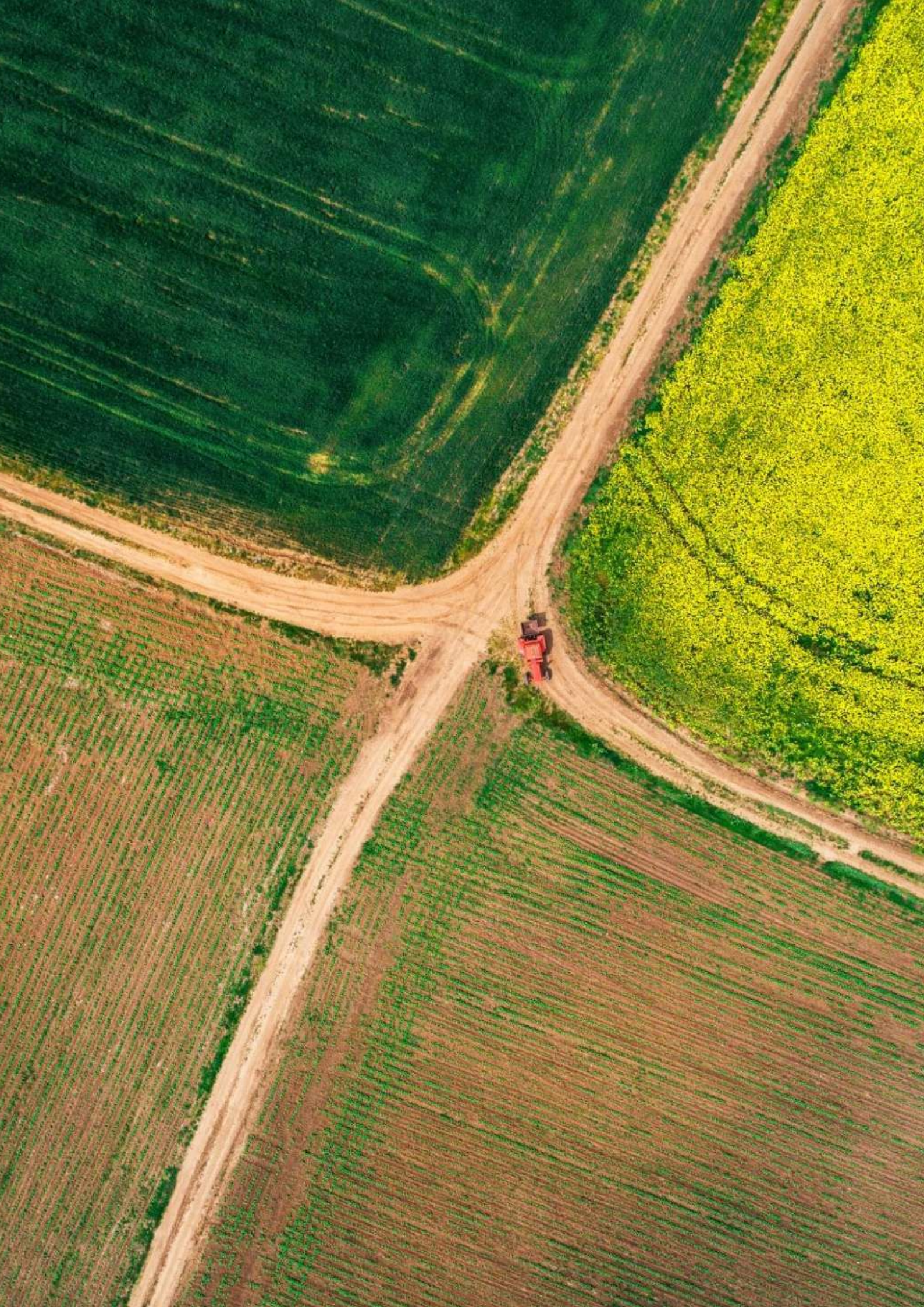
Doktar's Impact Report 2024-2025

Transformation at a Scale

Doktar



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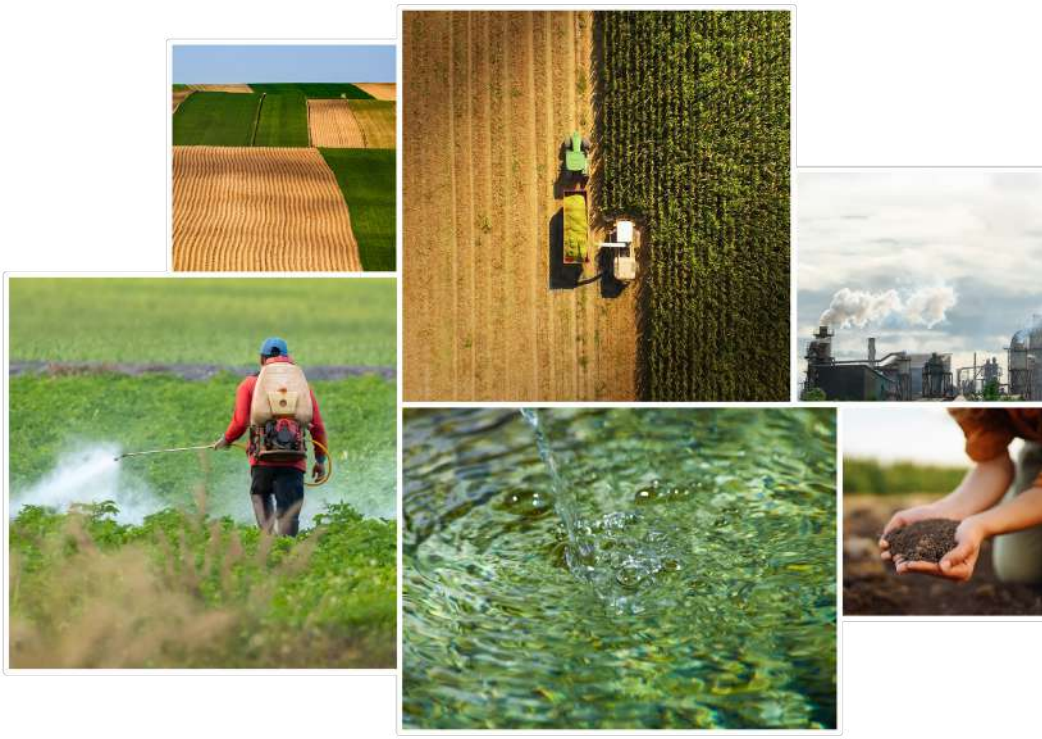
2024 & 2025 by the Numbers

We conducted a total of 12 programs in 2024, with 24 programs still in progress for 2025. A total of 140,000+ hectares have been successfully onboarded, with environmental KPIs set to be finalized following the next harvest season. Here are some insights and estimations:

AREA	Climate & sustainability activities implemented across **140,051 hectares**
WATER	Total replenishment amount will be **8,630 million liters**
BIODIVERSITY	Thanks to IPM, farmers can use **19% less pesticide**
SOIL	By using 4R Nutrient Mng, a farmer can increase **N-Use efficiency by 26%**
CARBON REDUCTION	Reduced carbon emissions will be **78,905 MtCO2e**
CARBON REMOVAL	Total sequestered carbon amount will be **5,735 MtCO2e**
LIVELIHOOD	Increasing yield and decreasing inputs lead to **24% profit increase** for farmers



Introduction: Why This Matters

Global greenhouse gas emissions reached 57.4 gigatonnes of CO_2e in 2022, a record high (UNEP, 2023). Meanwhile, climate-related disasters have quadrupled since 1970, causing escalating economic and human losses worldwide (WMO, 2021).

Agriculture is at the center of this challenge. Land use in the sector accounts for 23% of global emissions while also facing growing risks that threaten future food security (IPCC, 2019).

In response, governments and markets are tightening expectations through new regulations, disclosure frameworks, and accountability measures, requiring companies and investors to demonstrate measurable progress toward climate goals.

At Doktar, we believe that green transformation must go hand in hand with digitalization. We help multinational companies translate sustainability commitments into verifiable climate impact by embedding AI- and IoT-powered tools into agricultural value chains. This report presents the results of our 2024 and 2025 projects, highlighting measurable contributions to emission reduction, ecosystem resilience, and farmer livelihoods.

