Agrifood policies and challenges of the agrifood system in Egypt

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Abstract

Agrifood policies shape the different stages of the Agrifood sector from production to consumption. In Egypt, the agrifood sector is a key player in the Egyptian economy providing jobs and income, mainly for rural and vulnerable households. Though the system is not on full potential and face several challenges. Challenges include climate change, water and land scarcity, rising population, poverty and inequality. Over the years, several agrifood policies had been implemented to overcome these challenges. Agriculture and food subsidies, land tenure and crop procurement are the main policies applied by the Egyptian government. Instead of the drawbacks of some of the policies in the sector, Egypt succeeded in increasing agricultural production and ensuring access to food.

Keywords*: Agrifood policies, Agriculture production, Agro-processing, Food subsidies, Food consumption.*

Introduction

Egypt is a food import dependent country with cereal dependency ratio was more than 40 percent. Instead of the economic growth achieved in Egypt with a GDP per capita of 11,566 constant 2017 International USD, poverty and food security remains a challenge for the development of the country. Among Egyptians, 29.8 percent are considered as poor and 7 percent are considered undernourished (FAOSTAT, 2024; CAPMAS, 2024).

With 57 percent of the population in rural areas and concentration of poverty in rural areas, agrifood sector in Egypt is a key player in the economy to ensure food and income to vulnerable individuals. Agriculture, forestry, and fishing represent around 11 percent of GDP value added and employs around 19 percent of total employment in 2022 (World Bank Group).

Several Agrifood policies had been implemented over the years to ensure food security for the growing Egyptian population. Policies as food and agricultural subsidies, land use policies, trade agreements, and food safety regulations shape Egypt's Agrifood system. Agrifood policies attempt to overcome the challenges faced by the sector as climate change, smallholdings, limited access to information and technology and food dietary habits (Gouell and El-Miniawi, 1994; FAO, 2023). With Egypt's vision 2030, the Egyptian government policies aim a radical transformation of rural areas and improvement of rural livelihoods to achieve rural development and ensure decent life in rural villages. The "DECENT LIFE" initiative targets 4,500 villages for investment in infrastructure and public services, the establishment of agriculture services centers, development of irrigation shops, canals and markets (Ministry of Planning and Economic Development, 2024).

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However, the agrifood system in Egypt is challenged by the growing population, limited resources climate change and global uncertainty as what was observed during the food crisis of 2008, the COVID-19 pandemic, and the Russo-Ukrainian war.

The present chapter overviews the Agrifood system in Egypt (section 1) with a discussion of the different policies implemented over the years (section 2). Section 3 concludes.

1. Overview of the agrifood sector in Egypt

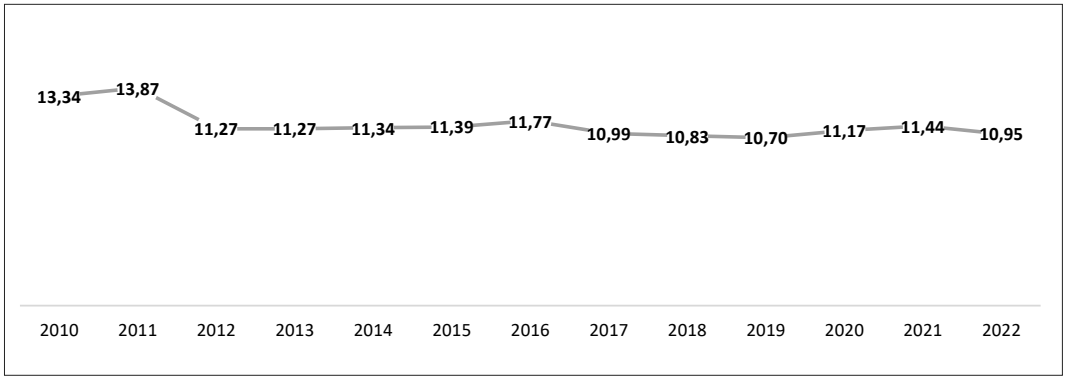
The Agrifood system is a key pillar of the Egyptian economy playing a prominent role in job creation, poverty reduction and ensuring food security. The system can be divided into several stages: input production, agriculture production, agro-processing and trade and services. The Agrifood system accounted for 24.2 percent of GDP in 2015. The food processing activities are concentrated in Lower Egypt, with 78.3 percent of food processing gross output. While Upper Egypt is the main player of primary agriculture with a contribution of 30.2 percent to agricultural gross output. The sector is characterized by a dominant presence of SMEs representing at least 90 percent of the Agrifood production and export firms. Agrifood SMEs generate more than 90 percent of employment in the sector. However, they are more vulnerable to external shocks because of their size, lower productivity and limited access to resources and finance (IFPRI, 2018; Abu Hattab *et al*., 2021).

Agriculture Sector

The agriculture sector is the third largest sector in the Egyptian economy, with a value added around 10.95 percent of the Egyptian GDP and around quarter of the Egyptian population working in the farming and fishing industries. This share was stagnant since 2012, but increased during the COVID-19 pandemic. The sector was considered as the most resilient sector during the pandemic with a share of value added of 11.44 percent of GDP (Figure 1). In the FY 2020/2021, the sector attracted 6.8 percent of total implemented investment. It is the fourth sector after transportation and storage, real estate and manufacturing sectors (General Authority of Investment and Free Trade, 2022). The role of the agriculture sector differs geographically, with a higher share of employment in agriculture in Upper Egypt governorates, while Lower Egypt has a relatively higher share of GDP from agriculture (Kassim *et al*., 2018; Rocha *et al*., 2023; USAID, 2024; FAO, 2023).

