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An Analysis of Food Security with New Agricultural Policies in Egypt

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Abstract: The agricultural sector is of great importance in economic development as it is the cornerstone in providing food to the population in addition to providing agricultural raw materials needed for many manufacturing industries, which in turn are linked to the production capacity and consumption needs of these commodities. The agricultural sector and its related activities are considered one of the most important pillars in the economies of countries in supporting the food security file and its various axes, given that the sector is responsible for providing the basic needs of the people and providing the raw materials needed for many industries, in addition to its tangible contribution to the GDP. It is also an interwoven sector and is an important mechanism for localizing development. Food security is a national security issue, and therefore countries work to achieve their food security as much as possible through their local production, given the risks of external sources of economic and political fluctuations. The paper seeks to know what food security is and how it can be achieved, what is the current situation in Egypt and the rates of self-sufficiency in basic commodities, as well as clarifying the most prominent challenges facing the Egyptian state on its way to achieving its food security, as well as the efforts made by the Egyptian government to overcome These challenges, in addition to directing some recommendations that can contribute alongside the state's efforts to improve the Egyptian food security situation in general, as well as dealing with emergency times of crisis.

Keywords: Food Security, Agricultural, Environmental Pollution, Egypt

1. Introduction

Achieving food security constitutes a major challenge for the state, and a top priority that requires it to take immediate measures and develop strong policies based on addressing all dimensions of food security and not being satisfied with the mere availability of food, but rather ensuring access to it, drawing from it and the stability of its supplies, and increasing the rates of self-sufficiency in food commodities, especially The challenges faced by this file are great in light of the exacerbation of the phenomenon of climate change and what it causes in terms of high temperatures, scarcity of water, deterioration of soil quality and desertification of huge areas of agricultural land, and its economic and social consequences. [1]

In 2020, the world witnessed an unprecedented setback in efforts to reduce hunger and malnutrition and close the food gap resulting from the inability of the growth rates of domestic food production to keep pace with consumption growth rates, considering the widening areas of conflicts, climate changes, economic downturn, and elevated levels of insecurity. Equality, whether in income, technology, health, or education. [2]

The outbreak of the Corona pandemic came to exacerbate the complex situation, and enter the world into a state of stagnation and food deficit that is increasing day by day amid a state of imbalance that affected supply and supply chains, and led to a rise in commodity prices, as the price index of agricultural commodities increased by 30%, compared to the same period From the year 2020, malnutrition is spreading, as the number of malnourished people is expected to increase from 130 million people to 800 million in the world. [3]

2. Global Food Security

As the world's population continues to grow, more effort and innovation will be needed to sustainably increase agricultural production, improve the global supply chain, reduce food loss,

and waste, and ensure that all who suffer from hunger and malnutrition have access to nutritious food. Many in the international community believe it is possible to end hunger in the next generation and are working together towards this goal.

Besides getting enough calories, proper nutrition has other dimensions that deserve attention, including the availability of micronutrients and healthy diets. Inadequate micronutrients in the diet of mothers and infants can have long-term birth effects. Unhealthy diets and lifestyles are closely linked to the increasing incidence of non-communicable diseases in both developed and developing countries. [4]

Extreme poverty and hunger are predominantly prevalent in rural areas, and smallholder farmers and their families make up a very large proportion of the poor and hungry. Thus, eradicating poverty and hunger is fundamentally linked to enhancing food production, agricultural productivity, and rural incomes.

Agricultural systems around the world must become more productive and less wasteful. The application of sustainable agricultural practices and food systems, including in both production and consumption, must be pursued from a holistic and integrated perspective.

There are many elements of farmers' traditional knowledge that, if enriched with the latest scientific knowledge, can support productive food systems through the sound and sustainable management of soil, land, water, nutrients and pests, and the wider use of organic fertilizers.

Given the projected changes in temperature, precipitation and pests associated with climate change, the global community is called upon to invest more in research, development, and demonstration of technologies to improve the sustainability of food systems everywhere. Building resilience in local food systems will be crucial to avoiding widespread shortages in the future and ensuring food security and good nutrition for all. [5]

In the latest edition of the State of Food Security and Nutrition in the World, published today, it is estimated that nearly 690 million people were suffering from hunger in 2019, an increase of 10 million compared to 2018, and about 60 million people over a five-year period. The rising costs and declining affordability also mean that billions of people are unable to eat healthy or nutritious foods. The largest number of hungry people is in Asia, while the fastest increase is in Africa. It is estimated in this report that the COVID-19 pandemic could push more than 130 million additional people worldwide into a cycle of chronic hunger by the end of 2020. The COVID-19 pandemic is exacerbating the vulnerabilities and shortcomings of global food systems – which also means all activities and processes that affect food production, distribution, and consumption.

