Chapter 17
Strategic Food Reserve Management and Food Security in Saudi Arabia

Mutasim Mekki Elrasheed

Abstract Strategic food reserve is a strategy that is implemented by many countries in the world, including Saudi Arabia (KSA), to sustain food security and encounter international food market shocks. In this context, the Ministry of Environment, Water and Agriculture (MEWA), KSA, has assigned the role of the supervision and execution of food security, including strategic food reserve, to the Saudi Grain Authority (SAGO) (Currently known as General Food Security Authority). This chapter describes the strategic reserve and its management as a tool for sustaining food security in KSA. It also sheds light on the role of SAGO in managing strategic food reserves and achieving food security. Moreover, it describes the locations and capacities of storage facilities; grain buying modalities; grain selling and distribution practices; and flour mill companies in KSA. It is clear that private business has fully engaged in achieving KSA Vision 2030 of flour mill sector privatization. It is also evidence that grain storage capacity is increasing over time and is distributed all over the country. Furthermore, KSA has a well-established body called the commodity abundance committee (CAC), constituted of representatives from different institutions, including SAGO, responsible for monitoring food strategic reserves in the Kingdom. In doing so, the CAC used active early warning systems to identify food stock levels in the country and determine the required actions accordingly. Actions range from the provision of finance, support, and/or direct purchase of critical food items. It is also evidence that SAGO has succeeded in sustaining a stable food reserve during critical times.

Keywords Commodity Abundance Committee · Fodder · Food security · Food stockpiles · General Food Security Authority · Saudi Grains Organization (SAGO) · Strategic food reserve · Wheat

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1 Introduction

A strategic reserve is the reserve of a commodity that is controlled and maintained by the government to protect the economic and national security of a country or to meet unforeseen events. The term strategic reserve is an emerging term on the global scene. Yet, the stoking process has been known since ancient times, especially in the field of foodstuff and in expectation of emergencies. In this regard, it is important to differentiate between different types of stocks. According to Teng and Darvin (2018), in their quotation of Abbott (2013), there are two types of stocks: working stocks and buffer or reserves stocks. Working stocks or pipeline stocks are the stocks that are held by agents/organizations to ensure continuous operations. On the other hand, reserved stocks are the food that is stored more than the working stocks. Both types of stocks are usually used to influence markets or maintain food supplies over the years.

According to Caballero-Anthony et al. (2015), reserves are classified into three categories of stockpiles: public, private, and household. The first category is directly owned, monitored, and administered by the government, while the second category is owned by private enterprises but jointly monitored and co-administered by private owners and the government. On the other hand, household stockpiles are the stock that is directly owned by the consumer and/or small producer and monitored by the government. They went further and classified public stockpiles into four types: emergency/humanitarian stocks, buffer stocks, safety net stocks, and stocks for trade. The emergency/humanitarian stocks are stocks that deal with food access and are used to protect vulnerable groups in the event of food shortage during emergencies, while the buffer stocks are used to guarantee stability in the availability and price of food. Moreover, safety net stocks are directed to improve the availability and access for certain groups of the population who face chronic food security and the fourth category, stocks for trade, is usually held by exporting countries.

Based on the fact that the Kingdom of Saudi Arabia (KSA), is a water-stressed country and heavily depends on food imports for sustaining its food security (Baig et al. 2019), the Ministry of Environment, Water and Agriculture (MEWA) has developed a comprehensive national food security strategy. The supervision and execution of this strategy is assigned to the Saudi Grains Organization (SAGO) according to MEWA Minister's decision No. 1/620, dated 1st July 2017 (17/10/1439 H) (SAGO 2021). Moreover, MEWA has identified a 10-priority scope of work, among which the food strategic reserve program occupied the second position. However, the high costs associated with food strategic reserve and storage are considered among the challenges that face the achievement of food security in KSA (SAGO 2021). It is worth noting that, MEWA has adopted the initiative for an effective food strategic reserve and storage program, which includes an early warning system and agricultural markets information, in its national transitional programs to encounter food security risks (MEWA 2022).

The objective of this chapter is to describe strategic reserve management in KSA as a tool for sustaining food security. This chapter is divided into five sections.

Section 1, is the introduction, while Sect. 2, gives a snapshot of KSA agro-food products; Sect. 3, covers the basic concepts of food security and strategic reserve. Section 4 is devoted to strategic reserve management in KSA, while the last section is the drawn conclusion and prospect.

2 Snapshots on Saudi Agro-Food Products

The Kingdom of Saudi Arabia (KSA), the largest country in the Arab and Middle East country and the main petroleum producer in the world, is located in the south-western part of Asia. The country is well endowed with different natural resources and diversified environmental conditions. However, the environmental situation in the country is not suitable for producing sufficient food products to meet its population needs and reach the level of domestic self-satisfaction. The weather condition of KSA is hot, arid, and dry; the soil is sandy with low fertility; and the water sources are very limited to meet agricultural needs. Moreover, a very minute percentage of land (1.6%) is classified as arable land (World Bank 2022). Such a situation pushed the Kingdom to spend more than 7 billion USD in 2019 on importing its food requirements (WITS 2022). Statista (2021) estimated the average self-sufficiency ratio of food items in KSA in 2019 as 36.1%. However, despite the unsuitable conditions, the agricultural sector contributes significantly to the KSA economy. Available literature showed that the agricultural sector contributes substantially to achieving food security and attaining self-sufficiency in the country. In this regard, it is worth mentioning that, in 2021 KSA has achieved the self-sufficiency level from fresh milk (121%), table egg (112%), and date (118%) and is moving forwards to attain it from other agricultural commodities (General Authority for Statistics 2021). Moreover, about 300 thousand small-scale producers are engaged in the agri-business and about one million of the population earn their living from agriculture. The sector also adds 64 billion Saudi Riyals to the country's GDP and supplements the non-petroleum GDP by 4% (MEWA 2017).

