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Enhancing Agricultural Productivity in Egypt: The Impact of Scaling up The Use of Modern Agricultural Techniques on Main Crops.

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ABSTRACT

The rising global crises have underscored the critical role of food security, especially in developing nations, prompting a reevaluation of agricultural strategies by various governments. This pivotal shift highlights agriculture as not only a means to meet immediate food requirements but also a vital element for sustainable growth. By enhancing agricultural productivity, nations are striving to stabilize and expand their economies through adequate domestic food production, bolstered exports, and a steady supply of raw materials for industry. The case of Egyptian agriculture is a prime example of this strategy in action. Here, the upscaling of advanced agricultural technologies is considered crucial for improving food security outcomes. This study aims to evaluate the impact of upscaling modern and improved agricultural technologies on the Egyptian agricultural sector using a CGE model that is based on the latest comprehensive SAM database for the base year 2019.The results indicate that the adoption of new agricultural technologies could significantly enhance production, GDP, exports, and household income while simultaneously cutting down on imports and CPI. This analysis points to a potent economic and social yield, highlighting the imperative for policymakers to dismantle institutional hurdles and widely implement these innovations in the agricultural sector. The decision-makers must disseminate these technologies so that they reach farms at the lowest cost to countries and ensure that farms adopt these technologies through large-scale extension programs via radio, television, and other programs in a way that makes clear to the farmer the expected increase in production and thus income.

KEYWORDS: Productivity, Total Factor Productivity (TFP), Modern Agricultural Techniques

1. INTRODUCTION

The world has faced several crises in recent times (such as COVID-19, the supply chain crisis, and the Russian-Ukrainian war) that have impacted its economic, social, and environmental pillars (Xu et al., 2021). Food security has become one of the most affected aspects, prompting many countries, especially developing ones, to review their strategies and plans regarding food security

to prevent the exacerbation of problems and risks associated with it and to avoid the possibility of more population groups slipping into poverty. Decision-makers have worked on finding ways and mechanisms to enhance food security and reduce poverty rates. The agriculture sector was considered the governing sector in this matter, through which countries strive towards sustainable development, securing the food needs of their citizens, supporting the industrial sector by providing the necessary raw materials, as well as contributing to providing agricultural products that can enhance the export sector (Christiaensen et al., 2011). The agriculture sector was considered one of the most important tools and means to reduce poverty (Laborde et al., 2020).

Egyptian agriculture bears a significant economic and social burden within the Egyptian economy. Despite the declining contribution of Egyptian agriculture to the Gross Domestic Product (2020) to around 11.5%, it still plays a major role in achieving food security. Local food production is considered a fundamental guarantee for food availability and stability, as it accounts for an average of 40% of the total food needs of the Egyptian population. Additionally, around 40% of the population, who are farmers, rely on agriculture as their main source of income. This sector also contributes to employing about 25% of the total workforce, with agricultural exports accounting for about 15% of total exports (Siam, Ahmed and Sabbah, 2022). Agriculture is linked with strong backward and forward linkages to several non-agricultural sectors, including the production sector of agricultural inputs (chemicals, animal feed, machinery, and seeds) as important backward linkages, and the food industry sector, cotton industry sector, and food trade sector as important forward linkages [1].

Agriculture bears this heavy burden, especially in terms of food security and livelihoods for rural populations, under a narrow base of total arable land of about 9.4 million feddans and water resources of around 60 billion cubic meters annually. The average per capita share of agricultural land is about 0.09 feddan, the lowest in the world, while the per capita share of water is 577 cubic meters annually, which is below the global water poverty line by about 42%. Under this limited base, the agricultural sector can only meet a share not exceeding, as mentioned earlier, 40% of the national food needs, especially for basic food commodities such as grains, oilseeds, peas, lentils, and sugar, as well as meat and dairy products (Al husseini et al., 2022)s.

2. THE PROBLEM OF STUDY

Despite the presence of modern agricultural techniques in the Egyptian agricultural sector, such as integrated pest control and biofertilization, their application remains very limited and is not widespread across the sector. This can be attributed to either the lack of data related to their applications, the narrow application of these technologies, or the nonexistence of these technologies at all. In this regard, this study tries to answer two fundamental questions: The first deals with the enhanced or modern technologies that can be applied in the fields of crop production, with technical and economic efficiency being considered, while the second investigates the potential effects of applying the proposed technological and institutional packages at both sectoral and national levels.

