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nexus



# Water-Energy-Food-Nexus Farming: Upscaling Solutions for Small and Medium-Scale Farms

Water  
Savings of up  
to 42.2% per  
Year

Savings of up  
to 5,447.6  
Liters of Diesel  
per Year

Reduction of  
CO2 Emissions  
of up to over  
10 Tons per  
Year

Savings of up  
to 43,580 EGP  
for Diesel per  
Year

296 People  
Trained

## KEY OUTPUTS

External Financial Feasibility Study

Nexus Farming Brochure

Internal Financial Feasibility Study

Training Reports

SDG Impact Report

Workshop Reports

Policy Brief

Brief on Financing Options

جبال Geba  
— SUSTAINABILITY . AGRICULTURE . LIVELIHOODS —



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**Implementation period:** 2022–2023

**Implemented by:** Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and GEBAL Egypt

**Co-funded by:** European Union (EU) and the German Federal Ministry for Economic Cooperation and Development (BMZ)

**Locations:** Dandara and El Heiz, Egypt

**Contribution to SDGs:** 1, 2, 3, 6, 7, 11, 12, 13 and 15.

### Local Context

Egypt needs to develop tangible and scalable responses to water scarcity, food insecurity, and climate change. Ensuring sustainable livelihoods for a rapidly growing population means a substantive increase in food production while using less and less of Egypt's dwindling land and water resources. At the same time, Egypt needs to reduce its CO2 emissions to meet the Paris Agreement and diversify its energy supply.

### Objective and Approach

Against this background, the Nexus Regional Dialogues Programme in the MENA region has joined forces with Gebal Egypt, specialized in rural development in Egypt, to carry out the Nexus Farm Initiative.

The initiative focuses on integrated greenhouses systems that are fully powered by solar energy, integrate fish and crop farming, and are based on circular water use models that boost water-use-efficiency. Gebal has implemented prototypes of these climate-smart farms in the Western Desert, and Upper Egypt. Funded through CSR programs and grants, the demonstration sites were implemented between 2020 and 2022 and are functioning successfully.

Building on the insights from these demonstration sites, Gebal is implementing the Nexus Farm Initiative, under which it brings together stakeholders from the banking sector, policy-making and civil society and the farming community in a series of dialogue sessions to jointly work towards creating an enabling environment that will allow farmers in Egypt to replicate the sustainable farming models.

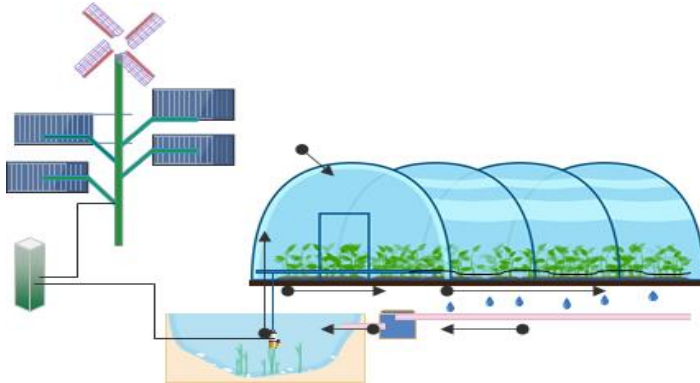
In doing so, Gebal conducted multi-stakeholder dialogue rounds, gave WEF Nexus trainings, developed business models and feasibility studies and documented lessons learned and insights in the form of policy recommendations and briefs.



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The model can save between 37% and 42% of water or up to 2 million liters of water per year as compared to an open farm of the same size irrigated by flood irrigation.

A major milestone of the Nexus Farm Initiative is the on-going development of a **Nexus Farming Loan Product** that will enable farming initiatives targeting a) maximum water use efficiency, b) renewable energy usage, and c) enhanced food production, while at the same time focusing on integrated, circular systems. Through the integration of these three elements, the Nexus Farming Loan Product will be an important addition to other loan products on the Egyptian market. Based on extensive discussions with representatives from the Egyptian banking sector, Gebal has commissioned two feasibility studies of different versions of integrated, climate-smart farming practices as pre-requisites for the development of the Nexus Farming Loan Product, which is currently being elaborated

## Nexus Farms in Numbers

### WATER EFFICIENCY

The model can save between 37% and 42% of water or up to 2 million Liters of water per year as compared to an open farm of the same size irrigated by flood irrigation.

### LAND USE EFFICIENCY

Greenhouses produce around 3 times more food than open field production, depending on the growing conditions.

### ENHANCED PRODUCT QUALITY

Resulting products are available off season, nutrient rich, and freshly harvested.

### REDUCTION IN CARBON EMISSIONS

The system saves up to 5,447.6 Liters of Diesel per year, saving 13,619 kg of CO<sub>2</sub> emissions.

### ECONOMIC EFFICIENCY

Cutting back on Diesel consumption can save farmers up to 43,580 EGP per year.

### FINANCIAL FEASIBILITY\*

The Return on Investment is between 215 and 233%, the cost recovery period 7 years.

\*see reports for details