The kingdom has gone steps ahead in sustaining its food security. No wonder, Vision 2030 emphasized reducing the dependence on the oil sector, diversifying the country's income sources, sustaining food security, and attaining efficient use of water in addition to others (Vision 2030 2023). In this context, MEWA (2017) has released its national agricultural strategy for 2030. The strategy gives much attention to agro-food products: agricultural products (cereals, vegetables, fruits, and green fodders), livestock and poultry products (live animals, red meat, broiler chicken, fresh milk, and table egg), and fishery (both captured and cultured fish). The strategy has seven strategic objectives and five pillars. Moreover, in 2020 KSA declared a significant improvement in the self-sufficiency level of certain agro-food products. For instance, the Kingdom has achieved self-sufficiency from dates, table eggs, and fresh milk (MEWA 2020a). However, it achieved 60% and 41% sufficiency levels from broiler chicken and red meat, respectively (MEWA 2020a, b). Baig et al. (2022)

argued that strengthening the agriculture extension systems in KSA would help in achieving food security and addressing the adverse climate change effect.

In recent years, Saudis food imports witnessed a continuous increase over time, predominantly cereals, rice, meat, and dairy products. In 2019, food imports grew by 6.5% compared with 2018 and reached 144.3 billion US dollars (Best Food Importers 2021). According to Baig et al (2019), the main imported food items were barley, sheep, rice, chicken, and wheat constituting about 40% of the total imports. In this regard, Best Food Importers (2021) argued that KSA is the major importer of cereals, with a value reaching up to 4.3 Billion US dollars. However, rice, barley, corn, and wheat are the main imported cereal crops. In this context, Kashifi et al. (2022) stated that the import of major cereal crops by Saudi Arabia significantly reduces the country's water footprint (embedded water in the trading of commodities), that is, solves the problem of local water shortage. They also argued that the annual decline of consumable water footprint due to the imports of wheat, maize, rice, and barley is estimated at 24 billion cubic meters (M^3) per year on a global scale. Moreover, trades of cereal crops in the Kingdom significantly reduced water consumption, energy usage, and CO_2 emissions.

3 Concept of Food Security and Strategic Reserve

3.1 Concept of Food Security

Food security is the situation that "exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active productive and healthy life" (FAO 1996). According to FAO (2001), the objective of domestic food security is the assurance of readily available food supplies in sufficient quantities and quality within the purchasing power of even the poorest consumers all year round – a target that centered heavily on the improvement of production, processing, storage, and distribution. Based on the aforementioned information, food security is composed of four dimensions: availability, accessibility, utilization, and sustainability. Food availability is the situation that occurs when sufficient quantity and quality of food exist in a particular place and time (Brown et al. 2015; Ahmed et al. 2022). Based on the available literature, food availability is concerned with the supply side of food security (Brown et al. 2015), and is composed of different items such as food production, trade system, packaging transport, and storage (Ingram 2011). Whereas, the focus of food accessibility is the demand side of food security which is greatly affected by the physical, economic, social, and technological situations of the individuals. Food utilization refers to the efficient utilization of the available and accessed food to meet an individual's nutritional needs. Many factors in the literature are found to be affecting food utilization such as food safety, quality, consumption patterns and trends, food processing, storage, and preservation facilities. Lastly, food stability

refers to the sustainability of all food security dimensions over time (Ahmed et al. 2023). In all aspects, household access to a stable and sustainable food supply is a prerequisite for the formation of food security.

3.2 The Concept of Strategic Reserve

Strategic grain reserves, which are also called emergency food reserves or food security reserves, have gained great attention after the global food crisis of 2007–08 (IFPRI 2010). Since then it is considered a crucial element of food security strategy in the world. It is worth noting that the strategy of food reserve has been in use for thousands of years and proved to be highly effective in sustaining food, nevertheless, they need to be properly established (Murphy 2009). Nowadays, grain reserves are gaining increasing attention for protecting food supplies from price and supply uncertainty. Moreover, most governments maintain a belief that food reserves can act as a buffer from disasters and climate change shock, moderate interruptions in trade due to export bans (Lassa et al. 2019), and smooth out price volatility (Murphy 2009). Furthermore, Ahmed et al. (2012) described the working mechanism of the strategic reserve agency in Sudan, which can be summarized as purchasing and storing grains during the surplus seasons to protect producers from grain price drop and selling and/or distributing it during deficit seasons or in cases of emergencies. However, this mechanism might not suit all countries due to the particularity of each. The stabilization of commodity prices improves the welfare of both producers and consumers by developing the whole business. In this regard, Larson et al. (2014) developed a competitive storage and trade model, based on Middle East and North Africa (MENA) wheat markets and the rest of the world. They argued that the strategic inventory policy succeeded in protecting consumers in the region from steep price spikes in addition to lowering the price in the MENA region. However, they mentioned that achieving successful strategic reserve programs requires holding greater reserves. On the other hand, Pierre et al. (2018) studied the impact of the Tanzanian National Food Reserve Agency (NFRA) on maize market prices and argued that the pricing strategy used by NFRA had a limited overall impact on prices during the period 2010–2014, despite its significant impact on some regional markets.

