Journal of Agricultural Economics and Social Sciences

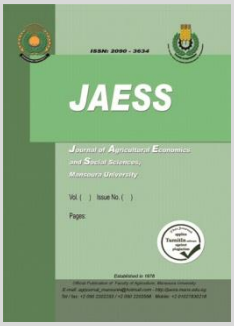
Journal homepage: www.jaess.mans.edu.eg
Available online at: www.jaess.ekb.eg

Food Security Concerns and Sustainable Agricultural Production in Egypt

Abdelaal, H. S. A.*

Agricultural Economics Department, Faculty of Agriculture, Minia University

Cross Mark



ABSTRACT

Agriculture is one of Egypt's most important sectors and a principal economic and social concern. The challenge to Egypt's agriculture is to sustainably expand agricultural production to meet escalating domestic demand for food and serve as a pathway out of poverty. However, the agricultural sector faces many difficulties and challenges that have characterized the sector in recent decades. This paper outlines the key characteristics of Egypt's agriculture and the significant threats to agricultural production and productivity. Besides, it summarizes current trends in productivity growth rates of the major grain crops. The overall objective of the article is to analyze the impact of food security concerns on agriculture sustainability in Egypt and the consequences of unsustainable agriculture systems on food security. The nexus of food security concerns – the growing number of poor people, increasing demand for food, escalating food prices, resource constraints to increase food production, struggling economy, and the burden of food imports- has stimulated agricultural intensification. On the other hand, unsustainable cropping systems could lead to the exhaustion of scarce water resources, deterioration of soil fertility, and pollution of water and land resources. Such consequences caused by agricultural intensification jeopardize Egypt's ability of food production into the future.

Keywords: Sustainable agriculture; Egypt; Food security; Good Agricultural practices.

INTRODUCTION

Egyptians created one of the most powerful and ancient civilizations, profoundly influenced the region, based on the union of the River Nile and the fertile lands. The annual flood of the River Nile loaded with silt and clay has formed prodigious fertile lands and periodically renewed the topsoil along the riverbanks and the Delta. The toiling and gifted Egyptian peasants are recognized as the first people who practiced agriculture on a large scale since they developed and utilized basin irrigation which permitted them to control the flood of the river to best befit their farming needs.

Although the contribution of the agricultural sector to GDP is gradually diminishing, from 21% in 1980 to 13.84% in 2000, and further to 11.69% in 2017 (UNCTAD, 2019), agriculture remains one of Egypt's most important sectors and a principal economic and social concern. It is not only an economic activity but also a part of the region's heritage and history, a matter of food security, a source of employment, and a significant driver of land and water use. In 2017, the agricultural sector provided 25% of the total country employment (CAPMAS, 2018a). Further, it expands beyond the agricultural business to include a variety of agriculture-based industries, such as food manufacturing and services and textile. However, Egypt's agriculture faces many difficulties, such as scarcity of land and water resources, land fragmentation, and increasing demand for food. The challenge to Egypt's agriculture is to sustainably expand agricultural production to meet escalating domestic demand for food and serve as a pathway out of poverty, particularly in rural areas.

This study outlines the key characteristics of Egyptian agriculture and the significant threats to agricultural production and productivity. Besides, it summarizes current trends in productivity growth rates of the major grain crops. The overall objective of the article is to analyze the impact of food security concerns on agriculture sustainability in Egypt. The analysis also expands to the consequences of unsustainable agriculture systems on food security.

Deterioration of land and water resources in Egypt

The scarcity of fertile soils and renewable water resources is one of the basic features of agriculture in Egypt, challenging the nation's capacity to produce food and attain food security in the long run. Arable lands in Egypt are scarce (**Error! Reference source not found.**) and Farmland area covers 3.83 million ha, taking up only 3.8% of all Egypt's land in 2017 (CAPMAS, 2019a).

Table 1. Agricultural land area and per capita agricultural land in Egypt during the period 2000 -2017.