Who is Doktar?

Doktar is a technology company transforming agriculture through data, AI, and digital tools. Founded in 2017 and headquartered in the Netherlands, the company provides an end-to-end platform that covers all core farming needs, from real-time monitoring and decision support to measurable sustainability outcomes. Its integrated ecosystem of IoT devices, smart software, and AI-powered insights enables full-farm digitization, actionable intelligence, and traceable climate impact.

Today, Doktar operates across more than 10 countries, supporting 250,000 hectares of regenerative farmland and partnering with six of the world's ten largest food and beverage companies. By combining farmer engagement, measurable impact reporting, and scalable digital solutions, we help agribusinesses and global food producers achieve verifiable climate resilience and progress toward their 2030 sustainability commitments.

TECHNOLOGY DEPLOYED

TEAM

A team of 110 multi-disciplinary professionals, each bringing unique expertise to drive our innovations:

- Mathematical Agronomy
- Full Stack Electronics
- GIS Experts
- Software Developers
- Data Science and ML Engineers
- Social Sciences
- Sustainability Experts
- Farmer Engagement Specialists

OFFICES

- Wageningen University Campus, NL
- Istanbul Technical University, TR
- Ege University, Izmir, TR

PRODUCTION FACILITY

- Istanbul, TR

SELECTED CUSTOMERS PORTFOLIO

Cargill, Coca-Cola, Nestlé, pladis, DANONE, Microsoft, Unilever, tat, PEPSICO, FERRERO, DIAGEO, Givaudan, BAYER, CORTEVA agriscience, syngenta, BASF

Our Approach

“Turning sustainability commitments into verifiable and scalable outcomes”

Doktar’s unique digital approach helps partners align with their net-zero climate goals by optimizing resource use, safeguarding ecosystems, and strengthening farmer resilience.

