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Symposium Policy Note 1

Enabling farmers to lead food system transformation and resilience in Egypt

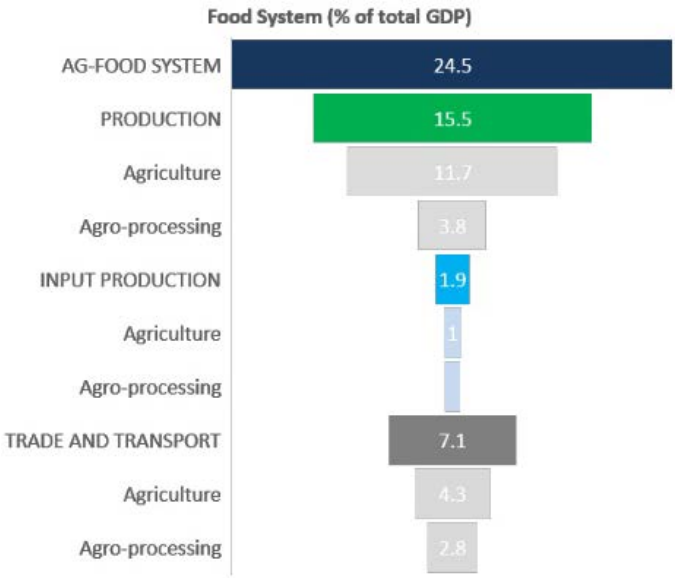
This policy note is one in a series of four notes that summarize key findings and recommendations from 32 seminars organized by IFPRI between 2016 and 2020 under the Evaluating Impact and Building Capacity Project funded by the United States Agency for International Development (USAID) and from related research done in collaboration with national and international partners in Egypt. The briefs have been prepared on the basis of a joint symposium and are intended to give policymakers and program designers in the areas of social protection, nutrition, agricultural policy, and the digitalization of agriculture a quick overview of research-based recommendations on key policy issues that will better enable Egypt to achieve several of the goals outlined in the Sustainable Development Strategy 2030.

Agricultural and food policies will play an important role in making Egypt's food system fit for future challenges, including resilience to shocks, such as the ongoing COVID-19 pandemic. This brief highlights the importance of enabling farmers so that they can contribute significantly to a broader transformation and to resilience of Egypt's food system and rural economy. Five areas of action are highlighted:

- Invest in a renewed system of agricultural extension services, with an emphasis on new technologies and production systems and on nontraditional crops.
- Ease rigidities for farmers and increase the market orientation of the agriculture sector, including markets for fertilizer and staple crops.
- Revisit the current irrigation management system to allow for the adoption of new irrigation technologies and increased efficiency of water usage.
- Support the development of agro-processing value chains where there are missing markets or market frictions in order to achieve a sustainable and nutrition-sensitive food system.
- Coordinate agricultural policy with policies of other government ministries to support rural transformation and employment opportunities off the farm.

Egypt's agriculture sector will continue to play a key role for the country's socioeconomic development. But the real significance of the sector only becomes apparent when the whole food system – with agricultural production as its backbone – is taken into account. The food system in Egypt makes up about a quarter of GDP, including food-related trade, transport, and processing (Figure 1).[1] In addition to its contribution to economic output, the food system also plays a critical role in job creation, food and water security, and nutrition. Agriculture has also been the most resilient sector during the ongoing COVID-19 pandemic,[2] which has highlighted the sector's importance for building a food secure and resilient economy.

Figure 1: Egypt's food system as a share of the national economy



Source: Authors' analysis.

Agricultural and food policies will play a crucial role in making Egypt's food system fit for the future, such as supporting Egypt's path to becoming a higher-income country and addressing related challenges, including population growth and climate change. This brief highlights the importance of enabling farmers so that they can contribute significantly to broader food system and rural transformation.

