

# Reviewing Egypt's food subsidy scheme: Addressing new challenges for food security

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## Keywords

Egypt, External Factors, Food Security, Food Subsidy

## Abstract

*Food subsidies have played indispensable roles in consolidating food security and social stability in Egypt for decades. Nevertheless, they have also brought significant financial burdens on the Egyptian government. This article assesses the historical progression and challenges of various food subsidy programs since 1970, analyzing their impact on Egypt's socio-economic stability, including their advantages and disadvantages. Egypt is currently confronted with significant external challenges. These factors encompass the decrease in water supply due to the finalization of the Grand Ethiopian Renaissance Dam, the Russia-Ukraine war resulting in increased costs for imported wheat and fertilizer, and halved revenues for the Suez Canal due to the Red Sea conflicts. This paper uses a case study in Egypt, employing both qualitative and quantitative methodologies to examine the impact of these challenges on food subsidies. The results indicate that food subsidies are crucial for sustaining fundamental living standards for numerous people, but their efficiency needs to be reinforced through innovative agricultural techniques and financial reform to guarantee long-term viability. The paper suggests proactive solutions to enhance the efficiency of food subsidies and alleviate financial burdens, emphasizing the need for international collaboration and technical advancement in tackling Egypt's food security issues.*

## 1. Introduction

Famine has been documented as a worldwide problem for thousands of years. However, with the development of economics and the rapid growth of the global population, famine has presented different challenges in various periods (Goncharova and Merzlyakova, 2022). Even in 2022, between 691 million and 783 million people globally suffered from hunger, a number that is even higher than in periods before the COVID-19 pandemic (FAO et al., 2023). The reasons for hunger in different regions are complex. They generally involve indigenous factors such as natural, economic, and social drawbacks, as well as exogenous factors like international trade and regional conflicts.

Food subsidies are a useful tool that is widely applied by governments across all continents and regions to rival hunger. Especially in Egypt, where nearly 69 million people got benefit from the ration card scheme and 79 million people benefited from its bread subsidies by 2021, food subsidies play a crucial role in maintaining the basic livelihood of local citizens and ensuring a stable society. However, it is worth noting that food subsidies are not a panacea for all situations. Although they have vital positive effects, they also impose a heavy encumbrance on local finance. In Egypt, funds spent on food subsidies accounted for about 6 percent of the national budget in 2021 (UNDP, 2021). Therefore, it is important to understand the social and economic effects of various food subsidy policies across different time periods. An analysis of subsidies and the respective macroeconomic conditions in each historical period will contribute to more objective and efficient advice for future development and for combating new challenges.

Given the complicated nature of international events, such as regional conflicts and increasing interest rates in Central Banks across countries that hold dominant positions in the global financial markets, the Egyptian food system is currently experiencing a difficult period that it has to contend with the adverse impacts from a series of external sources. Previous research has predominantly focused on Egypt's food subsidy strategies across different periods and political regimes. However, there has been relatively little study on how traditional food subsidy strategies address the complex external factors emerging after 2022.

Therefore, this paper aims to address the following question: What insights can be gleaned from the historical evolution of Egypt's food subsidy policy in managing today's complex and adverse external economic conditions?

In this article, Section 2 reviews the current literature on historical hunger events, unfavorable natural conditions in the Middle East and North Africa (MENA), and various subsidy schemes. Section 3 introduces the research methodologies. Section 4 investigates the Egyptian food subsidy policies and their impact on government finances since 1970. Section 5 lists three urgent external challenges that Egypt is facing now and their respective impacts. Although the adverse effects of these external events are multifaceted, we will limit our research to a single dimension of their impact on government revenue and expenditure. Section 6 discusses the burden of current food subsidies and strategies for reducing these stresses. Section 7 provides a conclusion that includes the limitations of this paper and directions for future research.

## 2. Literature Review

Studies on food subsidies are usually conducted within the broader context of international food security. The establishment of the Food and Agriculture Organization of the United Nations (FAO) in 1943 represents one of the early global efforts to focus on effective food production and supply (Shaw, 2007). FAO's early initiative set 'A secure, an adequate, and a suitable supply of food for every man' as a general objective and called for all countries to increase their agricultural production (United Nations, 1943).

Literature related to investigating food security usually focuses on its four widely accepted pillars: availability, access, utilization, and stability. Since their first introduction in the early 1970s, policies have incorporated these pillars as core criteria in assessment frameworks (Guiné et al., 2021). Recent improvements to the concept include adding more dimensions like agency and sustainability (Clapp et al., 2022). These pillars have upbuilt substantive directions for practitioners across industries to develop new ideas for alleviating the problem of famine, including technological innovation, social administration, policy reforms, direct or indirect investments, and international trade. Among all these methods, food subsidies under social assistance frameworks are a popular way that consolidate availability, access, and stability at the same time.

