

# From Floods to Markets: Understanding the Ripple Effect of Weather Variability on Food Prices

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## Introduction

Recent news has highlighted a rise in food prices following the devastating floods affecting Johor, Kelantan, Melaka, Perak and Terengganu. The prices of vegetables such as spinach (*bayam*), mustard greens (*sawi*), water spinach (*kangkung*), red peppers, tomatoes and lady fingers have surged by up to 80%<sup>1</sup>. Similarly, seafood, including mackerel (*kembung*), sardines, Spanish mackerel (*tenggiri*), prawns and crabs, experienced price hikes of up to 40%<sup>2</sup>. These increases are partly due to already elevated prices when goods reach sellers, as floods have destroyed vegetable crops and bad weather has limited fishing activities, reducing supply<sup>3</sup>. With farmers awaiting floodwaters to subside before they can begin replanting, the effects of these disruptions could extend well into next year.

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<sup>1</sup> New Straits Times (2024)

<sup>2</sup> Harian Metro (2024)

<sup>3</sup> Harian Metro (2024); New Straits Times (2024)

However, it is important to note that these reports are based on news coverage, which may not always capture the full complexity of the situation. While concerning, such reports are not new. Similar patterns of price hikes have consistently been observed over the years, particularly following monsoon seasons<sup>4</sup>. These recurring events highlight a deeper, systemic issue that warrants closer examination.

This paper investigates the relationship between weather conditions and food prices, analysing how extreme weather events disrupt supply chains and drive food price volatility. Additionally, it seeks to chart a pathway for improving our understanding of these disruptions and identifying the foundational steps necessary to develop effective long-term solutions.

## Understanding the Influence of Weather on Food Prices

The impact of weather variability on food prices has been widely studied<sup>5</sup>. While extreme weather events may influence food prices, they typically act in combination with other factors, such as supply-to-demand imbalances, exchange rates, international trade policies and the interconnections between biofuels and commodity prices<sup>6</sup>. Understanding how weather variability influence food prices provide insights into market dynamics and pathways to mitigate associated risks.

A study by Yang et al. (2022) identified several mechanisms through which weather variability influences food prices, particularly for perishable goods like vegetables<sup>7</sup>:

- **Disruption of growth cycles:** Weather changes can either shorten or prolong vegetable growth cycles, leading to harvests occurring earlier or later than expected. These timing shifts disrupt the synchronisation of supply and demand, thereby influencing market prices.
- **Supply shortages:** Fluctuating weather patterns that lead to extreme events such as floods or droughts can significantly reduce crop yields. Such supply shortages exert upward pressure on prices, particularly in vulnerable markets.
- **Impact on quality:** Weather conditions during growth, transportation and sales stages can affect the quality of vegetables. Poor-quality produce often sells for lower prices, while a reduced supply of high-quality goods can push prices higher.
- **Increased transaction costs:** Extreme weather events can disrupt transportation and trading activities, raising transaction costs and further escalating prices.

Similar challenges are observed in the pricing of fisheries and livestock products. Adverse weather conditions disrupt fishing activities, reducing seafood supply by limiting fishing hours or

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<sup>4</sup> BH Online (2021); (2022); (2023)

<sup>5</sup> Saunders, Kaye-Blake, and Cagatay (2009); Brown and Kshirsagar (2015)

<sup>6</sup> Abbott, Hurt, and Tyner (2008)

<sup>7</sup> Yang et al. (2022)

damaging aquatic ecosystems<sup>8</sup>. These conditions can also compromise product quality, with extreme weather causing spoilage during transportation or contamination from pollutants in aquatic environments. Livestock production faces similar risks, including contamination by pathogens and declines in product quality due to extreme weather events. These quality concerns in both fisheries and livestock sectors can erode consumer confidence, resulting in price volatility—either spiking due to scarcity or falling due to reduced quality. Moreover, damaged transportation infrastructure, such as roads, railways and ports, exacerbates these challenges by disrupting the distribution of seafood and livestock products, further straining supply chains<sup>9</sup>.