Making farmers fit for the future by revamping agricultural extension

Increases in agricultural productivity depend on farmers experimenting with new crops and new technologies. However, farmers – and especially smallholders – need access to higher-quality agronomic advice to manage the risks associated with shifting to new modes of production. Promising productivity-enhancing measures that farmers could apply more widely include new cultivation techniques, such as raised-bed technology and wide furrows; adoption of new seed varieties and livestock breeds that are better able to tolerate shorter growing seasons, water deficits, and increased soil and water salinity; drip irrigation; and digital and precision farming technologies.[3]

A challenge in promoting these technologies is that the quality of public agricultural extension services in Egypt has been severely eroded. Strengthening Egypt's extension systems should be a top priority. The use of digital information and communications technologies (ICTs) to expand the reach of public extension services has been successfully piloted in other countries. For example, videos have been used effectively to improve access to agricultural advice for farming populations with low literacy levels. This approach could be a model for Egypt.[4] Another complementary, local

[1] El-Enbaby, H., 13 December 2016. https://www.slideshare.net/ifpri/hoda-elenbaby-2016-ifpri-egypt-seminarthe-role-of-agriculture-and-agroindustries-for-accelerating-economic-transformation-in-egypt

[2] Breisinger, C., M. Raouf, M. Wiebelt, A. Kamaly, and M. Karara. 2020. *Impact of COVID-19 on the Egyptian economy: Economic sectors, jobs, and households*. MENA Regional Program Policy Note 06. Cairo: International Food Policy Research Institute. https://www.ifpri.org/publication/impact-covid-19-egyptian-economy-economic-sectors-jobs-and-households

[3] Govind, A., 19 April 2019. https://www.slideshare.net/ifpri/ajit-govind-icarda-2019-ifpri-egypt-auc-cares-climatesmart-agriculture-solutions-for-egypt;

Abousabaa, A., 29 March 2018. https://www.slideshare.net/ifpri/aly-abousabaa-icarda-2018-ifpri-egypt-seminar-unleashing-the-potential-of-egyptian-farmers

[4] Abate, G.T., T. Bernard, B. van Campenhout, E. Lecoutere, S. Makhija, and D.J. Spielman. 18 July 2019. https://www.slideshare.net/ifpri/david-spielman-ifpri-2019-ifpri-egypt-wb-innovations-for-agricultural-development-in-egypt

context-specific, and community-driven approach that has been successful in pilot projects in Egypt is the use of model farmer field schools to showcase innovative agricultural practices and technologies.[5]

Easing rigidities related to the production and marketing choices of farmers

In addition to providing better agronomic advice and enhancing farmers' knowledge, increasing production options would also benefit farmers. Despite a period of reform and liberalization in Egypt's agriculture sector in the 1980s and 1990s, some current agricultural policies continue to influence markets for strategic crops. Procurement policies for wheat, maize, rice, and other strategic commodities allow for the setting by government of a price floor for these commodities that usually is higher than the world price. This system encourages farmers to grow cereals even when alternative crops, including fruits and vegetables, could be grown more efficiently. This is also the case where farm areas are small or mechanization levels are low. While cereal yields are very high in Egypt, the value produced per worker for cereals is much lower that it would be for alternative crops, such as tomatoes and potatoes.[6]

In addition, restrictions in place within the centralized irrigation system of the Nile Valley determine where water-intensive crops can be grown. While these regulations can be important for water-saving purposes, they restrict farmers' ability to adopt more profitable crops and production patterns. Going forward, agricultural and food policies in Egypt should balance valid concerns about food security, water savings, and protection of smallholders with an understanding that rural economic transformation will accelerate if farmers are able to make decisions more freely about labor allocations, consolidating ownership of land, and moving toward the production of those crops for which Egypt has a comparative advantage.

Increased flexibility can also help farmers adapt to shocks and climate change and improve water use efficiency

Agricultural policies and farmers' choices must be seen in the context of shocks (such as the ongoing COVID-19 pandemic), climate change, and climate uncertainty. IFPRI researchers and collaborators have found that in scenarios in which farm households have more flexibility in allocating resources to different crops, can rent land in or out easily, and face less restrictive policies on imports, all farm households are better able to adapt to potential decreases in irrigation water availability associated with climate change.[7] In line with increasing technology adoption and access to extension, it is critical to continue promoting technologies, such as greenhouses and salt and heat tolerant crop varieties, that will be suited to efficiently maintaining crop production in the face of predicted changes in climate and sea level.