Through IoT sensors, satellite imagery, and onsite and agronomic support, Doktar captures precise, real-time data on soil health, water use, crop vitality, and biodiversity indicators, ensuring that every insight supports resource-efficient and environmentally responsible farming.

We create ’digital twins’ of fields using advanced data, enabling precise monitoring, management, and analysis of operational needs.

Doktar collects, analyses and provides informed suggestions based on real-world data, leveraging AI models to cater to each field’s unique properties. This enables early problem detection and timely intervention, aligning farm operations with climate resilience and sustainable production goals.

Continuous monitoring via satellites and sensors tracks yield performance and environmental metrics, ensuring measurable sustainability outcomes.

Our Three-Pillar Impact Framework

Doktar's sustainability programs address five key regenerative impact areas—water, soil, biodiversity, carbon, and livelihoods—through a range of targeted interventions. These interventions can be implemented individually or in combination, depending on the specific requirements and objectives of each program. For example, within a water stewardship program, irrigation efficiency measures can be integrated with cover cropping practices to maximize impact.

Sustainability programs achieve those activities with its *"RegenAg"* framework, which is composed of 3 main pillars:

Regenerative Approach

Water Stewardship

Farmer Extension Services

1. Regenerative Approach

At a Glance:

Integrating precision ag-tech to optimize farming decisions, including 4R nutrient management, irrigation efficiency, and integrated pest management, ensuring immediate impact on soil, water, carbon, biodiversity, and farmer livelihoods.

Building long-term soil organic matter through regenerative practices, such as cover cropping, conservation tillage, crop rotation, intercropping, hedgerow plantings, and biological inputs, enhancing resilience and ecosystem health.

Developing tailored long-term transition roadmaps for each farm, informed by field-level data and continuous monitoring, to guide regenerative adoption at scale while safeguarding productivity.

Measuring and verifying outcomes with international frameworks, including the SAI Regenerative Agriculture framework and Cool Farm Tool, ensuring transparent, data-backed claims for sustainability reporting.

At Doktar, regenerative agriculture (or “RegenAg”) is not defined as a single practice, but as a systemic pathway for transition toward resilient, climate-aligned, and farmer-centric food production. Our approach combines technology-driven optimization with long-term soil and ecosystem restoration, ensuring that farmers can adopt regenerative methods at scale without compromising productivity.

Our comprehensive framework is built on two activity groups: Precision Ag-Tech Integration and the Soil Organic Matter (SOM) Improvement Roadmap. Together, these complementary categories enable measurable progress in water conservation, soil health, biodiversity, carbon reduction, and farmer livelihoods.

1.1. Precision Ag-Tech Integration

The first stage of regenerative transformation focuses on integrating precision ag-tech tools into daily farm management. These practices, such as **4R nutrient management, irrigation efficiency, and integrated pest management**, require accurate data measurement and informed decision-making. By guiding farmers away from traditional habit-based cultivation and toward data-driven actions, they deliver measurable impact across water, soil, biodiversity, carbon, and farmer livelihoods.

Because these solutions optimize existing practices rather than fundamentally altering cultivation patterns, they are scalable, easy to adopt, and low risk in terms of yield performance. This makes them an effective entry point for farmers hesitant to adopt unfamiliar methods.

Example: Through 4R nutrient management, powered by digital soil analysis and tailored fertilization advice, nitrogen fertilizer use is significantly reduced. This leads to measurable cost savings for the farmer and a direct reduction in greenhouse gas emissions, as nitrogen fertilizers are one of the major contributors to agricultural carbon footprints.

Doktar's precision ag-tech portfolio includes:

- **4R nutrient management:** Digital soil analysis and fertilization recommendations
- **Irrigation efficiency:** Soil moisture sensors, flowmeters, and satellite-based irrigation planning
- **Integrated pest management:** Digital pest trap stations and predictive analytics
- **Biodiversity and habitat management:** Cultivation protocols and AI-powered large language models for advisory

1.2. SOM Improvement Roadmap

The second stage focuses on increasing Soil Organic Matter (SOM), a fundamental requirement for long-term soil regeneration, water retention, biodiversity support, and carbon sequestration. Once farmers are equipped with precision tools, training, and agronomic guidance, they are prepared to adopt higher-level regenerative practices that deliver cumulative benefits over time.