The idea of food reserves comes in response to the timeless characteristics of agriculture production, that is, the existence of seasonal constant, inelastic demand coupled with variable short-run supply (Murphy 2009). Accordingly, government intervention through reserving food is to correct the aggregate food market's failure, smooth out spatial and time prices volatility, complement or replace the private sector and/or prepare for food emergencies (Murphy 2009). However, for developing countries, two cautions should be taken into consideration. The first one is the unavailability of the required food on the world market; and, the second is the unaffordability of food, especially during the prevalent food shortages.

The grain reserves strategy might not be a suitable measure for solving chronic hunger as people who live with hunger lack purchasing power, not a food supply (Murphy 2009). Accordingly, a grain reserve policy in a situation of chronic food insecurity should be complemented by other policies, containing some methods of food aid such as the U.S. food stamp program, consumer subsidies, or other kinds. From a policy perspective, grain reserves have some drawbacks: it costs money, creates distorted markets; includes guesswork based on transparent and accountable verdict, in contrast, competition is better financed, informed, and politically powerful (Murphy 2009). Along the same line, Würdemann et al. (2011) argued that, despite the numerous and valuable role played by food reserves on food security, but still maintaining and operating publicly held reserves has some disadvantages such as high cost which is usually incurred in the investment, maintenance, monitoring and operating reserve. In this regard, the World Bank (2021) identified three areas for improving strategic grain reserves to enhance the food security situation in Zambia and Zimbabwe. These areas are (a) reduction of the costs of strategic grain reserve management (fiscal costs); (b) improvements in the delivery and distribution of emergency assistance; and (c) increasing the role of the private sector.

Based on the experience of some South Sahara African countries, it was found that the usage of on-farm and off-farm storage capacity and agro-processing techniques add considerable value to products and increase their shelf life (Adeyeye 2016). Furthermore, the same author added that the shortages of food preservation capacity in the South Sahara African countries are considered among the main limiting factors that affect their food and nutrition security. Accordingly, he stressed the importance for those countries to promote and adopt the mentioned techniques to ensure staple food supply and attain national food security.

Food stockpiling was performed by many countries around the world. Some countries depend on national production, while others involve in government-to-government trade, importation, or even government-to-private trade (Teng and Darvin 2018). However, for some MENA countries, due to the reoccurring disruption of trade and adverse environmental conditions, they invested in strategic grain reserves, took measures for achieving self-sufficiency, and acquired foreign land for investment. Yet, the accumulation of food stocks is the most efficient for them (Wright and Cafiero 2011).

4 KSA Food Security and Strategic Reserve

The KSA Cabinet approved the comprehensive national food security strategy in 2018 (decree No. 439 dated the first of May 2018 (15/8/1439 AH)) (SAGO 2022a). According to SAGO (2022a), a new vision of food security was set taking into mind two situations: steady state and emergency state. The vision for the steady state is to ensure safe and nutritious food for all Saudis stably and sustainably and for an emergency, the state is "to quickly and reliably ensure affordable safe and vital commodities for all Saudi during times of crises". SAGO also identified the

methodology for commodity selection in cases of steady and emergency states. For steady state, the methodology of selection is based on three steps: categorized food commodities by type of nutrient contribution in the human diet (based on WHO guidelines); screen out food commodities based on the lowest share of local production and imports; and fix appropriate quantities and promote a healthier diet, and adding value chain analysis. On the other hand, the methodology of an emergency is four: screen out commodities based on the lowest share of local production and imports; select a list of 6 commodities that ensure 2000 kcal/day and maintain a balanced diet; screen out commodities on non-affordability, non-suitability for dry storage and non-sustainability for production or handling; and add dependencies (select strategic food commodities).

Moreover, SAGO priorities and scope of work have been identified, which include ten-food security areas. These areas are baseline and analysis of the current situation of food security; food strategic reserve program; integrated governance models for coordination between sectors and stakeholders; food security early warning system (including agricultural market information system); food loss and waste production program; national policy for trade and import of food and partnership agreements with countries; regulatory analysis GSFMO and other intuitions to determine strength, weaknesses, and improvement; food security and nutrition training and awareness abroad, in addition to, promoting KSA participation in food security committee agreement and treaties (SAGO 2022a). Likewise, indicators for achieving food security in KSA such as affordability, availability, quality and safety, and resilience have been identified. Indicators of affordability are monthly price monitoring, tailored agricultural tariffs, a variety of social safety programs, and agricultural finance (SAGO 2022d), while for availability are: government focus on agricultural R & D, transportation network, irrigation infrastructure, and food loss & waste baseline. However, indicators for quality and safety are excellent public health; healthy lifestyle; food safety & food storage regulations and resilience are agricultural productions; effective weather-focused early warning system to mitigate risks; commitment to developing vegetation and combat desertification; and Saudi green initiatives as the roadmap for sustainable future (SAGO 2022d). Moreover, KSA has identified five strategic objectives for food security these are (SAGO 2022a):

- Achieve a sustainable domestic food production system for privileged commodities,
- Diversify and stabilize external food supply sources,
- Ensure access to safe and nutritious food for all KSA residents and promote healthy and balanced eating habits,
- Build food security resilience capabilities and
- Institutionalize food security at the national level and ensure clear and accountable governance.