Year	Agricultural land Area million ha	Population millions	Per capita Agricultural land ha	Year	Agricultural land Area million ha	Population millions	Per capita Agricultural land ha
2000	3.29	69.91	0.047	2009	3.69	82.47	0.045
2001	3.34	71.23	0.047	2010	3.67	84.11	0.044
2002	3.42	72.59	0.047	2011	3.62	85.90	0.042
2003	3.41	73.98	0.046	2012	3.70	87.81	0.042
2004	3.48	75.38	0.046	2013	3.76	89.81	0.042
2005	3.52	76.78	0.046	2014	3.75	91.81	0.041
2006	3.53	78.16	0.045	2015	3.82	93.78	0.041
2007	3.54	79.54	0.044	2016	3.82	95.77	0.040
2008	3.54	80.95	0.044	2017	3.83	97.75	0.039

Source: CAPMAS, 2020

* **Corresponding author.**
E-mail address: hamdy.abdelaal@mu.edu.eg
DOI: 10.21608/jaess.2021.79224.1009

Secular trend estimates show the slow increase in agricultural land area (old and new lands) during the period 2000-2017. As shown in Table 2, the agricultural land area increases annually by 0.86%. moreover, as the population increases, the per capita agricultural land decreases since the ability of the country to add new lands is limited due to water shortage and scarcity.

Table 2. Summary of secular trend estimates: agricultural land area and per capita agricultural land.

Variables	Equation	F	R^2	Growth Rate (%)
Agricultural land Area (Million hectares)	$\hat{Y} = 3.30 + 0.031\ X_i$ $(195.6)^{**}$ $(19.9.3)^{**}$	396.7^{**}	0.961	0.86
Per capita Agricultural land (hectare)	$\hat{Y} = 0.048\ e^{-0.011X_i}$ $(140.2)^{**}$ $(-16.3)^{**}$	266.0^{**}	0.943	-1.1

- Values between parentheses are t values, and ** indicates significant at 0.01 significance level.

Egypt's farmland, primarily old lands, suffers from two serious issues, deterioration of land fertility and continued sprawl of residential and urban development on arable lands. Land survey results (based on soil characteristics and productivity) reflect the advance and continuation of land degradation in Egypt. The first-grade soils, the most fertile and highest-yielding lands, declined by 67.4% from 1.26 million ha in 1996-2000 to 411 million ha in 2001-2005. In contrast, the second-grade lands increased by 24% from a total area of 1.11 million ha in 1996-2000 to 1.37 million ha in 2001-2005. Likewise, the total area of the third and fourth-grade lands, less fertile and low-yielding soils, increased by 70% and 280% respectively during the same period as a result of adding newly reclaimed lands to the agricultural land base. Besides, around 35% of all farmlands in Egypt suffer from soil salinity problems (EEAA, 2001). Waterlogging and land salinization, resulting from the rise of sea level and intrusion of saltwater into low-lying soils in the Delta and unsustainable management of land and water in addition to the reuse of drainage water in irrigation, are the primary causes of land degradation in Egypt (Desert Research Center, 2017). Other driving forces that have contributed to the land degradation problems in Egypt include the continued encroachment of residential development on farmland, the development of the AHD project in the 1960s, and climate change (Mohamed *et al.*, 2019).

Furthermore, urban development sprawl on fertile lands has severely become a growing issue, threatening food production in the long run. The rapid increase in population, growing number of rural areas, low economic returns from small farms, and population density are the main drivers that affect and alter land use in Egypt, mainly in overpopulated areas in the Delta and the Nile Valley. Between 1983 and 2018, Egypt irrevocably diverted 138 000 ha of farmland to non-agricultural utilizations, representing 3.60% of Egypt's total farmland area in 2017. Throughout the last decade alone, a total area of 35 700 ha of fertile soils shifted to developed areas (MALR, 2018). Overall, the majority of the expanding developed areas took place on the invaluable fertile lands, and this pattern may increase in the future since the population is predicted to grow from 95 million in 2017 to 123 million by 2030 and to boom to 174 million by 2050 (United Nations, 2017).

On the other hand, renewable freshwater in Egypt is limited to the country's annual share of the Nile flows of 55.5 BCM/ year accounting for 97% of the total renewable water resources, limited groundwater (long-term average) of 2.3 BCM/ year, and very scarce annual precipitation (long-term average) of 0.5 BCM/ year. Secondary water resources include, for instance in 2016, 6.9 BCM of groundwater percolated from irrigation water in the Nile Valley and Delta, 11.9 BCM of agricultural drainage water, 1.2 BCM of treated municipal wastewater, and 0.1 BCM desalination of seawater for seaside resorts and hotel (CAPMAS, 2018a). Not only has Egypt scarce water resources and is the country approaching physical water scarcity, but also the country's annual allocated flow of the Nile water is anticipated to decline due to water infrastructure developments in the Nile Basin such as the construction of the Grand Ethiopian Renaissance Dam (Di Nunzio, 2013). Water scarcity and future water shortages adversely will reduce cropping area and decrease crop yields, especially summer crops such as maize and rice (Abdelaal and Thilmany, 2019).

