



MENA2050

A WHITE PAPER BY THE
MENA2050 POLICY AND ADVOCACY CENTER
FOOD SYSTEMS COMMITTEE

TRANSFORMING AGRIFOOD SYSTEMS

IN THE MENA REGION

CHALLENGES, STRATEGIES
AND PATHWAYS TO
SUSTAINABILITY



June, 2026



MESSAGE FROM THE CEO



MENA2050 was established with a long-term vision: to support the emergence of a more resilient, connected, and prosperous Middle East and North Africa by 2050. Despite the complexity of the region, we believe there is a real opportunity to shape a shared future grounded in cooperation, innovation, and sustainable development. Within this vision, agrifood systems stand out as one of the most critical and unifying domains for action, sitting at the intersection of food, water, and energy, and shaping economic resilience, public health, and social stability across the region.

This white paper comes at a critical moment. Agrifood systems across the region are under increasing strain, driven by climate change, resource scarcity, and structural dependencies. The region is warming at nearly twice the global average, while remaining heavily reliant on food imports and increasingly exposed to external shocks. Recent developments have only reinforced this reality. Escalating conflicts across the Middle East have shown how quickly supply chains, markets, and access to food can be disrupted. In this context, food security is not a sectoral issue, it is a prerequisite for resilience, economic continuity, and regional stability. Yet the region is not defined by its vulnerabilities alone. It holds significant strengths: a strategic geographic position, a rich agricultural and culinary heritage, and a rapidly evolving innovation ecosystem. The opportunity is clear, but realizing it will require a more coordinated and long-term approach than we have seen to date.

This document is intended as both an analytical foundation and a call for alignment. Developed by the Food Systems Committee within MENA2050's Policy and Advocacy Centre, it reflects a deliberate effort to examine agrifood systems through a regional lens, an approach that remains rare, yet essential given the shared challenges and interdependencies across the region. By stepping beyond national perspectives, it offers a more grounded basis for identifying practical pathways forward and informing more relevant policy thinking. While the analysis reflects data up to 2025, the direction is clear: moving beyond fragmented responses toward more integrated and resilient food systems. At MENA2050, we see this as part of a broader shift toward more coordinated regional thinking, one in which agrifood are recognized not only as essential infrastructure, but as a foundation for collaboration, trust-building, and shared prosperity



ELI BAR-ON

CEO - HEAD OF THE EXECUTIVE COMMITTEE
MENA2050

Finally, I would like to extend my sincere appreciation to the Food Systems Committee for their dedication and contribution to this initiative under the leadership of Dr. Lee Recht. This work reflects both strategic clarity and deep commitment, and I am grateful for the collective effort that made it possible





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EXECUTIVE SUMMARY

Agrifood systems across the Middle East and North Africa (MENA) are approaching a tipping point, undergoing acute stress, driven by structural vulnerabilities, environmental constraints, demographic pressures, and geopolitical volatility. The region encompasses 20 countries and over 500 million people, yet it is already warming at nearly twice the global average and is the most water-scarce region in the world. These structural conditions, combined with declining precipitation, land degradation, rapid population growth, and persistent political instability, are placing unprecedented strain on food production, nutrition outcomes, trade flows, and livelihoods. As these pressures intersect and reinforce one another, transforming agrifood systems in MENA is no longer a sectoral challenge, but a systemic and regional imperative.



20
countries



500
million people



x2 global average
climate change rate



most water-scarce
region in the world



Yet despite the scale and urgency of this challenge, the knowledge base needed to inform such transformation remains fragmented. Information on MENA agrifood systems remains fragmented across sectors, countries, and disciplines, with food often receiving less attention within the Food–Energy–Water (FEW) Nexus.



This white paper responds to that gap with a twofold objective: First, our paper provides a consolidated assessment of the state of agrifood systems across the region, bringing together environmental, socio-economic, nutritional, and geopolitical dimensions. Second, building on this assessment, we propose strategic and actionable recommendations to support a coordinated regional transformation.



Our analysis highlights a set of systemic challenges that extend beyond individual sectors. Extreme water scarcity and accelerating climate change threaten to reduce yields of major crops by up to 60% by mid-century, while unsustainable resource use intensifies pressures on energy systems and ecosystems. At the same time, high dependence on food imports, reaching up to 70–90% for key staples in several countries, exposes the region to global market volatility and trade disruptions. Food insecurity and malnutrition persist alongside rising obesity and diet-related non-communicable diseases, revealing deep structural inequalities in access to safe, nutritious food. Trade constraints, weak regional integration, and governance gaps further undermine resilience, while data fragmentation limits evidence-based policymaking and cross-border cooperation.



Yet our paper also underscores that MENA is not only defined by vulnerability. The region possesses significant and often underutilized strengths that can serve as levers for transformation. Its rich cultural and culinary heritage offers opportunities for sustainable diets, agri-tourism, and value-added production rooted in local ecosystems and knowledge. MENA's strategic geographic position, anchored by some of the world's leading ports, places it at the crossroads of Europe, Africa, and Asia, making it critical to global food trade and logistics. A young population, with nearly 60% under the age of 30, represents a major demographic asset for innovation, agri-entrepreneurship, and the adoption of digital and climate-smart solutions.



Framed through the FEW Nexus, our paper identifies key findings and pathways for action across interconnected domains, including water, climate, food security and nutrition, trade, and governance. It emphasizes the need to rebalance the nexus by elevating food systems to strategic importance and by strengthening the links between domestic production, regional trade, and consumption patterns.



