

## GUST CSD Policy Brief

# Managing Food Price Volatility in Oil-Exporting Nations

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### About the author:

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### Keywords:

Oil Prices, Food Prices, Food Security, Gulf Cooperation Council, Sustainable Agriculture, Energy-Intensive Technologies

### SDGs:

9, 11, 12

### Highlights:

- Oil prices have an uneven impact on food prices, with increases having a more pronounced effect than decreases. This is particularly relevant for energy-intensive agricultural commodities like corn and wheat.
- Gulf Cooperation Council (GCC) countries, which rely heavily on food imports, are vulnerable to global food price inflation due to their dependence on oil revenues and the interconnectedness of energy and food markets.
- Investing in energy-intensive agricultural technologies, such as desalination for water supply and controlled-environment agriculture (e.g., greenhouses), can help GCC countries reduce their reliance on global food imports and enhance food security.
- Policy recommendations include leveraging energy resources to support advanced agricultural technologies, building robust food storage and distribution infrastructure, and establishing price stabilization funds to mitigate the impact of oil price volatility on food prices.

# Managing Food Price Volatility in Oil-Exporting Nations

**Background** Global food prices are influenced by many factors, one of the most significant being oil prices. Recent studies (Camp, 2019; Ebadi et al., 2025) examine the connection between oil prices and food costs, focusing on five key agricultural products: corn, soybeans, wheat flour, meat, and milk. The findings reveal that oil prices affect food production costs through energy-intensive processes like transportation, irrigation, and the production of fertilizers and pesticides. When oil prices rise, food prices increase, but when oil prices fall, food prices do not decrease by the same amount. This pattern suggests that energy costs play a role in food production, particularly transportation and input costs.

Agricultural products such as corn, soybeans, and wheat are among the most affected by oil price fluctuations due to their energy-intensive production processes. Corn, in particular, is heavily linked to oil prices because it is a key input in ethanol production, an alternative fuel. When oil prices rise, the demand for ethanol increases, driving up corn prices. Additionally, corn farming requires significant energy for machinery operation, irrigation, and fertilizer production, all of which become more expensive when oil prices increase. Soybeans are similarly impacted due to their use in biodiesel production. Higher oil prices make biodiesel a more attractive alternative fuel, increasing demand for soybeans. Furthermore, the transportation and processing of soybeans are highly energy-dependent, causing costs to rise with oil prices. Wheat, another staple crop, is also sensitive to oil price changes, primarily due to its reliance on fuel for planting, harvesting, and distribution. When transportation and production costs increase, wheat prices tend to follow suit, making it one of the crops most affected by oil price volatility.

On the other hand, meat and milk prices are less directly affected by oil price changes, though they still experience indirect impacts. Meat production involves multiple stages, including feeding, processing, and transportation, but the effect of oil price fluctuations is primarily transmitted through feed costs rather than direct energy usage. Since livestock feed often consists of corn and soybeans, higher oil prices may raise the cost of meat production, but this effect is delayed and less immediate than in crop production. Similarly, milk production requires energy for milking operations, refrigeration, and transportation, but these costs make up a smaller proportion of the total expenses than feed and labor. While oil price increases may lead to higher operational costs, the overall impact on milk prices is relatively moderate compared to crops like corn, soybeans, and wheat (Camp, 2019).

However, the effect of oil prices on food is generally unpronounced compared to the impact of demand factors. While oil prices influence food costs through transportation, production, and energy-related expenses, demand factors often dominate in determining food prices. Consumer preferences, population growth, income levels, and global trade policies significantly affect the demand for food products. For example, rising incomes in developing countries lead to higher meat and dairy consumption, increasing demand for grains used as animal feed (Delgado, 2003). Additionally, seasonal changes, extreme weather events, and geopolitical disruptions can create supply shortages, driving food prices higher regardless of oil price movements. Thus, while oil prices contribute to food price fluctuations, factors such as shifts in consumer demand, agricultural productivity, and global trade dynamics often have a more pronounced and lasting impact.

Oil price volatility is particularly concerning for countries that rely heavily on food imports, such as those in the GCC. This reliance has been quantified in various studies and reports. For instance, approximately 93.6% of Kuwait's food and beverage trade relied on foreign imports in 2022. As reported in 2014, Saudi Arabia imported about 80% of its food needs from abroad. Qatar and Bahrain showed similar patterns, with Qatar's food import dependency at 97% and Bahrain's at 92%, indicating their substantial reliance on imported food. The United Arab Emirates also imports around 70% of its food requirements, though it does cultivate major vegetable crops such as tomatoes, cabbage, eggplant, squash, and cauliflower locally. It is worth mentioning that the UAE has a higher economic diversification level than other GCC countries, with a relatively lower reliance on oil revenues. This is largely due to the UAE's investments in tourism, aviation, real estate, and finance sectors, which have helped reduce the economy's dependency on oil in recent years.

GCC countries have limited arable land and depend on external suppliers to meet their food demands. Consequently, any rise in food demand translates into higher prices, placing financial strain on governments and households alike. At the same time, countries that export oil but import food must balance economic benefits from oil revenue with the costs of food price inflation. Policymakers in these nations need strategic solutions to mitigate risks and ensure stable food supplies.

## Key Insights

- The impact of oil prices on food costs is uneven across different commodities. While oil price changes highly affect crops like corn and wheat, meat prices remain relatively stable. This discrepancy is because livestock production relies on a combination of feed, labor, and land, making it less directly sensitive to oil

price fluctuations than crops requiring significant fuel for machinery and transportation.