A large body of literature has investigated the necessity of a sound food subsidy system in protecting people from extreme natural events. A series of urgent famine events in the 1970s prompted governments and international organizations to undertake faster and more ambitious collaborations to address these tough issues. Although the severity of each hunger event varied across countries, developing countries in the Middle East and Africa faced more significant hardships. In 1972 and 1974, Bangladesh experienced two almost sequential food crises. Although natural disasters like drought and deluge were the initial reasons, human factors like lack of imports and an imperfect food subsidy system have been proven to be other causes for the failure of famine management (Dowlah, 2006). In Malawi, where agriculture heavily depends on natural rainfall, erratic rainfall and the subsequent flood caused a national maize production deficit in 2001. The sluggish warning system and distempered food supply system exacerbated the scope of starvation and ultimately worsened the crisis (Menon, 2008).

Under food subsidy schemes, governments provide food and funding to make the sustenance of the destitute individual or family possible through different schemes. Meanwhile, governments use these subsidies as economic incentives to modify people's dietary behaviors. Subsidies improve people's affordability of more and better foods. This increase in affordability is significantly related to the consumption of healthy foods (An, 2012). Literature has proven the effectiveness of such incentives. For example, a subsidy (price discount intervention) on fruits and salads could significantly increase the purchased amounts per day in a cafeteria. This study also illustrates such healthy foods have higher price elasticity (Jeffery et al., 1994).

While the benefits of food subsidies are well-documented, it is equally important to explore their potential downsides. First, food subsidies are also used by developed countries to modulate the agricultural market. This leads to increased production in developed countries, global oversupply, and depressed international market prices. For developing countries, importing agricultural products from the global market can sometimes be cheaper than domestic production, negatively impacting the revenues, attitudes toward technological innovations, and production efficiencies of their farmers (Dorward and Morrison,

2015). Second, as subsidies are a kind of government intervention in the free market, they are actually breaking the market equilibrium. This intervention can sometimes lead to the overuse of water, pesticides, and fertilizers, often resulting in a greater divide between the rich and poor. Considering that agricultural subsidies fall under the broader food subsidy system, some specific schemes will allow larger farmers to obtain higher benefits from these subsidies, while smaller farmers receive relatively less. For food subsidies, wealthy families and people living in cities can often receive higher benefits from it than impoverished families and those living in rural areas (Karami et al., 2012). Meanwhile, subsidies have the potential to become channels for elites and opportunists to engage in corrupt activities (Jha et al., 2013). Third, food subsidies and agricultural subsidies can bring financial burdens to governments, causing macroeconomic problems (FAO, 2015).

While food subsidies have been prevalent across developing countries, each nation has its unique advantages and disadvantages. Among these nations, Egypt stands out as a critical case due to its peculiar demographic and agricultural circumstances.

Egypt has the highest population in the MENA region. From 2000 to 2022, the total population reached nearly 111 million, representing an annual growth rate of 2.52 percent (World Bank, 2023). However, its water availability per capita is decreasing at an even faster rate and is already among the lowest in the world. In 2020, although 99 percent of its rural population and all of its urban population had access to improved, safe drinking water sources, the total water withdrawal per capita dropped to 721.2 m<sup>3</sup> per inhabitant per year from the 2010 value of 894.0 m<sup>3</sup> per inhabitant per year (FAO, 2023). Special natural conditions in Egypt, such as the leakage of groundwater, water and soil erosion (Wassif and Wassif, 2021), and the growing evaporation from Lake Nasser and other agricultural lands (Abdel Wahab et al., 2018), contribute significantly to the worsening water scarcity. The deterioration of water conditions is also accompanied by a decrease in arable land. Agriculture is highly dependent on the availability of water and land. As a result, local food production in Egypt is relatively inadequate, making it impossible to achieve self-sufficiency.

Given these existing natural and demographic conditions, it is crucial to explore the role of Egypt's food subsidy measures from 1970 onwards. The following sections will delve into the historical context, impacts, and challenges of these subsidies, analyzing potential methods for future improvements.

### 3. Research Methodology

This research used a case study approach focusing on Egypt and applied qualitative and quantitative methods to analyze the evolution and impacts of food subsidies. The information sources include government reports, peer-reviewed journal articles, and publications from international organizations. Key data sources include FAO, the World Bank, the Federal Reserve Bank of St. Louis (FRED), and the International Monetary Fund (IMF). Qualitative analysis was employed to find out the social impacts of food subsidies. Quantitative analysis was conducted concerning cross-check comparisons in different periods to bring out the differences in various indicators across these periods.