3. Severe Food Insecurity

A global report on the food crisis revealed that about 193 million people in 53 countries or regions experienced acute food insecurity at one or more crisis levels from IPC analysis (between phases 3 and 5 3-5 IPC) in 2021. Of these, more than half a million people in Ethiopia, southern Madagascar, South Sudan, and Yemen have been classified in the most severe phase of the acute food insecurity catastrophe, and their situation requires urgent action to avert widespread collapse of livelihoods, starvation, and death. [6]

Countries already experiencing high levels of acute hunger are particularly vulnerable to the risks created by the war in Eastern Europe, particularly because of their heavy dependence on food imports, agricultural inputs, and exposure to global food price shocks.

Severe hunger is rising to unprecedented levels and the global situation is getting worse. Conflict, the climate crisis, the coronavirus, and rising food and fuel costs created the perfect storm — and now we have the war in Ukraine, piling one disaster on top of another. [7]

4. Food Insecurity Facing the Middle East and North Africa

Food insecurity in the Middle East and North Africa region is a growing challenge. Even before the outbreak of the COVID-19 pandemic, UN agencies estimated that the region had more than 55 million undernourished people out of its 456.7 million population. This pandemic, and with it the protracted conflict situations in some countries of the region, in addition to other factors, make hunger one of the most common problems of falling into extreme poverty.

States remain seriously concerned about this situation; The region must contend with the structural challenges that impede efforts to provide food for its rapidly growing population. These challenges are as follows:

Table 1. *Structural challenges and obstacles to providing food to the population.*

The first challenge	The second challenge	The third challenge
The first of these challenges is climate change, whereby the increase in the frequency and intensity of climate variability and rising temperatures affect local farming activities. Half of the region's population is already suffering from scarcity of water resources, and the average per capita available water supply is expected to halve considering the current projections of a population increase to about 700 million in 2050. Moreover, the year 2020 witnessed one of the worst waves The Desert Locust has spread to more than 23 countries, including Yemen and Djibouti, affecting the livelihoods and food security of millions of people.	The second challenge facing our region is the population growth rate itself, which is the highest in the world, as well as the growth of urban areas, where 66% of the population is expected to live in cities by 2030. Agricultural productivity rates do not keep pace with the same population increase, except in Egypt, which is higher than the global average.	The third challenge is diet and nutrition; Countries in the region are exceptionally dependent on food imports, particularly wheat and other basic grains. The region imports half of its food needs from abroad, a percentage that rises to 90% in the countries of the Gulf Cooperation Council. Government-subsidized wheat products make up a third of the calories consumed by citizens. Between a quarter and a third of the adult population in the region is obese.

The diet of the countries of the region cannot support the health of the people; The food they provide provides the population with the necessary calories, but it does not provide sufficient nutrition. As a result, people suffer from the double health burden of malnutrition, whether from stunting or from obesity.

Statistics indicate that nearly half of children in Yemen and a third of them in Djibouti are already underweight for their age, with long-term repercussions on their cognitive development as well as on the economic trajectories of these two countries. [8]

4.1. Food Security

The term food security refers to the availability of food for individuals without any shortage, and it is considered that food security has been achieved when the individual is not afraid of hunger or that he is not exposed to it and is used as a criterion to prevent future food shortages or interruptions due to several factors considered dangerous, including drought and wars. And other problems that stand in the way of food security.

4.1.1. Food Security Challenges

Figure 1. *Food security challenges.*

4.1.2. Food Security in Egypt

The issue of food security is considered one of the most important and vital strategic issues because of its political, social, and economic dimensions. It is an issue related to Egyptian national security, so the Egyptian state pays special attention to it, but the country faces many challenges, the most prominent of which are: the water crisis, climate change and population increase. [9]

The components of food security are represented in the geographical characteristics of the country, the abundance of water resources, the abundance of human resources, the abundance of agricultural land, pastures and forests, the abundance of livestock, and the possession of modern technology. Food security also includes four important dimensions, namely:

