

Climate-smart agriculture and development practices in Egypt:

Report on a policy seminar event

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Introduction

Egypt faces environmental stresses that are being intensified by climate change despite the country's relatively minor contribution to global greenhouse gas emissions. Agriculture is one of the most climate-sensitive sectors, employs nearly one-fifth of the workforce, contributes substantially to GDP, and underpins national food security. Rising average temperatures, shifting rainfall patterns, and sea level rise in the Nile Delta are already creating significant risks for agricultural productivity. These challenges are compounded by the background of water scarcity, increasing land salinity, and the over-exploitation of groundwater. Climate-smart agriculture (CSA) encompasses practices and innovations designed to sustainably increase productivity, enhance resilience to climatic shocks, and—where possible—reduce greenhouse gas emissions.

This policy note summarizes presentations and discussion shared during the workshop held in Cairo on **May 25th 2025**, as part of the Bridging Evidence and Policy (BEP) seminar series, a collaborative initiative by the Egyptian Food Bank (EFB), the International Food Policy Research Institute (IFPRI), and the Sawiris Foundation for Social Development (SFSD) which brings together researchers, policymakers, and development practitioners.

Climate forecasting and early warning systems (EWS)

A panel discussion on climate forecasting and early warning systems (EWS) brought together representatives of the Egyptian government from the Egyptian Meteorological Authority (EMA), Climate Change Information Center (CCIC) and Information and Decision Support Center (IDSC) and, as well as the FAO Regional Office for the Near East (FAO RNE).

Representing the Egyptian Meteorological Authority (EMA), Amira Nasser explained that the Authority plays the scientific role of producing forecasts and outlooks, while other partners in the government as

well as external NGOs as the World Food Programme (WFP) translate them into actionable agricultural advice. She emphasized the importance of aligning with international EWS standards.

Mohamed Fahim, Director of the Climate Change Information Center (CCIC) under the Ministry of Agriculture, explained the value for agriculture of EWS using the example of a minor heatwave in 2019 which wiped out nearly 90 percent of Egypt's mango and olive harvests. Fahim said that EWS must not only forecast risks but also deliver concrete guidance for farmers. The CCIC now issues daily climate warnings, while the challenge lies in embedding these messages into everyday agricultural practice, supported by robust communication infrastructure and farmer trust. He pointed to an example of this in the recent collaboration between CCIC and EMA, including the *Bashaer* platform, which delivers tailored, climate-smart recommendations directly to farmers.

Mai Mohsen, Head of Technical Office Information and Decision Support Center (IDSC), explained that IDSC supports public awareness through initiatives such as the Nabta mobile app and supports decision-making by serving as the Cabinet's advisory body, convening a public policy forum, and publishing specialized platforms such as the Climate Policy Journal and Afaq al-Manakh. These tools are designed to strengthen the bridge between researchers and policymakers. From a regional perspective, Ayman Omer, Senior Field Program Officer at the Food and Agriculture Organization (FAO RNE), noted that while Early Warning Systems are already in place in 19 countries in the region, most remain single-hazard focused and reactive rather than anticipatory, as highlighted in joint IFPRI-FAO review (FAO 2025). In his words, two gaps persist: first, warnings often stop short of providing actionable advice; second, communication gaps mean that many smallholders never receive them at all.

Pathways to CSA: Insights from Practice

While EWS are designed to prompt adaptation to changing climate patterns, it is vital for farmers to have awareness of climate adaptation strategies that are appropriate and cost effective for their context. Piloting new technologies and approaches are important components of guiding policy to support farmers in this area.

As an example of an NGO working directly with smallholder farmers to pilot approaches to climate smart agriculture, Mohamed El-Karamany presented the contract farming model of the Egyptian Food Bank (EFB). This model directly connects smallholder farmers to the 100,000 vulnerable households that the food bank serves. Unlike traditional sourcing of food supplies for distribution, this model empowers farmers with fair pricing, non-financial agricultural support, and guaranteed market access. EFB is also piloting ethical sourcing mechanisms such as QR codes that trace products back to farmers, increasing transparency. Yet, EFB noted ongoing challenges in persuading smallholder farmers to invest in costly climate adaptation measures, which are often viewed as risky or yielding uncertain returns.