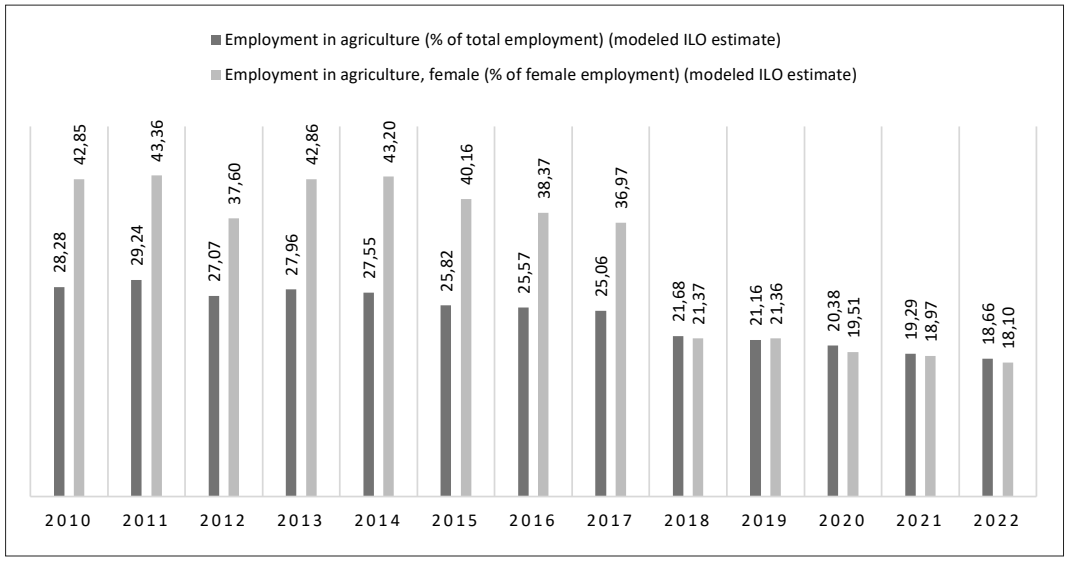
Agriculture used to be a major source of wage and self-employment in rural Egypt. In 2010, employment in agriculture counted for 28 percent of total employment. This share decreased over the years to reach 18.66 percent during 2022. Similarly, for female employment, with female agriculture employment was around 43 percent of female employment in the same year. However, this share decreased over time to reach around 18 percent of female employment in 2022 (Figure 2).

Figure 1 - Agriculture, forestry, and fishing, value added (% of GDP).



Source: Word Bank Group, 2024.

Figure 2 - Employment in Agriculture (2010-2022).



Source: World Bank Group, 2024.

This decline in the share of agriculture in total employment can be attributed to several factors, including the increase in worker productivity, rural-urban migration for better economic opportunities, and the diversification of the Egyptian economy towards industry and services. However, the agriculture sector remains the third most important sector in terms of GDP and main source of income for the low-income households, with a growth rate of 10.8 percent in the FY 2021/2022 (General Authority of Investment and Free Trade, 2022).

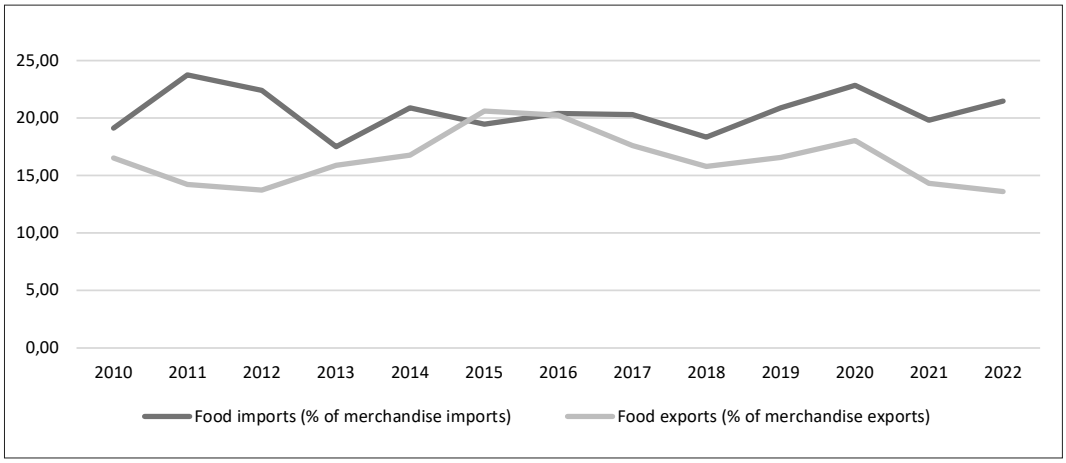
The agriculture production in Egypt is concentrated around the Nile River and the sector is dominated by smallholdings, with less than 1 hectare, supported by irrigation systems. Egyptian farmers cultivate around 4.6 million ha annually along the Nile River, and 2 million ha are cultivated in new lands in the desert. Around 80 percent of the cultivated area is covered by wheat, clover, rice and cotton. Cash crops as cotton and cereals as wheat are mainly used in the industrial sector as raw materials (Khalaf, 2017; World Bank, 2022).

Food and Beverage Sector

The Egyptian agriculture sector is characterized by strong backward and forward linkages with the rest of the economy. As a result, the food sector is one of the top five sectors with high labor absorption potential, with 13 percent of total non-petroleum exports, 500 Milliard EGP investment in the sector and 5,200 industrial institutions. The food and beverage sector is the first sector in employment and the second top industry by manufacturing value added, with 21 percent of value added in manufacturing in 2019 (FAO, 2024a). The sector employs over 750,000 individuals; this corresponds to around 35 percent of jobs in the manufacturing sector and approximately 16 percent of the overall labor force in the country's direct employment. Meanwhile, indirect employment in the Agrifood sector was estimated at approximately 2.25 million workers (Kamel and El Bilali, 2022; Rocha *et al.*, 2023; USAID, 2024).