Besides, water is wasted during the delivery from the Nile to farmlands and is inefficiently used in the field, intensifying the stress on the already exhausted water resources. The country has an intensive irrigation network of about forty thousand km of conveyance canals and sub-canals branching from the River Nile and transporting water to millions of producers across different geographic zones (Karajeh *et al.*, 2011). The long conveyance and distribution canal system is water-wasting, lost about 4.2 BCM in 2017 due to evaporation of water from the surface, deep infiltration into soil layers below the canals, and leakag (CAPMAS, 2018c). Additionally, about 71% of the total area equipped for irrigation, mainly in old lands, is under the surface (flood) irrigation schemes of which their efficiency of water application in the field is very low, leading to waterlogging (El-Kilani and Sugita, 2017). Over irrigation, coupled with the reuse of drainage water and insufficient drains system, has negatively impacted agricultural productivity.

Stagnant productivity

Fertile soils and available Nile water for irrigation have given rise to agricultural productivity per hectare in Egypt to be one of the highest worldwide. As **Error! Reference source not found.** and illustrate, cereal yields, wheat, rice, and maize, significantly grew between 1961 and 2017. For instance, wheat yield more than doubled. The productivity per hectare of wheat rose from 2.93 ton/ha in 1961-1979 to 6.43 ton/ha in 2000-2017, at an average annual rate of growth of 1.74%. Similarly, maize yield increased by 123% from 3.47 ton/ha in 1961-1979 to 7.74 ton/ha in 2000-2017, at an average growth rate of 2.08% annually. Rice yield grew by 82% from 5.25 ton/ha in 1961-1979 to 9.57 ton/ha in 2000-2017, at an average growth rate of 1.09% annually.

Figure **1. Productivity per hectare of grains in Egypt between 1960 and 2017.**

Nevertheless, most of the improvements in grain yields occurred in the subperiod of 1980-1999, as exhibited in **Error!**

Reference source not found. and Figure 1. Significantly, wheat yield grew by 3.49% per annum, compared to 1.37% between 1961 and 1979, and 0.18% a year over the 2000-2017 period. Likewise, productivity per hectare of maize and rice substantially increased over this subperiod. The gains in cereal yields occurred between 1980 and 1999 can be ascribed to the availability of water and fertility of soils in this era in Egypt, advancements in genetics and crop breeding programs, enhancements in equipment and machinery, and improvements in fertilizers and chemicals (Wang *et al.*, 2015).

Table 2. Grains' average annual productivity growth rates in Egypt between 1961 and 2017.

Periods	Wheat		Rice		Maize	
	Yield ton/ha	GR [1] %	Yield ton/ha	GR %	Yield ton/ha	GR %
1961–1979	2.93	1.37	5.25	0.69	3.47	2.42
1980–1999	4.96	3.49	6.94	2.20	5.52	3.53
2000–2017	6.43	0.18	9.57	0.26	7.74	0.14
1961–2017	4.65	1.74	7.21	1.09	5.54	2.08

[1] GR = Growth Rate. Source: FAOSTAT, http://www. fao.org/faostat/en/#data.