Hassan El Badawy, Advisor for Agri-Digital Solutions at GIZ, presented insights from the Agriculture Innovation Project (AIP) in Upper Egypt which targets smallholder farmers with holdings under three feddans. The Agriculture Innovation Project focuses on low-cost, context-appropriate interventions and practitioners have found that training through field schools and peer-to-peer knowledge transfer via "lead farmers" significantly influences adoption behavior.

Alia Hafiz, Head of Nutrition at the World Food Programme (WFP), highlighted the organization's work piloting climate smart technologies and the relationship with land consolidation, an alternative approach to focusing purely on smallholder farmers. WFP's interventions targeting consolidated plots averaging

25-52 feddans have demonstrated energy consumption reductions of 30-50%, water use efficiency improvements of up to 30%, and household income increases of approximately 20%. These outcomes suggest that when coupled with technical assistance and sustainable energy technologies, land consolidation can enhance both productivity and climate resilience.

The role of the private sector is also crucial in supporting farmers in adopting new approaches that enhance climate resilience. Mozare3 is an example of this role as a leading agricultural technology company which provides financial and non-financial services to farmers. Hamis El Gabry, Head of Grants and Partnerships at Mozare3, reflected on the company's agri-fintech experience. Mozare3 positions digital applications as entry points for introducing data literacy, supported by field-based agricultural engineers and call center services. However, a critical constraint is dependency on reliable market access: the utility of data-driven tools remains limited without assured market channels. Hamis emphasized that export markets, particularly North American destinations, offer higher value potential compared to European markets, where traceability requirements often exceed smallholder documentation capacity. Mozare3's embedded financing model addresses credit access barriers through in-kind input provision rather than cash disbursement, mitigating risks related to input quality and fund diversion. The tripartite contract model involving farmers, financial institutions, and Mozare3 as guarantor reduces information asymmetries and secures interest rates between 5-9% through partnerships with institutions such as the National Bank of Egypt. However, scalability depends on sustained institutional partnerships and sufficient production volume to justify administrative overhead.

Research and Policy Connections

On the side of research, more work remains to be done. A systematic review completed by IFPRI and IFAD highlights the scarcity of rigorous evidence on Water-Energy-Food Nexus interventions in the MENA region (El Didi et al., 2025). Only 17 studies exist despite the growing policy momentum. The review identified diverse policy interventions being explored in the region including supporting technologies such as desalination, wastewater reuse, drip and solar irrigation; farm management practices like conservation agriculture and adaptive crop varieties; institutional innovations such as Water User Associations; and policies around subsidies. Policy effectiveness depends on minimizing trade-offs while maximizing synergies across sectors. For example, solar-powered irrigation offers farmers cost savings, lower emissions, and reliable water supply, but unchecked diffusion of solar-powered groundwater pumping risks depletion of non-renewable aquifers. A nexus policy approach to this technology could include governance safeguards and financing schemes to support smallholders. Rigorous research and evidence are needed to inform the development of such policies.

Conversations at the seminar also highlighted the importance of policy coordination between agriculture and nutrition. Agricultural systems optimized for yield and commercial value do not automatically produce nutritionally adequate or affordable food supplies while Egypt's nutrition crisis, characterized by simultaneous prevalence of undernutrition, micronutrient deficiencies, and overweight/obesity imposes substantial GDP costs through reduced cognitive development in children and diminished labor productivity. Egypt has established a National Food and Nutrition Strategy with agricultural sector participation, but operationalization remains weak.

Participants agreed that effective policy coherence requires evidence-based investment as well as cross-sectoral coordination.

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