3. STUDY OBJECTIVE

The main objective of this study is to provide an analytical framework for the technologies and technological innovations that can be applied in Egyptian agriculture on a wide scale to address future challenges and risks, while maintaining the highest performance indicators for the agricultural sector across various levels. From this objective, the following sub-objectives emerge: Analyzing the current situation regarding agricultural technologies and technological innovations; identifying improved and modern technologies suitable for application in Egyptian agriculture that can replace current agricultural technologies in key agricultural and food production areas, specifically crop production; evaluating the

[1] https://www.usaid.gov/egypt/agriculture-and-food-security

potential economic, social, and environmental impacts of proposed agricultural technologies on sustainable agricultural development and food security; and addressing future challenges.

The rest of our study is laid out as follows: In part two, we dive into the study's methodology and identify the data sources, while part three delves into critical previous research on advanced agricultural technologies suitable for crops in Egypt's agricultural sector. Then, part four looks at the economic and social impacts of spreading these cutting-edge agricultural technologies across the sector. Finally, we wrap up with part five, offering a concise summary and our recommendations based on the study's findings.

1. Study methodology and data sources:

This study adopts the Computable General Equilibrium (CGE) model, a sophisticated economic tool that plays a crucial role in the analysis of international trade, policy impacts, and the broader global economy. By providing a detailed, quantitative framework, the CGE model helps stakeholders make informed decisions that can shape economic strategies on both a national. More details of the model and its database can be found here (Lemelin and Robichaud, 2015). Regarding the database, the study was based on the Social accounting matrix for the Egyptian economy for the base year 2019 (S *et al.*, 2021) (Look at an appendix 1).

2. A literature review on modern and improved technologies that can be followed and applied in Egyptian agriculture:

This part will address modern and improved technologies that can be applied to wheat, maize, rice, sugar cane, and sugar beet.

The implementation of modern technologies and good agricultural practices in Egypt has significantly improved wheat yield per feddan. Abdelmageed et al.(2019) attributed this increase to the use of better planting methods, modern irrigation techniques, and the development of new high-quality seed varieties. Croppenstedt (2005) further emphasized the role of improved technical efficiency, with better information on irrigation management and extension visits leading to higher output; moreover, both Zeidan et al. (2005) and Solieman et al.(2015) highlighted the positive impact of specific interventions, such as the use of nitrogen fertilizer, micronutrients, and foliar application, as well as the adoption of new wheat varieties and the use of laser leveling. These findings collectively underscore the importance of a multifaceted approach to enhancing wheat production in Egypt. As mentioned above, a wide range of modern and enhanced techniques and practices can be applied to wheat crops, with the aim of increasing productivity primarily and conserving irrigation water secondarily. According to experts' opinions and previous studies on wheat crops, these technologies together can enhance per-feddan productivity to reach around 26 ardeb per feddan (equivalent to about 3.93 tons per feddan), compared to the current productivity of wheat crops, which was 19 ardeb per feddan in 2020 (equivalent to 2.88 tons per feddan), with a productivity increase rate ~~of~~ up to 36.5%.

The use of modern technologies and good agricultural practices has been shown to significantly increase rice yield per feddan in Egypt (Sharaa, 2023). This is further supported by the impact of genetic improvements in rice, which have led to increased productivity and water use efficiency (Mehana *et al.*, 2021). Technological interventions such as the use of improved varieties, integrated nutrient management, and resource conservation have also been found to enhance rice yield (Atar Singh, Singh and Lakhan Singh, 2012). Similarly, the adoption of environment-friendly technologies, including the system of rice intensification and resource conservation, has been shown to increase rice productivity. These findings collectively underscore the importance of modern technologies and good agricultural practices in improving rice yield in Egypt. The application of the aforementioned modern techniques can lead to increasing the productivity of rice crop per feddan to about 5.5 tons per feddan compared to about 3.8 tons per feddan in 2020, with an increase rate of productivity reaching about 44.7%, in addition to achieving significant water savings.

The use of modern agricultural technologies and practices has significantly increased maize yield in Egypt. Sharaa (2023) highlighted the role of improved varieties, cultivation techniques, and modern irrigation systems in enhancing crop productivity; furthermore, Monem et al.(2001) emphasized the positive impact of biofertilizers on maize yield, particularly when used in combination with reduced N application. Ehsanullah et al. (2015) underscored the importance of tillage practices and sowing methods in improving maize growth and yield. These findings collectively demonstrate the substantial positive impact of modern technologies and good agricultural practices on maize yield per feddan in Egypt. By applying the package of enhanced and modern agricultural technologies, referred to in the study for maize crops, which were obtained after reviewing previous studies and consulting experts in this field, it is likely to increase the yield per feddan of maize from about 3.2 tons/feddan (in 2020) to about 4.2 tons/feddan, with an estimated increase in productivity of about 31.2%. In addition, water consumption will be saved.