Increasing water use efficiency will be critical for adapting to climate change and other pressures on water resources. In the Nile Valley, irrigation water is delivered through a rotating system in which water is made available to farmers free of charge at regular intervals. This system constrains farmers' ability to switch their crop production practices to make more efficient use of water, such as moving

[5] Bayasgalanbat, N. 26 February 2019. https://www.slideshare.net/ifpri/nomindelger-bayasgalanbat-fao-2019-ifpri-egypt-nnc-seminar-100-million-healthy-lives

[6] Kassem, N., 9 May 2017. https://www.slideshare.net/ifpri/nada-kassem-2017-ifpri-egypt-seminar-how-to-make-agriculture-climate-smart-in-egypt;

Nin-Pratt, A. 13 December 2016. https://www.slideshare.net/ifpri/alejandro-nin-pratt-2016-ifpri-egypt-seminar-what-can-be-learned-from-economic-transformation-and-agricultural-transition-experiences-in-mena

[7] Nin Pratt, A., H. ElDidi, and C. Breisinger. 2018. *Farm Households in Egypt: A typology for assessing vulnerability to climate change*. MENA Regional Program Working Paper 12. Cairo: International Food Policy Research Institute. https://www.ifpri.org/publication/farm-households-egypt-typology-assessing-vulnerability-climate-change

from flood irrigation to higher-efficiency systems, including sprinkler or drip irrigation. Efficiencies in water use for agriculture could be achieved through judicious changes to the current system of irrigation water delivery and support for farmers in the adoption of more efficient irrigation systems.

While the overall efficiency of the Egyptian irrigation system is high, in that most water used eventually returns to the Nile, cycling water through multiple rounds of flood irrigation can reduce water quality downstream. A possible solution is to continue to invest in improving irrigation systems by replacing open canals with pipes to minimize water loss and allow continuous flow. These improvements have high returns for farmers in terms of yield and also increase water quality and reduce water loss in the irrigation system as a whole.

Agriculture in the new lands outside of the Nile Valley relies on exploitation of groundwater resources in the Nile Aquifer and the Nubian Sandstone Aquifer.[8] Land reclamation project planning should explicitly account for the opportunity cost of using these nonrenewable water resources. Doing so will enable Egypt to maximize the benefits from its groundwater resources by modeling realistic water demand over time in order to identify optimal crop mixes and water allocations for long-term sustainability.

Beyond the farm and toward a sustainable food systems approach

While enabling farmers and providing all supply chain actors with an enabling environment is the cornerstone of agricultural policy, a food systems approach that considers "from farm to fork" is best suited for achieving food and nutrition security. Looking across the entire agrifood sector points to the role of agricultural processing in enhancing the productivity of the sector, beyond increasing agricultural production alone. Quality training and product certification are necessary to develop higher value-added activities, such as processing sun-dried tomatoes, deseeding pomegranates, or other value addition that can take advantage of Egypt's existing comparative advantage in horticultural production.[9]

Government can also contribute to easing market frictions, such as high transaction costs, challenges for private sector registration, and poor access to market information.[10] For example, the Bank of Egypt has identified specific gaps in agricultural value chains as a priority for targeting incentivized credit. These include promoting fruit and vegetable collection centers and establishing digital agricultural platforms for actors in the strawberry and livestock value chains to facilitate the formation of virtual cooperatives.[11]

IFPRI researchers and their collaborators used an economywide model for Egypt to investigate how different means of nurturing various agricultural commodity value chains would affect key outcomes for the Egyptian economy as a whole and for specific regions.[12] The simulations compared policies biased toward different value chains of a similar magnitude in terms of the overall growth in agricultural GDP and looked at the outcomes those policies would have on poverty, GDP, and dietary diversity. The research concluded that, while general nurturing of agricultural value chains is good for economic growth, is pro-poor, and improves nutrition, only for a few commodities did increased value-chain investment improve all of the outcomes considered. In fact, expanding the value chains

[8] Kurdi, S., 19 August 2019. https://egyptssp.ifpri.info/2019/08/19/ifpri-egypt-seminar-fertilizer-policy-in-egypt-and-options-for-improvements/

[9] El Shaikh, O., 29 March 2018. https://www.slideshare.net/ifpri/othman-elshaikh-goe-2018-ifpri-egypt-seminar-unleashing-the-potential-of-egyptian-farmers