## 4. Egypt's Food Subsidies: Evolution and Implications

### 4.1 The Pivotal Role of Food Subsidies in Socioeconomic Stability

As one of the subsidy schemes of long-standing all over the world, the earliest Egyptian food subsidy system can be traced back to 1941. To keep people from the negative impacts of the war, the government provided commodities such as sugar, tea, and oil to people directly. Since then, in its decades-long history, most subsidy policies have been proposed and implemented around two pillars: the "Ration cards" scheme and the "Flour and bread" scheme (Ecker et al., 2016).

The "Ration card" scheme mainly acts on basic commodities. The government sets subsidized prices, significantly lower than the real cost, for a series of food. Each family can buy such goods up to a specified limit at authorized stores. The government controls and regulates the subsidized prices, the number of subsidized food categories, and the level of benefits that different families can get (Ramadan and Thomas, 2011).

The "Flour and bread" scheme, unlike the "Ration card" scheme, applies to all residents of the country but only reduces the selling price of flour and bread. "Baladi bread" is a key product of this scheme; it is

very cheap and available to everyone without any restrictions. During the 1960s, the government even provided free bread through market channels to reduce the living costs of industrial workers and promote the industrialization of the country. In 2009, 76.37 percent of the total food subsidy budget was spent on bread subsidies (Ramadan and Thomas, 2011).

Early studies from the 1980s to 1990s evaluated the positive impacts of food subsidies. In 1986, the World Bank indicated that Egypt provided cheap food to most of the people and it could have the lowest level of malnutrition among countries with similar per capita income (World Bank, 1986). A study in 1996 simulated a scenario in which, if the Egyptian government phased out food subsidies from food and beverage expenditures, the Gini coefficient in urban and rural areas would rise by 3.7 percent and 1.2 percent respectively. This demonstrated that during this period, the value of food subsidies in Egypt primarily benefited people with penniless living standards, thus contributing to improved income distributions (Ali and Adams Jr, 1996). Another research indicated that during the 1999-2000 fiscal year, the bread subsidies played a crucial role in lifting 730,000 individuals above the poverty line (Ahmed et al., 2001).

Food subsidies also played an essential role during the previous food crisis in Egypt. Global wheat prices experienced a surge from the middle of 2007 to the end of 2008 due to large-scale droughts in grain-producing countries, the increasing use of biofuels in developed countries, and the manipulation of commodity prices by international hedge funds. This surge in wheat prices led to a spike in domestic food prices in Egypt. However, during this period, the government implemented stringent measures, allocating a significant amount of money for bread subsidies. This ensured that the prices of Baladi bread could remain stable. As a result, people were able to afford basic food items. Consequently, needy families in Egypt were less impacted by the food crisis compared to similar families in other countries (Korotayev and Zinkina, 2011).

#### 4.2 Financial Burden: A Historical Dilemma

In Egypt, the subsidy scheme serves not only as financial support for citizens but also contributes to maintaining social and political stability. By the end of the 1980s, various subsidies covered a wide range of livelihoods, including food, agriculture, industry, energy, housing, clothing, transportation, and public services. Among all these subsidy categories, food and energy are the two most important sectors.

The original intention of food subsidies was to remit the pressure from wartime supply shortages and ensure an adequate supply of daily necessities. The government purchases food from both domestic and international markets at market prices and sells it to citizens at a lower price. A great amount of money is spent to offset the price gap. However, with the gradual increase in the categories of subsidized food and the number of beneficiaries, the amount the government had to pay increased rapidly. Foreign earnings and international aid can cover only a small portion of these expenditures; the inflationary financing of government deficits had to cover the rest. From 1957 to 1971, the total government expenditure on all subsidies rose from 6 million EGP to 42 million EGP, as illustrated in Figure 1. The real cost of food imports per capita increased from 6 EGP to 35 EGP between 1969/1971 and 1979/1981, when the exchange rate was 1 USD to 0.43 EGP in 1971 and 0.7 EGP in 1979 (Scobie, 1983). This represents an increase in the percentage of government total expenditure on food subsidies from 0.2 percent to 14 percent (Korayem, 2001), indicating the early morphology of the fiscal burden.

