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SUSTAINABLE AGRICULTURAL DEVELOPMENT AND ITS IMPACT ON ACHIEVING FOOD SECURITY SAUDI ARABIA AS A MODEL FOR THE PERIOD 2004- 2020*

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ABSTRACT

Agricultural development in the Arab world holds a prominent place in many development programs as well as economic and social reform. Most Arab states, including the Kingdom of Saudi Arabia, have given great and common interest in this issue since the seventies until the present century where a group of Arab institutions were established to support agricultural development and enhance food security for the Arab world as it owns a large livestock wealth that needs development and attention in its subject, and the large fluctuations in food prices have played an important role in the rise in the value of food imports during the recent years, i.e. from 2019 until now due to the spread of the virus of (COVID-19) which negatively affected food security of large number of states importing agricultural materials. The weakness of agricultural production, compared to the demand resulting from population growth in the Arab world, leads to resorting to imports to meet the food needs of the population as agricultural exports constitute only a small percentage of total exports. In order to understand the reasons for the inability of the Arab states to achieve sustainable agricultural development that helps to achieve food security, this research deals with a review of the theoretical concept of sustainable agricultural development and food security and from studying the experience of the Kingdom of Saudi Arabia as a sample of the Arab states through the presentation, analysis and measurement of the impact of some indicators of sustainable agricultural development on some food security indicators, the conclusions and recommendations will be considered in developing the sustainable agricultural sector in order to achieve food security in the Arab world and in general where the most important finding concluded by the researchers is that the Kingdom of Saudi Arabia has followed a number of successful methods in preserving soil,

environment, water resources, pastures regulation, forests protection as well as combating desertification. The researchers recommended, in general to all Arab states, through this research, the need to follow modern methods in terms of preserving the soil, environment and water resources as well as combating desertification and getting rid of old farming methods to achieve better agricultural production that does not deplete natural resources to obtain the self-sufficiency of each country in order to achieve its food security.

*The research is extracted from a master's thesis of the first researcher

INTRODUCTION

The agricultural sector is considered one of the most important sectors with high added value and is considered one of the pillars of economic and social development for many developing or developed states. Agriculture constitutes a major source of food. It also absorbs a large proportion of the labor force and contributes to the provision of raw materials and intermediate inputs to many industries as well as obtaining or providing financial resources through export earnings or the replacement of imported agricultural commodities.

In order to achieve food security, which is the enjoyment of all people at all times with physical, social, and economic opportunities to obtain sufficient, safe, and nutritious food that meets their food preferences and needs. Therefore, the issue of food security is considered one of the most important issues of concern to states and international organizations. Food always remains the first path for groups to achieve continuity and survival and the importance of this issue necessarily emerges at a time of crises and severe economic tribulations in various states of the world as the Arab world lives in a state of food deficit that is increasing day by day. The volume of production of foodstuffs is not sufficient to cover its consumption as well as the case of political fragmentation that the Arab World witness and the lack of integrated strategic development planning at the national level, the weapon of food subsidies that Western states use to dominate the economies of states, the increasing population growth, the limited and misuse of natural agricultural resources and weak agricultural productivity. All these factors aggravated the food problem in the Arab world and increased the food gap and the economic dependence of the Arab states and it cannot be solved by relying on others or foreign aids by depending on the self and by insisting on formulating and executing a precise strategy to achieve the sustainable agricultural development and the Arab food security. To get out of the impasse, the strategic option necessitates the achievement of a sustainable agricultural development. This research dealt with the issue of agricultural development for the Kingdom of Saudi Arabia, being an Arab country that has achieved many achievements in the field of food security for its members and it can be taken as a study model that can be applied and benefited from. This research was divided into three axes. The first section dealt with the theoretical part of the study and then the second section dealt with the reality of agricultural development in the Kingdom of Saudi Arabia. As for the third topic, it was devoted to reaching the most important conclusions and recommendations recommended by researchers for the purpose of achieving sustainable agricultural development and achieving food security for Arab societies in general.

RESEARCH IMPORTANCE

The importance of research appears in the relationship of agricultural sector products to the issue of food security. If any country is unable to produce its requirements of various foodstuffs for local consumption and import them from abroad, this may expose it to many risks. The research reveals the nature of agricultural food production in the Arab world through the experience of the Kingdom of Saudi Arabia and its ability to achieve food security and bridge the food gap for its population in addition to proving that sustainable agricultural development is the direct bridge leading to achieving food security through the use of various material, technical and natural resources similar to water resources without depleting them and in ways that work to protect them.

RESEARCH PROBLEM

The research problem can be formulated through the following question: To what extent can sustainable agricultural development contribute to achieving food security and the possibility of achieving that agricultural development for all Arab states?

RESEARCH HYPOTHESIS

The research is based on the hypothesis that (sustainable agricultural development has a fundamental impact in achieving food security) and the model of agricultural development in Saudi Arabia can be adopted and applied in achieving food security throughout the Arab world.

RESEARCH OBJECTIVES

The research aims to be acquainted with the importance of the role of agricultural resources in achieving sustainable agricultural development and food security in addition to identifying the role of sustainable agricultural development indicators to achieve food security and know the relationship between sustainable agricultural development and food security indicators for the Kingdom of Saudi Arabia. The research also aims to know the challenges and obstacles facing the achievement of food security and identify the reasons behind the food problem and the lack of food security and then suggest some appropriate future solutions to solve this problem.

RESEARCH METHODOLOGY

The nature of the subject and the objectives to be reached made us rely on the descriptive and analytical method.