The sector ranks the third one in terms of exports. Egypt exports high-quality but low value-added agriculture products. The sector represents a major source of foreign currency. However, Egypt is considered as a net food importer with food imports representing 21.48 percent of total merchandises in 2022, compared to food exports that represent around 13.61 percent of total merchandise (Figure 3).

Figure 3 - Food Exports and Imports (% of total merchandises) - 2010 to 2022.



Source: FAOSTAT, 2024.

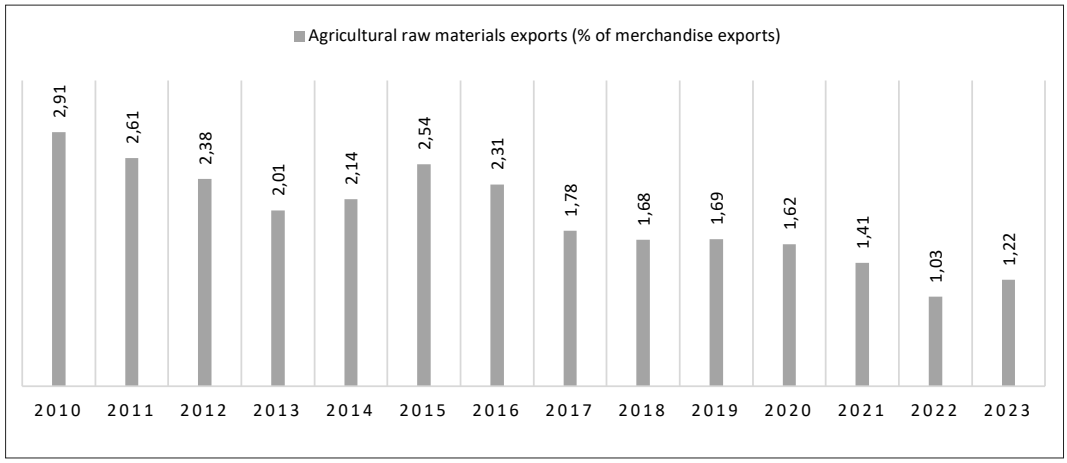
The food trade deficit balance is explained by the rising population with a population growth rate of 1.6 percent, putting pressure on food supply and widening the food supply-demand gap. Dependence on food, mainly cereal imports increased, with cereal dependency ratio is higher than 40 percent. The dependence on food imports leaves the country vulnerable to any fluctuation in international food prices, to external shocks and to any interruption in the global food supply chain. This was observed during the Food crisis of 2008, the COVID-19 pandemic and the Russo-Ukrainian war.

The country exports mainly raw products as cotton, fruits and vegetables, herbs and spices and imports intermediate and final products (Kamel and El Bilali, 2022; Rocha *et al*., 2023; USAID, 2024; Embassy of Switzerland in Egypt and UNIDO, 2022) (Figure 4). The value added of the Agrifood system is low and below the potential of the sector. Based on the estimates of the Oxford Business Group (2022), Egypt processes less than 10 percent of its fresh production and exports less than 1 percent of its processed products. Additionally, the Egyptian Agrifood sector suffers from high transaction costs because of the weak linkages between producers and processors, informality, and asymmetric information. Although Egypt is one of the world's leading producers of fruit and vegetables and the world's largest exporter of fresh citrus, Egypt is not on the list of top food processors for any of these items (Embassy of Switzerland in Egypt and UNIDO, 2022). Smallholders, who represents a majority of the domestic agriculture production, have limited access to the global value chain because of the competition and the quality and safety requirements. They are mainly poor, with small land area and limited access to technology and to market. They are forced to sell their products through the traders, most of the time without a legal contract. Additionally, the Egyptian food-processing sector is dominated by SMEs, which limits the benefits of economies of scale, leading to the manufacturing of products of sub-optimal quality and packaging. This might explain the low value added in the global value chain (Abu Hatab *et al*., 2021; Kamel and El Biali, 2022).

Food Consumption

Egyptians have diverse dietary habits, with staples like bread considered as a significant component of the Egyptian food basket. The share of dietary energy supply derived from cereals, roots and tubers is around 66 kcal/cap/day in 2018/2020. The increasing income resulted in an increase in protein consumption, processed food, imported goods and caloric restriction, mainly among the high-income households. While for the low-income households there is a heavy consumption of fats and sugars, mainly

Figure 4 - Agricultural Raw Materials (% of merchandise exports).



Source: Word Bank Group, 2024.

because of the food subsidies policy. The subsidy system covers around 73 percent of the Egyptian population. Subsidized bread is key component of the Egyptian households' food basket, produced mainly from imported wheat. Egypt is the first wheat importer worldwide, spending around 3 billion USD yearly on wheat imports. With soaring international wheat price, the subsidies budget imposes more pressure on the government's budget (Kamel and El Bilali, 2022; Ben Hassen and El Bilali, 2022).

Food expenditure represents more than 30 percent of total expenditure of low-income households. This important share leaves the poor households and their food security vulnerable to any price or economic shocks as what was observed during the COVID-19 pandemic. According to the Economic Research Forum's MENA COVID-19 Household Survey data; around 48 percent and 46 percent of the 2,007 households surveyed were unable to buy the usual amount of food due to increased prices and lower incomes, respectively. While 44 percent had to reduce the meals or portions they usually eat. And around 21 percent of households were unable to purchase the usual amount due to food shortages. These percentages are higher among individuals living in rural areas.