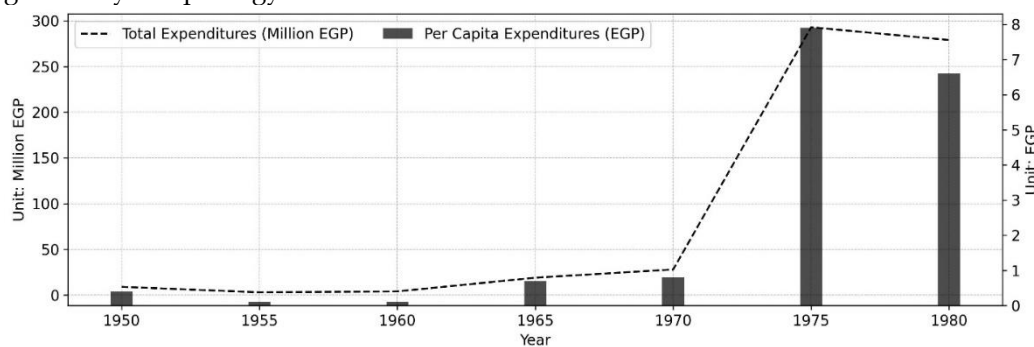


Figure 1. Government Expenditures on Wheat and Flour Subsidies (Scobie, 1983)

Soon after the mid-1970s, the apace expanding categories and amounts of subsidies began to exhibit their severe negative impacts on government finances. One potential way to alleviate the burden was to reduce the size of food subsidies while preserving basic living support. Therefore, reducing expenditures on subsidies quickly became an urgent appeal. With the guidance of the IMF, in January 1977, the government declared its intention to slash subsidies on a wide range of products such as high-quality bread, high-quality flour, rice, and sugar. Although the prices of some basic foods like the Baladi bread did not change, protests and strikes occurred in many places. Ultimately, the government had to terminate the project (Alderman and Von Braun, 1986).

Efforts to reduce food subsidy expenditures have spanned decades, with achievements in each period dependent on both internal policies and external environments. During favorable periods, such as 1980 to 1994, the total subsidy expenditure as a percentage of the country's GDP decreased from 12.5 percent to 2.2 percent. The food subsidy as a percentage of the government's total expenditure also decreased by more than half (Trego, 2011). A typical event during this period was the introduction of new types of bread in 1984. With cheaper ingredients, smaller sizes, and slightly higher prices, expenses on bread subsidies were smoothly reduced. By the fiscal year 1994, only subsidies for wheat, sugar, and cooking oil remained, compared to the 18 categories in 1980, resulting in a decrease of 2,053 million EGP in the real cost to the government in one year (equivalent to approximately 605 million USD at the 1994 exchange rate of 1 USD to 3.39 EGP) (Ali and Adams Jr, 1996). The proportion of people covered by subsidies also decreased to 78.7 percent from 90 percent in 1989 (Korayem, 2013).

However, the fiscal burden has gone up again since the 1990s. As the government has to spend a great amount of money in the international market to buy food, this expenditure continuously exceeds the revenue from exports. Consequently, the high rate of deficit to GDP has soon become a long-lasting problem for Egyptian government finances. Meanwhile, selling below cost has become another common and enduring issue. In the early 1990s, the sales price of each Baladi bread was less than half of its cost. In 2008, the market retail prices of subsidized rice and basic ration of sugar were less than one-fourth and one-sixth of their costs, respectively (Trego, 2011).

During this stage, the rate of increase in agricultural production could not keep pace with the population growth rate. Although the government spent a lot on food subsidies, the subsidy policy did not effectively promote the advancement of agricultural production. Meanwhile, farmers' revenues stagnated due to strict restrictions on crop prices and acreage, coupled with rising production costs (Richards, 1980). This situation diminished farmers' initiatives to increase production and technological innovation. Along with the rising demand for food, the government had to procure more crops from the international market. From 2003 to 2008, Egypt had to double its wheat imports. A spike in wheat prices also happened during this period, caused a nearly fourfold increase in the total cost of imported wheat by 2008 compared to 2003 (Trego, 2011).

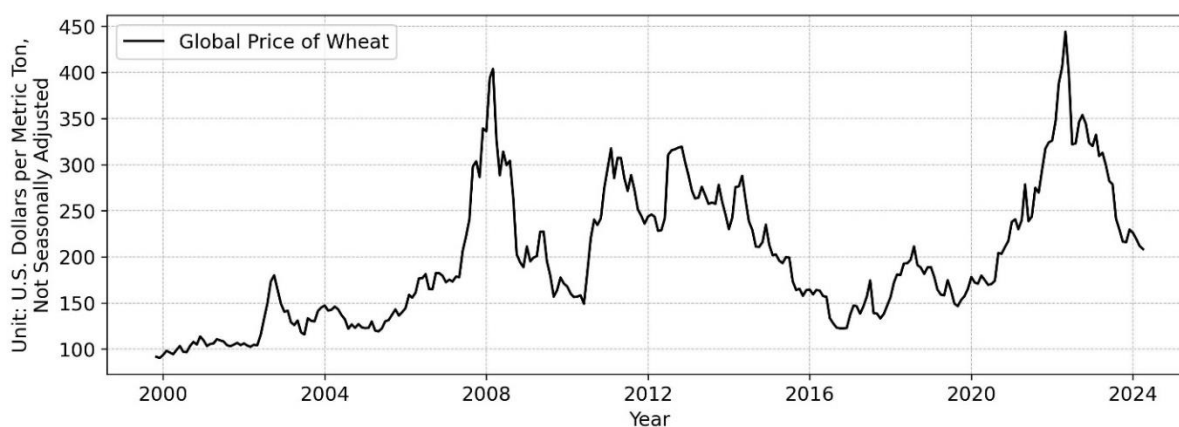


Figure 2. Global price of Wheat (FRED, 2024)