Key practices include:

- Cover crops, including nutrient-fixing species
- Gradual shift to conservation tillage
- Application of direct or composted livestock manure
- Residue management
- Crop rotation and intercropping
- Hedgerow plantings for habitat support
- Integration of biological inputs

By leveraging field-level data and historical monitoring, Doktar can establish baselines and identify the most suitable regenerative practices for each farm. Each farmer receives a **long-term transition roadmap** (typically spanning at least 10 years) outlining recommended practices such as crop rotation cycles, hedgerow establishment, or biofertilizer use.

1.3. Measurement and Verification

Progress is continuously monitored through Doktar's digital solutions, ensuring that regenerative outcomes are both scalable and verifiable. Impact is assessed through globally recognized tools, including the Cool Farm Tool, which measures carbon emission reductions and captures the effect of interventions across fertilizer use, energy consumption, irrigation efficiency, and more.

To ensure accuracy, comparisons are made against baselines established over three consecutive years, minimizing seasonal variability and benchmarking against conventional practices. This enables transparent reporting and reliable claims on the environmental and social benefits achieved.

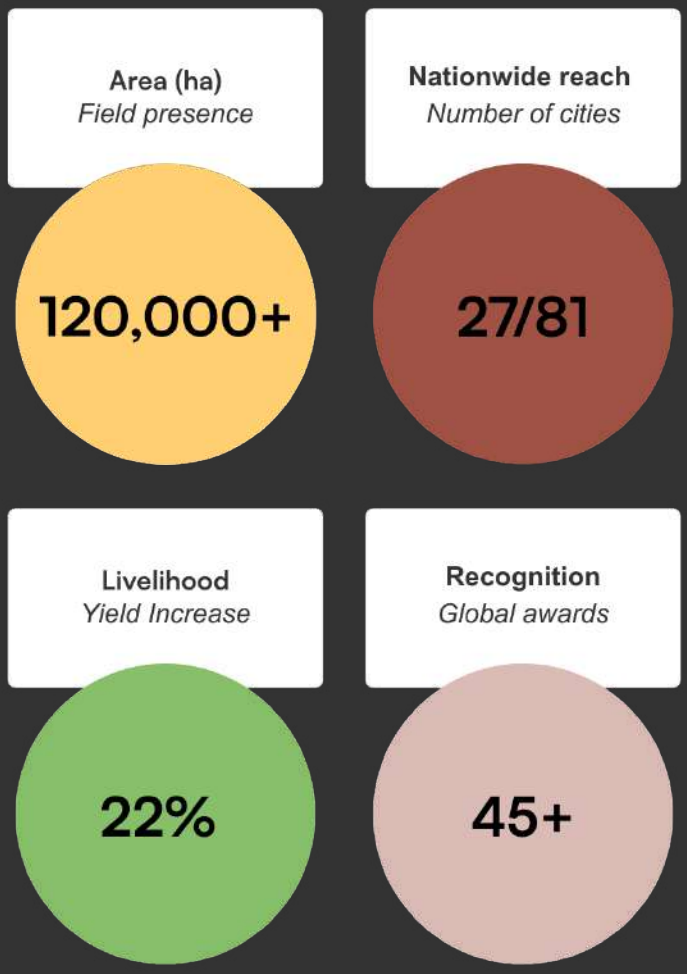
Client Impact Spotlight

We have been running a large-scale sustainability program since 2019. This flagship program has been transforming Turkish agriculture since its initiation, driving large-scale adoption of data-driven and regenerative practices. Designed to create measurable environmental and economic impact, it combines cutting-edge technology with international sustainability standards.

As part of this program, farmers implement a multi-practice regenerative model that integrates cover cropping, no-tillage farming, hedgerow planting, biofertilizer usage, integrated pest management, 4R nutrient management, and irrigation efficiency improvements.

These practices collectively lead to improved soil health, better nutrient use efficiency, and increased organic matter levels; water savings and reduced water footprint; enhanced biodiversity through habitat protection and restoration; and stronger farmer livelihoods and resilience. It demonstrates a scalable, data-driven regenerative agriculture model that delivers measurable environmental benefits and tangible economic value.

- Launched in 2019, the program operates **in 27 out of 81 provinces** in Turkey, creating a nationwide footprint.
- The program now covers **over 120,000 hectares,** including 30,000 hectares under multi- regenerative agriculture practices.
- Participating farmers transitioned from conventional to data-driven cultivation systems, resulting in **up to 22%** yield increase.
- Impact is measured and reported under international sustainability standards, including SAI/FSA frameworks and the Cool Farm Tool.
- Its SROI is measured annually by EY, with the latest result showing **3.72 TL of social value for every 1 TL invested.**
- The program has gained global recognition, receiving **45+ awards**, including the 2024 Edison Awards Gold Prize in the "Social & Cultural Impact — Environmental Solutions" category.