FIRST SECTION

Theoretical and Conceptual Framework for Sustainable Agricultural Development and Food Security

First Topic - Concept of Sustainable Agricultural Development

The concept of sustainable agricultural development dates back to the eighties of the last century in response to the growing ideas that local and international agricultural policies and programs must include a range of environmental, economic and social issues and be broader than the traditional areas of

agricultural production and food security. The importance of agricultural development has been demonstrated and this was confirmed at the Earth Summit which was held in Rio de Janeiro in 1992 in the agenda 21 of the specific programs and actions necessary to encourage sustainable agricultural development and no one denies the importance of preserving natural resources (land and water) from deterioration as well as preserving them to be used by future generations. The concept of sustainable agriculture is an integral part of the concept of sustainable development and certainly there is no sustainable development without sustainable agriculture, and many concepts of sustainable agricultural development have been received, the most important of which are the following:

First - Concept of Sustainable Agricultural Development

It is the management and protection of the natural resource base and preparation for technical and institutional change to ensure the continuous achievement of human needs for current and future generations. This development protects land, water and genetic diversity of plant and animal and it is not harmful environmentally, suitable technically, feasible economically and acceptable socially, so making it aims to provide the food needs for the population in the present and the future in terms of quantity and quality, providing sustainable job opportunities, increasing income and improving the standard of living for all workers in the agricultural sector in addition to preserving natural resources and working within the limits possible to increase their production without prejudice to the work to protect the agricultural sector from exposure to natural, economic and social factors harmful to the sustainability of production and to strengthen the mechanisms of self-reliance in productive work and ensure the participation of the population and promoting the development of human resources to achieve sustainable development¹. As for the concept of agricultural development, according to the International Fund for Agricultural Development², it means to find improved and more resilient ways of living for all poor rural people including smallholder farmers and workers who own small plots of land or who do not own any land, but without undermining the natural resources base and it aims to eradicate poverty and eliminate hunger³.

Second – Goals of Sustainable Agricultural Development

Sustainable agricultural development depends on the human factor and its advanced capabilities and skills in the agricultural production process. Rural development is the other face of agricultural development, hence the importance of experience, efficiency and training in the process of expanding agricultural land investment and increasing its production in quantity and quality, which affects economic development by providing food needs for the population, achieving food security and securing the future needs of the current generations. These goals are summarized as follows:

¹ Ahmed Jaber Salem Al-Salem, The Reality of Sustainable Agricultural Development and Its Requirements in Iraq, University of Basra, College of Administration and Economics, Master's Thesis, 2010, p.11.

² FAO, Food and Agriculture Organization in its seventy-fifth year: Together we grow, nurture and maintain sustainability, Rome, 2020, p.10.

³ <https://www.ifad.org/ar/ifad-and-the-sdgs>

Securing the citizens' needs for food:

Human societies are subject to the continuous development law in terms of increasing their numbers and in terms of the diversity of their cultures. This results in a continuous increase in the demand for agricultural commodities of its two parts, plant and animal. Therefore, securing food becomes the first job in the list of priorities. On the contrary, any deficit in meeting demand will result in more agricultural imports from other states and this will result in a deficit in the trade balance. Avoiding this deficit is dependent on the ability to produce it. Moreover, food is no longer an ordinary commodity, especially grains. It has a strategic perspective that falls under the door of food security, which is one of the tools of war during regional crises⁴.

Contribution of the agricultural sector to the formation of the Gross Domestic Product (GDP):

Agriculture is one of the vital sectors and one of the pillars of economic and social development in many Arab states. It constitutes the main source of sustenance for a large portion of the population, contributing to the employment of more than 27 million workers, or about 23% of Arab labor. This sector also contributes to providing food products and intermediate inputs to many industries, especially food ones. It contributes to the provision of foreign exchange through the return on exports of agricultural commodities. The economic and social importance of this sector is also reflected in the contribution of agricultural output to the gross domestic product of Arab states⁵.

Contribution of the agricultural sector to raising the income level of the population:

Increasing agricultural productivity and nutrition is a necessary condition but it is not sufficient for the development of the sector in a sustainable way with the aim of improving farmers' income and enhancing food security. For example, measures to introduce efficient agricultural techniques (for example to increase crops and animal production) will not succeed unless they are accompanied by building local capacities. Effectively through training and extension programs, development measures to improve agricultural productivity can fail unless supplemented by necessary services such as agricultural marketing, rural loans and microfinance. Success in implementing an effective sustainable development program requires some complementary improvements to the local infrastructure, such as feeder roads and small-scale irrigation networks. In addition, raising farmers' incomes, reducing poverty in rural areas and improving family food security requires diversifying agricultural production systems⁶.

⁴ Saleh Hussein Abdel Salam, Sustainable Agricultural Development in Al-Hasakah Governorate, A Geographical Study, Damascus University, Faculty of Arts and Humanities, Geography Department, 2019, p. 5

⁵ <https://www.arab-api.org/Journal.aspx>

⁶ Fahmy Beshay, Towards sustainable agricultural development in Iraq, Emergency Operations Department, Special Relief Programs Department, (Rome - FAO - 2003), p.32

The Agricultural Sector Contributes to The Preservation of Natural Resources:

Agriculture conserves resources by improving soil health, reducing pest and disease pressure, reducing erosion, increasing water and nutrient availability, and storing carbon in the soil by enhancing the resilience of crops in the face of high temperatures, droughts and floods as well as helping to mitigate from the effects of climate change. It also reduces production costs by achieving savings in machinery, labor, irrigation, mineral fertilizers and pesticides. However, conservation agriculture is not one size fits all, as the methods used to achieve its basic practices vary according to different crops and local conditions⁷.