Recently, the Russo-Ukrainian war and the currency depreciation resulted in soaring food prices, putting more pressure on household's purchasing power and threaten food security. Food costs in Egypt increased by estimated 17 percent in 2022 (Ben Hassen and El Bilali, 2022). According to the World Bank (2023) forecast, food inflation accounted for 24 percent to 33 percent of the prevalence of food insecurity in the MENA region. In Egypt, 27.5 percent of the population are considered as moderate or severe food insecure (FAOSTAT, 2024). The combined effect of the food, fuel, and fertilizer shocks had dire effect on rural households who mainly depend on agriculture as a source of income. An estimate of 13 percent of the population may suffer from a deterioration in diet due to deprivation of one of the food groups such as grains, fruits, vegetables, dairy products, protein foods and added fats (Abay *et al*., 2022).

2. Agrifood policies and challenges faced by the Egyptian agrifood sector

Agrifood policies shape the different stages of the agrifood sector from production to consumption. The implemented policies and strategies, since 1950s, were characterized by a dominant role of the government and public sector in the different stages of the food supply chain. The aim was to ensure equitable distribution of income and affordable food to urban areas from rural and peri-urban areas. Policies include land reclamation for agriculture, investment in irriga-

tion infrastructure, price control, crops rotation, areas allocation and agriculture input and food subsidies. Government's control over producer prices and crop procurement is a key agrifood policy instrument used by the Egyptian government since the 1950's. These policies aimed to guarantee enough production from strategic crops such as wheat and to ensure food security. Agriculture subsidies as fertilizers, credit and pest control had been provided by the government to encourage adoption of new technologies and reduce risks, mainly for small farmers. The agriculture cooperatives play a significant role in these policies. However, these policies resulted in a decline in yields and exports. The dependence on imports increased and the rural-urban gap increased. Land reform measures applied in the 1950s, and the cumulative effects of inheritance laws, resulted in land fragmentation. Egyptian agriculture sector is characterized by smallholdings that hinder the farmer's ability to benefit from economies of scale and the implementation of new technologies (Gouell and El-Miniawi, 1994; FAO, 2023; World Bank, 2023; Salem *et al.*, 2024; Kassim *et al.*, 2018).

Over the years, with structural reform programs, the role of the public sector diminished leaving more space to private sector to drive growth and job creation in the agrifood sector (FAO, 2023). There were two agriculture policy reform programs implemented since late 1980s: the Agricultural Production and Credit Project (1987-1995); and the Agricultural Policy Reform Program (1996-2002) (Kassim *et al.*, 2018). The reforms consisted of removing price controls, input subsidies, crop areas control, crop procurement and control of private farm processing and marketing. Regarding trade policies, there was a reduction in the maximum tariffs and adjustments of non-tariff barriers. In addition to comprehensive research and extension programs that developed new high yield crop varieties. These policies resulted in the increase of income, productivity and the Egyptian sector's exposure to the international competition. Moreover, major shifts in cropping pattern were observed. The area devoted to cotton decreased from 15 percent of total cropped area to only 8 percent. While the area devoted to fruits increased by 165 percent over the same period. And areas devoted to winter vegetables increased by 94 percent and summer vegetables increased by 32 percent (Gouell and El-Miniawi, 1994; FAO, 2023; World Bank, 2023; Salem *et al*., 2024).

More recently agrifood policies focus on crop improvement and crop variety development through research to increase crop yield, improvement of storage capacities, and reduction of transaction costs. The policies aim to increase the Egyptian sector's participation in high value global value chains and to increase the competitiveness of agricultural products in the international markets. These objectives are reflected in the Sustainable Agricultural Development Strategy towards 2030. The strategy aims to ensure food security, decrease dependence on imports and increase exports. The strategy promotes the sustainable and efficient use of natural agricultural resources, land, water, increasing agricultural investment and achieving rural development (Kassim *et al*., 2018; FAO, 2024b).

Agrifood policies and measures are used to overcome challenges faced by the agrifood system in Egypt. These challenges include climate change, energy, water and land scarcity, poverty, increasing population and increasing dependence on imports.

Climate Change and the agrifood sector

Egypt is highly vulnerable to climate change, among the top five (African Union, 2023). Climate change characterized by high temperature, water scarcity, limited precipitation and CO^2 emission threaten the different stages of the agrifood sector in Egypt. The environmental considerations might jeopardize the different dimensions of food security in the country.

Food availability is expected to be affected by climate change. Increasing temperature and variation in precipitation rates would result in a decline of several crop yields, with an estimated decline of wheat production by 15 percent, rice by 11 percent and maize by 19 percent by 2050 The delta region, where agriculture production is concentrated, is expected to lose around 30 percent of its food production by 2030. Though, cotton production is expected to increase by 17 percent by 2050 as a result of the increasing tem-

perature (Perez *et al*., 2021; UNFCC, 2022; Abu Hatab, 2023; UNDP, 2023).

Limited water resources are one of the key challenges facing-the agrifood system in Egypt Droughts, floods and water scarcity have negative drawbacks on agriculture and food production. The used irrigation system, the extensive rice cultivation and intensive agricultural production techniques put more pressure on the already scarce water resources. Available water from Nile River, the main source of irrigation, is expected to vary with the increasing temperature, rising sea level and the Grand Ethiopian Renaissance Dam (UNDP, 2023).