The high waste rate is another contributor to financial pressure. Many subsidized foods brought heavy costs to the government but were ultimately not consumed or eaten by people. For wheat, from farm to table, waste occurred at various stages including pre-harvesting, storage, transportation, and processing (Elmenofi et al., 2015). In 1996, nearly 17.7 percent of subsidized commodities were wasted, with Baladi bread accounting for the highest share (61.7 percent) of the value of wasted food, worth 2.3 billion EGP (approximately 678 million USD at an exchange rate of 1 USD = 3.39 EGP in 1996). Flour accounted for the second highest share of value, at 14.9 percent, but had the highest waste rate, at 29.6 percent (Löfgren and El-Said, 2001). Under the food subsidy scheme, low sales prices, waste, and financial burdens create a vicious circle. Low prices lead people to buy more subsidized food without valuing it, with some even using it as animal feed. This artificially inflates demand, making it difficult to track actual usage. Consequently, the government imports more subsidized food than is truly needed.

## 5. Ongoing Challenges for Egypt's Food Security

### 5.1 Establishment of Grand Ethiopian Renaissance Dam: Reduced Water Supply

Originating from the convergence of the White Nile in Uganda and the Blue Nile in Ethiopia, the Nile River flows northward through South Sudan, Sudan, and Egypt before emptying into the Mediterranean Sea. It supplies over 95 percent of Egypt's fresh water and meets 80 percent of the country's irrigation demands. The agriculture sector consumes 89 percent of its flow every year (Osman et al., 2016).

Recent concerns about the water supply from the Nile River focus on the establishment of the Grand Renaissance Dam in Ethiopia (GERD). Construction of GERD started in 2011. For a long time before that, several international treaties and agreements had established a basic consensus across countries on the administrative measures of the Nile River. Earlier agreements, such as the Egypt and Sudan Nile Agreement in 1959, stipulated that Egypt and Sudan were eligible to get 55.5 billion and 18.5 billion cubic meters of water per year from the Nile River, respectively (El-Nashar and Elyamany, 2018). However, such treaties ignored the interests and influences of upstream countries. Due to the high dependence on the Nile River, artificial events in upstream countries can easily have serious effects on the Egyptian water supply and subsequently affect domestic agricultural production. Although a few benefits were expected (Tesfa, 2013), when GERD began to fill its reservoir, Egypt was estimated to lose some of its shares from the river during the period of affusion and to permanently lose absolute control of the natural runoff in its domain once the dam is fully operational.

Previous literature has provided various quantitatively modeled outputs. Among those that have a significant impact on agriculture and food production are:

1) **Less water supply:** A decrease in the outflow from 90 percent to 80 percent of the river's maximum level will result in a 0.40m to 0.75m decrease in the Nile water levels (El-Nashar and Elyamany, 2018). Meanwhile, the establishment of GERD is estimated to reduce the flowing velocity of the river, resulting in more sedimentation, a 5.9 percent increase in evaporation losses, a higher salinity, and a decrease in the active storage of Lake Nasser (Ramadan et al., 2013).

2) **Less arable land:** In upper Egypt and Delta, agricultural land will decrease by 29.47 percent and 23.03 percent respectively (El-Nashar and Elyamany, 2018). Another study measured the percentage losses in agricultural lands as a result of different levels of release from the Aswan High Dam (AHD). It illustrated that as the yearly AHD release decreased from 52.7 BCM to 33.3 BCM, the percentage losses in agricultural lands in Upper Egypt will decrease by 12.70 percent to 46.24 percent, and by 7.09 percent to 38.97 percent in the Middle Egypt and Delta regions (Abdelhaleem and Helal, 2015).

3) **Less electricity supply:** The establishment of the dam will increase the annual losses from the AHD lake to 12 BCM, compared to 11.23 BCM in a scenario with only the AHD (Abdelhaleem and Helal, 2015). This will cause a 20 percent to 30 percent reduction in hydropower generated from the AHD (El-Nashar and Elyamany, 2018).

Fresh water, arable land, and power supply are three core inputs for agricultural production. Reduced water, land, and electricity will contribute to a worse condition for Egyptian domestic agriculture and a lower amount of annual food and crop production (Rashad and Shaaban, 2022). However, to satisfy the food requirements of the growing population, the government will have to procure more from the global market. Even if prices and exchange rates remain stable in the coming years, total spending will go up.