4.1 Strategic Reserves in KSA: SAGO Establishments, Objectives, Vision, and Mission

The SAGO, which is formerly known as the General Organization for Silos and Flourmills (GSFMO), was established in 1972 by the Royal Decree Number (M/14) issued on 8th of May 1972 (25/3/1392 AH) and amended by Royal Decree Number (M/3) dated 26 October 1985 (12/2/1406 AH). Moreover, Saudi Cabinet Resolution Number (35) dated 9th November 2015 (27/1/1437 AH) was issued, which include approval for establishing four flour mills joint-stock companies, in addition to, approving the amendment of the name of the General Organization for Grain Silos and Flour Mills to "General Organization for Grains" and its reorganization (SAGO 2022a). Therefore, the Cabinet Resolution Number (328) dated 9th of May 2016 (2/8/1437 AH) was issued approving the organization of the Saudi Grain Organization, provided that the corporation undertakes the management, operation, and development of silos, in addition, to the tasks of organizing, monitoring and supervising the activity of flour mills with the following duties and responsibilities (SAGO 2022b):

- Setting up the activity of silos and flour mills to attract investors to intrude into this sector.
- Licensing the activity of silos and flour mills, and monitoring the performance and duties of the licensed firms.
- Setting quality and safety standards related to the activity of silos and flour mills in coordination with the relevant ministries and government agencies, and monitoring the implementation of those standards
- Buying and selling wheat, finding a reserve stock of wheat sufficient for the Kingdom's needs, and completing its balance periodically.
- Organizing, controlling, and supervising the activity of flour mills.
- Monitoring the quality of wheat and what milling companies produce from flour.
- Providing the necessary quantities of wheat required for full operation of the flour mill companies in accordance with the pricing policy proposed by the SAGO which regulate the activity of silos and mills for flour production, and in accordance with the government policies for market support.
- Monitoring the competition rules in the field of providing silos and flour mills activity services.
- Working to protect consumers from the activities related to silos and mills activity products.
- Proposing the pricing policy for the products from flour mill activity.
- Barley Import:
- The feed barley import file was assigned to the SAGO according to Royal Decree No. (40657) dated 27th of May 2016 (19/8/1437 AH). Starting from October 2016, SAGO was required to distribute and sell barley along with maintaining an appropriate strategic reserve for emergency circumstances.
- According to the Council of Ministers Resolution No. (197) dated 10th of November 2020 (24/3/1442AH), the private sector is responsible for the importing and selling of feed barley according to the regulations contained in the Resolution.

4.1.1 SAGO's Vision

According to SAGO (2022e), the vision of SAGO is written: "To lead the food security efforts and ensure the provision of the strategic goods at reasonable prices and the sustainability of the strategic and reserve stock of food goods and their reliability".

4.1.2 SAGO's Mission

The mission of SAGO is "To enhance the development of the sector of food goods related to the strategic stock by the efficient organization, reliable data and analysis of the market and effective response to emergency situations" (SAGO 2022e).

4.2 Strategic Reserves Facilities, Locations, and Capacities

KSA has 27 silos that are used for strategic grain reserves. These silos are distributed all over the kingdom. The numbers of silos in Riyadh are four, whereas in Qassim and Hail are three each; but for Jeddah, Dammam, Khamis Mushayt, Al-Jouf, and Wadi Al-Dawaser, are two each, and for Tabouk, Madina Monawara, Al-Kharj, Al-Jumom, Jazan, Al-Ihsaa, and Yanba is one each. The total grain storage capacity in KSA is 3.44 million tons (SAGO 2022a, b, c, d, e) with Riyadh, Jeddah, Dammam, Qassim, Khamis Mushayt, Tabouk, Madina Monawara, Hail, Al-Jouf, Al-Kharj, Wadi Al-Dawaser, Al-Jumom, Jazan, Al-Ihsaa, and Yanba storing capacity of 535, 260, 220, 485,120,100,60, 300, 100, 210, 500, 250, 120, 60, and 120 thousand metric tons, respectively (SAGO 2022b).

The SAGO also owns considerable unloading capacities for imported wheat amounting to 10 - 12 thousand tons per day in Jeddah Islamic Port, King Abd Al-Aziz Port in Dammam, Jizan Port, and Yanbu Commercial Port (SAGO 2022a).

4.3 SAGO and Food Security in KSA

With the onset of the Corona pandemic and in the context of unifying and coordinating efforts and sustaining food security in KSA, a committee for monitoring food commodities abundance was established. Members of this committee are MEWA; Ministry of Commerce and Saudi General Authority of Foreign Trade; Ministry of Municipal & Rural Affairs & Housing; SAGO, Saudi Food and Drug Authority (SFDA), and Zakat, Tax and Customs Authority (ZTCA). In 2019, a team of representatives from 10 different identities emerged from the commodity abundance committee to monitor the levels of strategic reserve and the stability of food commodities supplies. These identities are Ministry of Commerce; Risk Unit at

Royal Court; Saudi General Authority of Foreign Trade; Council of Saudi Chambers; General Authority for Statistics; Saudi Agricultural and Livestock Investment Company (SALIC); Ministry of Municipals & Rural Affairs & Housing; SAGO, SFDA; ZTCA and Agricultural Development Fund. The main tasks of the team are to (SAGO 2022a):

- Perform daily monitoring of strategic stock levels of grains (wheat, barley, and flour); local meat production (fish, red meat, and local broiler chicken); table eggs and fresh milk; catering goods; import risks and external food conditions and its alternatives.
- Draft, suggest, and revise proposed actions to legalize and redirect necessary food stocks, legalize export, and use possible scenarios.
- Review and identify calorie intake per person from different food groups according to WHO.

