

## Evolution of the Role of the Agricultural Sector in the Food Security of Jordan: - A SWOT Analysis after a Century of Establishment

*Amer Subhi Jabarin<sup>1</sup>*

<sup>1</sup> Senior Agribusiness Consultant- Retired, School of Agriculture-University of Jordan

Received on 1/7/2021 and Accepted for Publication on 29/8/2021.

---

### ABSTRACT

In 1921, the population of the Emirate of Transjordan was only 230 thousand people. The newly born country had few natural resources and few population centers, and its only real revenue was British government aid. The latest statistics show that Jordan's population amounted to 10.96 million in August 2020, which means that the population has increased by more than 46 folds over the last 100 years. The huge increase in the kingdom's population has put huge pressures on the limited resources available to the agricultural sector and consequently jeopardize the food security situation, especially in the last few decades. Food security in Jordan is a complex issue which exacerbated during the latest Covid-19 epidemic which coincided with the ongoing refugee crises. The main objective of this paper is to explore the main directions of the expected role of the agricultural sector and its impact on the food security situation in Jordan in the next century. The researcher used a descriptive analysis tool that uses the points of strengths (S), weakness (W), opportunities (O), and threats (T) (SWOT) to achieve the objective of this research. The main conclusions drawn from the SWOT analysis conducted in this paper are as follows: 1) climate change and the decline in the very scarce water resource is the major challenge that is currently facing and will continue to face the agricultural sector which will jeopardize the food security system in Jordan, 2) another major challenge is the high population growth rates and a large number of refugees in the country, 3) The absence of clear and robust food security policy, and 4) Food waste and post-harvest losses are another major threat of the food security in Jordan. To minimize these challenges, the researcher recommends the following that: 1) Increase the water use efficiency of the current agricultural production systems through adopting new irrigation techniques such as improved drip irrigation systems, 2) expand in the hydroponic production systems that save huge amounts of irrigation water which could also be produced near urban centers to save transportation costs of final production, 3) introduce drought-resistant varieties of field crops, forage crops and trees, 4) improve the post-harvest handling systems of perishable agricultural products to reduce losses across the different stages of the value chain such expanding with cold storage facilities, cold trucks, pre-cooling, and proper packing and packaging, 5) improve the agricultural education curricula through establishing new programs that meet the current and future food market demand, and 6) support and encourage young researchers through incubating and accelerating their new ideas which could add great values to the current agricultural and food security system in Jordan.

**Keywords:** Food security, hydroponics, climate change, food waste, drip, economy, agricultural sector, SWOT

---

## INTRODUCTION

In 1921, the population of the Emirate of Transjordan was only 230,000. The newly born country had few natural resources and few settlements, and its only real revenue was British government aid. The latest statistics show that Jordan's population amounted to 10.96 million in August 2020 (DOS, 2021) which means that the population has increased by more than 46 folds over the last 100 years. Figure 1 shows the distribution of Jordan's population by sex from 1921 to 2020. Jordan's population pyramid of 2018 which shows the distribution of the population by age groups indicates most of Jordan's population is young with a median age in Jordan is 23.8 years.

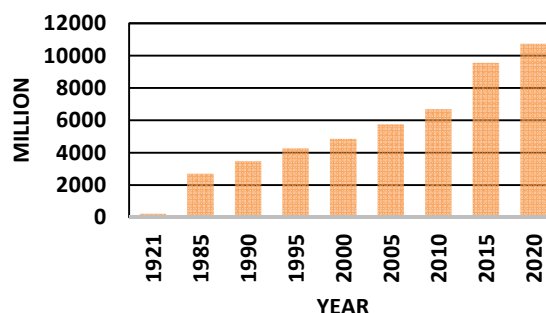
Even at the time of the establishment, Jordan had very limited natural resources for the little amount of population at that time. The challenges of the limited scarce resources became more chronic over the last 10 decades due to the continuous increase of the population because of high natural growth rates and waves of migration from neighboring countries, especially the Palestinian crisis in 1948 and then 1967. The latest wave of refugees fled to Jordan was after starting the Syrian crisis in 2011. The latest estimates show that Jordan hosts around 658,000 registered Syrian refugees, while the total real number is estimated at around 1.3 million of which 81% are living out of camps (ACAPS. 2021).