Third - Obstacles to Sustainable Agricultural Development

There are many obstacles that place restrictions on this sustainability and may curb it. The current obstacles or determinants, which will become available in the future and the opportunity currently available, as well as those that will arise in the future, naturally differ from one country to another, and from time to time as they may change in relation to each other according to the efforts that are made to deal with. In general, we can look at the obstacles to sustainable agricultural development, the most important of which is the erosion of the natural resource base, as the excessive use of natural resources such as forests, fisheries and fresh water and the high levels of pollution, including greenhouse gas emissions, due to environmental degradation and climate change destroy many of the gains made in development and reduce poverty over the past decades including progress towards achieving the Millennium Development Goals as well as pests and diseases that have ravaged agricultural systems based on intensive chemical inputs societies all over the world⁸. The other obstacle is population pressure as the continuous increase in population, one of the huge problems from which the peoples of the world are suffering from, the problem of rapid population growth. This rapid population growth is attributed to developments in the environment in various industrial, commercial, food and social fields.

Fourth - Dimensions of sustainable agricultural development, which can be summarized as follows:

Economic dimension:

In the field of food, the Arab region is an area of food deficit that is compensated by the recovery of basic food commodities from abroad. The Arab states cannot dispense with some commodities necessary for living, such as grain as well as meat and dairy. This deficit is increasing with time, and reliance on external sources to provide food requirements has become a heavy burden for the Arab states⁹.

⁷ FAO, Food and Agriculture Organization of the United Nations, Conservation and Expansion in Practice, 2016, p.20

⁸ International Labor Office in Geneva, Sustainable development, Decent Work and Green Jobs, Fifth Report, Fifth Agenda Item, International Labor Conference, 2012/2013 session, p.1.

⁹ arab-ency.com.sy/detail/124

Social dimension:

The difference in the cultural level of the peoples and the values, customs, traditions and behavioral methods that prevail in their societies may have their effects on agricultural products and the way of their production. The possession of lands and the size of ownership are considered important social phenomena that are often related to the difference in the nature of agricultural products¹⁰.

Human development dimension:

The experiences of Asian states, including them, show us the possibility of using human energy productively without the presence of additional capital resources. One of the important measures in this field is the reorientation of farmers on the basis of instilling in them the spirit of cooperation, teamwork, trust and altruism, as well as increasing the capital used in this vital sector and increasing agricultural extension to mobilize farmers and put them in a new position through which they can contribute effectively to the agricultural development process and develop them culturally and socially¹¹.

Environmental dimension:

It preserves natural resources and increases the vitality of the entire agricultural ecosystem, starting with humans, crops, animals and even soil organisms. The best guarantee of this is the good management of the soil, and the preservation of the health of crops, animals and humans through biological processes (self-regulation). This means the use of local resources in a way that limits the loss of nutrients, biomass and energy and prevents pollution and the focus on the use of renewable resources is included in this concept¹².

Second Topic - Theoretical and Conceptual Framework for Food Security

First: Concept of food security

The concept of food security dates back to the sixties of the last century, after the occurrence of the global food crisis that resulted in the convening of the World Food Summit in 1974 in Rome¹³. Definitions of the term food security differed as a result of the different viewpoints of the authors of this term, namely international organizations and bodies and those who adopted this term from local governments and the most important international organizations that define the concept of food security is the Food and Agriculture Organization of

¹⁰ Ahmed Ajaj, Spatial Development Requirements and their Impact on Agricultural Development, case study, Daraa Governorate, Master's thesis, Damascus University, Faculty of Architecture, Department of Planning and Environment, 2016, p. 23

¹¹ Fiqh Center for Research and Development, Obstacles to Agricultural Development in the Kingdom of Saudi Arabia, 1997, p. 10

¹² - Ghassan Eid Ismail Abu Mandeel, The Funding Role of Civil Society Organizations in Sustainable Agricultural Development, Case Study of Gaza sector 1996-2010, Master's thesis, Islamic University of Gaza, College of Commerce, Department of Development Economics, 2011, p. 30

¹³ Al-Sadiq Awad Bashir, Challenges of Arab Food Security, first edition, Beirut, Arab House of Science, Lebanon, 2009.

the United Nations (FAO), which defined food security as (all people's obtainment, at all times, of food sufficient for a healthy and active life)¹⁴, and it was also defined (it is available when physical, social and economic opportunities become available to all people at all times to obtain sufficient, safe and nutritious food that meets their nutritional needs and food tastes and ensures healthy and active lives for them)¹⁵.

Second – Goals of Food Security:

There are four main goals of food security:

Access:

It means that a person has the resources to purchase or obtain food. For example, a person may not have enough money to buy food and pay rent, so he or she must decide which of these basic needs is most vital to survival at that time¹⁶.

Stability:

Stability is usually related to the availability of food or access to food. It requires that food be available to individuals and families at all times¹⁷.

Availability:

It is represented in the presence of different resources or sufficient income in order to obtain food, whether using food aid, home production, or others¹⁸.

Utilization:

The use of food to meet all needs, which requires the provision of supporting infrastructure such as adequate food systems, sanitation, and health care, to reach a state of nutritional well-being, and this dimension clearly shows the importance of non-food inputs in achieving food security¹⁹.

Third- Theoretical Relationship between Sustainable Agricultural Development and Food Security

Food security in a particular country or region is defined as “one of the strategic components of agricultural development, contained within the sustainable economic and social development plan, which includes many policies, programs and projects that would increase the productivity of basic food commodities through the optimal use of available local resources and the elimination of all forms of loss and damage to all food commodities, starting from the producer to the consumer, rationalizing the consumption of all food

¹⁴ FAO, State of Food and Agriculture, food security some microeconomic dimensions, Roma, 1996, p.322.