4.2. Elements of Food Security

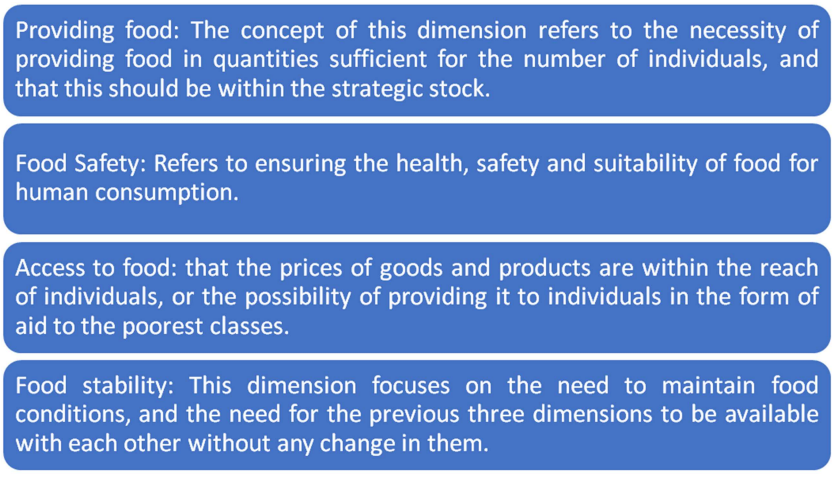


Figure 2. *Elements of Food Security.*

Food Insecurity has Serious Consequences in Several Directions, as Follows:

High food prices: Food insecurity means a shortage of food commodities, which leads to a rise in food prices when the demand for food remains stable or increases, so people's access to food becomes limited.

Unemployment: Food insecurity leads to a slowdown and decline in the state's economy, which results in a decrease in the state's ability to raise wages, which leads it to lay off some employees from their jobs and thus spread unemployment.

High health care costs: The higher the rate of food insecurity, the higher the incidence of disease, and thus the burden on the health care system increases, and the costs of care increase.

Children: Food insecurity leads to malnutrition in children; As a result, they become more susceptible to diseases and the need for hospitalization, and they suffer from laziness, lethargy and lack of physical activity, which affects their academic activity and social interaction with their peers.

Figure 3. *Food insecurity.*

5. Egyptian Food Security Challenges

Achieving food security constitutes a major challenge for the state, and a top priority that requires it to take immediate measures and develop strong policies based on addressing all dimensions of food security and not being satisfied with the mere availability of food, but rather ensuring access to it, drawing from it and the stability of its supplies, and increasing the rates of self-sufficiency in food commodities, especially The challenges faced by this file are great in light of the exacerbation of the phenomenon of climate change and what it causes in terms of high temperatures, scarcity of water, deterioration of soil quality and desertification of huge areas of agricultural land, and its economic and social consequences. [10]

5.1. Food Security in Egypt Faces Several Challenges, the Most Prominent of Which Are the Following

1. Encroachment on Agricultural Land

Agricultural lands are considered among the national wealth that must be greatly taken care of and preserved, as they provide foodstuffs for self-sufficiency, and there is no need to import from different countries of the world that can exploit this need for various purposes. Agricultural land has been reduced to concrete blocks, which poses a threat to national and food security, and the size of the encroachments on agricultural land since 2011 until the end of 2020 has reached (90,000 acres).

2. Agricultural Water Policy as well as the Renaissance Dam Crisis

The water policy used to irrigate agricultural lands by flooding represents one of the problems facing the agricultural policy in Egypt, especially since Egypt is one of the water-poor countries, which resulted in the failure of irrigation water to reach the ends of canals and drains, which led to the waste of thousands of agricultural acres in several governorates, and negatively affected the decline in the agricultural area allocated to strategic crops, including wheat.

Figure 4. *Dam crisis.*

Egypt's water share faces threats because of the crisis of the Ethiopian Renaissance Dam, which has a capacity of

about 74 billion cubic meters, and Egypt relies on the Nile River as a main source of water with a share of 55.5 billion cubic meters, representing 68.5% of the total water resources in 2019/2020. Water is the deep groundwater, rain, torrents, desalinated sea water, as well as reused wastewater and surface groundwater in the delta, estimated at 25.56 billion cubic meters and representing 31.5% of the total water resources in 2019/2020, and the agriculture sector is the main consumer of water as it consumes about 76% Of the current total consumption of 81 billion cubic meters, which makes it the sector most affected by any changes in Egypt's water share. [11]

3. Fragmentation of Agricultural Holdings

Egyptian agriculture suffers from a crisis of "fragmentation of holdings", i.e. small areas, especially in the old lands, and this is one of the most important obstacles that stand in the way of technological and digital advancement and development for this vital sector, and it prevents the use of modern machinery, equipment and devices, in the agricultural process at all. All levels and stages, starting from placing seeds, seeds, and seedlings in the ground, through weeding, irrigation, fertilization and spraying of pesticides, to the final stages of harvesting, collecting, harvesting, or removing the crop.