### The objective of this paper

This paper aims to explore the main directions of the expected role of the agricultural sector in the food security situation of Jordan in the next century. In this paper, the researcher used a descriptive analysis tool that uses the S(strengths), W(weakness), O(opportunities), and T(threats) to achieve the objective of this research. The SWOT analysis indicates the Strengths and the Opportunities of the agricultural sector that would help in attaining the food security goals that were stated in most of the recent

agricultural/food security strategies. The analysis would also signify the main obstacles that must be tackled to realize the intended success (i.e., the Weaknesses and Threats).

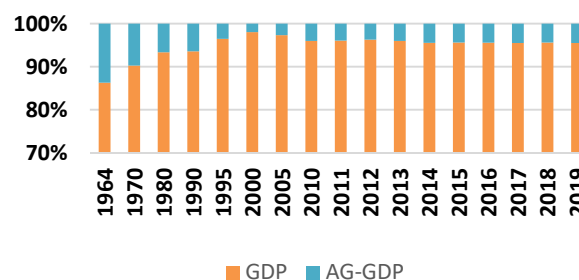
**Figure 1 Jordan's Population  
1921-2020 (million)**



The researcher relied on reviewing and analyzing many of the studies and reports prepared by many national and international agencies during the last two decades. The used data for conducting the descriptive analysis were abstracted from secondary sources such as the Department of Statistics (DOS), Central Bank of Jordan (CBJ), Ministry of Agricultural (MoA), Ministry of Water and Irrigation (MOWI), and other sources.

### Evolution of the Jordan's Economy and the Agricultural Sector

**Fig 2 GDP and Ag contrirubtion  
(1964-2019)**



Jordan's economy has been severely impacted by the different subsequent refugees' waves as of 1948. The waves of refugees have severely impacted the Jordanian economy which become increasingly dependent on international grants and loans. Jordan does not depend much on its natural resources due to the scarcity of oil and gas reserves, as the case of many neighboring countries. Over the last three decades, Jordan has executed several harsh reforms under different programs with the IMF and other donor agencies. As indicated in figure 2, the GDP in constant prices continued to grow despite all the turmoil in the region, although at a slow pace. The Gross Domestic Product (GDP) in 2019 at the constant prices (Base=2016) amounted to about 30 billion Dinar (CBJ, 2021). The sector of finance, insurance, and real estate has contributed to about one-fourth of the country's GDP. However, figure 2 shows the agricultural sector's contribution to GDP continued to decline from 16% in 1964 to 4.7% in 2019. It should be stated here that many agricultural experts claim that the contribution of the agricultural sector is way much higher than 4.7% as the reported indicators do not include the contribution of the agribusiness sector which could amount to 25% (Jabarin et. al, 2020).

Despite the low contribution of the agricultural sector to the GDP, it is considered one of the important sectors in the national economy for its role in providing the country with a large part of the local food, especially the needs of fresh fruits and vegetables and some grains. At present, Jordan is self-sufficient in most types of vegetables and some fruits. Vegetables constitute the main part of agricultural exports, which in turn constitutes an important source of foreign exchange generated from the agricultural sector.

During the last half-century, Jordan has made substantial progress in increasing agricultural production. The plant production has tripled since 1976. This attainment was achieved mainly from the expansion of irrigation networks,

the expansion of the use of greenhouses, and the high-yield hybrid seeds. One of the reasons for the increase in production was also in response to the expansion in domestic and international demand for fresh produce.