The use of modern technologies and good agricultural practices has been shown to significantly enhance the yield and economic efficiency of sugarcane and sugar beet crops in Egypt. El Batran (2023) found that an integrated package of modern technology, including nitrogen fertilizer, nutrients, and mechanical work, led to increased productivity and economic superiority for sugar beet producers. El-Sharif et al. (2009) emphasized the potential for self-sufficiency in sugar production through the use of modern technologies, particularly in sugar beet cultivation. Elasraag (2019) highlighted the importance of improving technology and work procedures, as well as increasing research and genetic improvements, to enhance the production of sugar beet seeds. Khalil et al. (2022) further underscored the positive impact of technology packages, such as laser leveling and fertilization inside irrigation hoses, on sugar beet production in Fayoum Governorate. These studies collectively demonstrate the significant role of modern technologies and good agricultural practices in maximizing the productivity and quality of sugarcane and sugar beet crops in Egypt.

The previous section discussed a range of modern and improved techniques and practices that can be applied to sugar cane production, based on previous field experiments and expert opinions. These techniques together can enhance the per-feddan productivity to around 55 tons per feddan, compared to the current productivity of 46.6 tons per feddan in 2020, representing an increase of approximately 18%. On the other hand, referring to the packages of modern and enhanced technologies and practices that can be applied to sugar beet crops, derived from previous studies, these technologies as a whole can enhance the per-feddan productivity to reach about 28 tons per feddan, compared to the current productivity of 21 tons per feddan in 2020, with an increase rate of about 33.3%.

The relationship between technological growth and capital accumulation is inherently complementary, where each drives and enhances the other. Technological advancements increase the productivity of capital, making investments more profitable and encouraging further capital accumulation. Conversely, accumulated capital provides the necessary resources for research and development (R&D) and the adoption of new technologies. The Solow-Swan model emphasizes that long-term economic growth is driven primarily by technological progress, as capital alone faces diminishing returns. Endogenous growth theories, like those of Paul Romer, further illustrate that economic activities, including capital investments in human capital and innovation, spur technological advancements (Solow, 1956). Historical evidence, such as the Industrial Revolution, showcases how technological innovations necessitated substantial capital investments, fostering further economic growth (Barro and Sala-i-Martin, 2004).

A two-step approach in the study sounds methodically robust. Starting with the collection of improved agricultural techniques for specific crops sets a solid foundation based on empirical data derived from field experiments and obtained from previous literature. Then, leveraging these productivity gains to introduce shocks to Total Factor Productivity (TFP) converts the model

from a static to a dynamic framework, which is crucial for capturing the fluidity and responsiveness of the economy over time. This dynamic model should give a clearer picture of the potential impacts of these agricultural innovations on Egypt's economy.

3. The economic effects of applying modern technologies on the agricultural sector and the Egyptian national economy:

3.1 BASELINE:

The difference between the baseline projection and a policy shock reflects the effects of a policy change, which are identified through simulations of policy scenarios and the baseline. The baseline benchmarks were simulated dynamically and recursively, representing the path of the Egyptian economy from 2020 to 2030. The baseline is not a prediction but offers a plausible trajectory for growth and economic structural changes in the absence of any policy alterations. Figure 1 displays the gross domestic production values from the Ministry of Planning and Economic Development[2] alongside results from the model simulation. These findings demonstrate the model's capacity to accurately simulate the Egyptian economy during the years 2020–2022.

