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Brief

Designing Next-Generation Agriculture Systems in Syria: From Recovery to Transformation (NexGenAg-Syria)

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CGIAR Food Frontiers and Security Program

The CGIAR Food Frontiers and Security Program focuses on strengthening fragile, urban, and island food systems by catalyzing innovative policies, investments, and local capacities to improve food and water security, nutrition, and climate resilience for the world's most vulnerable communities.
https://www.cgiar.org/cgiar-research-porfolio-2025-2030/food-frontiers-and-security/

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Front cover photo: Tabqah Dam water flow toward Raqqah, Tabqah, Syria. (Credit: Combined Joint Task Force – Operation Inherent Resolve/DVIDS)
Back cover photo: Refurbished greenhouse in Deir ez-Zour, Deir ez-Zour, Syria. (Credit: USAID Essential Services Program/DVIDS)

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The Context

After more than a decade of conflict, Syria's agricultural sector faces interconnected pressures from degraded land, salinized soils, damaged water and sanitation infrastructure, and growing drought risk in already water-scarce dryland zones. These pressures constrain agricultural productivity, food security and the ability of national institutions and development partners to target recovery investments effectively.

Recovery creates an opportunity not simply to rebuild what was lost, but to guide investment toward a more diversified, resource-efficient and climate-resilient agricultural sector. Doing so requires a shared understanding of where water is available and used, where land is degrading, which crops are best suited to different zones, where productivity gaps are greatest, and where interventions such as rainwater harvesting or water reuse have the strongest potential.

NexGenAg-Syria is designed to provide that shared planning intelligence by helping national partners move beyond rebuilding what was lost toward a more diversified, productive and climate-resilient agricultural sector aligned with Syria's Agricultural Strategy 2026-2030. This research-for-development initiative is jointly implemented by the International Center for Agricultural Research in the Dry Areas (ICARDA) and the International Water Management Institute (IWMI), in partnership with Syria's Ministry of Agriculture, with funding from the CGIAR Food Frontiers and Security Program. The innovation of NexGenAg-Syria lies in integrating water availability and use, land condition, crop suitability, productivity gaps, and reuse opportunities into a common spatial decision support framework for prioritizing agricultural recovery investment

Objectives

NexGenAg-Syria brings together water, land, crop and climate analysis so that government, development partners and investors can make better-informed choices about where and how to support agricultural recovery.

- Plan with evidence: National water accounts will clarify how water enters, moves through and is consumed across Syria's major land and water-use landscapes, while land-degradation hotspot maps will identify where restoration and improved management are most urgently needed. Together with agro-ecological zoning and crop-suitability atlases, these tools will replace fragmented data with a shared evidence base for planning and decision-making.
- Decide where to intervene: A national scale assessment will identify locations with promising rainwater-harvesting opportunities for supplementary water supply. Water-reuse opportunity assessments, combined with analysis of selected wastewater treatment systems, will help determine where safe and productive reuse could be feasible and what treatment options may be appropriate.
- Diversify beyond wheat: Agro-ecological zoning and crop-suitability analysis will identify viable diversification pathways beyond current crop patterns, including potentially profitable, nutritious and climate-resilient options such as lentils, other legumes, oilseeds and horticultural crops. This can improve diets and incomes while reducing pressure on stressed land and water resources.
- Strengthen food and nutritional security: A more diverse and locally appropriate food basket can improve nutrition for Syrian households and reduce their exposure to climate, food production and market shocks.
- Capture productivity gains: Yield-gap analysis will show where actual production falls below achievable levels, while remote sensing-based biomass/yield and water productivity assessments will identify where agricultural production per unit of water is comparatively low and where realistic efficiency and productivity gains may be achievable. Together, they will support realistic, zone-specific production targets and identify where productivity and water-use efficiency gains are most achievable.
- Attract and target investment: By bringing these complementary assessments together, the unified ICARDA-IWMI technical package will give government (Ministry of Agriculture, Ministry of Energy (and Water), donors/development banks (Islamic Development Bank or International Fund for Agriculture Development) and the private sector a credible basis for directing investment toward priority locations and interventions in Syria's agricultural recovery.

NexGenAg-Syria bridges the gap from rebuilding what was lost to designing what comes next — a more diversified, more resilient and better-nourished agricultural sector that is fit for the climate, the market and the aspirations of the Syrian people.

Geographic Focus

The project runs at national, zonal and sectoral levels:

- **National scale**: water accounting, potential of new rainwater harvesting structures, land-degradation hotspots and water-reuse opportunity assessment across Syria (Figure 1).
- **Northwestern rainfed zone**: wheat, barley, medicinal crops, legumes and conservation agriculture options.
- **Selected irrigation and reuse systems**: water productivity assessment and wastewater treatment plant analysis to guide safe reuse.