2. Water Stewardship Framework

At a Glance:

Reducing water consumption through informed irrigation, using soil sensors, flowmeters, and satellite monitoring to replace habit-based practices with data-driven decisions, ensuring savings without yield loss.

Minimizing water loss through regenerative practices, building soil organic matter with cover cropping, conservation tillage, and residue management to increase water-holding capacity and reduce runoff.

Capturing rainfall through rainwater harvesting systems, designing site-specific reservoirs and distribution networks to create renewable water sources and reduce reliance on groundwater.

Measuring and verifying impact with VWBA methodology, establishing baselines, tracking interventions with Doktar's digital tools, and enabling transparent, third-party verification of results.

Water is one of the most pressing resources under climate stress, and agriculture is both a driver of its overuse and a sector highly vulnerable to scarcity. At Doktar, we address this challenge through a dedicated Water Stewardship Framework that combines precision ag-tech adoption, regenerative practices, and rainwater harvesting. Together, these approaches reduce consumption, minimize loss, and enhance replenishment, creating measurable value for ecosystems and farming communities.

2.1. Water Consumption Reduction via Informed Irrigation:

Traditional irrigation practices often lead to significant inefficiencies, with farmers applying more water than crops require or soils can absorb. Even under “efficient” systems, over-irrigation remains common.

Through soil sensors, flowmeters, and satellite monitoring, Doktar enables farmers to shift from habit-based watering to **data-informed irrigation decisions**. This not only reduces water withdrawals but also lowers energy use and input costs, while safeguarding yields.

2.2. Water Loss Reduction via Regenerative Agriculture:

Beyond optimizing irrigation practices, soils must be able to retain and utilize water effectively. Doktar strengthens this capacity by integrating regenerative agriculture practices that build **soil organic matter (SOM).** Cover cropping, conservation tillage, and residue management all enhance infiltration and storage, reducing runoff and evaporation.

While SOM improvements require time (typically three or more years for significant results) this component complements irrigation efficiency measures and delivers lasting resilience for both farms and ecosystems.

2.3. Water Capture via Rainwater Harvest:

In regions where rainfall is significant but underutilized, Doktar supports the design and implementation of rainwater harvesting systems.

By analysing rainfall patterns, soil properties, and farm topography, we identify optimal locations for reservoirs and distribution systems. Captured rainwater is then integrated into irrigation practices, reducing reliance on groundwater withdrawals and providing a renewable water source for long-term sustainability.

2.4. Measurement and Verification:

All three approaches are guided by the Volumetric Water Benefit Accounting (VWBA) methodology proposed by the World Resources Institute. Using Doktar's digital monitoring tools, we establish clear baselines, track interventions, and quantify water benefits at field level. Results are independently verifiable, ensuring transparency and credibility in sustainability reporting.

Client Impact Spotlight

Since 2022, we have been running a long-term partnership project designed to deliver measurable water replenishment benefits. This project was situated in basins where our partner's operations are located and classified as high priority through comprehensive water vulnerability assessments.

The initiative began in Bursa and quickly scaled up to include Çorlu and Isparta, covering diverse cropping systems such as orchards, sugar beet fields, and rose plantations. Building on its success in Turkey, the project has also expanded to other critical basins in Jordan, Iraq, Saudi Arabia, and Morocco, strengthening regional water resilience.

- **2,545 billion litres of water replenished annually** across a total of 2,400 hectares through a mix of water management practices.
- Initially launched in one basin (Bursa) and **scaled to three Turkish and four international basins**, reflecting its replicability and scalability.
- Implemented three complementary approaches: Water consumption reduction, water loss reduction, and rainwater harvesting. Water consumption reduction emerged as the most impactful approach due to its strong return on investment.
- Supported farmers with digital soil analyses and tailor-made fertilisation plans, enhancing soil health through 4R nutrient management principles, as evidenced by improvements in nutrient use efficiency (NUE).
- Realised **up to 32% carbon emission reductions per farm**; achieved through input optimisation including fertiliser use, energy efficiency, and precision agriculture practices.
- Delivered **an average 23% profitability increase for farmers** compared to conventional practices, based on year-over-year calculations and benchmarking.

This demonstrates how a data-driven, multi-stakeholder water replenishment strategy can create tangible environmental impact and economic value, while ensuring scalability across regions facing acute water stress.

3. Farmer Extension Services

At a Glance:

Engaging farmers through onsite visits and direct support, providing tailored agronomic guidance and troubleshooting at the field level.

Strengthening communication and training systems, including digital channels, structured cultivation protocols, and group workshops.

Building awareness of the "why" behind change, linking new practices to farmer benefits such as profitability, soil health, and long-term resilience.