4.3.1 Mechanism for Determining the Abundance Index of Basic Food Commodities in the Kingdom

The monitoring team of the Commodity Abundance Committee (CACO) approved scientific methodology to update a daily monitoring report on the level of stocks and supplies of 19 basic food commodities. The team used a scale composed of three levels (safe supply level, Medium supply level, and supply level required government intervention) to describe the status of the commodity supply level in the kingdom. The safe supply level exists when the strategic reserve level constitutes about 75 - 100% of the total carrying capacity of stored goods. A medium supply level exists when the strategic reserve level ranges between 50 – 75% of the total capacity for good storage. At this stage, the private sector will be asked to increase the storage rates and the government will provide supportive programs to ensure their compliance. The last stage, which required the intervention of the government, occurred when the strategic reserve is less than 50% of the total carrying capacity for goods storage, here, the government intervenes directly to import goods and raise reserve quantities to the target level (SAGO 2022a).

4.3.2 Measures Taken by the Commodity Abundance Committee to Improve Strategic Food Reserves in KSA

Usually, the CACO takes strong measures to sustain the strategic food reserve in the Kingdom during critical times. It usually directs SAGO, Saudi Agricultural Development Fund (SADF), and/or Saudi Agricultural and Livestock Investment Company (SALIC) to intervene in purchasing and/or financing the provision of needed commodities during critical times. For instance, in 2019, CACO has taken the following measures to ensure sustainable food reserve in the Kingdom (SAGO 2020):

- Increase fund allocation for purchasing local wheat production, and encourage Saudi investment abroad (The responsible authority is MEWA and SAGO).
- Finance soybeans import to support the private sector's stocks (The responsible authority is SADF).
- Finance maize import to support the private sector's stocks (The responsible authority is the Saudi Agricultural Development Fund).
- Start receiving private sector requests for financing barley import to support their stocks (The responsible authority is the Saudi Agricultural Development Fund).
- Coordinate with Indian partners to provide 10,000 tons of rice when needed (Responsible Authority is Saudi Agricultural and Livestock Investment Company (SALIC) (.
- Finance rice imports to support the private sector's stocks (The responsible authority is SADF).
- Finance the import of sugar to support the private sector's stocks (The responsible authority is SADF).
- Finance the import of red meat to support the private sector's stocks (The responsible authority is SADF).
- Finance the import of edible oil to support the private sector's stocks (The responsible authority is SADF).
- Import more than half a million cartons (equivalent to more than 183 million) eggs to balance the supply in the local market (Responsible authority is SALIC).
- Provide finance incentive for onion open cultivation operating costs (Responsible authority is SADF).
- Import 5,000 tons of onions to balance the supply in the local market (The responsible authority is SALIC).
- Provide incentive in financing the running cost of tomato production in greenhouses (The responsible authority is SADF).

4.3.3 Initiative to Develop an Early Warning System, Emergency Situations, and Manage Strategic Food Storage:

In 2020, SAGO continued its efforts to implement the initiative of developing an early warning and emergency system and managing strategic food storage through increasing silos storage capacities in the Kingdom's ports and developing a comprehensive strategic plan for strategic food storage (SAGO 2022a).

4.4 Grain Buying Modalities in KSA

According to the Honorable Cabinet Resolution No. (335) dated 19th of November 2007 (9/11/1428 AH), SAGO is responsible for meeting KSA needs from wheat and fodder barley. In doing so, SAGO applies a transparent policy to purchase wheat and fodder-barley from global markets, through offering tenders for international

companies specialized in grain supply. This procedure is usually done through six major steps based on five main principles. The five principles are:

- Selection of the best specifications
- Qualification of international companies
- Qualification of teamwork from SAGO specialists
- Follow up on global markets developments
- Open tenders for international bidders.

The main six steps are (SAGO 2020).

- Identify specifications standard:
  - That guarantees the import of the best types of wheat available in the global market.
  - For imported fodder barley that guarantees to achieve the required level of quality
- Qualifying of international companies:
  - An electronic form is available on the SAGO website with all the necessary information on the registration requirements.
  - Receive registration requests via email, study the request, and respond by accepting or rejecting.
- Monitoring international markets:
  - Contiguous follow-up of global grain price developments in the most important global markets.
  - Daily and weekly brief reports on the developments in the global grain markets.
- Bidding:
  - Determining the required quantities in addition to sending invitations to qualified (registered) companies via fax in accordance with the Government procurement system.
  - Announcing the tenders in the local and international media.
- Receive offers and quotations:
  - Select bidders with least price that adhere to the specifications specified by the SAGO committee responsible for grain importations.
- Quality control of imported wheat and barley:
  - Qualification of (8) international companies specialized in examining grains in exporting countries' ports.
  - Taking samples of shipments as soon as they arrive at Saudi ports to ensure conformity with both specifications and inspection reports received from international inspection companies.

It is noteworthy here that KSA purchased wheat from both local and international markets. The total quantities of wheat import reached 29.9 million tons for the period 2008–2019 and the average price was 265.3 thousand USD/metric ton (995 thousand Riyals/metric ton) (Fig. 1). Moreover, the estimated yearly increase of wheat import during the period from 2008 to 2019 was calculated to be 219.36 metric tons, whereas, the annual prices (1000 USD)/metric tons showed a declining trend by 8.99 units/annum.