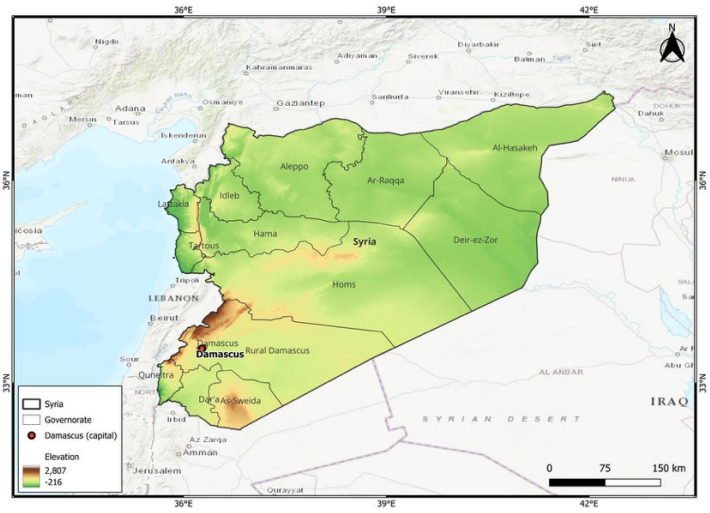


Figure 1. Map of Syria, NexGenAg focus country. *Source*: IWMI (2026)

Partners and Their Roles

NexGenAg-Syria combines complementary capabilities across agricultural science, water management, data and digital decision support. Syria's Ministry of Agriculture is a core partner in the initiative, helping to set priorities, share national data and validate results. CGIAR provides a global research platform and links to international science and investment networks. ICARDA contributes expertise in dryland agriculture, crop systems, agro-ecological analysis and long-standing country engagement. IWMI contributes water-resources assessment, remote sensing, geospatial analysis and digital decision-support capabilities. (Figure 2).

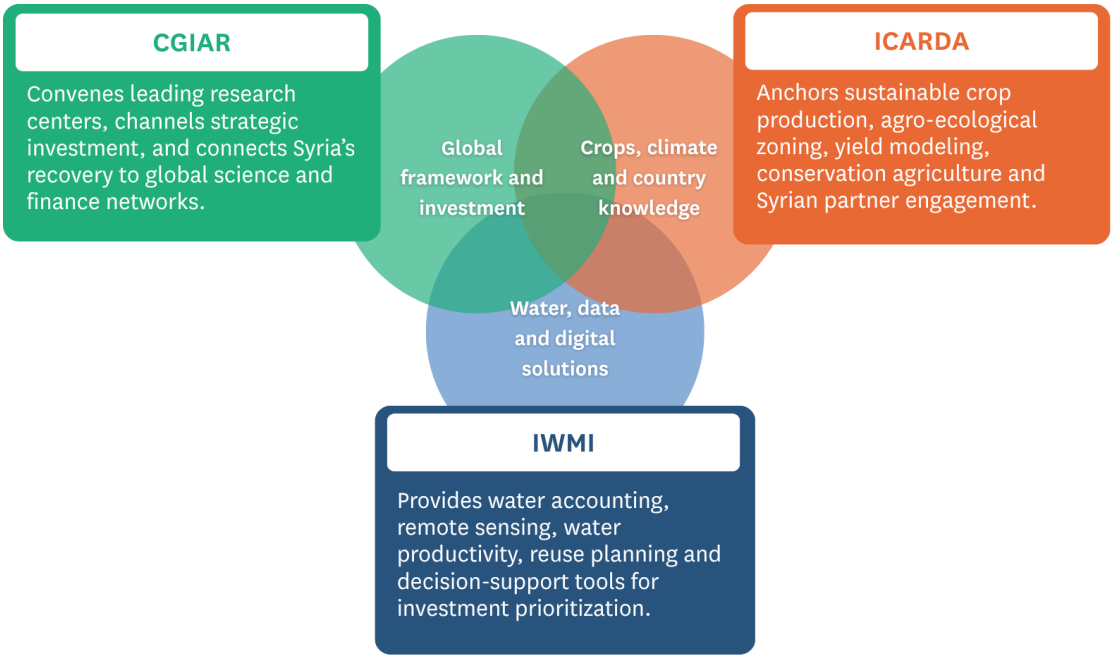


Figure 2. NexGenAg-Syria partners and roles. *Source*: Authors (2026)