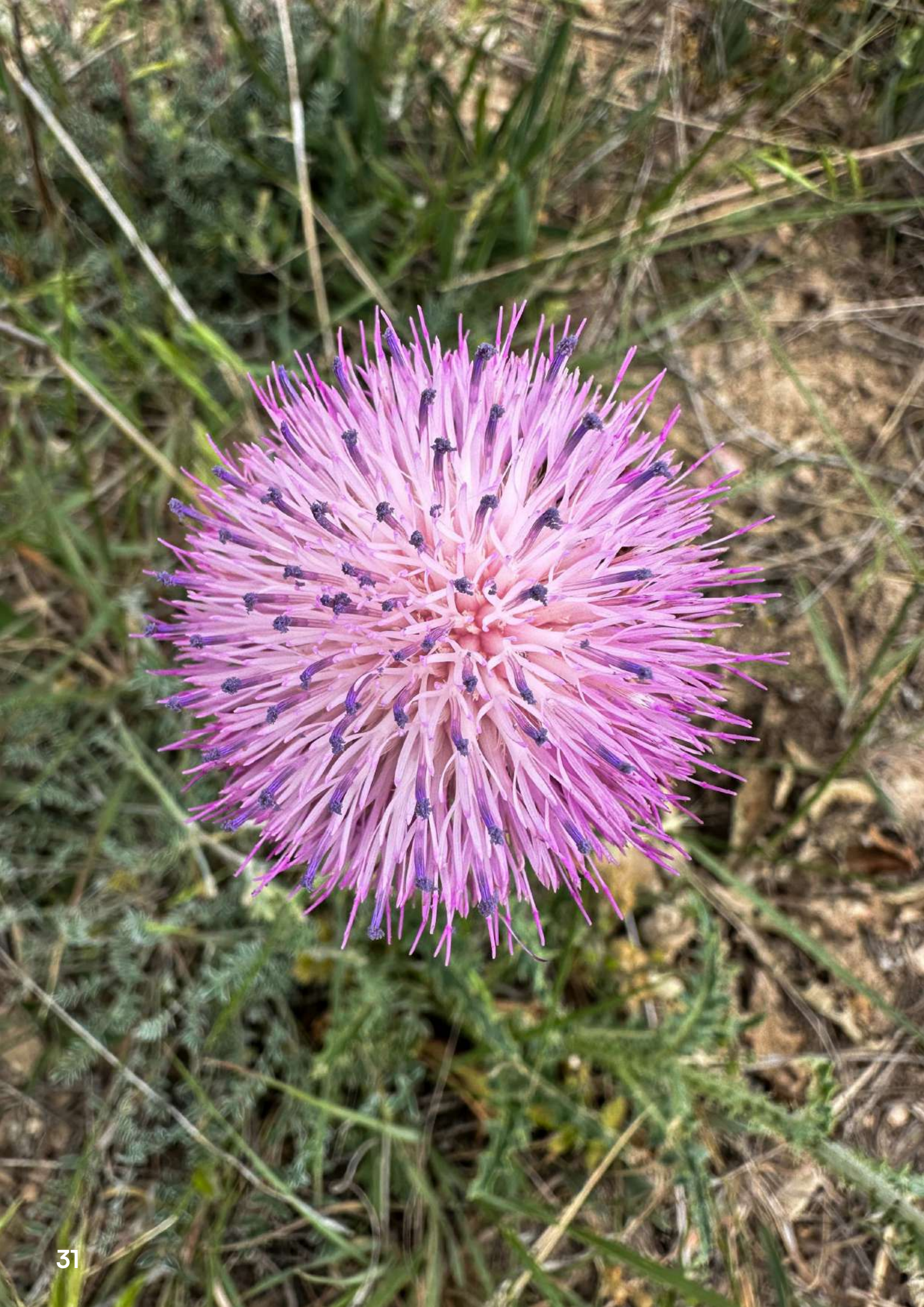
Ensuring standardization and scalability across projects, with extension services delivered by trained experts following a unified engagement framework.

Technology and data are powerful enablers of agricultural transformation, but they are most likely not enough on their own. For farmers to truly change practices, they need not only the tools, but also the knowledge, trust, and confidence to adopt them. That is why Doktar complements its regenerative and water stewardship frameworks with a **robust program of Farmer Extension Services**, designed to bridge the gap between digital recommendations and behavioral adoption.

Our extension services combine field-level engagement with digital support, ensuring that farmers understand not only what to do, but also why it matters for profitability, soil health, and long-term resilience. By embedding capacity building into every project, we create a structured, standardized, and scalable model for farmer engagement.

Core extension activities include:

- Onsite visits by agronomists and field experts to provide tailored guidance.
- Communication channels that ensure farmers receive timely updates and answers to questions.



- Cultivation protocols that standardize regenerative and resource-efficient practices.
- Trainings and group meetings that strengthen collective knowledge and peer-to-peer learning.
- Digital monitoring platforms that give farmers continuous visibility into their own progress.