Figure 5. *Fragmentation of agricultural.*

The average per capita share is currently, according to the head of the services and follow-up sector at the Ministry of Agriculture and Land Reclamation, "Abbas Al-Shinai," to only about 2 carats, and the fragmentation of possession is due to two reasons, namely sale or inheritance, so agricultural lands lose their total cadastral value, because they become fragmented basins that are divided With internal dividers, which hinders the agricultural process with current technological advances.

5.2. Weather Changes

Climate changes such as changes in temperature, weather intensity and the proportion of carbon dioxide in the atmosphere affect agricultural crops significantly, which leads to an increase in the salinity of agricultural land as a result of rising water levels, and the agricultural sector is one of the sectors most affected by climate changes, as plants have heat needs Light, and cultures are more sensitive than humans, have water needs, and a certain degree of salinity.

Nourhan Nabil, Abdel Nasser Kandil, (2022) Food Security in Egypt between Challenges and Confrontation, Jusoor for Strategic Studies. [12].

Figure 6. *Weather changes.*

5.3. Egypt's Efforts to Face Food Security Challenges

a. Facing the encroachment on agricultural land:

The Egyptian state dealt with this challenge in two ways, as it responded firmly to the encroachment on agricultural lands, in parallel with its national projects to increase the area of agricultural lands, as follows:

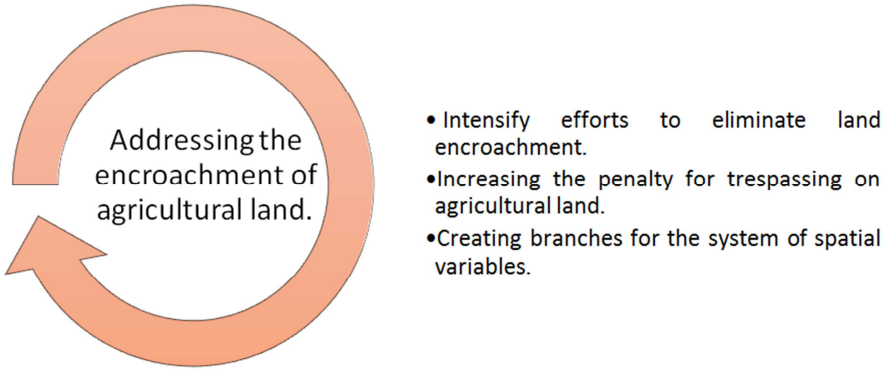


Figure 7. *Food Security Challenge.*

b. Strengthening Arab economic integration:

Through coordination between economic policies and revitalizing joint Arab action, especially in the agricultural field, creating a common Arab market, and working to improve the competitiveness of Arab agricultural products in local and global markets considering the current economic transformations imposed by World Trade Organization agreements, and this will not happen. Except through a strategy that makes achieving production efficiency among its objectives and the required cost reduction.

There are axes to achieve the food security strategy represented in:

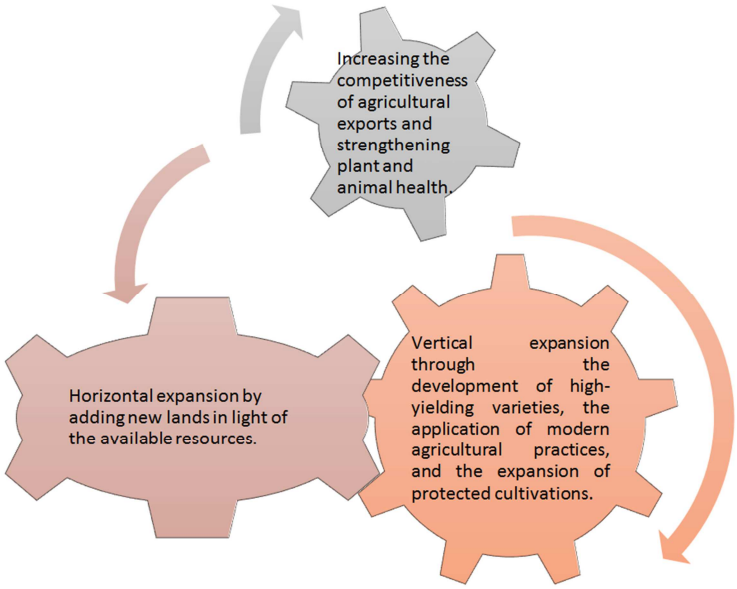


Figure 8. *Food security strategy.*

The most important motives for horizontal expansion are increasing the agricultural area and compensating for land loss as a result of urban expansion in light of limited land, raising the percentage of self-sufficiency in strategic commodities and achieving relative food security, raising the efficiency of the use of natural resources from land and water units, increasing exports and maximizing the added value of products Agriculture, as well as deepening the principle of inclusive and balanced development through the presence of horizontal expansion projects near most of the governorates of the Republic. [13]