Several laws and policies were implemented to consider environmental aspects and the negative impact of climate change on agriculture and natural resources. Egypt achieved a significant progress in climate change adaptation. Adaptation measures include change in sowing dates, in crop patterns and switching to heat and drought tolerant crops (African Union, 2023). Egypt's 2014 Constitution includes several environmental laws, as Law No. 48 of 1982 on protection of the Nile River, and its amendments and Law No. 12 of 1982 on irrigation and drainage, and its amendments. The government had regulated rice production and encouraged shifts from the flood to pressurized irrigation in old land to control the drain of water supply. In the extended reclaimed land in the desert, new efficient irrigation technologies are implemented. In 2021, a new law on water resources and irrigation was approved by the Parliament. The law imposes penalties on farmers who do not respect the specified area of land cultivation (Perez *et al*., 2021; UNFCC, 2022; FAO, 2023; Abu Hatab, 2021; El Nour, 2024).

Other resources challenges include land and energy. Soil degradation resulting from the intensive agriculture practices and informal urbanization are other significant challenges to agriculture production. In 2018, the Parliament amended the Agriculture Law and impose more strict penalties for informal construction on agricultural land (El Nour, 2024). Several reforms of energy subsidies have been implemented to face energy scarcity, limit wasteful consumption and ensure transition to clean energy. Moreover, the Sustainable Development Strategy of Egypt 2030 seeks a series of institutional and legislative reforms to ensure efficient management of natural resources as water and to promote sustainable consumption patterns. The strategy accounts for environmental consideration and encourages the participation of the private sector and civil society (UNDP, 2023).

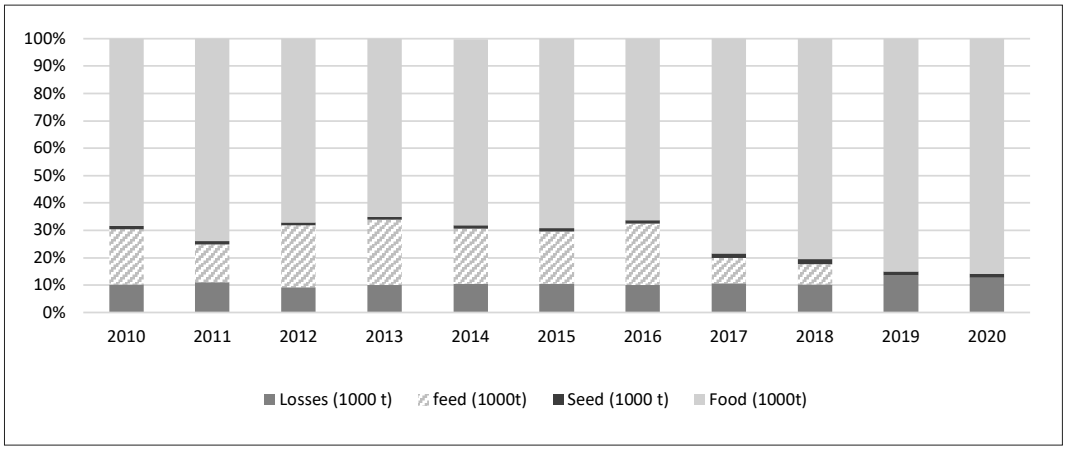
The decline in agriculture and food production, from climate change, would result in an increase in food prices, limiting the economic access to food. Additionally, vulnerable farmers in rural areas affected by climate change might lose their income, sell their assets and fall into poverty as a result of climate change (Ibrahim and Ramadan, 2023). The Egyptian government applied several measures and policies to ensure food consumption, mainly for poor households. These policies will be discussed in more details in the next sub-section.

Poverty and Food Subsidies

Socio-economic challenges such as poverty, rural-urban migration, and income inequality threaten food security in Egypt, mainly economic access to food. Poverty is concentrated in rural areas and food expenditure represents more than 30 percent of poor household total expenditure.

Several agrifood policies focus on consumption to ensure food security. Food subsidy system is a key food policy in Egypt, implemented since the Second World War to ensure access to basic food items. It has been considered an effective social safety tool for protecting the poor, mainly during times of economic hardship. The Egyptian food subsidy system plays a major role in reducing poverty and ensuring food security. Estimates show that poverty would increase by 3 percent if the food subsidy system is eliminated (El-Laithy, 2020). However, food subsidies constitute an important burden on the government's budget. Food subsidy budget was 32 percent of the total subsidy budget in the 2016/2017 fiscal year (Ministry of Finance, 2017). Throughout time, a variety of problems plagued the food subsidy system including ineffective targeting, leakage and waste and dependence on imports. The subsidized food products are energy-rich, but nutritionally poor in carbohydrates such as

Figure 5 - Wheat uses 2010-2022.



Source: FAOSTAT, 2024.

cereals, wheat and sugar. Excessive consumption of subsidized foods in Egypt leads to high levels of overweight (45 percent) and high levels of malnutrition (a quarter of Egyptian children) (Smulders *et al*., 2013; SOLIDAR, 2013; Breisinger *et al*., 2013; Ecker *et al*., 2016; Ramadan, 2015 and UN-ESCWA, 2015).

The Egyptian Government intervention in the different stages of the subsidized products supply chain distortions the market, creating a complex system of price controls, compulsory procurement, and controlled distribution through government outlets (Gouell and El-Mikawi, 1994). As discussed by Ramadan and Thomas (2011), such intervention prevents the economic agents from having their expected response, reducing the beneficial effect at any stage and limiting its effects passing through to other agents at other levels of the chain. The intervention in the bread supply chain over the years, resulted in the leakage of the purchased wheat to the black market and as animal feed instead of reaching the targeted population (Figure 5).

The high cost of the system and its ineffectiveness due to excessive waste and the lack of precise targeting of those who are eligible, and the rise in international prices for wheat and various food products, shed the light on the importance of reforming the Egyptian food subsidy system.