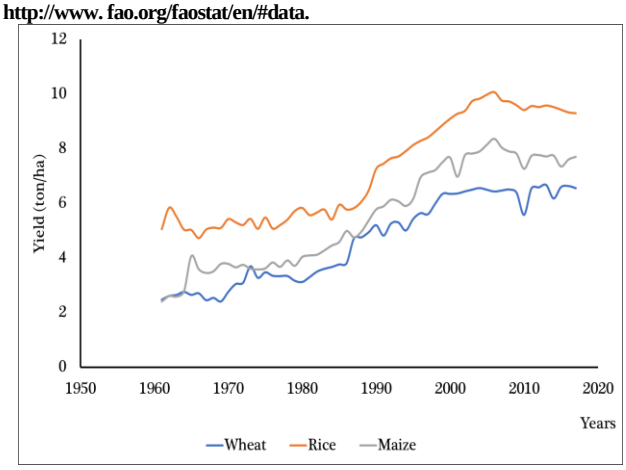
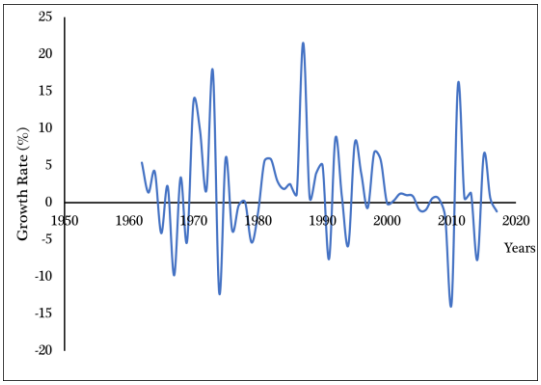
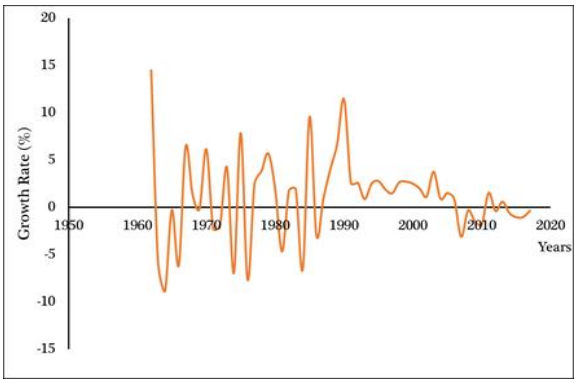


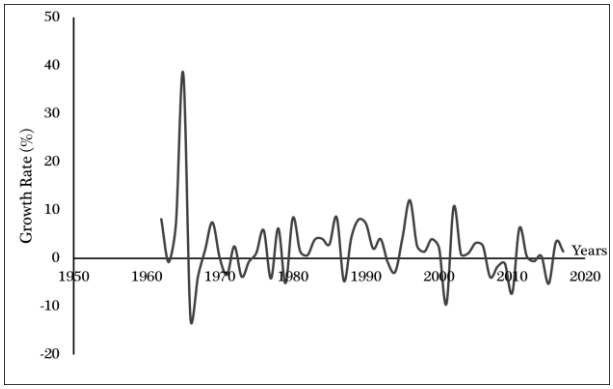
Figure 1. Productivity per hectare of grains in Egypt between 1960 and 2017.



(a)



(b)



(c)

Figure 1. Growth rate in cereal yields in Egypt between 1961 and 2017: (a) Wheat; (b) Rice; (c) Maize.

Later, between 2000 and 2017, the rate of growth in cereal yields has declined. As **Error! Reference source not found.** shows, cereal yields grew at an average annual rate of less than one percent. The stagnancy in land productivity in the last two decades can be explained by water scarcity and degradation of fertile lands, unsustainable agricultural practices, and the slowdown in expenditure on agricultural research (Rosegrant *et al.*, 2001; Pardey, 2011). Thence, Egypt sustainably needs to raise land productivity in the next decades, not only to preserve land and water resources but also to mitigate adverse impacts of agricultural intensification on agricultural resources in terms of quantity and quality. Furthermore, future gains in crop yields will mostly benefit smallholders who depend heavily on farm products for home consumption and already generate low income from farming activities.

The nexus of food security concerns and unsustainable agriculture in Egypt

The nexus of food security concerns – the growing number of poor people, increasing demand for food, escalating food prices, resource constraints to increase food production, struggling economy, and the burden of food imports- has stimulated agricultural intensification (**Error! Reference source not found.**). Recent government policies have focused on providing sufficient food for the growing population to avoid socio-political disruption and narrowing or, if possible, eliminating the food gap to reduce the burden of food imports. Therefore, Egypt has devoted extensive

resources in reclaiming new lands to increase food production. Further, the country has promoted the cultivation of crops that represent a large share of food imports, essentially wheat and maize.

Currently, food insecurity issues in Egypt are a matter of economic access to food. The percentage of the population under the poverty line has nearly doubled in the last two decades from 16.7% in 1999-2000 to 32.5% in 2017-2018 (CAPMAS, 2019b). Most of the poor people live in rural areas, particularly in middle and upper Egypt, and, typically, they include tenant growers and small farmers. Besides, escalating food prices, mostly resulted from currency floating in 2016, are one of the main drivers behind higher inflation rates in Egypt (Vasquez, 2016), as food and non-alcoholic beverages was the largest category of total expenditures in 2017-2018, accounting for 37.1% of overall expenditures, and rising to 42-50% among the consumers in the lowest 50% of income (CAPMAS, 2019b). Moreover, as food prices rise, malnutrition and hunger increase. Poor households tend to reduce their consumption of relative expensive foods such as meats, fruits, and dairy and shifts toward lower-cost and calorie-dense foods with low nutrient content such as cereals, mainly bread, and tubers such as potatoes, resulting in a decline in nutritional diversity and increase of obesity (Bordignon, 2013).