## 5.2 The Russia-Ukraine War: Disruption of Wheat and Fertilizer Supply

Due to the lack of local production, Egypt's food supply heavily depends on international imports, making it vulnerable to regional conflicts. Ukraine and Russia are major exporters of wheat, corn, and cooking oil. Egypt, as the biggest wheat importer all over the world, sourced about 72 percent of its total wheat imports from Russia and Ukraine in 2016, and this figure rose to 75 percent to 85 percent between 2019 and 2021.

Since 2022, the war in Ukraine has significantly impacted the global supply of wheat. In 2022, the percentage of imported wheat for Egypt from Russia and Ukraine plummeted to about 15 percent, and in 2023, it slightly recovered to 27 percent (Comtrade, 2023). Reasons include the sanctions on Russian trade imposed by western countries, creating a burdensome environment for Russia to export its products. Additionally, the warfare significantly disrupted local production and transportation in Ukraine, limiting its ability to export wheat (Elsafty and Mahmoud, 2022). Meanwhile, most Asian countries experienced lower domestic reserves and higher demand for crops following COVID-19 (Abay et al., 2023). Drastically reduced global supply, combined with many countries' increased demand, caused a sharp increase in global wheat prices. However, Egypt's demand for wheat remains constant and even higher than historical levels.

Meanwhile, as Russia is also a major exporter of nitrogen and potassium fertilizers, its exported nitrogen fertilizer accounts for about 15 percent of the global market (Laborde Debucquet and Mamun, 2022). Due to the aftershocks of COVID-19 in 2021, global nitrogen fertilizer prices were already on an upward trend. The war aggravated the situation and pushed the price of ammonia to 1,323 USD in March 2022, nearly six times of its price in mid-2019 (Rice and Vos, 2024). The surge in fertilizer prices has not only affected local food production in Asian countries, but has also hit farmers in Ukraine hard, who have had to bear higher costs, leading to a decline in productivity. This has led to a vicious cycle of commodity price increases and production cuts.

The influences of such sharp increases in food and fertilizer prices have extended beyond merely the financial burden to governments; moreover, they increase the risk of regional food crisis. In Abay's Vulnerability Map, Egypt is identified as one of the few countries suffering from extreme high risks to its food supply because its food consumption is directly exposed to low stocks and Russia's export restrictions (Abay et al., 2023). As Egypt cannot increase its local production under the current circumstances, it remains heavily dependent on external sources and is unable to reduce its import levels. Consequently, Egypt must suffer the higher import prices now and in the coming years. For the food subsidy system, such a price spike will also perturb the supply chain of the Baladi bread scheme, causing significant backlogs and more unavoidable government expenses (Mostafa et al., 2024).

## 5.3 Red Sea Conflicts: Decreased Revenue for the Suez Canal

Starting operations in 1869, the Suez Canal connected the Mediterranean Sea and the Red Sea, contributing to the rise and prosperity of three major cities: Port Said, Suez City, and Ismailia. During its over 150-year history, the canal has played a key role as the shortest path from Europe to countries around the Western Pacific Ocean and the Indian Ocean, making it one of the busiest sea routes in the world. In 2016, it contributed 4.2 billion USD to the Egyptian economy, accounting for about 13.9 percent of total revenue and 25 percent of total exports (Soffer, 2023).

A peaceful and stable Red Sea area is critical for the normal operation of the Suez Canal. However, recent regional conflicts in the Middle East have significantly reduced the daily transit volume of the Suez Canal. In February 2024, Osama Rabie, Chairman of the Suez Canal Authority, announced a significant drop in revenues for January 2024. The income for the month fell by 46 percent, totaling \$428 million, compared to the \$804 million recorded in January 2023 (Egypt Today, 2024). By April 2024, about 50 percent of shipments that used to pass through the Red Sea had been rerouted to the Cape of Good Hope, leading to a decrease in Egypt's revenues (Chhabria, 2024). The channel and efficiency of imported food into Egypt have also been affected, creating double pressure on food supplies.