In 2019, SAGO implemented the local wheat-purchasing program, within the framework of Cabinet Resolution No. (66) Dated 2nd March 2016 (22/5/1437 AH) to control KSA green-fodder cultivation. The resolution assigned SAGO the mission of purchasing wheat from qualified farmers who cultivate wheat in an area of less than 50 hectares. This program extends for five years; however, the maximum purchased quantity must be less than 700 thousand tons/year (General Food Security Authority 2023a, b). In this regard, it is worth mentioning that the purchased quantity of wheat in 2019 was 202.179 thousand tons bought from 930 farmers scattered almost all over the Kingdom. However, in 2021 the purchased quantity increased substantially to reach 573.43 thousand tons, but it declined in 2022 by 6.5% (General Food Security

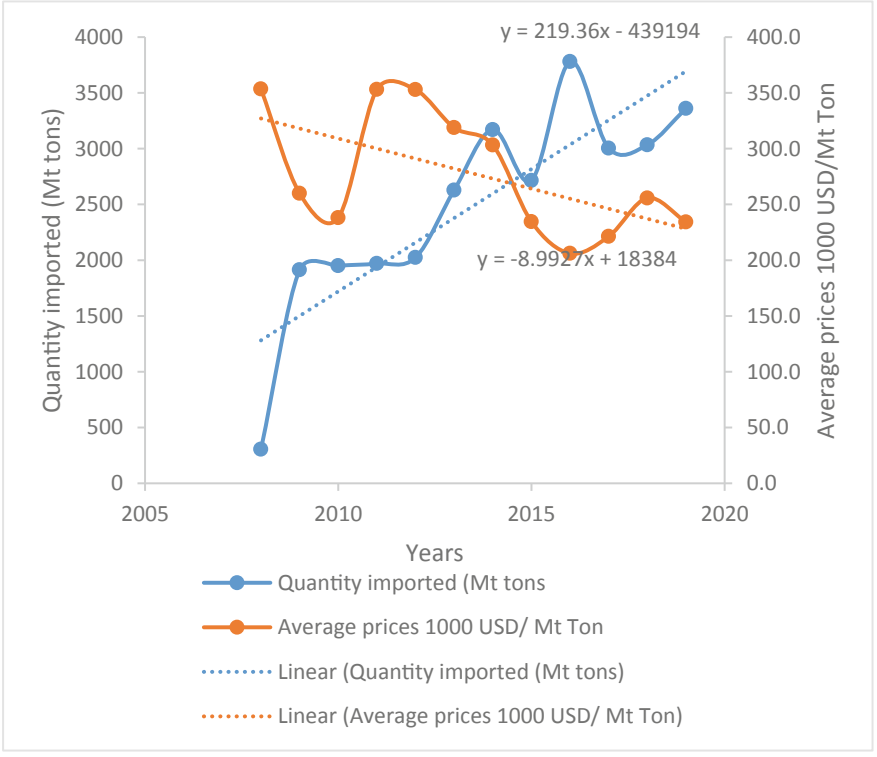

Fig. 1 Total quantities of imported wheat (tons) by SAGO and their average prices for the period 2008–2019. *Source* Calculated by the Author from data collected from SAGO (2020)

Authority 2023a, b). It is important to note here that the local wheat purchased is considered one of three sources that SAGO depends on for sustaining the food security in the Kingdom. Other sources are purchasing 20% of the total wheat purchased from Saudi investors abroad, in addition to the international tenders offered by the SAGO and in which companies compete (General Food Security Authority 2023a, b). Such policy has resulted in a substantial increase in the area and production of wheat locally by 236.9 thousand tons/year and 32.2 hectares/year, respectively (Fig. 2).

On the other hand, SAGO officially started the task of importing fodder barley in October 2016. In December 2016, it signed contracts for importing 945 thousand tons of fodder-barley to be supplied during the first quarter of 2017. Moreover, in 2017, it signed contracts for importing 7.33 million tons as an additional amount to the previously contracted quantity of 1.02 million tons by the Saudi Grains and Fodder Holding Company (SGAF) (Fig. 3).

In 2018, SAGO signed contracts for importing 8.74 million tons of fodder-barley; however, in 2019 the imported quantity decreased by 39.5% to 5.29 million tons due to the good rainy season. The average prices for the imported fodder were 806 and 771 Riyal/ton in 2018 and 219 respectively, (SAGO 2020).

SAGO has taken strict measures to ensure the quality and conformity of wheat and barley to the specifications standard.