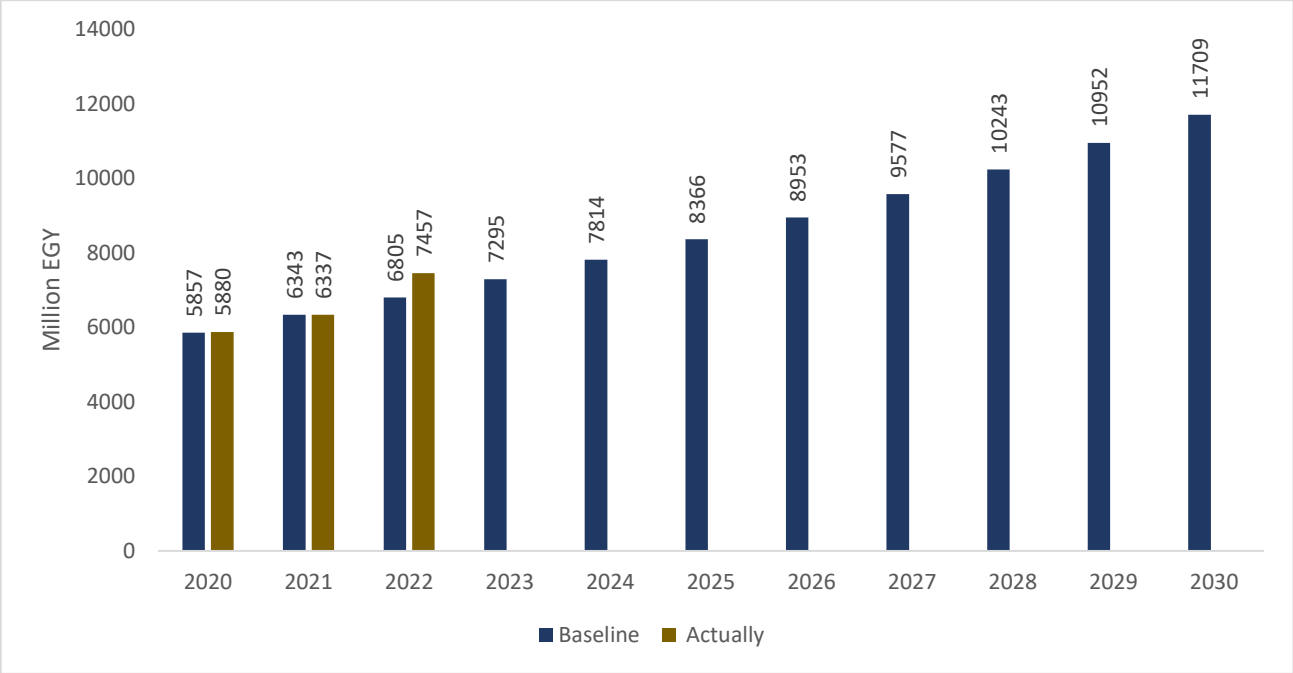

Figure 1. Gross Domestic Production (Million EGY).

3.2 RESULTS

This section outlines the simulation results of the CGE model. The findings are presented as percentages, depicting the difference between the simulation outcomes and the baseline figures. These results are divided into two stages for clarity and depth of analysis: The first stage focuses on the macroeconomic level, providing an overview of broader economic impacts. The second stage delves into specific microeconomic indicators, offering a detailed examination of narrower economic effects.

Given that agriculture accounts for approximately 11.5% of Egypt's GDP, using GDP is crucial for assessing changes in the economy. The introduction of modern agricultural technologies is expected to enhance crop productivity, which will have both direct and indirect economic effects. These impacts are captured in the Computable General Equilibrium (CGE) model detailed below.

https://mped.gov.eg/GrossDomestic/Index?lang=ar ٢

Figure 2 illustrates the percentage deviations from the standard growth path for macroeconomic indicators by 2030. Improved crop yields are projected to increase GDP by 1.22% relative to the baseline. The consumer price index (CPI) is anticipated to decrease by about 0.37%, which in turn is expected to boost consumption by approximately 1.1%. Regarding trade, there will be a notable improvement in the trade balance, with imports decreasing by about 0.56% and exports increasing by about 0.24% compared to the baseline.

