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Global Food Security Under Geopolitical Shock: The Persian Gulf Conflict and the Strait of Hormuz

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Abstract

The conflict that began in late February 2026 in the Persian Gulf region, together with severe disruption to maritime trade through the Strait of Hormuz, has created risks for global energy, fertilizer, agricultural, and food systems. The Persian Gulf is central to global energy markets and plays an important role in international fertilizer and commodity trade. Higher energy and transportation costs can increase expenses throughout agricultural supply chains, including production, irrigation, storage, and distribution. Recent increases in selected food commodity prices, although still below previous peaks, indicate renewed uncertainty in global markets. If conflict-related supply-chain disruptions persist, the risk of broader food-security pressures in late 2026 and 2027 could increase. This is a scenario-based risk assessment rather than a confirmed outcome. This review examines the impact of the Persian Gulf conflict and the severe disruption of the Strait of Hormuz on food prices and global food security, including potential implications for food insecurity.

Keywords

Food security, Persian Gulf, Conflict, Food prices

Introduction

Food security

Food security is a fundamental component of sustainable development, social stability, and national security in contemporary societies. According to the Food and Agriculture Organization (FAO), food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life [1]. Sustainable access to food ensures public health and social welfare and contributes significantly to the economic, political, and social stability of countries. In recent years, food security has come under increasing pressure from geopolitical tensions, trade disruptions, and armed conflicts that affect food production, exports, and access to markets [2]. In this context, conflicts and geopolitical tensions are among the most significant drivers of food insecurity. Because such shocks can limit sustainable access to food by damaging production infrastructure, disrupting supply chains, increasing transport and energy costs, constraining international trade capacity, and weakening household purchasing power. Recent evidence shows that armed conflict can intensify food insecurity and hunger by disrupting food production and exports and by exposing vulnerable populations to acute food crises [3]. In many conflict-affected countries, food insecurity and hunger have intensified, exposing millions of people to acute food

crises [3]. In recent years, global food security has been shaped increasingly by geopolitical tensions, energy-market volatility, and disruptions in international supply chains.

The effect of Strait of Hormuz on food prices

The conflict that began in late February 2026 in the Middle East, generated major shock to global energy, fertilizer, and agricultural systems. The Strait of Hormuz represents one of the most critical maritime chokepoints for the global trade of oil, natural gas, and chemical fertilizers. Any disruption in this strategic corridor can significantly increase global energy and agricultural production costs. Rising energy prices and potential shortages of fertilizers may therefore threaten agricultural productivity and food supply worldwide. FAO reported that the disruption of the Strait of Hormuz affected a major corridor for fuel shipments and that approximately 1.3 million tons of fertilizers per month could no longer transit through the Strait, increasing risks to agricultural production and food security. Disruptions along this route can therefore affect global energy markets, agricultural input availability, food prices, and food security [4]. Consequently, instability or disruption in this route may not only affect global energy markets but also influence agricultural production, food prices, and countries' access to food.

The disruption of maritime transport through the Strait of Hormuz has raised concerns about the continuity of energy, fertilizer, and agricultural input flows. Recent assessments indicate that prolonged disruption could increase risks to global agri-food systems and place upward pressure on international food prices [5]. Rising energy prices, increasing costs of fertilizer production and transportation, higher maritime insurance premiums, and disruptions in the export of agricultural inputs are among the most important consequences of such a crisis. The significance of this issue becomes even more evident when considering the strong dependence of modern agricultural production on energy and chemical fertilizers. Recent studies indicate that the global food system relies heavily on supply chains for natural gas, phosphate, and nitrogen-based fertilizers. Disruptions in these sectors can reduce agricultural yields, increase production costs, and ultimately intensify global food insecurity. The conflict in Iran and the Persian Gulf may affect food prices through three main channels:

1. Escalation of fuel and fertilizer prices: Import-dependent nations are particularly vulnerable to sudden fuel price surges, which propagate immediately through local energy and agricultural production chains [4].
2. Disruption in food supply: Disruptions to regional food trade could reduce supply availability in import-dependent markets and contribute to higher food prices.
3. Conflict-related disruptions in transportation and logistics may further increase food prices. Instability in Iran and the Persian Gulf can increase transit time, fuel consumption, freight costs, insurance premiums, and air and land transport expenses. These additional costs may be transmitted alongside the supply chain, ultimately affecting final food prices and increasing pressure on both suppliers and consumers.