FARMER ONBOARDING

TECHNOLOGY DEPLOYMENT

AGRONOMIC SUPPORT

PROGRAM MANAGEMENT

These are conducted by Doktar's farmer engagement experts and agronomists under a unified framework, ensuring consistency across different projects and geographies. The result is a more resilient farming community that is equipped not just with new technologies, but also with the skills and confidence to sustain transformation over the long term.

Since it was first founded, Doktar's extension services supported thousands of farmers across diverse geographies, resulting in:

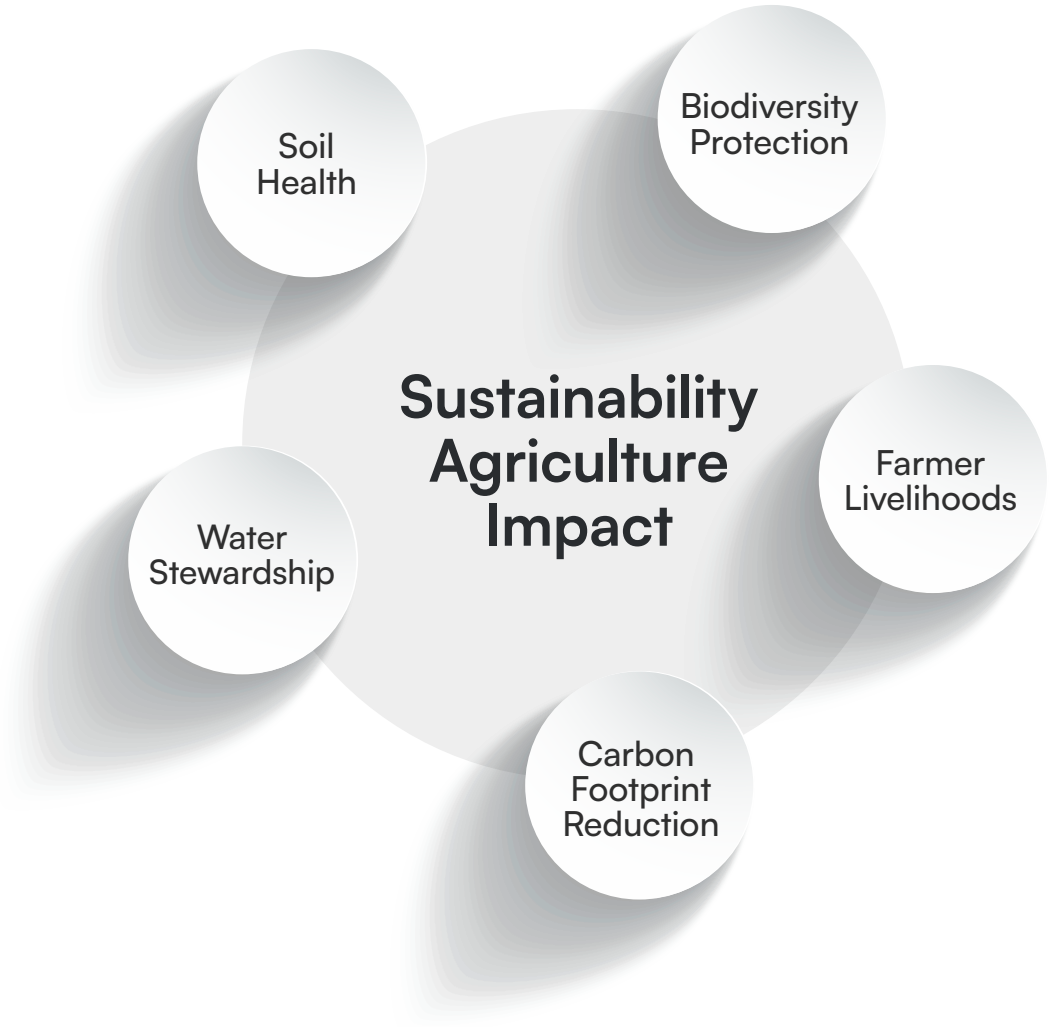
- Improved soil and water management, reducing resource stress while safeguarding yields.
- Higher adoption rates of regenerative practices, including crop rotation, nutrient management, and integrated pest control.
- Strengthened farmer resilience, through ongoing training and access to a knowledge-sharing network that continues beyond the life of individual projects.

The MRV of Sustainability Programs

Doktar offers a **Monitoring, Reporting, and Verification (MRV) platform** that combines advanced technologies with a farmer engagement framework, helping you drive measurable environmental and social outcomes.

Designed for corporate ESG programs and multi-stakeholder collaborations, as well as organizations implementing or overseeing sustainability programs, our comprehensive sustainability module can achieve scope completion, KPI follow-up, real time activity tracking and extensive impact reporting that aligns with international standards. By turning field-level data into verifiable reports, we help you demonstrate compliance with standards, support certification processes, and strengthen stakeholder trust.