Since 2014, many reforms had been implemented to the system. These reforms include liberalizing the subsidized products supply chain, especially the local bread supply chain. This reform ensures that consumers are the main beneficiary of the subsidies. Bread subsidy is not universal anymore. The new bread system consists of providing 150 subsidized loaves of bread per month per individual for households who have bread ration cards. The new system provides a more balanced diet by offering 33 different products, allowing consumers to choose products that match their preferences and needs. Additionally, the beneficiary database was updated and revised to reduce inclusion and exclusion errors (Abdallah and El Shawarby, 2018; FAO, 2015).

Supply-Demand Gap in an uncertain world

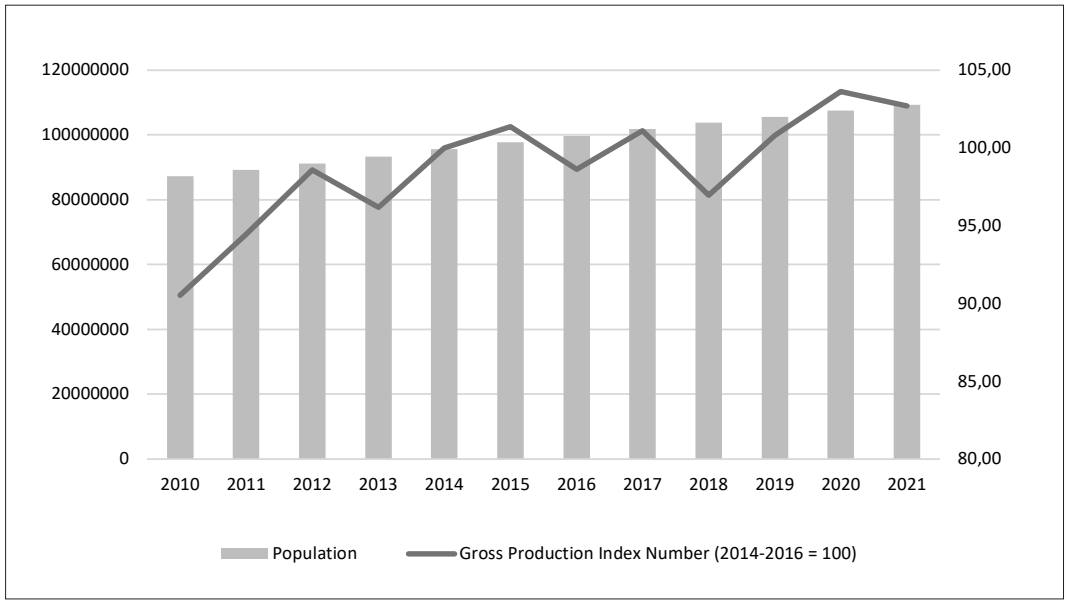
The local agricultural production is not sufficient for the rising consumption. Egyptian population annual growth rate is 1.5 percent, with total population reaching more than 100 million Egyptians in 2021. Agricultural production is varying over time. In 2021, Gross Production Index increased to 102.70 compared to 90.53 in 2010, with 2014-2016 as base year (Figure 6). This increase in agriculture production is not sufficient to provide enough food supply for Egyptians, mainly during crisis.

Figure 7 shows the variation of food supply per capita per day. It had been declining over years since 2008. The supply-demand gap increases dependence on imports, leaving the

country vulnerable to any disturbance in the global food value chain and fluctuations in international food prices. This was observed during the different crisis over the years, as the food and fuel crisis of 2008, the COVID-19 pandemic and the beginning of the Russo-Ukrainian war. In 2008, the government's reaction to the food price crisis consisted of expanding the food subsidies system to protect the poor from any rise in food prices. Other measures include increasing the wages of public employees, reducing tariff rates on several commodities, and banning rice exports (UN-WIDER, 2015). During the pandemic, the precautionary measures and policies implemented disrupted the different stages of the food supply chain, locally and globally. These measures threaten food security with negative drawbacks on agriculture production and the livelihoods of poor households. Individuals limited mobility and income loss negatively affected food access, physically and economically.

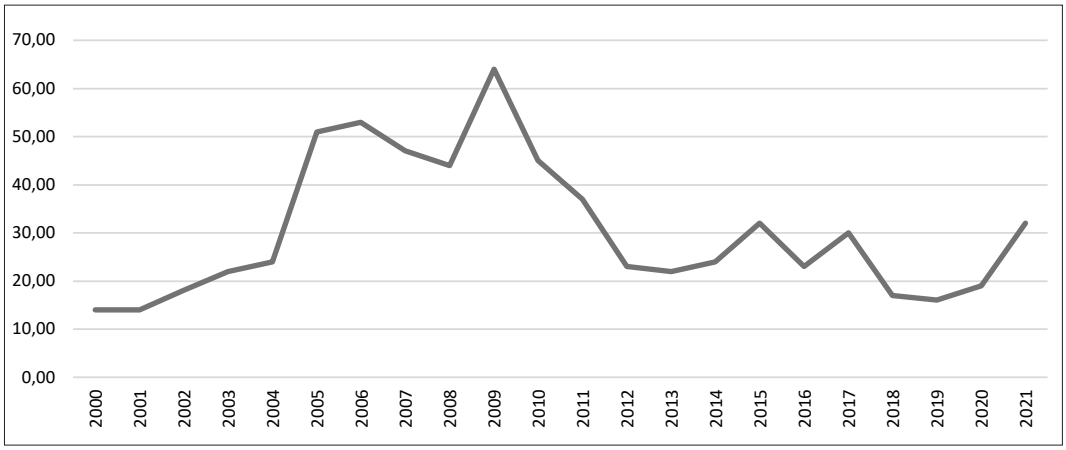
As a result, several policies were implemented to mitigate the negative drawback on the different dimensions of food security. Policies include the delay of agricultural taxes, new credit facilities to farmers, economic stimulus package to SMEs in fish, poultry and livestock and expanding existing social protection programs as Takaful and Karama programs. Additionally, the government invested in new silos and modern storage capacities to reduce the grains waste. The low level of the technology used in the different operations, poor infrastructure and storage are important drivers of the losses at the different stages of the value supply chain. Loss in the Egyptian food production is estimated at 14.2 percent. Losses in wheat, a strategic crop in Egyptian diet, is around 13 percent. The Egyptian government increases investment in land reclamation and cultivation and infrastructure project in the agricultural sector. These projects include field irrigation improvement projects and high-tech storage silos. As a result, the wheat cultivated area exceeded 3.4 million feddan, and the grain silos capacity doubled to enhance food availability (FAO, 2020; Salem *et al.*, 2024). As showed by Figure 7, food supply per capita started increasing since 2020, reflecting the positive effects of the different new policies and investment in the sector.