5.4. The Effects of Land Shortages on Life in Egypt

One of the negative effects is that the loss of agricultural lands leads to the randomness of life. The buildings on cultivated lands were not characterized by the rural aspects that govern the traditions of individuals, and they were not characterized by the organized urban aspects of the city. So the person became a resident of housing that had nothing to do with the cultivation of the land, and thus began a shift in the nature of economic life in the village from an agricultural society that relied entirely on the

producer of the surrounding land to a consumer of most of his needs from outside it; Many villages were characterized by a lack of agricultural labor and a large number of workers in other fields, moving daily to the city. This constructive encroachment on agricultural lands led to a demographic distortion that reflects the impact of random construction on the formation of individuals and society. Thus, the psychology of overcrowding spread and surrounded the original cities, which led to a cultural distortion in the rural and civil manifestations that govern the traditions of individuals, and this resulted in a change in the behavior and behavior of many individuals that led them to exhausting competition, in which many of its owners may resort to violence in dealing with their daily affairs, which led to Decreased performance and indifference to the surrounding environment; As well as the separation of many individuals within this random ocean from the general issues of society and its aspirations for the future.

Figure 9. *Environmental Pollution.*

6. Environmental Pollution Causes the Loss of Agricultural Land

Environmental pollution and the negative impact on the surrounding agricultural lands

Another reason leading to the loss of agricultural lands is environmental pollution and the negative impact on the surrounding agricultural lands. As a result of building on cultivated lands, which caused a shortage of spaces between the original buildings and the deterioration of their environmental surroundings with the accumulation of construction waste and human waste that spread around and on the cultivated lands, which causes environmental pollution with the increase of random building waste and the pollution of the water of canals and drains with sewage water, which causes health risks; It is expected that there will be environmental and health risks that threaten the productive human capacity, which requires an increase in the cost of developing environmental awareness and an increase in financial allocations for the removal of residues and waste to improve the proportion of this negative phenomenon, which increases the burden of the state in overcoming these problems. [14]

Figure 10. *Environmental Pollution.*

7. Environmental Pollution Causes the Loss of Agricultural Land

The issue of achieving food security is considered one of the strategic issues that attract great global attention, as military force alone is no longer sufficient to ensure the security of peoples. Necessity for the independence of its political and economic decision. [15]

Considering the limited water resources, the continued population increase, and then the demand for food commodities, whose prices are witnessing a significant increase, and resorting to imports to bridge the food gap, the matter involves high risks with regard to Egyptian food security, as the continued dependence on imports to reduce the gap between supply and demand for food. The main food commodities cause an increase in the burden on the state budget and increases the trade balance deficit, in addition to the economic dependence on the exporting countries.

7.1. Achievements of the Agricultural Sector in Numbers

The total agricultural area of Egypt is about 9.7 million acres, while the total cropped area of Egypt is about 17.5 million acres, throughout the agricultural seasons of the year. The Egyptian agricultural sector contributes about 17% to commodity exports abroad, and the percentage of the contribution of the agricultural sector to the GDP is about 15%, and the percentage of workers in the agricultural sector is about 25% of the total workforce in Egypt.

The Central Agency for Public Mobilization and Statistics announced an increase in the total cropped area to 16.4 million acres in 2020/2021, compared to 16.3 million acres in 2019/2020, an increase of 0.5%. The total cultivated area reached 9.6 million acres in 2020/2021, compared to 9.5 million acres in 2019/2020, an increase of 1.5%. [16].