Combining technology, farmer engagement, and project management tools, we create measurable impact across water, soil, biodiversity, carbon, and farmer livelihoods to provide a comprehensive view of the sustainability journey across the entire supply chain.



Conclusion: Looking Ahead

The challenges of climate change and sustainability demand urgency, but they also present an opportunity to reshape how we use resources, support communities, and protect ecosystems. As this report demonstrates, measurable and scalable impact is possible when ambition is paired with data, technology, and collaboration.

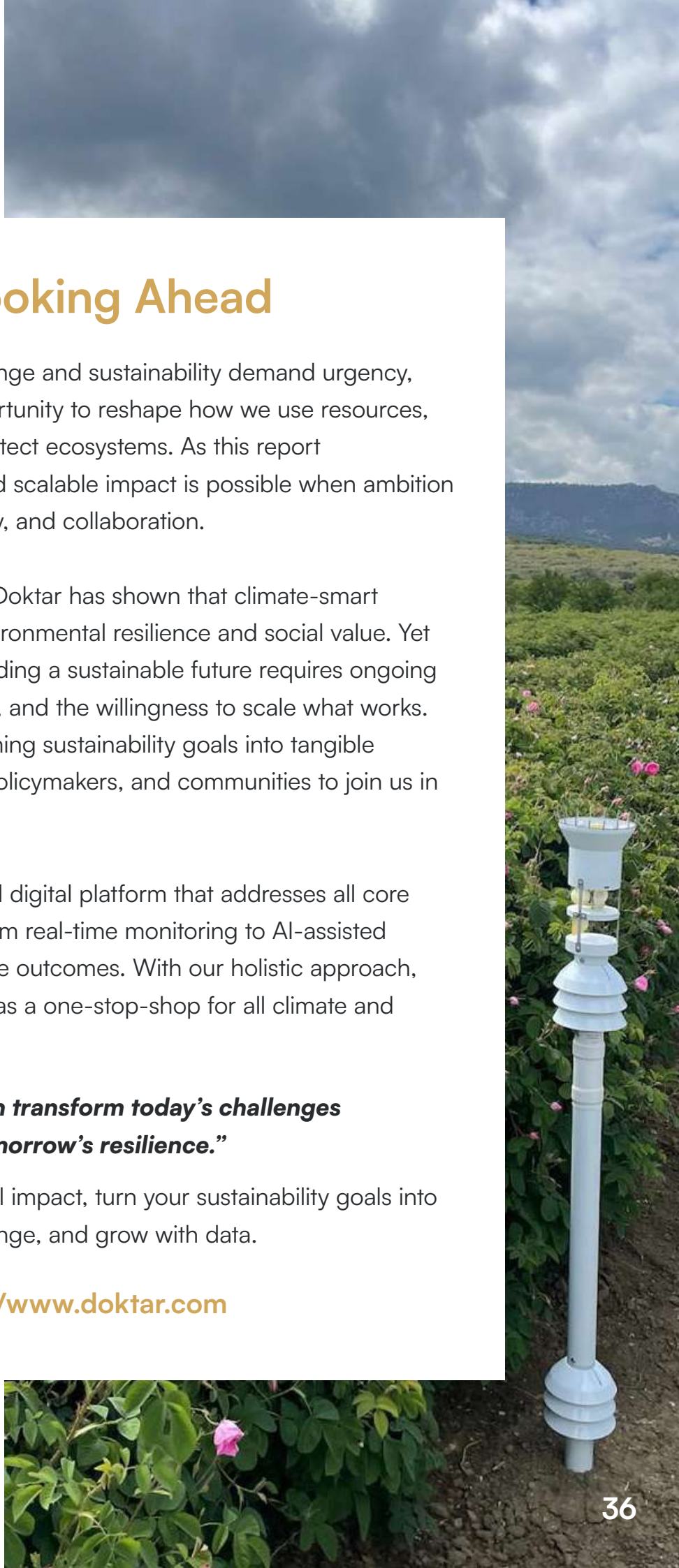
Through our 2024 initiatives, Doktar has shown that climate-smart solutions can deliver both environmental resilience and social value. Yet this is only the beginning. Building a sustainable future requires ongoing commitment, collective action, and the willingness to scale what works. We are dedicated to transforming sustainability goals into tangible outcomes, inviting partners, policymakers, and communities to join us in creating lasting impact.

Doktar remains an end-to-end digital platform that addresses all core sustainable farming needs, from real-time monitoring to AI-assisted decision support with verifiable outcomes. With our holistic approach, we aim to establish ourselves as a one-stop-shop for all climate and sustainability initiatives.

"Together, we can transform today's challenges into tomorrow's resilience."

Partner with us to create real impact, turn your sustainability goals into lasting change, and grow with data.

https://www.doktar.com



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