Escalating fuel and fertilizer costs inflate on-farm production expenses and may reduce fertilizer use, with adverse effects on crop yields and grain supplies [5]. Nations highly dependent on imports from the Persian Gulf, particularly across Asia, Africa, and the Middle East, may face rising input costs, transport pressures, and declining purchasing power under prolonged disruption scenarios [6].

Kiparisov and Folberth [7] showed that a simultaneous disruption in the energy market, mineral fertilizers, and agricultural trade could substantially reduce the availability of globally traded calories and increase the risk of humanitarian crises in food-import-dependent countries. Such conditions could increase the risk of humanitarian crises, particularly in food-import-dependent countries [7]. Furthermore, empirical studies in agricultural economics indicate that geopolitical risks are associated with increased volatility in global food markets. Research utilizing the Glosten-Jagannathan-Runkle generalized autoregressive conditional heteroskedasticity mixed data sampling model, such as that by Dai et al. [8], demonstrates that geopolitical tensions heighten long-term price volatility for wheat, corn, soybeans, and rice, thereby undermining market stability. This dynamic may increase food-security risks, particularly for low-income, food-importing nations reliant on international trade. Disruptions in the Strait of Hormuz can therefore extend beyond energy markets by affecting agricultural inputs, transportation costs, food prices, and access to food.

Lessons from the COVID-19 Pandemic for Food-supply-chain Disruptions

The results of the studies have shown that COVID-19 led to significant changes in the demand and supply of food, because the initial spread of COVID-19 was concentrated largely in urban areas, its immediate impact on field-level agricultural production was relatively limited. The onset of the COVID-19 pandemic catalyzed a systemic shock to global food supply chains, characterized by abrupt demand-side volatility and the decoupling of domestic production from consumer accessibility. Bottlenecks in off-farm supply chains, coupled with labor constraints, created significant inefficiencies, leading to food waste in certain sectors while causing supply shortages elsewhere. Over time, it became evident that the pandemic's primary impact was the exacerbation of pre-existing vulnerabilities, particularly affecting the affordability of nutritious food groups. Evidence from 181 countries (2019 - 2021) suggests a strong correlation between the pandemic and increased food prices, disproportionately affecting food-insecure populations [9].

The Impact of Food Trade Globalization on the Structure of the Global Food System

Recent international studies have shown that the globalization of food trade has significantly transformed the structure of the global food system and increased interdependence among countries. According to Kummu et al. [10], food supply diversity has increased in many

countries over recent decades; however, this trend has been accompanied by a growing reliance on international trade and a decline in food self-sufficiency, which may increase countries' vulnerability to trade disruptions and external shocks. The study further suggests that changes in global trade patterns play an important role in determining the resilience or fragility of food systems. In addition, Tendall et al. [11] emphasize that food system resilience depends on the capacity of food systems to maintain access to sufficient, safe, and nutritious food during crises and unexpected shocks, making resilience a key prerequisite for sustainable food security. Furthermore, Janssens et al. [12] demonstrate that international trade can serve as an effective climate change adaptation mechanism by compensating for regional production shortages and reducing the risk of hunger and food insecurity. These findings indicate that global food security is increasingly dependent on the stability of trade networks, the resilience of supply chains, and effective international cooperation.

Consequences of the Persian Gulf Conflict on Food Security

Prolonged conflict and associated supply-chain disruptions could increase the risk of a broader food crisis in late 2026 and 2027. This statement represents a scenario-based risk assessment rather than a confirmed outcome. Higher fertilizer, energy, and transportation costs can increase agricultural production and distribution costs and may place upward pressure on food prices. The magnitude and duration of these effects will depend on the persistence of supply disruptions, the availability of alternative trade routes, and the ability of producers and markets to adjust [2, 6].

The Effect of the Persian Gulf Conflict on Food Prices

FAO, reported that the global food price index increased in April for the third consecutive month, following the increase in energy costs and disruptions caused by conflicts in West Asia (Table 1). The FAO food price index, which tracks monthly changes in international prices of a globally traded basket of food commodities, averaged 130.7 points in April, up 1.6% from the revised March level and up 2% from a year earlier [6].

