices, others, such as French beans and green chilli, have sharply increased, influenced by both demand growth and seasonal availability. The compound annual growth rates highlight these variations across commodity groups, underscoring the interplay between production costs, transportation expenses, and market disruptions, which were notably exacerbated by events such as the COVID-19 pandemic.

## REFERENCES:

1. CP Chandrasekhar ( 2013): Not a Benign Market: An analysis of Food Price Inflation and Volatility. Agrarian South:Journal of Political Economy. Vol-2, issue-2, ( 121-159)
2. C. S. C. Sekhar & Devesh Roy & Bhatt (2018). "Food inflation and volatility in India: trends and determinants," *Indian Economic Review*, Springer, vol. 53(1), pages 65-91, December.
3. Sthanu R Nair & Leena Mary Eapen, 2011. "Food Price Inflation in India: A Commodity-wise Analysis of the Causal Factors," *Working Paper* 97, Indian Institute of Management Kozhikode.
4. Rajkhowa, P., Kornher, L. ( 2022) COVID-19 and distortions in urban food market in India. *Indian Economic Review*. Vol. 57, 133–164 (2022). <https://doi.org/10.1007/s41775-022-00130-3>
5. Madaan, L., Sharma, A., Khandelwal, P., Goel, S., Singla, P., & Seth, A. (2019). Price forecasting and anomaly detection for agricultural commodities in India. 52–64. <https://doi.org/10.1145/3314344.3332488>
6. Lalrin sangpuii, Malhotra R ( 2019). Price spread, Marketing Efficiency, and constraints in Marketing of Chayote ( *Sechium edule*) in Mizoram. *Indian journal of Hill Farming Journal*
7. Mizoram Statistical Abstract (2023) , Directorate of Economics & Statistics, Government of Mizoram
8. Spiker, M. L., Welling, J., Hertenstein, D., Mishra, S., Mishra, K., Hurley, K. M., Neff, R. A., Fanzo, J., & Lee, B. Y. (2023). When increasing vegetable production may worsen food availability gaps: A simulation model in India. *Food Policy*, 116, 102416. <https://doi.org/10.1016/j.foodpol.2023.102416>