Although the Jordanian agricultural sector continues to adopt all degrees and different forms of technology within its available capabilities, its growth lags other economic sectors. However, the sector is still one of the important economic sectors that contribute to the Jordanian economy. Despite its low contribution to the GDP of 4.7% (Central Bank of Jordan, 2021), the sector is considered as 1) one of the main sources of income for about 80 thousand families in the rural areas of Jordan, 2) provides job opportunities for about 10% of the total employment of both Jordanian and non-Jordanians, 3) has an important role in preserving biodiversity, vegetation, and soil nutrition, 4) helps reduce the risk of desertification; and 5) during the COVID-19 epidemic closure, the sector continued providing the population with horticultural and dairy products.

#### **Evolution of the Food Security Situation in Jordan**

As stated by the United Nations Committee, "food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (UN-FAO, 1996). As indicated by the definition, there are four dimensions of food security: 1) Physical availability of food, 2) economic and affordability, 3) Food utilization in terms of preparation and diversity of diet, and 4) stability of food supply and access all the time to all people.

According to the UN-WFP, Jordan is an upper-middle-income country and is considered a food secure country with a score of 11.2 on the 2018 Global Hunger Index (Grebmer, et. al, 2016)<sup>1</sup>, indicating that the level of hunger is moderate. The Global Hunger Index is a tool that is calculated every year to measure and track hunger globally

as well as by region and by country. A scale of 9.9 is considered low, while it is considered moderate if it is between 10-19.9. However, the report indicated that Jordan faces many challenges in attaining food security which include a variety of structural and political factors, such as unemployment, high cost of living compared to the level of income, high poverty rates, and sluggish economic growth (WFP, 2020).

It should be stated here that Jordan has adopted the Sustainable Development Goals (SDGs). The integrated 17 SDGs are recognized as actions for positively affecting social, economic, and environmental sustainability. The government has been working on mainstreaming the SDGs into its national policies and taking actions to achieve positive change included in the 2030 Agenda. Amongst the 17 SDGs of the UN, SDG2 and SDG 13 are the most relevant to food security and climate change. The Government has been aiming at SDG 2 explicitly to “end hunger, to achieve food security and improved nutrition and promote sustainable agriculture”.

The agriculture and food sector is key to the achievement of the SDGs in Jordan. Sustainable agriculture is an important contributor to economic growth and the livelihoods of vulnerable communities, especially in rural areas. The Jordanian Ministry of Agriculture, Ministry of Environment, and the Ministry of Planning and International Cooperation (MOPIC) are the main three official bodies directly involved in implementing actions to achieve the SDGs. In 2020, following the effects of COVID-19, the MOA has ratified a new updated agricultural strategy for 2016-2025 which links to the achievement of SDGs and improved food security.

As indicated above, an essential requirement of attaining food security is the physical availability of the food items at an affordable cost, which is the major role of the agricultural sector in the country and the other agri-food processing sector. The agricultural sector of Jordan is significantly affected by the environmental and socioeconomic characteristics of Jordan such as the arid climate, low rainfall

rates, great variation in the topography of its lands, and a high rate of natural population growth (which amounts to 2.4 percent per year, according to the population survey conducted by the Department of Statistics at the end of 2020) (DOS, 2021). Together, these factors impose great pressures on Jordan’s limited resources, especially water.

### **SWOT Analysis of the Agricultural Sector of Jordan**

The SWOT analysis is a tool or a model that can help the decision-makers and planners in the agricultural sector to get insights into the past and contemplate possible solutions to prevailing or potential difficulties that face the agricultural sector and could hinder it from achieving food security (Brohi, et al, 2020; (Akhtar and Pirzada, 2014; Hong, 2010; Ra and Eschenbach, 1992). The four components of the model are defined as follows:

Strengths (S) as any capabilities that exist and could help in exploiting available and potential opportunities and combat threats.

Weaknesses (W) are any conditions and deficiencies that exist that hinder the sector's ability to exploit opportunities.