Wheat

The FAO cereal price index rose 0.8% from March to April 2026 and was 0.4% higher than a year earlier, mainly due to an increase in wheat and corn (Table 1). The increase was driven by drought concerns, expectations of reduced wheat plantings amid higher fertilizer costs, and logistical disruptions. Under the assumptions described in the FAO assessment, grain production in 2026 - 2027 may remain substantial, although fertilizer, energy, and logistical disruptions could create downside risks. The increase in wheat prices was driven by concerns over drought in parts of the United States and the possibility of below-average rainfall in Australia, together with expectations of reduced wheat plantings in 2026 as farmers shift toward less fertilizer-intensive crops amid high fertilizer and energy costs associated with disruptions to the Strait of Hormuz. Higher fertilizer and energy costs may discourage fertilizer use and could negatively affect future crop yields and production; however, these effects remain projections rather than confirmed outcomes [6].

Corn and rice

The world corn price increased by 0.7%; FAO's rice price index (all types) rose 1.9% in April, driven by higher prices for Indian rice and aromatic rice, reflecting higher production and marketing costs in most rice-exporting countries following a jump in crude oil and its derivatives prices (Table 1) [6].

Oil and meals

The FAO vegetable oil price index increased by 5.9% from March to April 2026, reaching its highest level since July 2022. The increase was driven by higher prices for palm, soybean, sunflower and rapeseed oils, with stronger prospective demand from the biofuel sector and higher crude oil prices contributing to the increase [6].

Meat

The FAO meat price index reached a new record in April and increased by 1.2% compared to March and 6.4% compared to the previous year. World beef prices rose to a new high (Table 1) [6].

Potential implications for global food insecurity

If acute supply disruptions persist beyond mid-year and oil prices remain elevated, global food insecurity could worsen in 2026, particularly in vulnerable food-importing regions. This statement should be interpreted as a scenario-based risk assessment rather than a confirmed outcome [13].

Conclusion

The increase in food prices is accompanied by risks. According to the World Bank's April 2026 commodity markets outlook and its subsequent analysis of the food-market implications, under the baseline assumption that Middle East supply disruptions ease around mid-year, food commodity prices are projected to rise modestly, with grains increasing by 2% in 2026, oils and meals by 4%, and the overall food index by around 2.5%. However, risks of the food-price outlook remain tilted upward. Whether supply disruptions ease as expected will be a key question for global food markets in the coming months. The conflict involving Iran has severely disrupted maritime trade through the Strait of Hormuz, limiting the movement of essential agricultural inputs, including fuel and fertilizers, and placing upward pressure on prices. These disruptions may reduce agricultural production and increase food costs if elevated input prices persist. According to the FAO, global agrifood systems have so far shown resilience, supported in part by relatively strong stocks and adequate supplies from previous seasons. However, continued increases in commodity and energy costs could gradually transmit through agricultural supply chains and place additional pressure on consumer food prices. Higher crude oil prices and stronger prospective demand from the biofuel sector contributed to upward pressure on vegetable oil prices. The FAO food price index tracks international prices

Table 1: FAO food price index and component indices from January 2020 - April 2026.