Weather variability may also influence the behaviour of market participants, including farmers, wholesalers and retailers. These actors may adjust their expectations and trading decisions based on anticipated price movements, contributing to short-term market instability<sup>10</sup>. Furthermore, information about the impacts of extreme weather events—such as reports of crop losses or supply chain disruptions—can amplify these market fluctuations, further intensifying uncertainty and volatility<sup>11</sup>.

### **Brief Analysis of Price Trends and Fluctuations**

An analysis of the prices of selected commodities, based on data from the Federal Agricultural Marketing Authority (FAMA), reveals trends consistent with news reports on vegetable retail prices. As illustrated in Figures 1(a) to 1(f), vegetable prices typically spike between October and December, peaking during this period, and remain elevated until January of the following year. Prices then gradually decline, returning to lower levels around March<sup>12</sup>.

The data from FAMA's website ([link to data](#)) further shows a similar trend at the wholesale and ex-farm<sup>13</sup> levels, indicating that price hikes begin early in the supply chain<sup>14</sup>. This pattern aligns with observations discussed in the previous section, where farmers and wholesalers face increased costs possibly due to low yields, disrupted logistics and quality issues caused by adverse weather conditions. These challenges compel stakeholders across the supply chain to adjust prices upward to mitigate losses.

While further research is required to establish a definitive correlation between extreme weather events and price fluctuations during this period, the timing coincides with Malaysia's Northeast Monsoon season (November to March)<sup>15</sup>. This season is marked by heavy rainfall, particularly in flood-prone states, which often results in agricultural disruptions.

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<sup>8</sup> Farquhar et al. (2022)

<sup>9</sup> Godde et al. (2021)

<sup>10</sup> Yang et al. (2022)

<sup>11</sup> Ibid.

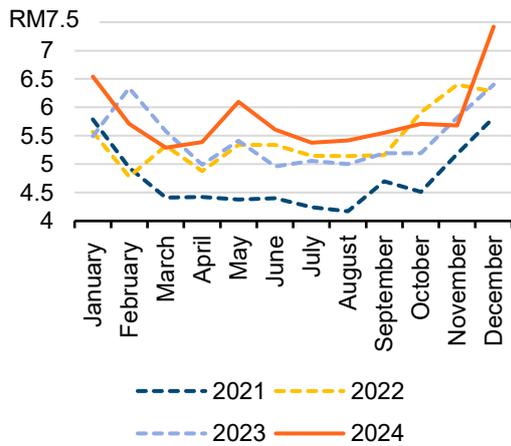
<sup>12</sup> FAMA (2024)

<sup>13</sup> Ex-farm refers to the price of agricultural products sold directly from the farm before additional costs, such as transportation, processing or packaging, are added.

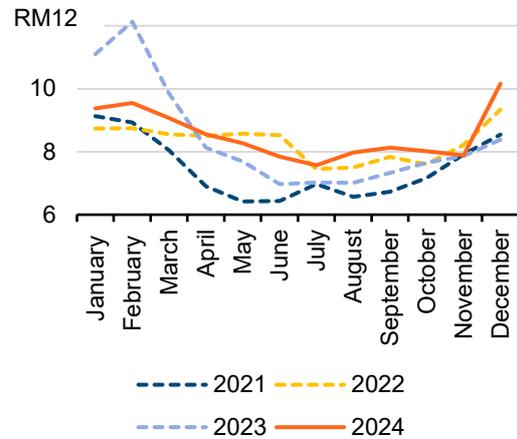
<sup>14</sup> Ibid.

<sup>15</sup> METMalaysia, (n.d.)

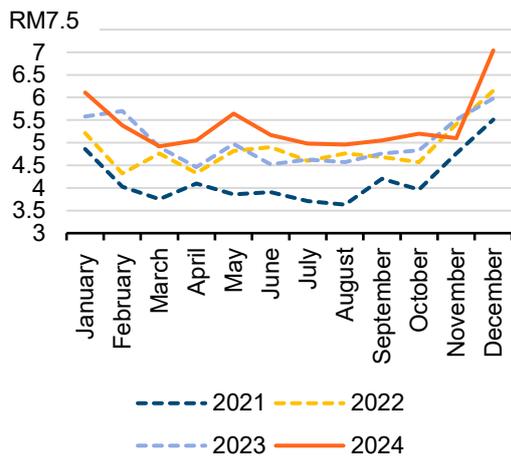
**Figure 1(a): Average monthly retail price of spinach**