- **Historical prices matter**—past food prices influence future price trends, making it essential to track long-term market patterns. This finding highlights the importance of market expectations and the role of traders and investors in shaping food prices. When oil prices rise, businesses and consumers anticipate higher food costs, leading to market adjustments that can prolong price increases even after oil prices stabilize.
- Oil prices have a minimal role in food price volatility, but other elements such as climate conditions, consumer demand, and supply chain disruptions also contribute to fluctuations. This complexity means that solutions to food price instability must go beyond energy policies and address broader market dynamics.

## Implications for Policy and Contribution to the Sustainable Development Goals (SDGs)

For oil-rich, food-importing countries, such as those in the GCC, food price volatility is a major concern. These nations rely heavily on imports, making them vulnerable to global price swings. However, strategic investments can help mitigate these challenges by promoting food security and economic stability (SDG, 12).

## Recommended Actions:

1. **Invest in Local Food Production (SDG, 9, 12):**
  - Develop **greenhouse agriculture, hydroponics, and vertical farming** to reduce reliance on imported food. These methods require less land and water than traditional farming, making them well-suited for arid regions. For instance, greenhouse farming, or controlled-environment agriculture,

uses structures like greenhouses to grow crops in controlled environments that regulate temperature, humidity, light, and water. This method is particularly valuable in regions like the GCC, where natural environmental conditions such as high temperatures, water scarcity, and arid land make traditional farming challenging. Greenhouses allow for year-round production, reduced water usage, and protection from extreme weather conditions, making them an attractive solution for food security.

- Expand **desalination facilities** to provide a stable water supply for agriculture. Water scarcity is a major barrier to food production in the GCC, and investing in desalination technology can help create a more self-sufficient food system. It is worth noting that agricultural desalination is generally less costly and more efficient than desalination for drinking water for several reasons. First, the water used for farming does not need to meet the strict quality standards required for potable water, meaning it does not need to undergo the same extensive purification processes. This reduces the overall energy and operational costs. In agricultural desalination, the focus is on removing salts and other impurities that might affect crop growth, rather than ensuring the water is safe for human consumption. Second, agricultural desalination can benefit from economies of scale. Large-scale desalination plants designed for farming can be built to serve vast areas of agricultural land, allowing for more cost-effective operations compared to smaller, more complex systems needed for potable water production. Additionally, in some cases, renewable energy sources such as solar or wind power can be

used to power desalination plants for agricultural purposes. These energy sources can be more cost-effective in the long run, especially in regions with abundant sunlight or wind. This helps lower the environmental footprint and energy costs associated with desalination for farming, making it a more sustainable option. Lastly, agricultural desalination can sometimes use lower-quality water sources compared to drinking water desalination. For example, brackish water, which is less saline than seawater, may be used for irrigation. Desalinating brackish water typically requires less energy than desalinating seawater, thus making it a more economical option for agriculture.

- Support **agricultural research and innovation** to develop crop varieties that can thrive in extreme climates. Advancements in genetic modification and soil enhancement techniques can improve local food production capacity.

## 2. Strengthen Food Security Infrastructure (SDG, 11):

- Improve **food storage and distribution systems** to ensure stable supplies during oil price spikes. Many food-importing nations lack sufficient storage facilities, making them more vulnerable to supply chain disruptions.
- Establish **strategic food reserves** to cushion against market fluctuations. Maintaining stockpiles of essential goods can prevent price shocks from destabilizing national economies.
- Encourage **regional trade partnerships** to diversify food sources and reduce dependency on a single supplier. Strengthening trade agreements with neighboring countries can enhance food security resilience.

### 3. Use Energy Resources to Support Agriculture (SDG, 9, 11):

- Leverage **renewable energy sources** (e.g., solar and wind) to power food production, reducing dependence on fossil fuels. Many oil-exporting nations have abundant renewable energy potential that remains underutilized (SDG, 9).
- Offer **subsidies and incentives** for farmers using energy-efficient agricultural technologies. Reducing energy costs in food production can help stabilize prices and improve economic sustainability.
- Integrate **waste-to-energy programs** that convert agricultural waste into biofuels. This approach can reduce reliance on traditional energy sources while promoting sustainability.

### 4. Enhance Market Stability Measures:

- Create **price stabilization funds** to assist producers and consumers during high oil prices. Governments can use these funds to cushion the impact of market fluctuations on vulnerable populations.
- Utilize **forecasting models** to anticipate price fluctuations and implement proactive policy measures. Advanced economic modeling can help policymakers make informed decisions about food and energy markets.
- Implement **targeted subsidies** for essential food items during periods of inflation. Temporary financial support can protect consumers while maintaining overall market stability.

## Future Directions

Further research should explore how **renewable energy** can lower food production costs, how different economic conditions affect food price volatility, and how policies in other countries can serve

as models for the GCC. A deeper understanding of these factors will help policymakers design effective strategies for ensuring food security.

Additionally, policymakers should consider the broader economic impacts of food price instability. Higher food prices can lead to increased inflation, reduced consumer spending, and economic uncertainty. By developing long-term strategies that address both energy and food price volatility, governments can create more resilient economies.

## Conclusion

Oil prices play a role in food price fluctuations, but they are not the main factor. Policymakers must take a **multi-pronged approach** to strengthen food security, using energy resources wisely, investing in sustainable agriculture, and building strong market protections. For GCC countries, integrating **agriculture and energy policies** will create a more resilient food system, ensuring economic stability and national food security in an unpredictable global market.

By implementing targeted investments, strengthening food security measures, and leveraging energy resources effectively, policymakers can mitigate the adverse effects of oil price volatility. A sustainable and diversified food system will not only benefit national economies but also improve long-term resilience against global economic shifts. In an era of increasing uncertainty, proactive planning and strategic policymaking are essential to ensuring that oil-exporting nations can maintain stable food supplies and economic prosperity.

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