Year - Month	Food price index	Meat price index	Cereals price index	Vegetable oil price index
2020 - 01	102.5	103.5	100.7	108.73
2020 - 02	99.6	101.0	99.6	97.55
2020 - 03	95.2	99.5	98.0	85.42
2020 - 04	92.4	96.5	99.6	81.18
2020 - 05	91.2	95.4	98.0	77.77
2020 - 06	93.1	94.5	97.3	86.61
2020 - 07	93.8	91.4	97.3	93.20
2020 - 08	95.7	91.4	99.2	98.70
2020 - 09	97.9	91.2	104.3	104.60
2020 - 10	101.3	91.6	112.1	106.45
2020 - 11	105.5	93.1	114.8	121.90
2020 - 12	108.5	94.7	116.4	131.20
2021 - 01	113.5	95.9	125.0	138.87
2021 - 02	116.5	97.7	126.1	147.46
2021 - 03	119.1	100.5	123.9	159.30
2021 - 04	122.1	104.4	126.2	162.19
2021 - 05	128.4	108.1	133.7	174.9
2021 - 06	125.4	110.9	130.3	157.7
2021 - 07	124.4	113.3	126.3	155.5
2021 - 08	128.0	113.1	130.4	165.9
2021 - 09	129.1	112.1	132.8	168.6
2021 - 10	133.3	111.6	137.1	184.8
2021 - 11	135.4	112.4	141.4	184.6
2021 - 12	133.7	110.5	140.5	178.5
2022 - 01	135.7	111.7	140.6	185.9
2022 - 02	141.7	113.7	145.3	201.7
2022 - 03	160.2	119.3	170.1	251.8
2022 - 04	158.8	121.3	169.7	237.5
2022 - 05	158.7	122.5	173.5	229.2
2022 - 06	155.7	125.4	166.3	211.8
2022 - 07	141.6	123.3	147.3	168.8
2022 - 08	138.7	120.3	145.6	163.3
2022 - 09	137.3	119.9	147.9	152.6
2022 - 10	136.7	116.5	152.3	151.3
2022 - 11	136.0	114.1	150.1	154.7
2022 - 12	133.1	111.9	147.3	144.6
2023 - 01	131.4	110.5	147.5	140.4
2023 - 02	130.7	112.1	146.7	135.9
2023 - 03	128.0	114.1	138.6	131.8
2023 - 04	128.4	116.0	136.1	130.0
2023 - 05	124.5	117.4	129.3	118.7
2023 - 06	123.0	118.6	126.6	115.8
2023 - 07	124.4	117.9	125.9	129.8
2023 - 08	121.8	114.5	125.0	125.8
2023 - 09	121.7	113.4	126.3	120.9
2023 - 10	120.7	112.0	124.8	120.0
2023 - 11	120.6	111.6	121.0	124.1
2023 - 12	119.1	111.2	122.8	122.3
2024 - 01	117.6	108.9	119.9	122.5
2024 - 02	117.4	112.5	113.8	120.9
2024 - 03	118.9	114.9	110.9	130.6
2024 - 04	119.2	116.6	111.6	130.9
2024 - 05	120.5	116.7	118.7	127.8
2024 - 06	121.0	118.1	115.2	131.8
2024 - 07	120.9	120.0	110.7	135.0
2024 - 08	121.7	122.0	110.2	136.1
2024 - 09	124.6	119.9	113.6	142.4
2024 - 10	126.9	119.2	114.4	152.7

2024 - 11	127.7	118.7	111.4	164.1
2024 - 12	127.3	119.6	111.4	162.1
2025 - 01	124.6	116.6	111.8	153.0
2025 - 02	126.6	116.9	112.6	156.0
2025 - 03	127.2	118.3	109.7	161.8
2025 - 04	128.2	121.6	110.9	158.0
2025 - 05	127.1	122.8	109.0	152.2
2025 - 06	128.1	126.0	107.3	155.7
2025 - 07	129.8	126.6	106.5	166.8
2025 - 08	130.0	127.8	105.6	169.1
2025 - 09	128.6	127.9	104.8	167.9
2025 - 10	126.4	125.0	103.8	169.4
2025 - 11	125.2	125.5	105.6	165.0
2025 - 12	124.5	124.8	107.2	165.2
2026 - 01	124.1	124.9	107.5	168.6
2026 - 02	125.5	126.5	108.7	174.2
2026 - 03	128.6	127.9	110.4	183.1
2026 - 04	130.7	129.4	111.3	193.9

of a basket of globally traded food commodities rather than retail prices paid by consumers. Therefore, changes in the index do not necessarily translate immediately into changes in consumer food prices. However, the increase in the FAO food price index relative to March indicates renewed upward pressure in international food commodity markets. This trend remains contingent on future geopolitical developments, including the potential de-escalation of tensions and the restoration of normal maritime flows through the Strait of Hormuz. If the disruption persists, the risk of a broader food-security crisis in late 2026 and 2027 could increase; however, this should be interpreted as a scenario-based risk assessment rather than a confirmed outcome.

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Conflict of Interest

None.

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