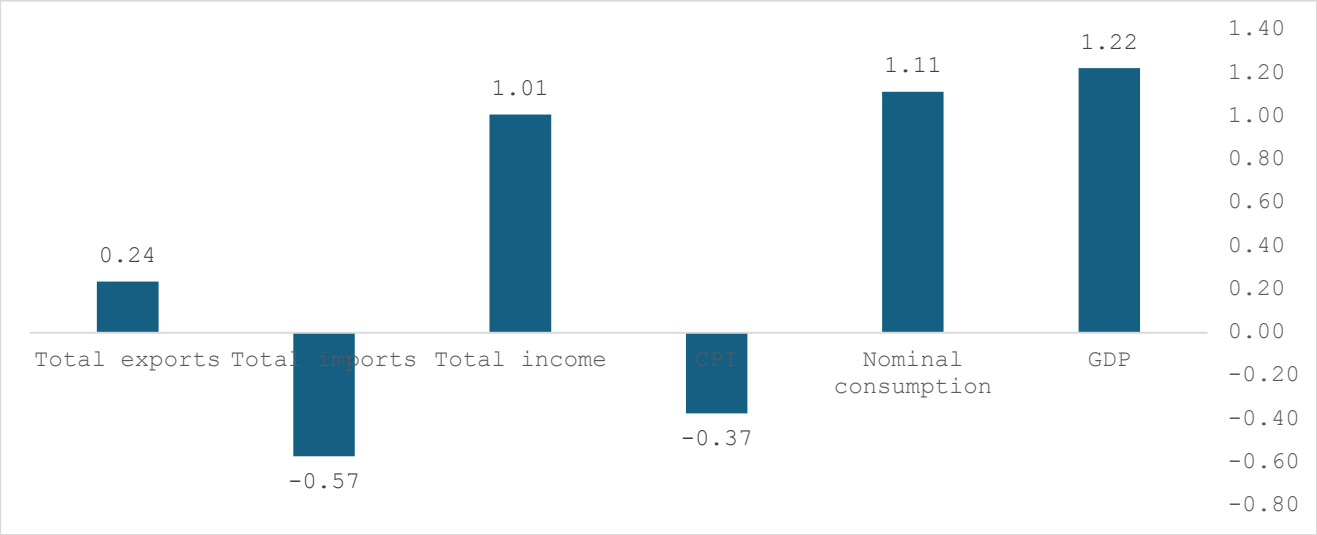

Figure 2. Impacts of the modern agricultural technologies on macroeconomic level (deviations from baseline growth path by percentage).

Implementing modern agricultural technologies has led to an increase in domestic supply, which is expected to cause a decrease in the prices of both general and specific agricultural commodities. This shift necessitates a focus on price levels. Specifically, Figure 3 illustrates the projected changes in prices for agricultural and other commodities. The results indicate a significant reduction in the prices of the agricultural commodities being studied, including wheat, rice, maize, beets, sugarcane, and sugar beet.

Moreover, rice prices are expected to decline by approximately 32.7% relative to the baseline, while sugar prices will decrease by about 19.9%. Similarly, maize and wheat prices are projected to fall by about 17.3% and 17.7%, respectively. These price reductions are attributable to varying increases in agricultural productivity for these crops. Although all five crops—rice, maize, wheat, sugarcane, and sugar beet—will benefit from enhanced productivity, this trend will impact two key areas: the income levels of farmers and the consumption patterns of these goods.

Due to the decline in the prices indicated in the figure, consumption rates for most agricultural commodities will increase. Household consumption of rice will increase by approximately 22.3%, and consumption of wheat and maize will increase by approximately 11% and 10.8% compared to the baseline.

Finally, modern agricultural technologies will positively affect the total factor productivity of related to the agricultural commodities under study (wheat, maize, rice, sugarcane, and sugar beet), which will positively affect local production, and hence increases the GDP. The CPI will also decline, leading to an increase in domestic consumption of these commodities.