Opportunities (O) are any external circumstances or trends that have a positive impact on the agricultural sector.

Threats (T): any external circumstances or trends that negatively affect the agricultural sector which in the absence of studied measures, may lead to losing the potential of the sector in achieving food security.

As part of the SWOT analysis, figure 3 portrays the main weakness and threats of the agricultural sector that also affect the food security of Jordan during the next century. The identified listed weaknesses and threats symbolize the cumulative pressures on the agricultural sector over the last decades. As indicated in the most recent National Agricultural Development Strategy, these weaknesses and threats also resulted in weak implementation of previous government agricultural strategies and lowered the ability of the sector to take advantage of the capabilities available in its development and modernization (MoA, 2020).

The internal and external weaknesses and threats resulted also in decreasing the value-added growth, increased unemployment, increased rural poverty, decreased the standard of living of farmers, and increased farmers' debts and default in paying their loans to former and non-formal creditors.

Other weaknesses that characterize the agricultural sector and may negatively affect food security in Jordan in the coming century include 1) attractiveness of the sector to youth and consequently relying on non-national laborers, 2) the agricultural education does not match market demand & innovation, 3) the low quality of horticultural production due mainly to the low enforcement of standards, 4) high rates of

postharvest losses, 5) very weak agricultural databases to that could support the decision making process of producers, exporters, and policymakers.

In addition to the threats mentioned above, other pressures on the agricultural sector that may also threaten the food security of Jordan include 1) climate change represented in the continuous decline in rainfall & droughts, 2) the alarming decline in groundwater due to over pumping and reduction in surface water that comes from Syria and Israel, 3) the high population growth rates and the waves of refugees, 4) conversion of rangelands to agricultural lands and the deforestation, 5) land fragmentation due to inheritance laws and lack of clear land-use policy, and 6) there is no clear food security policy.