Therefore, current strategies, policies, and strategic plans in Egypt ultimately have given priority to food security goals and the sustainability of water and land resources. The Sustainable Agricultural Development Strategy Towards 2030, adopted in 2009, mainly aimed to increase yields of the main crops such as wheat, rice, and maize by around 33%, 27%, and 43% by 2030 respectively relative to 2007 levels while paying considerable attention to the sustainability of water and land resources (MALR, 2009). Besides, the strategy focused on achieving food security through increasing self-sufficiency ratios in the major imported-food commodities, raising dietary diversification and quality, and improving the food support system. Furthermore, the recent national plans for water resources, the "National Water Resources Plan-2017" (NWRP-2017) and the "National Water Resources Plan-2017-2037" (NWRP-2017-2037), have sought to sustainably manage and develop water resources in terms of quantity and quality so as to secure the country's future water needs through increasing investments and spending on water projects and irrigation infrastructure, rationalizing water use, protecting farmlands, and increasing soil fertility and crop yields (MWRI, 2019, 2005).

However, the progress towards achieving such food security and sustainability goals is still modest. The self-sufficiency ratios of the major food staples declined compared to the 2007 levels due to a booming population and limited water and land resources to support intensive production of food and crops, resulting in a growing gap between domestic production and consumption. In 2018, the wheat self-sufficiency ratio shrunk to 36% compared to 54% in 2007, and the maize self-sufficiency ratio dwindled to 50% from 61%, while the rice self-sufficiency ratio diminished to 91% compared to 130% in 2007 (CAPMAS, 2020). Consequently, Egypt has been widely relying on imports to bridge the food gap (**Error! Reference source not found.**). Food imports are increasing and comprising a significant share (22%) of total merchandise imports (WTO, 2019), and Egypt has become one of the largest wheat importers worldwide, which aggravates the burden on the struggling economy.

Table 3. Total and food imports to Egypt during the period 2000 -2017.

Year	Total Imports million dollars	Food Imports million dollars	% Of total imports	Year	Total Imports million dollars	Food Imports million dollars	% Of total imports
2000	14578	3519	24.14	2010	52923	10145	19.17
2001	13376	3315	24.78	2011	58903	14794	25.12
2002	12770	3479	27.24	2012	69200	15666	22.64
2003	12950	2725	21.04	2013	66180	11674	17.64
2004	15950	2895	18.15	2014	66786	14898	22.31
2005	22449	3979	17.72	2015	63574	14391	22.64
2006	27300	3926	14.38	2016	55789	10945	19.62
2007	37100	5521	14.88	2017	61627	13487	21.88
2008	48382	8916	18.43	2018	72000	12833	17.82
2009	44946	7726	17.19	2019	70919	14329	20.20

Source: WTO, https://data.wto.org/.

Moreover, estimates of secular trend, as illustrated in **Error! Reference source not found.**, show that food imports increase annually by an average growth rate of 9.9%. This can be widely attributed to the rapid growth in population and the decline in self-sufficiency ratios in the major imported-food commodities such as wheat and maize. Further, over-dependence on food imports increases the country vulnerability to the volatility of international food prices and crucially requires a strong economy and availability of large reserves of foreign exchange to support the expenditure on principal food imports, especially wheat and corn (Porkka *et al*., 2017).

Table 5. Summary of secular trend estimates: total and food imports to Egypt.

Variables	Equation	F	R^2	Growth Rate (%)
Total Imports (Million dollars)	$\hat{Y} = 12708.25\ e^{0.103X_i}$ $(7.96)^{**}$ $(9.78)^{**}$	95.57^{**}	0.842	10.3
Food imports (Million dollars)	$\hat{Y} = 2634.59\ e^{0.099X_i}$ $(7.43)^{**}$ $(8.85)^{**}$	78.23^{**}	0.813	9.9

- Values between parentheses are t values, and ** indicates significant at 0.01 significance level.