¹⁵ FAO, State of Food Insecurity in the World, Rome, 2010, p.8.

¹⁶ <https://ffl.org/ar/15159/food-security-food-insecurity>.

¹⁷ <http://fsis.sd/SD/AR/FoodSecurity/Pillars>

¹⁸ Talal Meshaal, Importance of Food Security for Third World Countries, Topic Website, 2018, p.2.

¹⁹ <https://political-encyclopedia.org/dictionary>

commodities and improving the terms of trade exchange for those commodities and their production requirements, whether they are export or import, while maintaining the environmental balance, and preventing pollution in its various forms and forms, in the light of achieving the greatest possible extent of independence and reducing external dependence, aiming to provide these food commodities in sufficient quantity and quality to the entire population in their different areas of presence at prices consistent with their income levels on a continuous and sustainable basis. It is clear from this definition the “organic” relationship between the concept of food security and sustainable agricultural development, and that it is one of its components, thus, it is not possible to achieve food security without sustainable agricultural development²⁰. It plays an important role in the economies of the Arab states, as it provides food security through sustainable development as the latter is linked to increasing production and improving it in quantity and quality as well as corresponding to this population increase and directing the surplus to export, if any, as well as facing global competition. Accordingly, it has become necessary to use sustainable agricultural development to achieve self-sufficiency and to adopt agricultural policies that raise production and provide food, thus achieving self-sufficiency. The strategy message of the Arab Program for Food Security can be summarized in (enhancing efforts to modernize Arab agriculture, developing its productive and competitive capabilities, developing and maintaining natural resources and preserving the environment, in order to ensure the achievement of the goals of the current and future generations, within an integrated framework that achieves the interests of all Arab states and with competitiveness in a way that enables them to compete under conditions of free global trade in goods, services and intellectual property rights)²¹.

SECOND SECTION

Reality of Sustainable Agricultural Development and Food Security in the Kingdom of Saudi Arabia

First topic: Reality of Sustainable Agricultural Development in the Kingdom of Saudi Arabia

First- Indicators of Sustainable Agricultural Development for the Kingdom of Saudi Arabia

Gross agricultural product

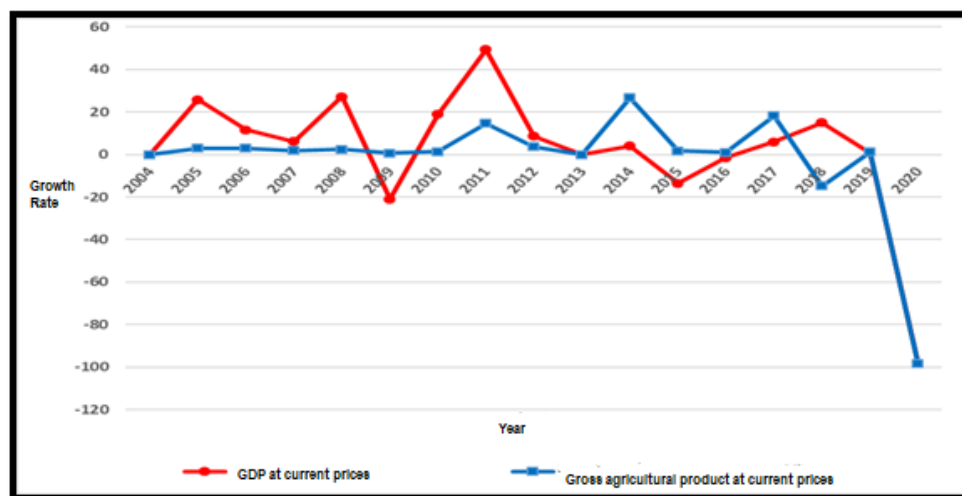
We note from Table (1) of the Statistical Supplement that agricultural output has increased for the period 2004-2020 at current prices at varying rates, reaching (17,922.7) million dollars in 2020 compared to 2004, which amounted to (9,917) million dollars at current prices and despite the spread of (COVID-19) disease, which reduced the workforce in the agricultural and animal husbandry sectors, as well as decreased productivity in all fields, Saudi Arabia did not bow to these difficulties because it relied on the method of

²⁰ grenc.com/show_article_main.cfm?id=12948

²¹ Mohammed Al-Sayyid Abdul-Salam, Food Security for the Arab World, Knowledge World 230, Kuwait, 1987, p.309.

diversification in its revenues to increase the gross agricultural product, for example, stopping the cultivation of green fodder which wastes water and the government gives guidelines to support the agricultural products in an optimal manner through organic agriculture, fish farming and greenhouses, as well as using modern methods in agriculture and animal husbandry. From figure (1) below, we note the highest growth rate of gross agricultural product for 2014 and it reached (26.7%), while the highest growth rate of GDP in 2011 amounted to (49.5%).