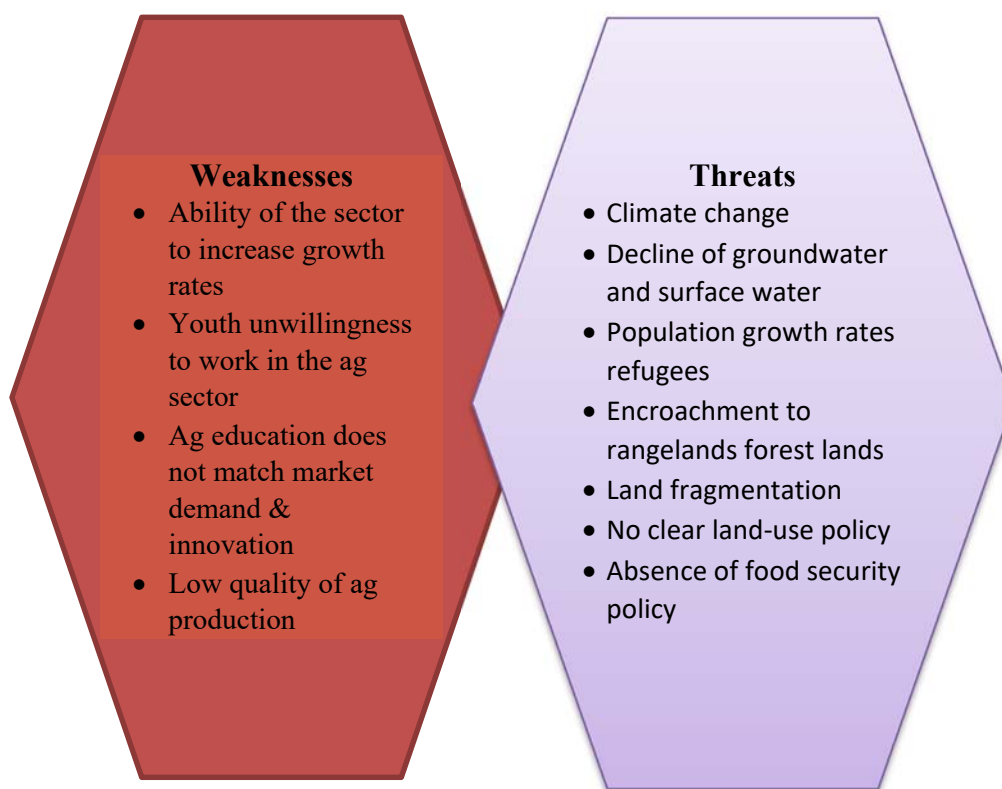


Figure 3. SWOT analysis (Weaknesses and Threats)

Figure 4 portrays the other part of the SWOT analysis which is related to the main strengths and opportunities of the agricultural sector that would also affect the food security of Jordan during the next century. The identified listed strengths and opportunities signify the cumulative prospects of the agricultural sector to grow as it helped the sector to grow during the last decades. As indicated in the National Agricultural Development Strategy, these strengths and opportunities resulted in increasing the volume of horticultural production, exports, and investments. Capitalizing on these opportunities and strengths would help in mitigating the weakness and threats facing the sector and accordingly, help in improving the food security situation in Jordan during the next century. Figure 4 shows that the major

strengths and opportunities of the agricultural sector that may improve the food security situation in Jordan include: 1) utilization of the comparative advantage of Jordan in producing many types of horticultural products in times where many other countries don't produce, 2) the proximity of Jordan's location and closeness to export markets, 3) well established private sector across the whole value chains, 4) availability of good infrastructure for transporting products from production areas to consumers in cities and export markets. Other opportunities include the ability of the Jordanian farmers in adopting advanced technologies and innovations.

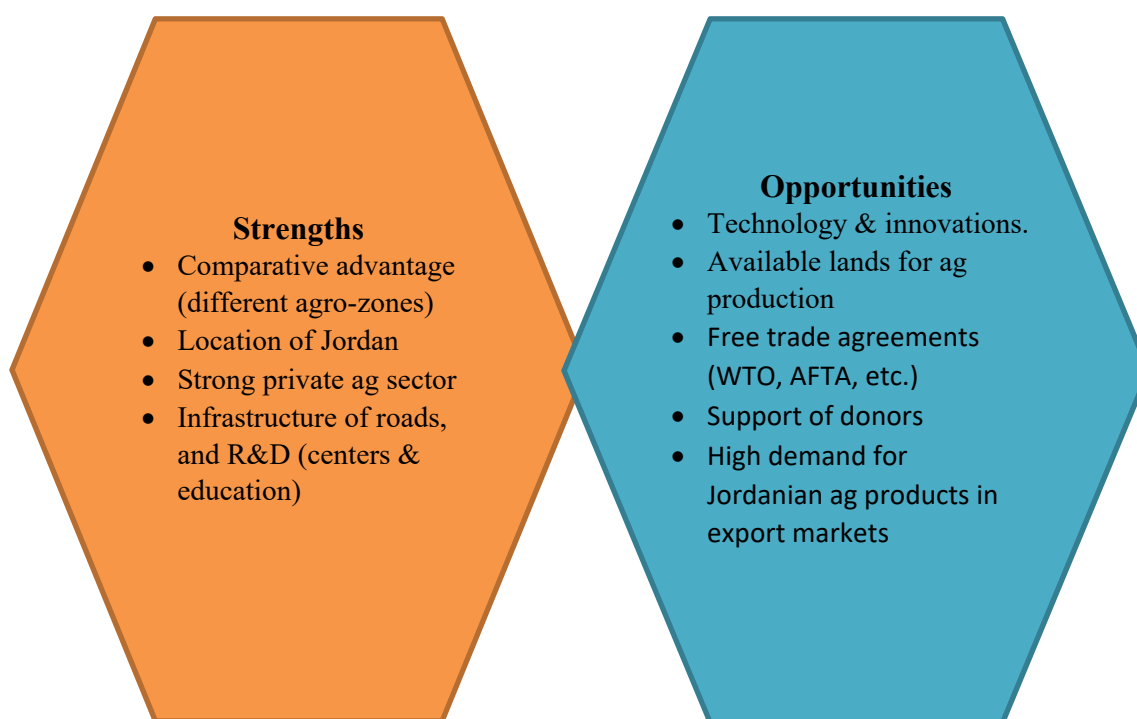


Figure 4. SWOT analysis (Strengths and Opportunities)