Furthermore, the persistent need to feed the rapidly growing population has prompted cropping intensity and exacerbated pressure on agricultural resources. The cropping intensity mounted 176%, and the total cropping

area increased by 15% from 5.85 million ha in 2000 to 6.74 million ha in 2017 (CAPMAS, 2019a). Unsustainable cropping intensification systems could lead to the exhaustion of scarce water resources, deterioration of soil fertility, and pollution of water and land resources. Such consequences caused by agricultural intensification jeopardize Egypt's ability of food production into the future. Thus, food availability could be another burgeoning issue in the next decades since Egypt is largely vulnerable to negative supply shocks, given its scarce and declining land and water resources base combined with unsustainable cropping systems, climate change, and low expenditures on agricultural research, and its over-dependence on imports. Moreover, the shortfall in domestic production, particularly grain crops, deepens the food gap, subsequently, increases the quantity and the burden of food imports, and drive-up domestic food prices.

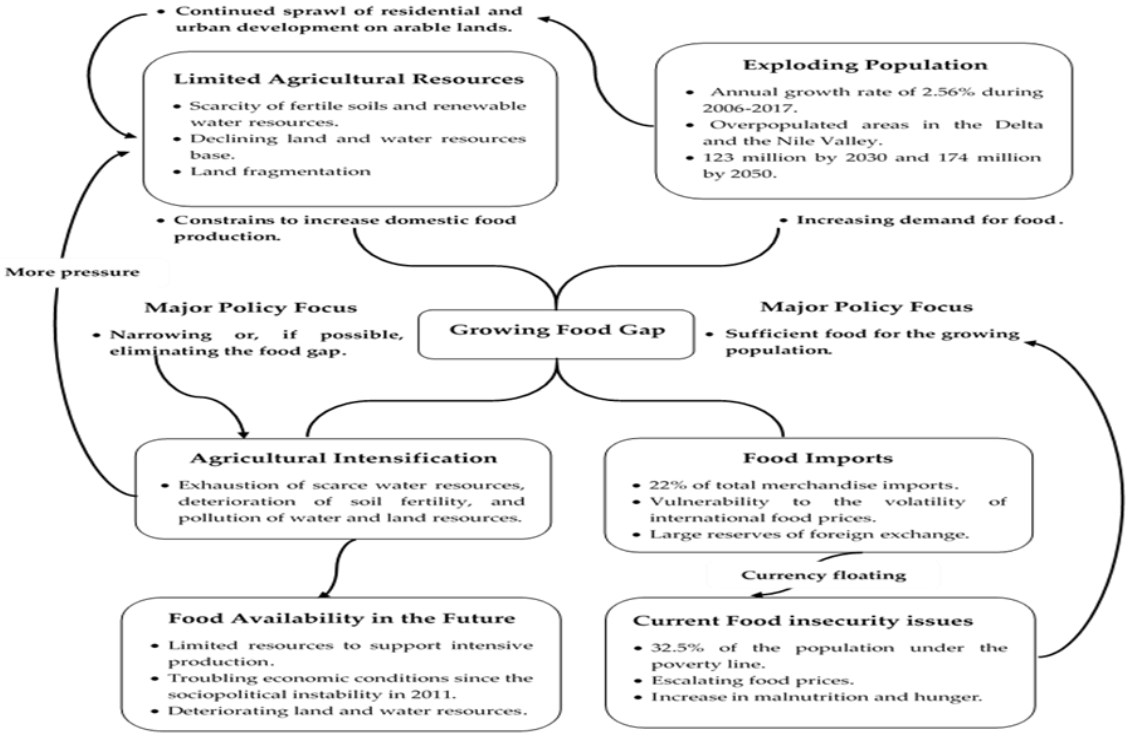


Figure 3. The nexus of food security concerns and unsustainable agriculture in Egypt.

Conclusion and policy implications

Agriculture is one of Egypt's most important sectors and a principal economic and social concern. It is not only an economic activity but also a part of the region's heritage and history, a matter of food security, a source of employment, and a significant driver of land and water use. The challenge to Egypt's agriculture is to sustainably expand agricultural production to meet escalating domestic demand for food and serve as a pathway out of poverty, particularly in rural areas. However, the agricultural sector faces many difficulties and challenges that have characterized the sector in recent decades and could jeopardize Egypt's ability and capacity to produce food into the future. These characteristics include scarcity of land and water resources, agricultural intensification, land fragmentation and small farming systems, grains-intensive cropping modes, stagnant productivity, and increasing demand for food.