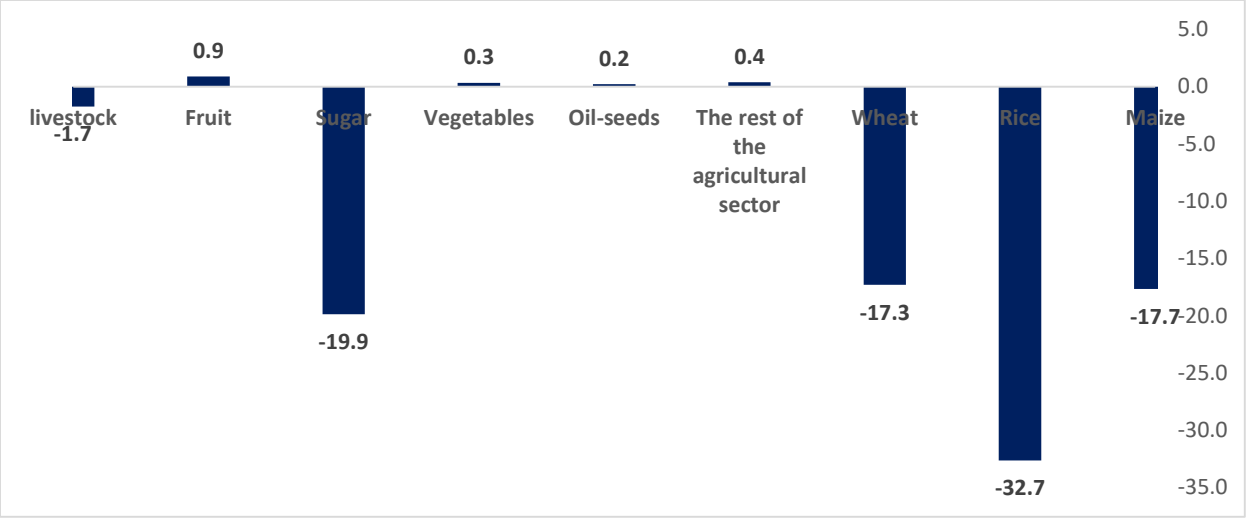

Figure 3. Change in the prices of local commodities (deviations from baseline growth path by Percentage).

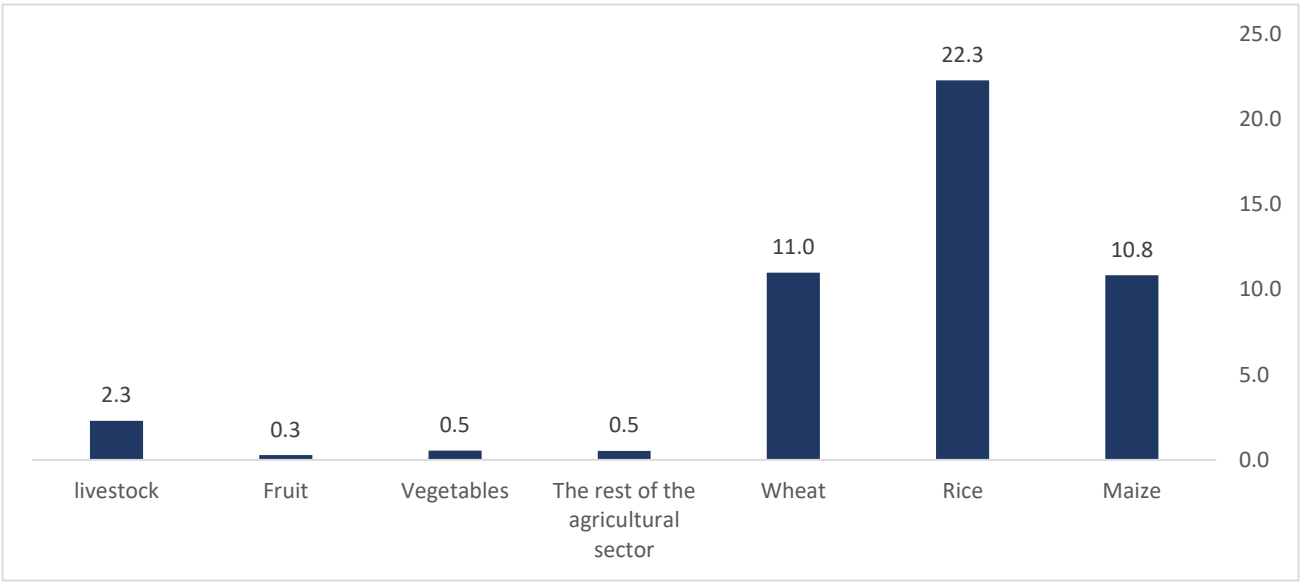

Figure 4. Change in commodity demand by Household (deviations from baseline growth path by percentage).

4. SUMMARY AND RECOMMENDATIONS

The recent global crises have significantly impacted the world, especially in terms of economic, social, and environmental stability. One of the most pressing issues that have emerged from these upheavals is food security. Particularly in developing countries, this challenge has forced governments to rethink their food security strategies to prevent worsening conditions and increasing poverty levels. Recognizing the critical role of agriculture, decision-makers are focusing on this sector as a fundamental solution to these problems. Agriculture is not just about meeting the immediate food needs of the population; it's also pivotal in supporting sustainable development. By producing sufficient food for domestic needs and supplying raw materials for the industrial sector, agriculture underpins both economic stability and growth. Moreover, the export of agricultural products is viewed as a vital strategy to combat poverty. By increasing exports, countries can generate more revenue, which in turn can be used to fund development projects and enhance the living standards of their citizens. This approach highlights the interconnectedness of agricultural productivity, economic policies, and

social outcomes, offering a pathway towards more resilient and prosperous societies.