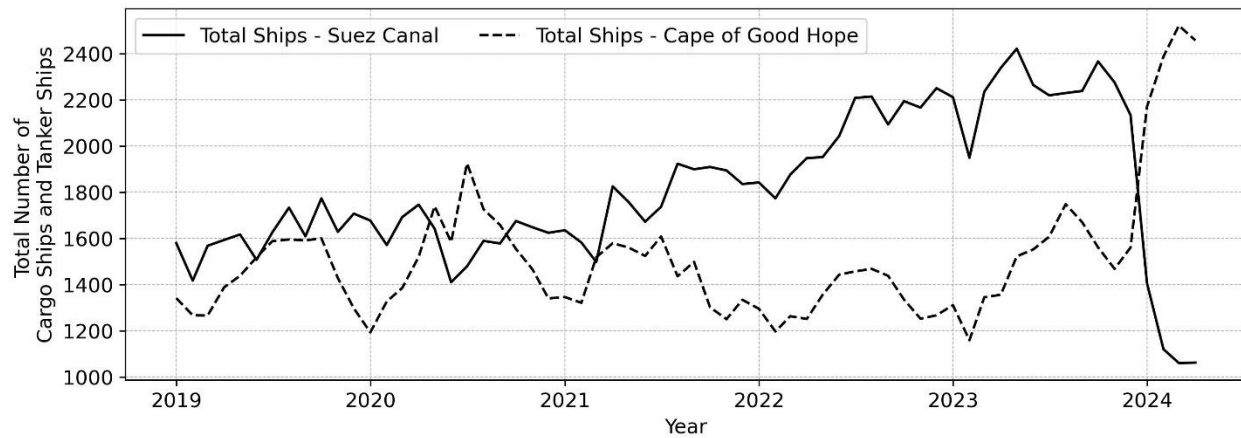


Figure 3. Monthly Transit Calls (IMF, 2024)

## 6. Discussion

### 6.1 Key Findings and Insights

This paper highlights the historical importance of food subsidies in Egypt and their bumpy developing process. It must be acknowledged and accepted that a contradictory but unavoidable social condition has formed: On the one hand, people need food but struggle to afford it entirely on their own. Food subsidies have changed from a social welfare measure to promote industrialization and production into a necessary action to ensure social order and political stability. On the other hand, large government spending on food subsidies has significantly affected investments that could have been used for industry development and urban construction. Although reducing subsidies is an effective solution to reduce the financial burden, evidence and experiences from acts in the last century have taught the administration that large-scale cuts in subsidies can cause protests and panic. Moreover, while subsidy cuts have had some success in some years of abundant supply, the fragile structure of the food supply chain has necessitated large expansions in food subsidies during times of food crisis, negating most of the long-term reform gains.

According to section 5, Egypt is facing a more complex situation with increased spending due to rising international wheat prices and reduced revenues from the Suez Canal. For the fiscal year starting on July 1, 2023, Egypt allocated 127.7 billion EGP (equal to 4.14 billion USD at the time this budget was made) for the whole food subsidy program (Abdallah and Awadalla, 2023). However, this budget was made before the significant decrease in revenue from the Suez Canal. Additionally, a rapid depreciation of the local currency is also seen during this period. It means that the real financial pressure would be much higher than projected.

### 6.2 Potential Solutions

The findings of this paper are consistent with the conclusions of the existing literature that reducing food subsidies is a difficult but necessary process. Overall, the core objective is to reduce government spending while maintaining an adequate supply of basic foodstuffs. Therefore, potential solutions can be divided into two broad categories: increasing domestic production and reforming fiscal schemes.

From the production side, Egypt faces an intractable problem: the extreme limitation of available fresh water and arable land. However, it benefits from abundant sunshine and sea water. Engineers are pinning great hopes on seawater desalination, facilitated by the adoption of renewable energy assets like wind turbines and solar PVs. Through the GIS system, they are also eager to discover new underground water sources in areas previously recognized as lacking water (Abdelzaher et al., 2023). Ongoing exploration into resolving the constraints of limited arable land includes taking advantage of vertical or indoor spaces, such as rooftop farming (Desouki et al., 2024) and smart automated indoor hydroponics and aeroponics greenhouse systems based on IoT (Internet of Things) technologies, etc. (Sadek et al., 2024)

From the fiscal side, reducing the amount directly spent on various subsidies is still a key strategy. Early studies have shown that different crop imports exhibit varying elasticity to subsidized prices. The correlation between imports of essential goods such as wheat and subsidized prices is low, while that of meat is higher. Generally, reducing real per capita subsidies by 10 percent would lead to a 4 percent decrease

in the volume of food imports (Scobie, 1983). Meanwhile, cutting non-agricultural subsidies, such as fuel (petroleum) subsidies, is another way to allocate limited government expenditures to those who need them more (Vidican Auktor and Loewe, 2022). Since fuel subsidies tend to benefit families with cars, who are often not from poorer groups. The Egyptian administration began reducing fuel subsidies in 2013, and so far, the process has been generally successful. The high expenditures in 2016 and 2017 were due to the depreciation of the EGP against the USD, as petroleum is priced in US dollars.