### Conclusions and recommendations

Food security in Jordan is a complex issue which exacerbated during the latest Covid-19 epidemic in addition to the ongoing refugee crisis. A recent report by the world bank and World Food Program (WFP, 2020) concluded that Covid-19 has pushed 17 percent of Jordanians to permanently lose their jobs with unemployment rates up to 26 percent in 2020. The report added that 42% of households are ranked in the category of harmful livelihood coping strategies (crisis level). This situation applies also to refugees in Jordan where about 21% of them in the host communities are food insecure (WFP, 2020).

The government of Jordan is expected to receive support from the WFP, FAO, and UNIDO to update Jordan's National Food security strategy and its implementation plan. In a UN press release early this year (UN, 2021), it was stated that the assumed updated strategy is expected to aim to: "1) Assist Jordan to realize its role as a strategic regional hub for food security, 2) Guide, and coordinate efforts and interventions related to food security in Jordan, 3) Achieve efficient utilization of available resources, potentials, and opportunities, 4) Minimize food loss and waste and provide proper targeting and monitoring of progress gauged against agreed-upon indicators, and 5) Accelerate the progress towards achieving relevant SDGs targets and meet Jordan's commitments"(UN-Jordan, 2021).

The main conclusions drawn from the SWOT analysis conducted in this paper include 1) climate change and the decline in the very scarce water resource is the major challenge that is currently facing and will continue to face the agricultural sector which will jeopardize the food security system in Jordan, 2) The high population growth rates and the large number of refugees in the country which increase the pressure on the limited resources for food production in the country, especially water, 3) The absence of clear and robust food security policy makes it hard to utilize the strengths and the opportunities of the agricultural sector in Jordan and to synchronize efforts to tackle the weaknesses

and the challenges facing the agricultural sector, and 4) Food waste and post-harvest losses are another major threat of the food security in Jordan. Research shows that food waste in Jordan ranged between 50% and 65%, according to Jordan Green Building Council (JGBC, 2016), which is close to double the international level of food wastage (33.3%), (FAO, 2018)

Given the above conclusions, it is believed that the food security issue in the next century will be jeopardized by challenges facing the agricultural sector. To minimize these challenges, the researcher believes that: 1) Increase the water use efficiency of the current agricultural production systems through adopting new irrigation techniques such as improved drip irrigation systems, 2) expand in the hydroponic production systems that save huge amounts of irrigation water which could also be produced near urban centers to save transportation costs of final production, 3) introduce drought resistance varieties of field crops, forage crops and trees, 4) improve the post-harvest handling systems of perishable agricultural products to reduce losses across the different stages of the value chain such expanding with cold storage facilities, cold trucks, pre-cooling, and proper packing and packaging, 5) improve the agricultural education curricula through establishing new programs that meet the current and future food market demand, and 6) support and encourage young researchers through incubating and accelerating their new ideas which could add great values to the current agricultural and food security system in Jordan.