Figure (1) Growth rate of GDP and gross agricultural output of the Kingdom of Saudi Arabia (millions of dollars) for the period 2004-2020

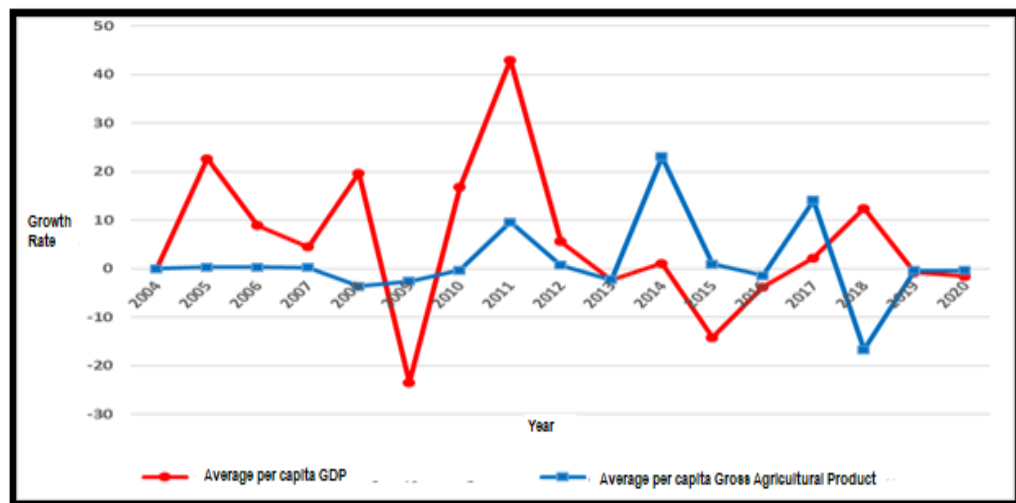


Prepared by the two researcher based on the data of table (3) of the Statistical Supplement by Excel software

Per capita GDP and gross agricultural product

Although the development of the average per capita GDP may not reflect the real level of per capita income, from Table (1) of the Statistical Supplement we note during the period 2004-2020 the rise and fall of per capita GDP and gross agricultural product at varying rates due to the reasons mentioned above. We note the highest value of per capita GDP at current prices was for the year 2012 amounted to (2,4911.4) dollars due to a significant increase in non-oil exports, and because Saudi Arabia did not depend on oil exports for its revenues, but different sectors contributed to the gross domestic product. As for the per capita share of the total agricultural product at current prices, it was the highest value in 2017, amounting to (622.8) dollars, due to the government’s tendency to support agricultural products and direct them optimally to organic agriculture, fish farming and green houses. We note from Figure (2) the highest growth rate of per capita GDP in 2011 amounted to (43%) and the highest growth rate of per capita agricultural gross domestic product in 2014 amounted to (23.1%).

Figure (2) Average growth rate of per capita GDP and gross agricultural product at current prices of the Kingdom of Saudi Arabia (dollars) for the period 2004-2020

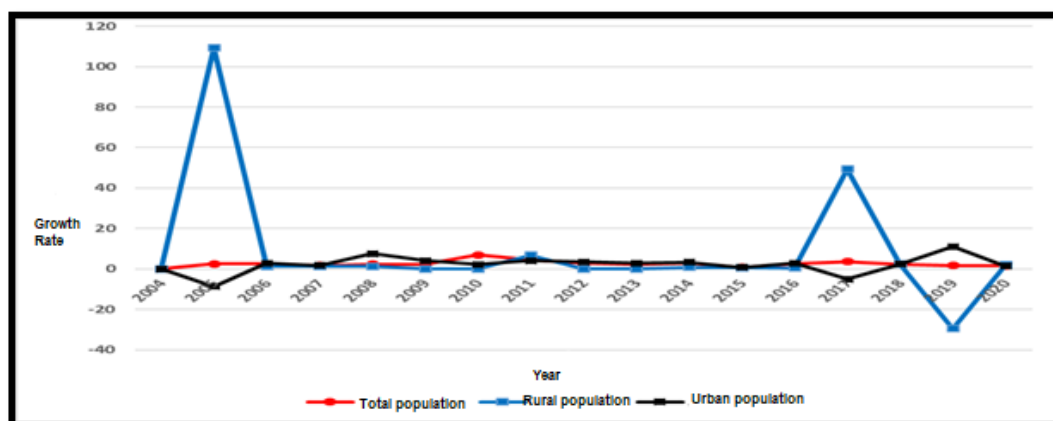


Prepared by the two researcher based on the data of table (3) of the Statistical Supplement by Excel software

Population and labor force in the agricultural sector

We note from Table (1) of the Statistical Supplement that the urban population in Saudi Arabia exceeds the number of the rural population despite the continuous increase in the total population. The total population in 2020 reached (34,813.9) million compared to 2004, when it reached (22,673) million. The urban population in 2004 reached (20,526.1) million and the rural population reached (2,146.9) million, meaning that the urban population exceeds the rural population (18,379.2) million. In the rest of the study years, we find a big difference between them despite the high agricultural production in the Kingdom, this is due to the fact that the owners of agricultural lands in Saudi Arabia are Saudis, but the workers in the agricultural lands are not Saudi, but of different nationalities in addition to their use of very advanced agricultural machines, most of which do not need a lot of labor to use them, but are used by a single person who steers and controls them or via the Internet. We have noticed that the agricultural labor force rises and falls for the period 2004-2020 unevenly until 2019 and 2020 decreased, reaching (287.8) (289.1) million people, respectively, compared to 2004, which amounted to (582.2) million and this decrease is due to the same reason that was mentioned above which is the use of manpower of multiple nationalities with the use of advanced strategies in agriculture and animal husbandry that do not depend on many labors. We note from Figure (3) that the highest growth rate of the urban population in 2019 reached (11%) and the highest growth rate of the rural population in 2005 reached (109.2%).