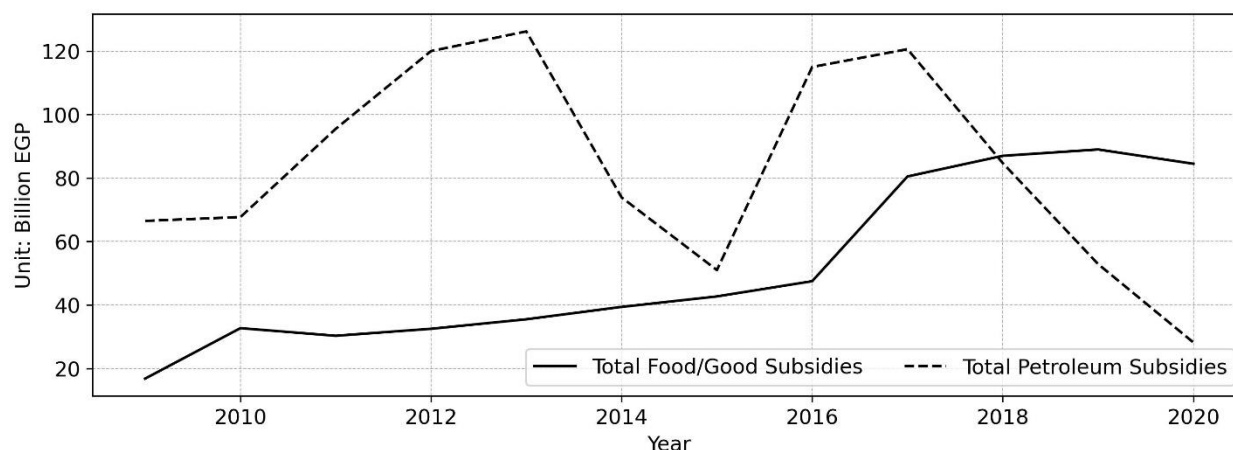


Figure 4. Government Expenditures on Food and Petroleum Subsidies (UNDP, 2021)

Moreover, international organizations should take effective action to assume their necessary responsibilities. Institutes should adopt more diplomatic means to promote effective international cooperation and to de-escalate regional conflicts. Additionally, domestic institutions should keep making efforts to attract foreign investments. Innovating agricultural technologies and increasing local production and development capacity is always a keyway to increase foreign exchange reserves and state revenues.

Finally, strengthening government oversight and management of the supply chain of subsidized food could be an effective way to reduce excessive government expenditure due to waste in various nodes. It is recommended that regulators introduce digital management tools and implement stricter supervision measures at all stages of the supply chain, focusing on eliminating black market speculation and the illegal resale of subsidized food. A modern tracking system for both the “money flow” and the “food flow” should be established. Meanwhile, regulators should provide basic education and mentorship to people who do not depend on bread for survival but might purchase unnecessary amounts and not eat all of them. In general, the total volume of imported food and domestically produced food should equal the amount of actual demand. With relatively stable levels of domestic production and actual demand, reducing waste could contribute to cutting down the requirement for imported food.

## 7.

## Conclusion

This study reviews the historical development, reforms, implications, and challenges of the Egyptian food subsidies. Over the past decades, the comprehensive and practical subsidy system has indeed brought meaningful support to the essential lives of tens of millions of people. However, it has also brought fast-growing financial pressures to the administration. Added to that, recent challenges, such as the less water supply due to the construction of the Grand Ethiopian Renaissance Dam, surging international wheat import prices due to the Russian-Ukraine war, and decreasing revenue from the Suez Canal owing to the Red Sea conflict, have intensified the complexity of maintaining a sustainable food subsidy system. Reducing large subsidy spending to compensate for food shortages requires stricter and clearer regulation, more proactive technological innovation, and a more determined international effort for peace. This is a difficult but necessary undertaking.

While this study provides insights into the Egyptian government's financial burden caused by recent external events, its limitations must be noted. First, the analysis is primarily qualitative and can serve only as a starting point for understanding these events detailed and precise impacts. Second, the effects of these cross-area events are highly interactive and extend beyond financial pressures. Isolating the financial effects from the broader macro context can cause bias in the results. Third, these three external events are still evolving rapidly, limiting the article's timeliness. Changes in the regional conflicts in the coming months may alter their indirect effects on Egypt's food subsidy system.

Therefore, future studies should consider a more comprehensive and pragmatic analytical model that takes into account the impact of multiple factors, including food subsidies, on government fiscal pressures. Meanwhile, developing a real-time, dynamic data tracking model would be beneficial. More quantitative modeling and analysis of case studies on the relationships between specific external challenges and Egypt's real demand for imported food will help the administration develop more economical and practical strategies for food subsidies.

From a long-term perspective, food subsidies should not be seen as a panacea. They should not be the only method to sustain national food security. Governments and businesses need to explore more diverse ways to collaborate effectively and build a solid social security system.

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