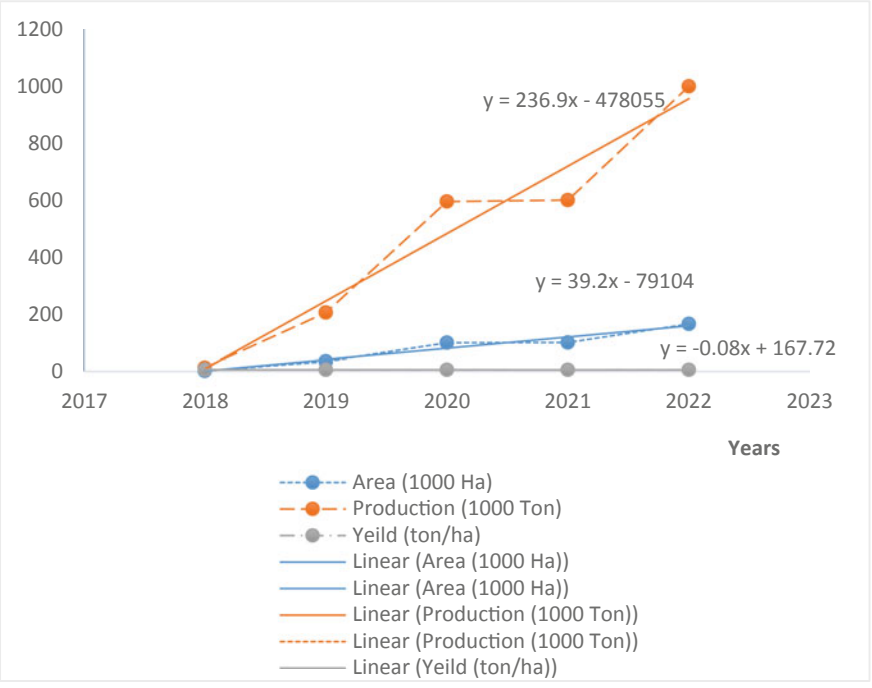

Fig. 2 Wheat cultivated area (Hectare) and production (000 tons) KSA for the period 2018–2022. *Source*:Calculated by the author from data collected from SAGO annual report 2019 (SAGO 2020)

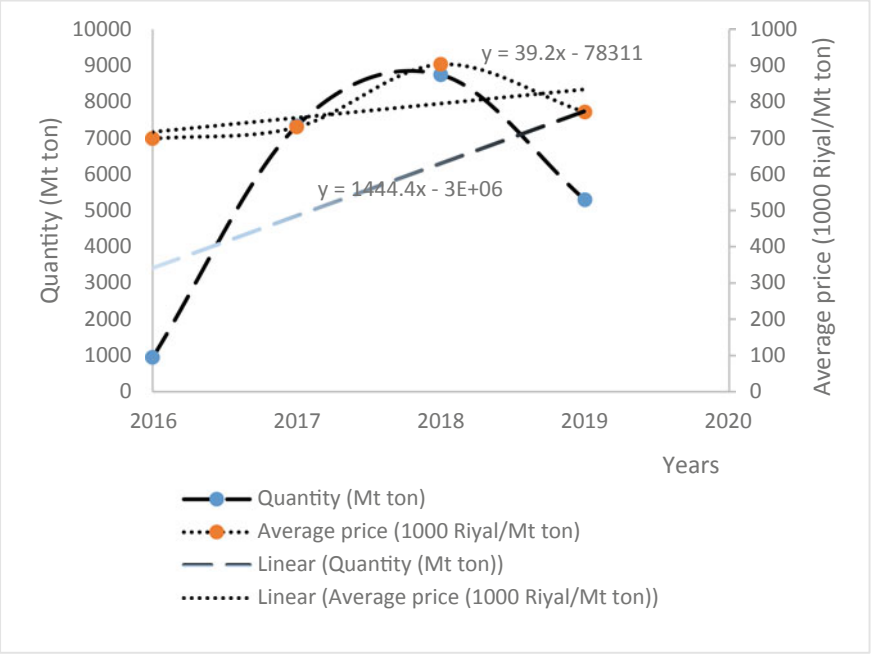

Fig. 3 Total quantities of imported fodder-barley (tons) by SAGO and their average prices for the period 2008–2019. *Source* Calculated by the author from data collected from SAGO annual report 2019 (SAGO 2020)

SAGO Steps for quality assurance (SAGO 2020):

- Selection of the best standard to guarantee the import of high Quality of wheat and barley.
- Qualifying international companies (as neutral companies) specialized in examination to check for wheat and barley at shipping ports
- Taking samples from each imported grain shipment to be examined by the SAGO laboratories immediately after the arrival of the imported ships to KSA ports (before unloading).
- Taking other samples from the shipment during the unloading process to be examined at SAGO laboratories (whether central or branch laboratory).
- Monitoring the quality of stocks during the storage period through implementing the ventilation, rotation, and fumigation processes in accordance with an approved schedule.
- Monitoring the quality of milling companies' products (flour), through monitoring changes in flour properties, and examining bakeries' complaints.

4.5 SAGO Selling and Distribution Practices

SAGO, by virtue of its jurisdiction, is responsible for securing the local market's needs for wheat and fodder-barley, by meeting milling companies' (four) wheat purchase requests and providing barley units (sales and distribution) with their required quantities (SAGO 2020).

In 2020, the Saudi government issued a decree assigning the responsibility of barley importation and distribution to the private sector. The decree became effective at the end of March 2021. According to USDA (2021), such a Saudi decree coupled with Kingdom revisions of its animal feed subsidy program policy in 2020 is expected to significantly reduce the quantity of barley imported and consequently affect U.S.A barley exports. It is important to note that, in 2019 the total imported quantity of barley was 3.9 billion tons, which is worth 3.31 billion Saudi Riyals (General Authority for Statistics 2020). The main barley exporting countries to KSA were Argentina, Russia Federation, and Ukraine with values of 763, 734, and 575 million Saudi Riyals, respectively.

Pertaining to wheat, in 2019, the total quantities of wheat sold by SAGO to the four milling companies amounted to 3.38 million tons of high-quality durum wheat (12.5% protein), compared to 3.48 million tons in 2018 (2.9% decreased). SAGO sold wheat to the four milling companies at a subsidized price of 180 riyals/ton, in order to maintain the subsidized selling prices of flour and wheat derivatives in the local market (Fig. 4). However, in 2021 Saudi Arabia removed the subsidy from wheat and fodders (SAGO 2022b).