[10] Fiani, J.D., 20 June 2019. https://www.slideshare.net/ifpri/dorra-fiani-kef-2019-ifpri-egypt-wb-innovations-for-agricultural-development-in-egypt

[11] Seif El Nasr, S., 20 June 2019. https://www.slideshare.net/ifpri/seif-el-dine-seif-el-nasr-central-bank-of-egypt-2019-ifpri-egypt-wb-innovations-for-agricultural-development-in-egypt

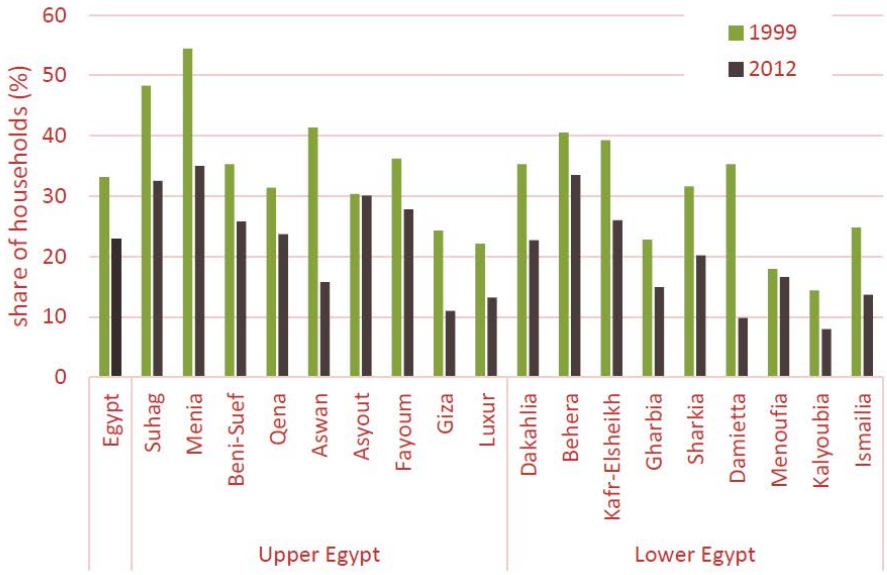
[12] Breisinger, C., M. Raouf, J. Thurlow, and M. Wiebelt. 2019. *Beyond the business case for agricultural value chain development: An economywide approach applied to Egypt*. MENA RP Working Paper 18. Washington, DC, and Cairo, Egypt: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/p15738coll2.133192

for some commodities can have negative economywide effects, such as by increasing demand for animal feed, which leads to increases in the cost of food. Consequently, a diverse combination of value chains is advisable for any strategy focused on enhancing agricultural value chains.

Support rural transformation and help farmers "move up" or "move out"

Historically, as countries and food systems develop and adoption of mechanization and other labor-saving agricultural technologies increases, the number of farmers usually decreases and the average farm size increases. In this process of rural transformation, some farmers will move out of farming to seek employment in other sectors, often related to the food system. The share of households in Egypt that are reliant solely on agriculture for their livelihoods has been falling over several decades (Figure 2).[13] Most farming households in Egypt today work on very small farms of less than a *feddan*. This is the case of 60 percent of households in Lower Egypt and more than 70 percent of households in Upper Egypt (El-Enbaby et al. 2016). As such, nonfarm income is already a crucial share of income for many rural households.

Figure 2: Share of agriculture-only rural households in 1999 and 2012 in Egypt, by governorate



Source: El-Enbaby et al. 2016

This structure of Egypt's agricultural labor force suggests that agricultural policy should be considered in the framework of a broader policy of rural development. Such a policy would emphasize expansion of nonfarm employment opportunities, particularly for those farmers using low levels of capital and with small landholdings. Supporting these small farmers in moving out of farming would also help other farmers to move up in farming.

[13] El-Enbaby, H., J.L. Figueroa, H. ElDidi, and C. Breisinger. 2016. *The role of agriculture and the agro-processing industry for development in Egypt: An overview*. MENA RP Working Paper 3. Washington, DC, and Cairo, Egypt: International Food Policy Research Institute (IFPRI). http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/131007

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