## REFERENCES

- Akhtar, K., S. S. Pirzada, (2014). SWOT analysis of agriculture sector of Pakistan. *J. Econ. Sustain. Dev.* 5, 127-134.
- Assessment Capacities Project (ACAPS), (2021), Jordan Response Plan for the Syria Crisis 2021 <https://www.acaps.org/country/jordan/crisis/syria> n-refugees
- Central Bank of Jordan (2021), Annual Statistical Bulletin, [www.cbj.gov.jo](http://www.cbj.gov.jo)
- Department of Statistics (2021), demographic statistics, [www.dos.gov.jo](http://www.dos.gov.jo)
- Department of Statistics, (2021), [http://jorinfo.dos.gov.jo/Databank/pxweb/en/Demographi\\_Statistics/-/Table5.px/table/tableViewLayout2/](http://jorinfo.dos.gov.jo/Databank/pxweb/en/Demographi_Statistics/-/Table5.px/table/tableViewLayout2/)
- Food and Agriculture Organization of the United Nations (2019). SAVE FOOD: Global Initiative on Food Loss and Waste Reduction. 2019.
- Hong, W. Y., (2010). SWOT analysis and strategy option in the development of China service outsourcing industry. *Int. Conf. Logists. Syst. Intel! Manag.* <https://doi.org/10.1109/ICLSIM.2010.5461141>.
- Jabarin, et. A., (2020), Recommendations for formulating an intervention strategy that aligns the current agricultural projects, addres gaps in reaching scale-small producers, and contributes to a sustainable agriculture program as part of the MACS for Jordan 2020-2022. This study was commissioned by the Inclusive Green Growth Department (Food and Nutrition Security Group) of the Dutch Ministry of Foreign Affairs.
- Jordan Green Building Council (JGBC, 2016). Your guide to waste management in Jordan. Amman. 2016.
- Klaus Von Grebmer, Jill Bernstein, David Nabarro, Nilam Prasai, Shazia Amin, Yisehac Yohannes, Andrea Sonntag, Fraser Patterson, Olive Towey, Jennifer Thompson, (2016), The concept of the global hunger index, Welthungerhilfe, International Food Policy Research Institute (IFPRI), Concern Worldwide, <https://www.ifpri.org/publication/concept-global-hunger-index-0>
- Ministry of agriculture (2020), National Agricultural Development Strategy 2025-2020, In the footsteps of the Renaissance, Amman, Jordan
- Ra, J. W. and T. G. Eschenbach, (1992). Environmental SWOT analysis for the Engineering and Science Management (ESM) program in Alaska, in *IEEE*, 15159. <https://doi.org/10.1109/IEMC.1992.225247>.
- Shaharyar Brohi, Tarique Ahmed Khuhro, Saima Kalwar, Asad Rajput, (2020), Assessment of agriculture sector using SWOT analysis: A case study of Mirpur Khas, Sindh. *Sindh Univ. Res. Jour. (Sci. Ser.)* Vol. 52 (04) 369-374 (2020), DOI:10.26692/sujo/2020.12.55
- WFP Jordan, Country Brief, (June 2021), <https://www.wfp.org/countries/jordan>
- WFP, Jordan Food Security Update, Implications of Covid-19, Aug 2020. <https://www.wfp.org/publications/jordan-food-security-update-implications-covid-19-july-aug-2020#:~:text=16%20December%202020-,Jordan%20Food%20Security%20Update%2DImplications,COVID%2D19%20July%2DAug%202020&text=Food%20security%20among%20vulnerable%20Jordanian,compared%20to%2016%25%20in%202018>.
- UN-Jordan, (2021), Press Release, <https://jordan.un.org/en/123433-jordans-food-security-strategy-be-updated-taking-consideration-impact-covid19>
- UN-FAO, 1996, World Food Summit



## تطور دور القطاع الزراعي في الأمن الغذائي الأردني تحليل نقاط القوة والضعف والفرص والمخاطر بعد قرن من تأسيس المملكة

عامر صبحي جبارين<sup>1</sup>

1

استشاري أعمال واقتصاد زراعي-متقاعد.  
قسم الاقتصاد والأعمال الزراعية- كلية الزراعة- الجامعة الأردنية.

تاريخ استلام البحث: 2021/7/1 وتاريخ قبوله: 2021/8/29.