Therefore, this study primarily aims to provide an analytical framework for advanced and modern technologies and associated technological and institutional innovations that can be applied in Egyptian agriculture to address future challenges and risks, while maintaining high performance indicators for the agricultural sector at various levels. To achieve this goal, the study begins by identifying suitable advanced and modern technologies applicable in Egyptian agriculture that can replace current agricultural technologies to achieve a significant improvement in food security indicators. In this regard, the economic and social impacts of the proposed technologies are evaluated, using the general equilibrium model based on the social accounting matrix for the Egyptian economy for the base year 2019. By employing a two-step approach that begins with harnessing improved agricultural techniques, the study lays down a solid empirical base. Then, by applying productivity enhancements as shocks to the Total Factor Productivity (TFP), the model is effectively converted from a static to a dynamic one. This shift is essential for accurately simulating the economy's potential to adapt and respond over time.

The study's results indicate a positive impact on both Agricultural production and gross domestic product, as well as an improvement in exports and a decrease in imports. Household income has also improved, having a positive effect on consumption. Therefore, it is necessary for decision-makers to strive to generalize this package of technologies in the Egyptian agricultural sector and thus remove the institutional obstacles that hinder the application of these modern agricultural technologies in the Egyptian economy.

5. REFERENCES

Abdelmageed K et al. (2019). 'Evolution of varieties and development of production technology in Egypt wheat: A review', Journal of integrative agriculture, 18(3), pp. 483–495.

Atar Singh AS, Singh AK and Lakhan Singh LS (2012). 'Effect of technological interventions on rice yield at farmers' field.'

Barro R and Sala-i-Martin X (2004). 'Economic growth second edition'. Cambridge MA.: The MIT Press.

Croppenstedt A (2005). 'Measuring technical efficiency of wheat farmers in Egypt'.

Ehsanullah UA et al. (2015). 'Tillage practices and sowing methods affect yield and related attributes of maize', Asian J. Agric. Biol, 3(1), pp. 8–14.

El Batran D (2023). 'The impact of using the technological package on sugar beet production', المجلة المصرية للاقتصاد الزراعي, 33(4), pp. 1468–1479.

Elasraag YH (2019). 'Economic analysis of sugarcane and sugar beet in Egypt', Zagazig Journal of Agricultural Research, 46(1), pp. 209–215.

El-Sharif L et al. (2009). 'Economic Potentialities Achieve Self-Sufficiency from Egyptian Sugar under the International Variables', American-Eurasian Journal of Agricultural and Environmental Science, 5(5), pp. 655–663.

Khalil YM, El Sayed ASS and Said HQS (2022). 'The Impact of using Technology Packages on the Economics of Sugar beet Production in Egypt): A Case Study in Fayoum Governorate', International Journal of Social Studies, 2(2), pp. 71–77.

Lemelin A and Robichaud V (2015). 'Calibrating a reference scenario for a multi-region, recursive dynamic world cge model'.

Mehana M et al. (2021). 'Impact of genetic improvements of rice on its water use and effects of climate variability in Egypt', Agriculture, 11(9), p. 865.

Monem MASA et al. (2001). 'Using biofertilizers for maize production: response and economic return under different irrigation treatments', Journal of Sustainable Agriculture, 19(2), pp. 41–48.

Serag E et al. (2021). A 2019 Nexus Social Accounting Matrix for Egypt. Intl Food Policy Res Inst.

Sharaa DA (2023). 'The impact of using some agricultural Technologies on the productive and economic efficiency for some crops in Egypt', Al-Azhar Journal of Agricultural Research, 48(1), pp. 311–321.

Siam GM, Ahmed YN and Sabbah SH (2022). 'The Potential Economic Impacts of Climate Change on the Most Important Cereal Crops Using IMPACT Model', The International Journal of Public Policies in Egypt (IJPPE), 1(3), pp. 12–25.

Solieman NY, Barghash RM and Hassan AA (2015). 'Economic study of the impact of using some technological methods on Egyptian wheat crop productivity', Life Science Journal, 12(1), pp. 12–20.

Solow RM (1956). A contribution to the theory of economic growth. The quarterly journal of economics, 70(1), 65-94.

Zeidan EM et al. (2005). 'Improvement of wheat productivity in newly reclaimed soil in Egypt', Annales Universitatis Mariae Curie-Skłodowska. Sectio E. Agricultura, 60.

الحسيني أم واخرون (٢٠٢٢). مؤشرات الكفاءة لماشية اللبن المزرعية في مصر وتقييم إحلال الأبقار الخليط محل الأبقار البلدية', المجلة المصرية للاقتصاد الزراعي, ٣(٣٢) ٨٩٩–٩١٣.