Figure (3) Population growth rate and rural and urban population of the Kingdom of Saudi Arabia (million people) for the period 2004-2020



Prepared by the two researcher based on the data of table (1) of the Statistical Supplement by Excel software

Second- Food security indicators in the Kingdom of Saudi Arabia

Agriculture in Saudi Arabia focuses on self-sufficiency as well as exporting wheat, dates, dairy products, eggs, fish, poultry, fruits, vegetables and flowers to markets all over the world. As the State works largely in the industry, petroleum and petrochemical industries, it also encourages agriculture and the government provides interest-free loans to farmers in the long term. The private sector also plays an important role in the GDP. Below are some of the most important indicators:

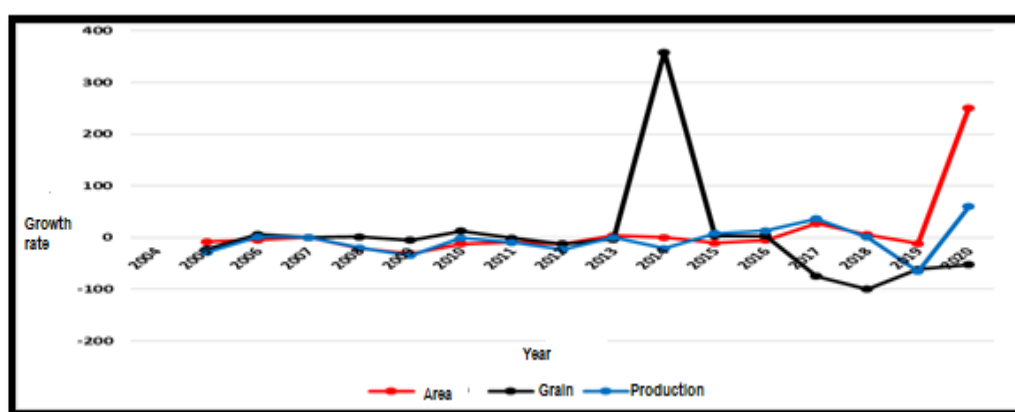
Plant production:

In its proposals, the Kingdom stressed the importance of working to increase plant production which is necessary to achieve economic development and to address the causes of faltering plant production, especially grains. As shown in table (2) of the statistical supplement, we note the reduction in the productivity of grains in the Kingdom of Saudi Arabia during the years 2004-2014 where it reached (859.1) thousand tons in 2014 compared to 2004 which amounted to (4,199.9) thousand tons and this is due to a series of gradual measures taken by the Ministry of Agriculture to limit the cultivation of grains until it is completely stopped due to the need for large quantities of water, and assigning the Grain Silos and Flour Mills Organization of all kinds to buy it from abroad to meet the needs of the inside. The indicators of the Ministry of Agriculture showed shrinkage in the area of agricultural holdings and the largest percentage decrease was recorded in the area of grain cultivation holdings for the wheat crop by about 25%, as it decreased from about 193 hectares to about 144 hectares in the year of the indicator. In the rates of self-sufficiency in grain crops, sorghum recorded the largest percentage by about 88%, then the millet crop by 55%, and the self-sufficiency rate of the wheat crop reached 28%, and the barley crop recorded the lowest self-sufficiency rate by about 0.2% after the amount of its production decreased by about 12.5%.

In the year of the indicator, it was produced by (14) thousand tons and in the previous year, it was produced by (16) thousand tons²². Then, it returned to rise in 2015 reaching (926.2) thousand tons compared to 2014, which amounted to (859.1) thousand tons, and the rise continued until 2018, reaching (1,199.7) thousand tons, due to the improvement in rainfall rates. As for the two years 2019-2020, grain production decreased, reaching (500) (800) thousand tons, respectively, due to the spread of the disease (COVID-19), which limited the smart investment* made by the Kingdom of Saudi Arabia.

Figure (4)

Growth rate of the quantity of grain production of the Kingdom of Saudi Arabia (thousand tons) for the period 2004-2020



Prepared by the two researcher based on the data of table (4) of the Statistical Supplement by Excel software

Livestock production:

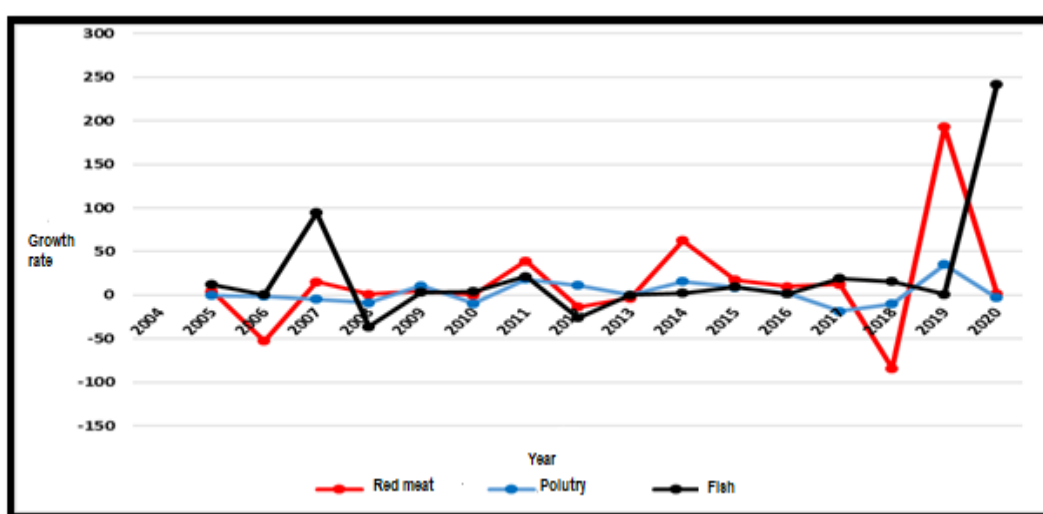
We note from Table (2) of the statistical supplement that red meat production decreased during the period 2004-2020 in Saudi Arabia, reaching (125) thousand tons in 2020 after it was (161.4) thousand tons in 2004, due to the varied environmental and climatic conditions as a result of the geographical expansion of the Kingdom, which made its climate varied between tropical and semi-tropical, which is characterized by high temperatures in summer and low rates of rainfall in winter and frequent droughts and water scarcity, which resulted in a negative impact on the productivity of animal herds and on fodder resources, especially on productivity of natural pastures. Poultry is one of the most desirable meals in the Kingdom, as the demand for it exceeds the demand for red meat. The Kingdom of Saudi Arabia, whose population does not consume a lot of fish, hopes to increase its production by ten times of its current production, through the development of fish farming activity in the Red Sea.