### الملخص

بلغ عدد سكان إمارة شرق الأردن في العام 1921 ما مجموعه 230 ألف نسمة فقط، وكان لدى الدولة المولودة حديثاً القليل من الموارد الطبيعية وعددًا قليلاً من المراكز السكانية، وكان دخلها الحقيقي الوحيد هو من مساعدات الحكومة البريطانية، وتشير آخر الإحصاءات إلى أن عدد سكان الأردن قد بلغ 10.96 مليون في آب / أغسطس من العام 2020، مما يعني أن عدد السكان قد زاد بأكثر من 46 ضعفاً خلال المئة عام الماضية، ووضعت هذه الزيادة الهائلة في عدد سكان المملكة تحت ضغوطاً هائلة على الموارد المحدودة المتاحة للقطاع الزراعي، وبالتالي عرضت حالة الأمن الغذائي للخطر ولاسيما في العقود القليلة الماضية. وبعد الأمن الغذائي في الأردن قضية معقدة تقاضت أبعادها خلال وباء كوفيد -19 الأخير الذي تزامن مع أصعب أزمات اللاجئين والمستمرة. وتهدف هذه الورقة إلى استكشاف الاتجاهات الرئيسية للدور المتوقع للقطاع الزراعي وأثرها على الأمن الغذائي في الأردن في القرن المقبل، استخدم الباحث أداة التحليل الوصفي باستخدام نقاط القوة والضعف والفرص والمخاطر للقطاع الزراعي الأردني (SWOT) لتحقيق الهدف من هذا البحث. وكانت الاستنتاجات الرئيسية المستخلصة من تحليل SWOT الذي تم إجراؤه في هذه الورقة كالتالي: (1) إن تغير المناخ والانخفاض في الموارد المائية النادرة للغاية هو التحدي الرئيسي الذي يواجهه القطاع الزراعي حالياً، وسيستمر في مواجهة مما سيعرض نظام الأمن الغذائي للخطر، (2) أما التحدي الآخر فهو معدلات النمو السكاني المرتفعة والعدد الكبير للاجئين في البلاد، (3) غياب سياسة أمن غذائي واضحة وقوية، (4) الهدر الغذائي وخسائر ما بعد الحصاد التي تشكل تهديداً رئيسياً للأمن الغذائي في الأردن. ولتقليل هذه التحديات، يوصي الباحث بالتالي: (1) زيادة كفاءة استخدام المياه لأنظمة الإنتاج الزراعي الحالية من خلال تبني تقنيات ري جديدة مثل أنظمة تحسين الري بالتنقيط، (2) التوسع في أنظمة إنتاج الزراعة المائية التي توفر كميات هائلة من مياه الري التي يمكن أيضاً إنتاجها بالقرب من المراكز الحضرية لتوفير تكاليف النقل للإنتاج النهائي، (3) إدخال الأصناف المقاومة للجفاف من المحاصيل الحقلية ومحاصيل الأعلاف والأشجار، (4) تحسين أنظمة ما بعد الحصاد للمنتجات الزراعية القابلة للتلف لتقليل الخسائر عبر مختلف مراحل سلسلة القيمة، كالنموذج في مرافق التخزين البارد والشاحنات الباردة والتبريد المسبق والتعبئة والتغليف المناسبين، (5) تحسين مناهج التعليم الزراعي من خلال إنشاء برامج جديدة تلبي الطلب الحالي والمستقبلي في سوق الغذاء، (6) دعم وتشجيع للباحثين الشباب من خلال احتضان وتسريع أفكارهم الجديدة التي يمكن أن تضيق قيم كبيرة لنظام الأمن الزراعي والغذائي الحالي في الأردن.

الكلمات الدالة: الأمن الغذائي، الزراعة المائية، تغير المناخ، الهدر الغذائي، التنقيط، الاقتصاد، القطاع الزراعي، SWOT.