On the other hand, in 2019, the total quantities of fodder-barley sold to distribution stations amounted to 6.452 Million tons compared to 7.996 Million tons in 2018 (a 19.3% decrease). The main fodder-selling stations are Jeddah, Jamoum, Shumaisi, Yanbu, Jazan, Duba, Dammam, and Jubail (SAGO 2020).

4.6 Production and Storage Capacity of Flour Mills Companies in KSA

The Mills sector is one of the new sectors that entered the Saudi economy after completing its privatization program, in line with the directions of the Kingdom's Vision 2030 and the National Transformation Program emanating from it. The vision aims to develop the contribution of the private sector in the Saudi economy through liberalizing the state-owned mills and making them available to the private sector investment both Saudi and foreigners (SAGO 2022c). SAGO moved its activities towards targeting four areas of the structure: transfer of assets, employees, and data, in addition to defining the legal framework (SAGO 2022c).

The Council of Ministers identified the silos and mills sector among the sectors targeted for privatization in order to increase competitiveness, improve productivity and stimulate investment. In 2017, four mill companies were established. In 2020,

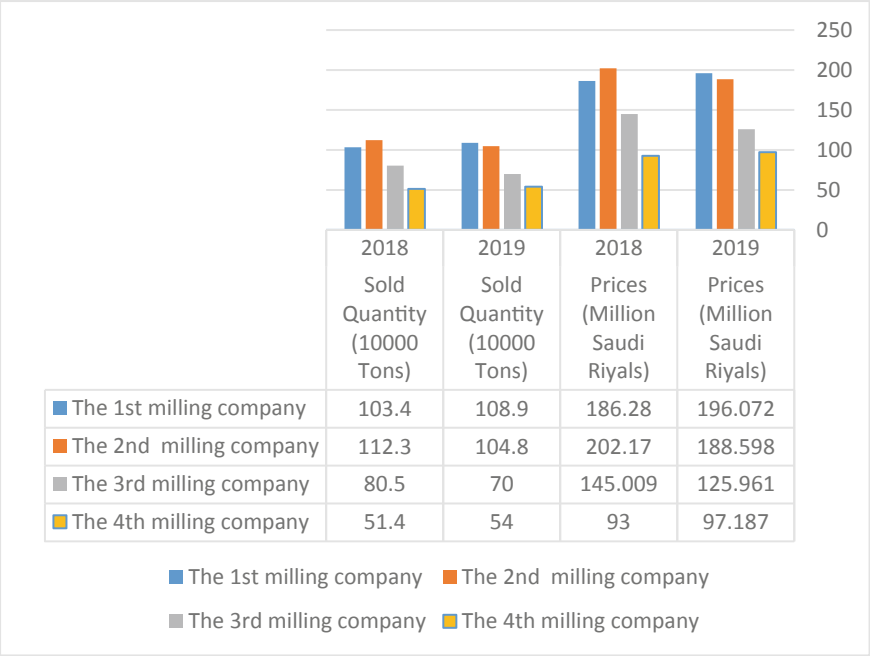

Fig. 4 Quantity of sold wheat (10 thousand Tons) to the four milling companies in KSA and prices (Million Saudi Riyals) in 2018 and 2019. *Source* Drawn by the Author from SAGO 2020b data

two companies out of the four milling companies were privatized: the First and Third companies. Similarly, in 2021, the other two companies were privatized. The First, Second, Third, and Fourth Milling Company has been awarded to Raha AlSafi Consortium; AlRajhi, Ghurair and Masafi Consortium; AlAjlan, Nadec, AlRajhi, and Olam Consortium; and Allana, AlOthaim and United Feed Consortium, respectively (SAGO 2022c).

The total available capacities for flour production for the four milling companies at the end of the year 2019 amounted to about 15.15 metric tons of wheat/day, and the total production capacities for the fodder factories were 3.2 metric tons/day, while the total operational storage capacities were 735 metric tons of wheat (SAGO 2020).

5 Conclusion and Prospects

The KSA, represented by MEWA, has developed a comprehensive national food security strategy, the supervision and execution of which was assigned to the SAGO, which is currently known as GFSA. In this regard, SAGO was assigned the responsibility of managing a strategic food reserve and early warning system including buying, importing, storing, and distributing the main cereals crops, particularly

wheat, and fodder-barley, however, in recent years, privatization took place and SAGO role is confined to the monitoring and supervision. Additionally, in order to facilitate the work, the commodity abundance committee was formed, from a different identity including SAGO, with the responsibility of daily monitoring the levels of strategic reserve and stabilizing food commodities supplies. Undoubtedly, KSA has a well-established flour mills sector, storage capacities, and distribution system. Likewise, it has a well-defined food reserve system that delineates authorities and responsibilities. In this regard, it is worth noting that the kingdom depends on three food sources to sustain its strategic food reserve at a safe level: local production, investments abroad, and imports. Pertaining to local production, the KSA has a clear policy for improving local production and achieving self-sufficiency from certain products. Moreover, the commodity abundance committee has clear procedures that can be used during critical times. For instance, the commodity abundance committee liaises with Saudi Agricultural Development Fund, Saudi Agricultural and Livestock Investment Company (SALIC), and MEWA in the intervention for maintaining the strategic stocks at a safe level through the provision of fund, support, and/or sometimes directly purchasing of commodities when their strategic reserve is less than 75% of the total carrying capacity of goods storages. It is also evidence that food security policies that were implemented by the Kingdom have succeeded in sustaining food security during critical times of COVID-19.

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