²² https://www.aleqt.com/2014/05/18/article_849770.html

* Smart investment: The movement to cultivate outside the country in order to avoid water scarcity and the desert nature of the investing country. Saudi Arabia, for example, chose the Dark Continent specifically because it owns 60% of the arable land around the world, in addition to the large population and labor available at low prices in addition to the quality of the soil, the abundance of water and the good investment climate.

The said goal expresses an ambitious given the environmental and commercial difficulties surrounding it. The increase in fish production for the period 2004-2020, which amounted to (483.3) thousand tons in 2020 compared to 2004, which amounted to (66.8) thousand tons and despite the low consumption of fish in the Kingdom, but its ambition to increase fish production despite the difficulties it faces in breeding Fish, including water pollution due to oil tankers, in addition to the high salinity in the Kingdom's waters due to its surroundings with the seas and oceans. We find the highest growth rate for the amount of red meat and poultry meat in 2019 amounting to (192.9%) (35.2%), respectively while the amount of fish was (241.6%) in 2020.

Figure (5) The growth rate of the amount of animal production in the Kingdom of Saudi Arabia (thousand tons) for the period 2004-2020



Prepared by the two-researcher based on the data of table (4) of the Statistical Supplement by Excel software

Second Topic - Steps to Establish Agricultural Development and Food Security in the Kingdom of Saudi Arabia

The Kingdom of Saudi Arabia has taken important steps to establish agricultural development, enhance food security, face the challenges of climate change, rising temperatures and scarcity of water resources, which have contributed to improving food security indicators and consumption systems, reducing losses and waste, achieving high rates of self-sufficiency for many strategic food commodities in local markets, and raising operational and productive efficiency of agricultural and food systems. Its vision is based on building a sustainable agricultural sector that contributes to achieving food and water security and economic, social and environmental development. It has also adopted a strategy for responsible agricultural investment abroad, developing agricultural and marketing services systems and improving agricultural productivity and food quality. It has also adopted, through its global, regional and local partnerships, many systems, technologies and innovations. The Kingdom is working to strengthen sectors supporting food systems by developing infrastructure in the sectors of transportation, scientific research institutions, agricultural

manufacturing and marketing and offering many investment opportunities to enhance the productivity of the agricultural sector and provide diverse food products in local markets, stressing the importance of taking short and long-term measures and measures to reduce the challenges and pressures facing the agricultural sector, natural resources and food security as a result of the pandemic that has affected many development and economic fields and its indirect effects on agricultural and food systems around the world.

Expansion in increasing productivity and sustainability and exploiting strategic partnerships and available investment opportunities that cover areas of common interest will support the agricultural sector, achieve food security and create a suitable environment for more partnerships and agricultural investments. Through the growth rates that were presented in this topic, we noticed a rise and a decrease in growth rates and their causes were varied, including political, economic, and natural causes and these influences worked on the disparity in production quantities and the value of the product which in turn achieves or does not achieve certain goals in order to reach food security of the Kingdom of Saudi Arabia.

THIRD TOPIC

Conclusions and Recommendations

Through the foregoing, the two researchers reached a set of conclusions and recommendations, which are as follows:

First – Conclusions:

1. We have noticed that the Kingdom of Saudi Arabia has followed the methods associated with preserving the vitality of the soil and getting rid of farming methods that harm the soil and the environment.
2. The Kingdom has been keen to use water resources in a manner that guarantees their protection, by using advanced irrigation methods to preserve the various water resources in a manner that ensures their protection.
3. The Kingdom has interested in organizing and preserving pastures through developing them, providing water resources and reducing pressure on them by concentrating grazing for meat-producing animals in fixed centers.
4. The Kingdom has initiated to enact laws that contribute to combating desertification, protecting forests and limiting their deforestation by regulating forest cutting operations and fighting fires.

SECOND: RECOMMENDATIONS

1. The Arab states should adopt methods related to preserving the vitality of the soil and getting rid of farming methods that harm the soil and the environment by introducing modern agricultural equipment and machines, fertilizers and improved seeds.

2. The necessity of using water resources in a manner that ensures their protection from depletion, by using advanced irrigation methods to conserve water resources.
3. The Arab states should seek to count, organize and preserve pastures through developing them and providing water resources to graze meat-producing animals in fixed centers in them.
4. It is important to issue laws that contribute to combating desertification and protecting the agricultural environment in the Arab world as well as protecting and developing forests and encouraging farmers to maintain them.