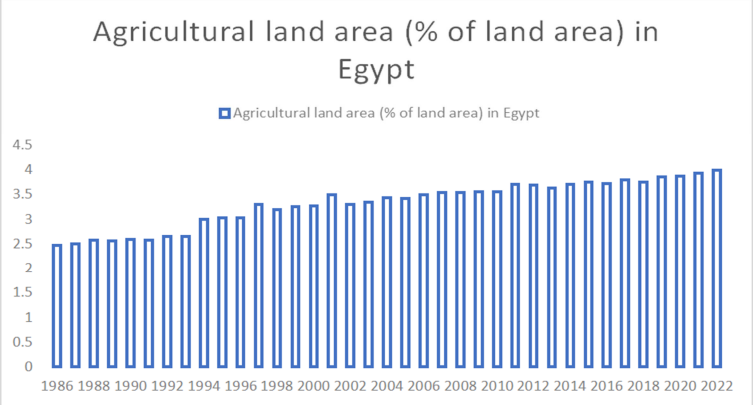
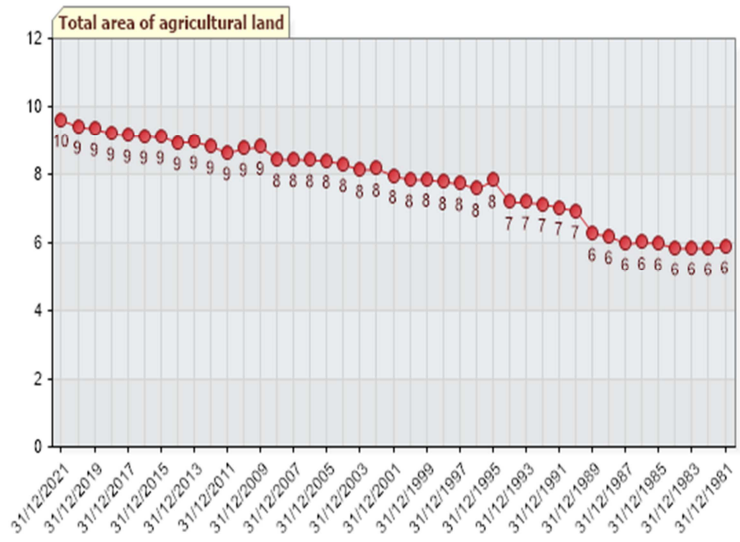


Figure 11. *Agricultural Land Area. In Egypt.*

7.2. Total Area of Agricultural Land (Million Feddan)

The agricultural sector, despite its great importance in strengthening the food security file, faces many challenges, the most important of which is the limited agricultural land and the decrease in its per capita share, which reached the equivalent of 2 karats per capita compared to an acre per capita in previous periods of time, as a result of the continued encroachments on agricultural land and urban sprawl despite what The state provides radical solutions in providing housing projects at all levels. The limited water needed to meet the increasing growth in the expansion of the agricultural area from horizontal expansion projects and the fragmentation of agricultural land, which is one of the biggest problems that hinders the implementation of agricultural policies, raises the level of costs, reduces the economic return, increases losses and the expected negative effects of climate change, given that the sector Agriculture is one of the sectors most affected by it, whether in terms of productivity, water consumption, changing farming systems and timings, increasing soil salinity, and the impact from marginal areas. The increasing effects of these challenges deepen the problem of population increase. [17]



Source: Ministry of Agriculture and Land Reclamation

Figure 12. *Total area of agricultural land.*

8. Conclusion

The agriculture sector and its related activities are considered one of the most important basic pillars in the economies of countries in supporting the food security file and its various axes, given that the sector is responsible for providing the basic needs of the people and providing the raw materials necessary for many industries, in addition to its tangible contribution to the domestic product. It is also a networked sector and is considered a mechanism. A mission to localize development.

With new technologies and continued support for the food security file, aiming to achieve more achievements, the most important features of which crystallize in the expansion of the agricultural area through the completion of the giant projects currently being implemented, with the expansion of smart and digital agriculture, the use of artificial intelligence

in many agricultural operations and practices, and the diversification of water sources and expansion. In modern irrigation systems, while continuing to develop early-maturing varieties and hybrids with low water requirements, the Egyptian state is adopting programmes, projects and initiatives in the field of agriculture and food security aimed at building agricultural and food systems capable of withstanding the face of climate change and adopting methods and mechanisms to support and increase the competitiveness of Egyptian agricultural exports.

Considering that food health and safety is the focus of attention of the political leadership and the expansion of programs to support digital transformation and mechanization of agricultural services while deepening regional and international agricultural cooperation and stimulating the investment climate in agricultural activity and related activities and including many projects among the priority projects in stimulating and simplifying investment procedures in them with the aim of Promoting investment in this promising sector, which is capable of achieving rapid growth rates, with the continuation of legislative reforms in the laws related to this sector, especially the agricultural and cooperative law, and the expansion of contract farming programs, especially strategic crops.

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