Figure 6 - Egyptian Population and Agriculture Gross Production Index.



Source: World Bank Group, 2024 and FAOSTAT, 2024.

Figure 7 - Per capita food supply variability (kcal/cap/day).



Source: FAOSTAT, 2024.

3. Concluding remarks and future directions

The chapter overviews the agrifood sector in Egypt and its different stages, agriculture production, food and beverage industry and food consumption. Egypt's agrifood system faces various challenges but also presents opportunities for growth, job creation and food security. Several agrifood policies had been implemented over the years to ensure food availability, access to food and to address the challenges faced by the sector as climate change, poverty and vulnerability to food imports.

Since 1950, the agrifood policies were characterized by a dominant presence of the government and public sector. Policies as land reforms aimed to reduce inequality. Though this policy resulted in land fragmentation and smallholdings. Similarly, food subsidy, the key instrument of the Egyptian agrifood policy resulted in price distortion and poor diet habits for poor households. However, over the years, several reforms had been implemented. The reforms are characterized by a shrinking role of the public sector leaving space to the private sector to lead job creation and economic growth.

Different new laws, regulations and investments had been implemented. As a result, Egypt succeeded in increasing agricultural productivity, cereals storage capacity and access to basic food items by vulnerable households. The agriculture sector in Egypt is a resilient sector, but the agrifood sector is still not on full potential. Egypt is mainly located in the downstream stage of the global supply chain.

More policies and measures are required to increase investment and innovation in the sector and increase its contribution to the global value-added supply chain. Climate Smart Agriculture and strategies resilient to climate change are necessary to ensure the sustainability of the agricultural production. Investments in rural development, nutrition, education programs and increasing small farmers' access to technology and information would increase their productivity, their income and their resilience. Reducing transaction costs and increasing investment in infrastructure for distribution and storage would increase food availability and affordability and enhance food security.

References

Abay A.K., Abdelradi F., Breisinger C., Diao X., Dorosh P.A., Pauw K., Randriamamonjy J., Raouf M., Thurlow J., 2022. Egypt: Impacts of the Ukraine and global crises on poverty and food security. IFPRI, *Global Crisis - Country Series*, Brief 18.

Abdallah M., Al-Shawarby S., 2018. The Tamween Food Subsidy System in Egypt: Evolution and Recent Implementation Reforms. In: Alderman H.,

Gentilini U., Yemtsov R. (eds), *The 1.5 Billion People Question. Food, Vouchers, or Cash Transfers?* Washington, DC: World Bank.

Abu Hatab A., 2023. *Egypt's Food System Under a Perfect Storm*, https://www.siani.se/news-story/egypts-food-system/.

Abu Hatab A., Lagerkvist C.J., Esma C.J., 2021. Risk perception and determinants in small- and medium-sized agri-food enterprises amidst the COVID-19 pandemic: Evidence from Egypt. *Agribusiness*, 37: 187-212.

African Union, 2023. *Egypt: Country Food and Agriculture Delivery Compact*, https://www.afdb.org/fr/documents/egypt-country-food-and-agriculture-delivery-compact.

Ben Hassen T., El Bilali H., 2022. Impacts of the Russia-Ukraine War on Global Food Security: Towards More Sustainable and Resilient Food Systems? *Foods*, 11, 2301. https://doi.org/10.3390/foods11152301.

Breisinger C., Raouf M., Thurlow J., Wiebelt M., 2019. *Beyond the business case for agricultural value chain development: An economywide approach applied to Egypt*. MENA RP Working Paper, 18. Washington, DC and Cairo, Egypt: IFPRI. https://doi.org/10.2499/ p15738coll2.133192.

Ecker O., Al-Riffai P., Breisinger C., El-Batrawy R. 2016. *Nutrition and Economic Development: Exploring Egypt's Exceptionalism and the Role of Food Subsidies*. Washington, DC: International Food Policy Research Institute (IFPRI) Book.

El-Laithy H., 2020. COVID-19 and social protection: from effective crisis protection to self-reliance. IFPRI-Egypt, https://www.slideshare.net/ifpri/heba-ellaithy-cairo-university-2020-ifpri-egypt-covid19-and-social-protection-from-effective-crisis-protection-to-selfreliance.

El Nour S., 2023. *Agricultural and Food Policies in Egypt Between 2014 And 2021: What Changed and What Didn't*. Arab Reform Initiative, Egypt Policy Dialogues.

Embassy of Switzerland in Egypt, UNIDO, 2022. Agrifood and Covid-19 In Egypt: Adaptation, Recovery and Transformation. Rapid qualitative assessment. *Inclusive and Sustainable Industrial Development.*

FAO, 2015. *Regional Overview of Food insecurity (NENA) Strengthening Regional Collaboration to build Resilience for Food Security and Nutrition*.