The results illustrate that Egyptian farmers experienced stagnancy in land productivity in the last two decades due to water scarcity and degradation of fertile lands, unsustainable agricultural practices, and the slowdown in expenditure on agricultural research. Therefore, the article suggests that Egypt sustainably needs to raise land productivity in the next decades, not only to preserve land and water resources but also to mitigate adverse impacts of agricultural intensification on agricultural resources in terms of quantity and quality.

Further, current food insecurity issues are a matter of economic access to food. However, findings suggest that food availability could be another burgeoning issue in the next decades. Egypt is highly vulnerable to negative supply shocks, given its scarce and declining land and water resources base combined with unsustainable cropping systems, climate change, low expenditures on agricultural research, and over-dependence on food imports. Further, the nexus of food security concerns – the growing number of poor people, increasing demand for food, escalating food prices, resource constraints to increase food production, struggling economy, and the burden of food imports- has stimulated agricultural intensification. Therefore, the troubling economic conditions, the exploding population, and the deteriorating land and water resources in Egypt will substantially aggravate food insecurity.

Collaborative work among the government, NGOs, and the private sector is needed to promote sustainable agricultural practices, provide proper agricultural extension, invest in agricultural research and development, and enhance the efficiency of water use and irrigation schemes. This would raise crop yields, limit the depletion of water resources, and reduce the deterioration of soil fertility as well as secure additional water resources to increase the

farmland area, ultimately leading to raising agricultural production and improving food security, and widely mitigating the adverse consequences of unstainable agricultural intensification.

REFERENCES

Abdelaal, H. and Thimany, D. (2019) 'Grains Production Prospects and long run Food Security in Egypt', Sustainability, 11(16), p. 4457.

Bordignon, G. (2013) 'The status of poverty and food security in Egypt: Analysis and Policy recommendations', World Food Programme, Cairo.

Central Agency For Public Mobilization & Statistics - Arab Republic of Egypt (CAPMAS) (2018a) Annual Bulletin of Irrigation and Water Resouces Statistics.

Central Agency For Public Mobilization & Statistics - Arab Republic of Egypt (CAPMAS) (2018b) Statistical Year Book 2018. Available at: https://www. capmas. gov.eg/Pages/StaticPages.aspx?page_id=5034.

Central Agency For Public Mobilization & Statistics - Arab Republic of Egypt (CAPMAS) (2019a) Annual Bulletin of Crop Area and Plant Production Statistics 2016/2017.

Central Agency For Public Mobilization & Statistics - Arab Republic of Egypt (CAPMAS) (2019b) Egypt-Household Income, Expenditure, and Consumption Survey, HIECS 2017-2018, Central Agency For Public Mobilization & Statistics - Arab Republic of Egypt.

Central Agency For Public Mobilization & Statistics - Arab Republic of Egypt (CAPMAS) (2020) Egypt' Statistical Abstract. Available at: https://www. capmas .gov.eg/ Pages/Static Pages.aspx? page_id= 7193.

Desert Research Center (2017) 'Final Country Report of the Land Degradation Neutrality Target Setting Programme', (January). Available at: https://knowledge .unccd.int/sites/ default/ files/ ldn_targets/ Sri Lanka LDN TSP Country Report.pdf.

Egyptian Environmental Affairs Agency (EEAA) (2001) The National Environmental Action Plan of Egypt 2002/17: Environment at the Center of Modernizing. Ministry of Environment, Arab Republic of Egypt. Available at: http://www.eeaa. gov.eg/ portals/0/ eeaaReports/neap/Neap_Eng-last.pdf.

El-Kilani, R. M. M. and Sugita, M. (2017) 'Irrigation methods and water requirements in the Nile Delta', in Irrigated Agriculture in Egypt. Springer, pp. 125–151. doi: 10.1007/978-3-319-30216-4_6.

Karajeh, F., Oweis, T. and Swelam, A. (2011) Water and Agriculture in Egypt. Cairo, Arab republic of Egypt: International Center for Agricultural Research in the Dry Areas (ICARDA). Available at: https://apps. icarda.org/wsInternet/wsInternet.asmx/DownloadFile ToLocal?filePath=Working_Paper_Series/Water_Ag riculture.pdf&fileName=Water_Agriculture.pdf.