Table (1) Agricultural Development Indicators of the Kingdom of Saudi Arabia for the period 2004-2020

Year	Gross agricultural product at current prices (Million dollars)	Per capita gross agricultural product at current prices (dollar)	Average per capita gross agricultural product at current prices (dollar)	Number of population			Manpower	
				Total population (million people)	Urban population (million people)	Rural population (million people)	Total manpower (thousand people)	Agricultural manpower (thousand people)
2004	437.4	9917	1241.7	22673	2146.9	20526.1	582.2	7504.9
2005	438.8	10208	1148.5	23262	4492	18770	594	8520
2006	440.3	10499	1791.7	23843	4546	19297	605	8750
2007	441.4	10701	2894.7	24242	4600	19642	600	8229
2008	425.4	10970	3375.8	25787	4654.6	21132.4	592.3	2710
2009	414.3	11045	3030.7	26660.9	4654.9	22006.3	542.5	7548.6
2010	412.9	11204	3740.5	27137	4654.6	22482.4	492.6	7887.2
2011	452.6	12843	5116.5	28376.4	4973	23403.4	475.4	9935.5
2012	455.8	13307	6147.3	29195.8	4973	24222.8	470	11286
2013	445.2	13307	6525.7	29889.8	4973	24916.8	470	11286
2014	548.1	16864.8	6518.3	30770.4	5015	25755.4	468.1	12391.4
2015	553.2	17159.3	4863.8	31016	5044	25972	495.4	12991.6
2016	545.6	17342.2	4526.7	31787.6	5070	26717.6	512.2	13431.3
2017	622.8	20514.8	5200.9	32940	7576.2	25363.8	463.5	13071
2018	519.2	17495.8	5652.3	33699.9	5421.2	25953.3	332	14021.9

2019	516.8	17708.9	6000	34268.5	5461	28807.5	287.8	14387.6
2020	514.8	17922.7	4200	34813.9	5570.2	29243.7	289.1	14455.5

Prepared by the two researchers based on statistics data

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Table (2) Food Security Indicators of the Kingdom of Saudi Arabia for the period 2004-2020

Year	Plant production (grains)		Animal production		
	Productivity (thousand ton)	Cultivate area (hectare)	Red meat (thousand ton)	Poultry (thousand ton)	Fish (thousand ton)
2004	4199.9	685.2	161.4	522.2	66.8
2005	3000.4	628.7	168.6	521	74.8
2006	3037	599.4	79.5	515	75.3
2007	3037	599.4	91.5	490	146.5
2008	2433	473.7	92.2	447	93.5
2009	1585.5	325.1	96.8	494	96.5
2010	1565	284.7	96.8	447	100.5
2011	1418	260.3	134.6	529	122.1
2012	1088	227.9	116.1	588	90
2013	1088	236.1	111.9	588	90
2014	859.1	235.9	181.9	680.1	91.9
2015	926.2	210.9	213.8	741.2	100.5
2016	1047.5	200.2	234.8	755.9	102
2017	1429	255.2	264.5	616.4	121.4
2018	1199.7	247.6	268.8	710.3	140.8
2019	500	237.4	123	749	141.5
2020	800	832.3	125	726	483.3

Prepared by the two researchers based on statistics data

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Table (3) – Growth Rate of Indicators of Sustainable Agricultural Development of the Kingdom of Saudi Arabia for the period 2004-2020

Year	Growth rate of GDP	Growth rate of gross agricultural product	Growth rate of per capita GDP	Growth rate of per capita gross agricultural product	Growth rate of total population	Growth rate of urban population	Growth rate of rural population
2004	-	-	-	-	-	-	-
2005	25.9	2.9	22.7	0.3	2.6	-8.6	109.2
2006	11.7	2.9	8.9	0.3	2.5	2.8	1.2
2007	6.2	1.9	4.5	0.2	1.7	1.8	1.2
2008	27.3	2.5	19.7	-3.6	2.3	7.6	1.2
2009	-20.9	0.7	-23.5	-2.6	2.3	4.1	0.0
2010	18.9	1.4	16.8	-0.3	6.9	2.2	0.0
2011	49.5	14.6	43.0	9.6	4.6	4.1	6.8
2012	8.6	3.6	5.6	0.7	2.9	3.5	0.0
2013	0.0	0.0	-2.3	-2.3	2.4	2.9	0.0
2014	4.1	26.7	1.1	23.1	2.9	3.4	0.8
2015	-13.5	1.7	-14.2	0.9	0.8	0.8	0.6
2016	-1.4	1.1	-3.8	-1.4	2.5	2.9	0.5
2017	5.9	18.3	2.2	14.1	3.6	-5.1	49.4
2018	15.0	-14.7	12.4	-16.7	2.3	2.3	2.3
2019	0.8	1.2	-0.8	-0.4	1.7	11.0	-29.5
2020	-98.2	-98.4	-1.6	-0.4	1.6	1.5	2.0

Prepared by the two researcher based on the data of table (1) by Excel software.

Table (4) Growth Rate of Food Security Indicators of the Kingdom of Saudi Arabia for the period 2004-2020

Year	Growth rate of grains production quantity	Growth rate of red meat production	Growth rate of poultry production	Growth rate of fish production
2004	-	-	-	-
2005	-28.6	4.5	-0.2	12.0
2006	1.2	-52.8	-1.2	0.7
2007	0.0	15.1	-4.9	94.6
2008	-19.9	0.8	-8.8	-36.2
2009	-34.8	5.0	10.5	3.2
2010	-1.3	0.0	-9.5	4.1

2011	-9.4	39.0	18.3	21.5
2012	-23.3	-13.7	11.2	-26.3
2013	0.0	-3.6	0.0	0.0
2014	-21.0	62.6	15.7	2.1
2015	7.8	17.5	9.0	9.4
2016	13.1	9.8	2.0	1.5
2017	36.4	12.6	-18.5	19.0
2018	0.8	-84.1	-10.1	15.6
2019	-65.3	192.9	35.2	0.9
2020	60.0	1.6	-3.1	241.6

Prepared by the two researcher based on the data of table (2) by Excel software.

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