FAO, 2023. *Climate-Smart Policies to Enhance Egypt's Agrifood System performance and Sustainability*. FAO Investment Center, Country Investment Highlight.

FAO, 2024a. *Egypt at a glance***,** https://www.fao.org/egypt/our-office/egypt-at-a-glance/en/.

FAO, 2024b. *FAOLEX Database - Egypt***,** https://www.fao.org/faolex/results/details/en/c/LEX-FAOC141040/#:~:text=Purpose%20of%20the%20Sustainable%20Agricultural,utilization%20of%20its%20environmental%20advantages.

FAOSTAT, 2024. *Food and agriculture data***,** https://www.fao.org/faostat/en/#home.

General Authority of Investment and Free Trade, 2022. *Egypt Facts and Figures*, https://www.investinegypt.gov.eg/flip/library/PDFs/reports/factsandfigures/Egypt%20snapshoot%20En%20(1).pdf.

Gouell A., El Miniawy A., 1994. Food and agricultural policies in Egypt. In: Allaya M., Thabet B., Allaya M., Thabet B., *Food and agricultural policies in the Middle East and North Africa: Egypt, Lebanon, Morocco, Sudan, Tunisia, Turkey*, Cahiers Options Méditerranéennes, n. 7. Montpellier: CIHEAM, pp. 7-68.

Hosni R., Ramadan R., 2018. Food Subsidy or Cash Transfer: Impact of the Food Subsidy Reform on Egyptian Households. *New Medit*, 17(3). DOI: 10.30682/nm1803b.

Ibrahim E., Ramadan R., 2023. *Would Climate Change Jeopardize Food Security in the MENA Region?*, presented at the Arab Society for Economic Research 17th Annual Conference-Dubai.

IFPRI, 2018. *Impact Evaluation Study for Egypt's Takaful and Karama Cash Transfer Program*, Synthesis Report: Summary of Key Findings from the Quantitative and Qualitative Impact Evaluation Studies.

Kamel I.M., El Bilali H., 2022. Agrifood Sustainability and Food Security in Egypt. In: Leal Filho W., Kovaleva M., Popkova E. (eds), *Sustainable Agriculture and Food Security*. Cham: Springer.

Kassim Y., Mahmoud M., Kurdi S., Breisinger C., 2018. *An Agricultural Policy Review of Egypt - First Steps Towards a New Strategy*. IFPRI, MENA regional program - Working paper 11.

Khalaf N., 2017. *Greening the Egyptian economy with agriculture*. Middle East Institute, https://www.mei.edu/publications/greening-egyptian-economy-agriculture.

Oxford Business Group, 2022. *How Egypt plans to expand agricultural output*, https://oxfordbusinessgroup.com/reports/egypt/2022-report/economy/fertile-lands-new-initiatives-to-increase-the-availability-of-arable-land-boost-crop-productivity-and-ensure-water-security.

Perez N.D., Kassim Y. Ringler C., Thomas T.S., Eldidi H., Breisinger C., 2021. *Climate-resilience*

Policies and Investments for Egypt's Agriculture Sector: Sustaining Productivity and Food Security. Washington, DC: IFPRI.

Ramadan R., 2015. *Demand and Supply Challenges of Food Security in Egypt*. Egyptian Center of Economic Studies (ECES) - Review n. 2.

Ramadan R., Thomas A., 2011. Evaluating the impact of reforming the food subsidy program in Egypt: A Mixed Demand approach. *Food Policy*, 36(5): 638-646.

Rocha J.S., Sanchez Y., Fathallah H., 2023. Climate-Smart Policies to Enhance Egypt's Agrifood System Performance and Sustainability. *Food and Agriculture Organization of the United Nations Country Investment Highlights*, 22.

Salem S., Dhehibi B., Omer A.M., Abd-Allah E.A., Souissi A., Akramov K., Baum M., 2023. *Policy Constraints an d Key Drivers for Enhancing Egyptian Agrifood Systems*. Policy Note.

Smulders M., Aw Dahir M., Dunn K., Verduijn R., 2013. *Food Security and Nutrition in the Southern and Eastern Rim of the Mediterranean Basin*. Food and Agricultural Organization of the United Nations, Regional Office in Near East.

SOLIDAR, 2013. *Investing in Social Protection and Decent Work in The Middle East and North Africa*, Briefing n. 61.

Tsakok I., 2023. *Short of Water and Under Increasing Pressure to Deliver Food Security: Key Policy Considerations. The Case of the Arab Republic of Egypt*. Policy Center for the new South.

UNDP, 2015. *Managing the environmental protection ecosystem in Egypt: Towards achieving a sustainable environment and addressing climate change risks*, https://www.undp.org/sites/g/files/zskgke326/files/migration/arabstates/English_Full-Report_Sep-12-209-248.pdf.

UN-ESCWA, 2015. *Priority issues in achieving social development in the Arab region. Extending social protection to persons with disabilities and informal workers in the agricultural sector*, E/ESCWA/SDD/2015/IG.1/4. Committee on Social Development, Tenth session, Rabat, 8-9 September 2015.

UNFCC (United Nations Framework Convention on Climate Change), 2015. *Nationally determined contribution - Egypt*.

UNU-WIDER, 2015. *The political economy of food price policy in Egypt*. Research Brief 2015/4. Helsinki: UNU-WIDER.

USAID, 2024. *Agriculture and Food Security*, https://www.usaid.gov/egypt/agriculture-and-food-security. (accessed: 23 March 2024).

World Bank, 2023. *Altered Destinies: The Long-Term Effects of Rising Prices and Food Insecurity in the Middle East and North Africa*. World Bank, Middle East and North Africa Region, MENA Economic.

World Bank Group, 2024. *World Development Indicators*, https://databank.worldbank.org/source/world-development-indicators.