**Figure 1(b): Average monthly retail price of lady finger**



**Figure 1(c): Average monthly retail price of water spinach**



**Figure 1(d): Average monthly retail price of red chilli (Kulai hybrid)**

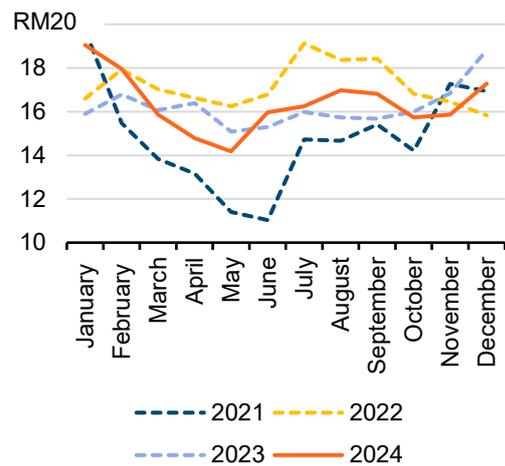


Figure 1(e): Average monthly retail price of cucumber

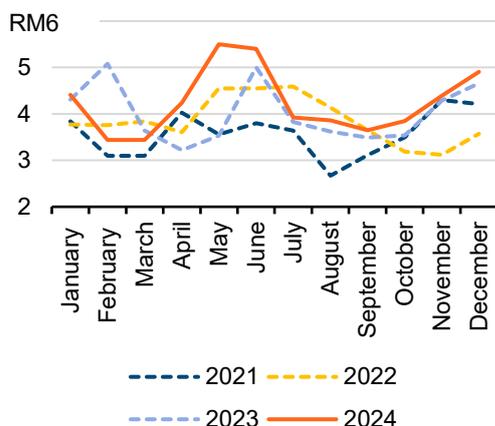
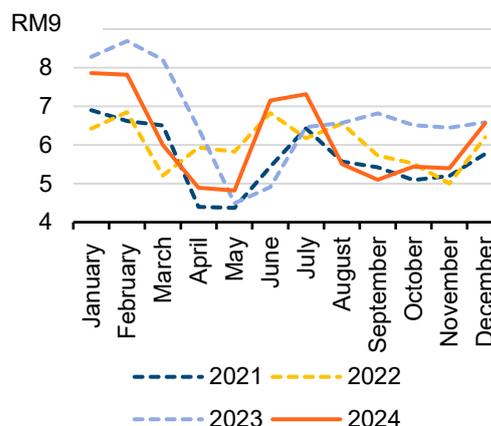


Figure 1(f): Average monthly retail price of tomato (highlands)



Source: FAMA (2024)

### What We Need: A Comprehensive Study on Food Prices in Times of Crisis

While the data shows a link between the price increases for certain vegetables and the monsoon season, it is important to recognise that other factors may also contribute to these fluctuations<sup>16</sup>. Future studies should adopt a more comprehensive approach to examine the relationship between extreme weather events and food prices, including the effects of diverse climatic events such as heat waves and unseasonal rainfall. Additionally, extending the analysis to encompass other staple foods is needed to gain a more holistic understanding of the situation. Such a detailed investigation will help to uncover the full range of underlying causes behind food price volatility.

Nevertheless, the observed price volatility points to the need to address the broader structural vulnerabilities within Malaysia’s agricultural and food supply systems. Key measures include:

1. **Strengthening climate resilience:** Investing in flood-resistant infrastructure, climate-resilient crop varieties and sustainable agricultural practices can reduce the impacts of adverse weather conditions.
2. **Improving logistical networks:** Enhancing transportation and storage systems minimises disruptions during extreme weather events, ensuring better supply chain efficiency.
3. **Enhancing data collection and analysis:** Better tracking of weather patterns, crop yields and market trends can enable early warning systems and better-informed decision-making.

<sup>16</sup> Abbott, Hurt, and Tyner (2008)

By addressing these systemic issues, Malaysia can move towards a more stable food pricing environment, protecting both consumers and producers from the adverse effects of market volatility.

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