NexGenAg-Syria is anchored in national policy and investment planning. Its products are designed around the water- and land-management goals of Syria's Agricultural Strategy 2026–2030, which calls for drought-resistant varieties, improved water-use efficiency and climate-smart practices, and they give the Ministry of Agriculture and its development partners a shared, spatially explicit evidence base for targeting recovery investment. The evidence is intended to inform the design and targeting of investment programs by development partners, including development banks such as Islamic Development Bank (IsDB) and International Fund for Agricultural Development (IFAD), in areas such as irrigation, water storage, wastewater reuse and land restoration, where poorly targeted investment is costly and difficult to reverse. *"Through robust and capable partnerships, NexGenAg-Syria is turning fragmented water, land and crop data into practical intelligence that can guide recovery investments, strengthen food security and build a more climate-resilient agricultural future for Syria."*

Project Activities

The work is organized into four interlocking activity areas. IWMI and ICARDA co-lead across pillars, combining water, land, crop and engagement expertise (Figure 3).

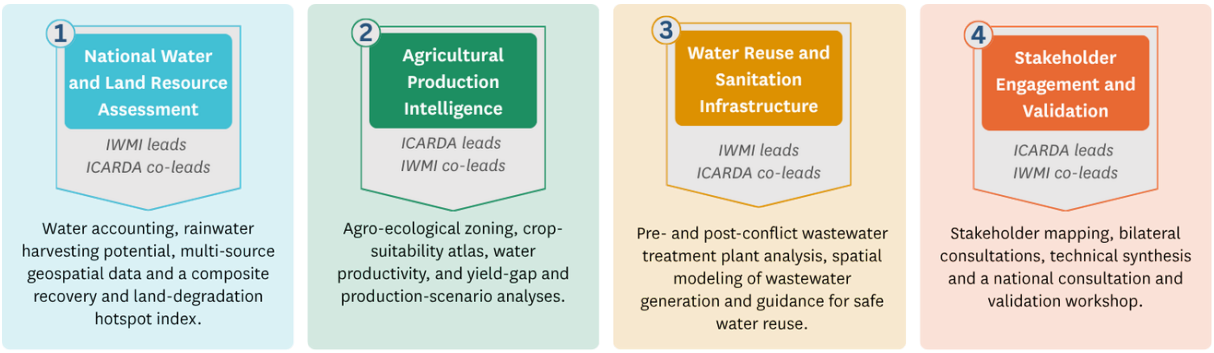


Figure 3. NexGenAg-Syria activity areas. Source: Authors (2026)

NexGenAg-Syria generates the evidence base for a digitally enabled, climate-resilient Syrian agricultural sector that enhances food security, raises productivity, and helps sustainably manage water and land resources by 2030 — in direct alignment with the targets in Syria's Agricultural Strategy 2026–2030.

Facilitating Better Decisions

All deliverables are co-designed as decision-support products — dashboards, atlases, geospatial apps, scenario and guidance documents that the Ministry of Agriculture and national partners can directly use to prioritize investment, plan interventions, and monitor progress against the targets of Syria's Agricultural Strategy 2026–2030 (Figure 4).



Figure 4. NexGenAg-Syria deliverables to support a digitally enabled, climate-resilient agriculture sector for Syria. *Source*: Authors (2026)

Conclusion

NexGenAg-Syria offers a timely opportunity to support Syria's agricultural recovery through practical, evidence-based solutions designed for long-term resilience. By combining global scientific expertise, strong national partnerships, and advanced water, land and crop intelligence, the initiative will help translate fragmented data into actionable priorities for investment and implementation.

Working with the Ministries of Agriculture, Energy and Emergency and Disaster Management of Syria, the General Commission for Scientific Agricultural Research (GCSAR) and farmer unions as co-developers, from defining priority questions to jointly validating results, the project will equip national agencies and development partners to better target interventions that strengthen food security, improve water productivity, restore degraded land, and expand climate-resilient livelihood opportunities. With sustained partnership and investment, NexGenAg-Syria can provide a scalable platform for evidence-based, nationally anchored decision-making that address immediate recovery needs while laying the foundations for a more productive, resilient and sustainable agricultural future. Building on the 2026 evidence base, the next phase will move from a historical picture to forward-looking, climate-adjusted decision support, including climate-scenario projections of water availability, rainwater-harvesting storage targets, and an assessment of multi-sectoral water demand to guide wastewater reuse.



CGIAR is a global research partnership for a food-secure future. CGIAR science is dedicated to transforming food, land, and water systems in a climate crisis. Its research is carried out by 13 CGIAR Centers/Alliances in close collaboration with hundreds of partners, including national and regional research institutes, civil society organizations, academia, development organizations and the private sector. www.cgiar.org

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IWMI International Water Management Institute

ICARDA Science for resilient livelihoods in dry areas