Appendix 1

The Computable General Equilibrium (CGE) model created by Partnership for Economic Policy (PEP) is a sophisticated analytical tool used to assess the economic impacts of policy changes and external shocks on an economy. By incorporating detailed economic data and theoretical frameworks, the CGE model simulates how economies react to various policy interventions, such as tax reforms, trade policies, and public investment strategies. This model is especially useful for policymakers and researchers as it provides a comprehensive picture of how different sectors of the economy interact and respond to changes, enabling informed decision-making and effective policy design.

PEP's CGE model stands out due to its flexibility and robustness in capturing the complexities of economic systems. It utilizes a wide range of data inputs, including household surveys, national accounts, and input-output tables, to create a detailed representation of the economy. The model is capable of analyzing distributional effects, thus highlighting how different income groups or regions are affected by policy changes. By integrating both macroeconomic and microeconomic perspectives, the CGE model provides a holistic view of the economic landscape, making it an indispensable tool for evaluating the potential outcomes of policy choices and fostering sustainable economic development.

الملخص العربي

تعزيز الإنتاجية الزراعية في مصر: أثر توسيع نطاق استخدام تقنيات الزراعة الحديثة على المحاصيل الرئيسية

فاطمة حفناوي و يسري نصر احمد

قسم الاقتصاد الزراعي كلية الزراعة جامعة القاهرة

واجه العالم العديد من الازمات الاقتصادية خلال الأعوام الماضية مثل أزمة وباء كورونا، وتعطل سلاسل الامداد العالمية والازمة الروسية الأوكرانية، وغيرها من الصراعات الإقليمية. وقد أبرزت الأزمات العالمية المتصاعدة الدور الحاسم للأمن الغذائي، وخاصة في الدول النامية، مما دفع الحكومات المختلفة إلى إعادة تقييم الاستراتيجيات الزراعية. ويسلط هذا التحول المحوري الضوء على الزراعة باعتبارها ليس فقط وسيلة لتلبية الاحتياجات الغذائية الفورية، ولكنها أيضًا عنصر حيوي للنمو المستدام. ومن خلال تعزيز الإنتاجية الزراعية، تسعى الدول جاهدة لتحقيق الاستقرار وتوسيع اقتصاداتها من خلال إنتاج الغذاء المحلي الكافي، وتعزيز الصادرات .

وتعد حالة الزراعة المصرية مثالا رئيسياً لتطبيق هذه الاستراتيجية. لذا، تهدف هذه الدراسة إلى تقييم تأثير الارتقاء بالتقنيات الزراعية الحديثة والمحسنة على القطاع الزراعي المصري باستخدام نموذج التوازن العام CGE استنادًا إلى قاعدة بيانات مصفوفة المحاسبة الاجتماعية SAM لسنة الأساس ٢٠١٩، والتي تعد أحدث إصدار لتصوير العلاقات التشابكية في الاقتصاد المصري. في هذا الإطار، يتناول نموذج التوازن العام المستخدم في الدراسة الحالية الصراعات الدولية والاقليمية المحيطة واثارها على أسعار السلع وكذلك تحرير سعر الصرف؛ كمحاولة لمحاكاة الأوضاع الحالية للاقتصاد المصري. بناء على ذلك، تشير نتائج المحاكاة إلى ان تبنى التكنولوجيات الزراعية الجديدة يمكن أن يعزز بشكل كبير الإنتاج الزراعي والناتج المحلي الإجمالي والصادرات والاستهلاك، في حين يؤدي في الوقت نفسه إلى خفض الواردات ومؤشر الرقم القياسي لأسعار المستهلكين. في ضوء العوائد الاقتصادية والاجتماعية المتوقع تحققها على الصعيدين الكلي (الاقتصاد المصري) والجزئي (قطاع الزراعة)، توصى الدراسة بضرورة قيام صناع السياسات بتذليل العقبات المؤسسية وتوسيع نطاق تطبيق التقنيات الزراعية الحديثة والمحسنة في القطاع الزراعي، والعمل على تعميم تطبيق تلك التقنيات بتكلفة مناسبة في متناول المزارعين، إلى جانب تنظيم برامج إرشادية واسعة النطاق عبر برامج الراديو والتلفزيون وغيره، لإبراز المكاسب المتوقعة في الإنتاج وبالتالي الدخل من جراء تبنى تلك التكنولوجيات الحديثة.

الكلمات المفتاحية: الإنتاجية، إنتاجية عناصر الإنتاج، التقنيات الزراعية الحديثة .