Ministry of Agriculture and Land Reclamation (MALR) (2018) Encroachments on Agricultural lands from 1983 to 2018. Cairo, Arab republic of Egypt.

Ministry of Water Resources and Irrigation (MWRI) (2005) National water resources plan for Egypt 2017. Cairo, Egypt. Available at: http://extwprlegs 1.fao.org/ docs /pdf/egy147082.pdf.

Ministry of Water Resources and Irrigation (MWRI) (2019) National Water Resources Plan-2017-2037. Available at: https://www.mwri.gov.eg/nwrpeg/ (Accessed: 15 August 2019).

Mohamed, E. *et al*. (2019) 'Land degradation', in The soils of Egypt. Springer, pp. 159–174.

Di Nunzio, J. (2013) 'Conflict on the Nile: The future of transboundary water disputes over the world's longest river', Indepedent Strategic Analysis of Australia's Global Interests, (November), pp. 1–7.

Pardey, P. G. (2011) 'A strategic look at global wheat production, productivity and R&D developments', Czech Journal of Genetics and Plant Breeding, 47(SPEC. ISSUE 1).

Porkka, M. *et al*. (2017) 'The use of food imports to overcome local limits to growth', Earth's Future, 5(4), pp. 393–407.

Rosegrant, M. W. *et al*. (2001) 2020 global food outlook: trends, alternatives, and choices. Intl Food Policy Res Inst.

United Nations (2017) 'World Population Prospects: The 2017 Revision'. Department of Economic and Social Affairs, Population Division (2017). Available at: https://population.un.org/wpp/.

United Nations Conference on Trade and Development (UNCTAD) (2019) UNCTADSTAT.

Vasquez, O. (2016) Egypt' S Increasing Food Prices Driving Higher Inflation. United States Department of Agriculture (USDA) Foreign Agricultural Service (FAS):Washington, DC, USA.

WTO, W. T. O. (2019) WTO Data portal. Available at: https://data.wto.org/.

مخاوف الأمن الغذائي واستدامة الإنتاج الزراعي في مصر

حمدي سيد عبده عبد العال

قسم الاقتصاد الزراعي كلية الزراعة جامعة المنيا

تعتبر الزراعة أحد أهم القطاعات الاقتصادية في مصر، فهي ليست نشاطًا اقتصاديًا فحسب، بل إنها مصدر للعمالة، ومحرك مهم لاستخدام الأراضي والمياه، بالإضافة إلى دورها في تحقيق الأمن الغذائي. إن التحدي الرئيسي الذي تواجهه الزراعة المصرية يتمثل في كيفية التوسع المستدام للإنتاج الزراعي لتلبية الطلب المحلي المتزايد على الغذاء، مع العمل كطريق للخروج من الفقر، لاسيما في المناطق الريفية. ويواجه القطاع الزراعي العديد من الصعوبات والمشكلات مثل ندرة الموارد الأرضية والمائية، والتكثيف الزراعي، وتفتت الحيازات الزراعية، وركود الإنتاجية، وزيادة الطلب على الغذاء. ويشرح هذا البحث الخصائص الرئيسية للزراعة في مصر والتهديدات الكبيرة للإنتاج الزراعي والإنتاجية، كما أنه يلخص الاتجاهات الحالية في معدلات نمو الإنتاجية لمحاصيل الحبوب الرئيسية، ويهدف بصفة أساسية إلى تحليل تأثير مخاوف الأمن الغذائي على استدامة الإنتاج الزراعي في مصر وعواقب أنظمة الزراعة غير المستدامة على الأمن الغذائي. وتشير نتائج إلى أن مخاوف الأمن الغذائي، والمتمثلة في العدد المتزايد للفقراء، وزيادة الطلب على الغذاء، وتصاعد أسعار الغذاء، والقيود المفروضة على الموارد لزيادة إنتاج الغذاء، والاقتصاد المتعثر، وعبء الواردات الغذائية، أدت إلى تحفيز التكثيف الزراعي وأنظمة زراعية غير مستدامة. من ناحية أخرى، يمكن أن تؤدي نظم الزراعة غير المستدامة إلى استنفاد الموارد المائية الشحيحة، وتدهور خصوبة التربة، وتلوث موارد المياه والأراضي. وهذه العواقب الناجمة عن التكثيف الزراعي تهدد قدرة مصر على إنتاج الغذاء في المستقبل.