Building on this novel and comprehensive assessment, which brings these domains together within a single framework, our paper also presents a strategic transformation agenda. This agenda focuses on advancing sustainable and regenerative production systems; leveraging technology, data, and innovation as enablers; strengthening governance, policy coherence, and regional coordination; mobilizing inclusive and outcome-oriented financial mechanisms; and embedding social and cultural dimensions at the heart of agrifood systems change. Together, these strategic domains provide coherent pathways for transforming agrifood systems in MENA into levers of resilience, economic opportunity, and stability.



Resilient food systems in the world's most climate-vulnerable region are not simply a development objective, they are foundational to long-term stability, social cohesion, and sustainable prosperity. By consolidating knowledge and translating them to actionable recommendations, this white paper aims to inform decision-making and advance coordinated action toward resilient and equitable agrifood systems across MENA.

MENA AGRIFOOD SYSTEMS AT A TIPPING POINT

SYSTEMIC RISKS		TRANSFORMATION PATHWAYS
Water scarcity, ~60% under severe water stress.		Integrated water management and allocation.
Climate stress, ~2x faster warming in MENA.		Adaptive and climate-resilient agricultural systems.
Import dependency, ~70-90% of the food available is imported.		Coordinated regional trade and supply systems.
Food insecurity, ~66M people impacted.		Improved food access and system resilience.
Fragmented and inefficient capital allocation.		Agrifood as strategic infrastructure attracting long-term blended capital.
Fragmented data and governance.		Integrated data systems and coordinated governance.

1










Introduction

Agrifood systems encompass all activities and elements involved in producing, processing, distributing, and consuming food. Responsible and sustainable management of agrifood systems is fundamental to human survival, economic development, and environmental sustainability.



In the MENA region, agricultural systems play a particularly crucial role, intertwined with issues of hunger and malnutrition, food and water security, energy use, climate resilience, and socio-economic stability. The MENA region presents a unique context for agrifood systems analysis and transformation. Stretching from Morocco in the west to Iran in the east, MENA encompasses a diverse range of climates, from fertile river valleys to vast deserts. This geographic diversity is matched by the region's rich cultural tapestry, with ancient agricultural traditions coexisting alongside modern, technology-driven farming practices.

TABLE 1: MENA AT A GLANCE

CATEGORY	DETAILS
 Number of countries	20 ¹
 Total population	508 Million in 2023 (World Bank 2024)
 Total area	15 million square kilometers 10% of the Earth's total land
 Climate	Semi-arid; Desertic; Mediterranean
 Top economies Based on GDP in Billions of US dollars (IMF, 2024)	<ol style="list-style-type: none"> 1. Saudi Arabia, 1.25 Trillion 2. United Arab Emirates (UAE), 545,05 Billion 3. Israel, 528,07 Billion 4. Iran, 434,24 Billion 5. Egypt, 380,04 Billion
 Main economic sectors	<ol style="list-style-type: none"> 1. Oil and gas, dominant in GCC² 2. Services 3. Agriculture, significant in North Africa
 Key regional import partners (IMF, 2024)	<ul style="list-style-type: none"> - China, top import partner for 67% of MENA countries - European Union, especially Spain, Italy and France
 Key regional export partners (IMF, 2024)	<ul style="list-style-type: none"> - China - European Union, largest trading partner in the region, representing 30% of their trade - India, significant partner of the UAE
 Major regional ports (Lloyd's list, 2023)	<ol style="list-style-type: none"> 1. Jebel Ali, UAE 2. Tanger Med, Morocco 3. Jeddah, Saudi Arabia 4. Salalah, Oman 5. Khalifa Port, UAE 6. Port Said, Egypt

¹ Algeria, Bahrein, Egypt, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen.

² Gulf Cooperation Council.



As shown in **TABLE 1**, the MENA region exhibits significant economic disparities, with wealthy states able to invest in agricultural innovation, while others face poverty and limited resources. These differences shape each country's capacity to address food security. Political instability, conflicts, and governance challenges further disrupt agrifood systems by affecting production, trade, and resource access. As a result, the region remains highly dependent on food imports, increasing its vulnerability to global market fluctuations and supply chain disruptions.



There is an urgent need to examine strategies to support agrifood systems transformation in the MENA region. Climate change poses an existential threat to the region's agrifood systems. The MENA region is warming at twice the global average rate, exacerbating water scarcity and desertification. These climatic shifts are projected to significantly reduce agricultural yields in many areas, potentially displacing rural populations and intensifying urban food insecurity (CEIP - Carnegie Endowment for International Peace, 2024).

In response to these challenges, some MENA countries have developed comprehensive national food security strategies. However, there remains great urgency in developing a regional food security strategy.

Central to understanding the challenges and opportunities in MENA's agrifood systems is the Food-Energy-Water Nexus.



Water infrastructure and use impacts fish stocks, food supplies and land use

Food production needs water & impacts water quality and availability



WATER

WATER SECURITY
MANAGEMENT &
INVESTMENT

FOOD

FOOD SECURITY
POLICY &
INVESTMENT

FOOD - ENERGY - WATER NEXUS



Clean water supplies need energy

Food production processing & transport needs energy



ENERGY

ENERGY SECURITY
GOVERNANCE &
INVESTMENT



Energy production needs water and impacts water quality and availability

Extraction, energy crops and carbon sequestration impact food supplies

This framework highlights the intricate relationships between food production, energy use, and water resources, which are particularly strained in this water-scarce region. The MENA region has only 1.4% of the world's freshwater resources, with agriculture consuming up to 85% of water resources in some countries. This leads to severe ecological strain from excessive groundwater extraction and a heavy energy demand driven by desalination and pumping, both essential processes for drinking water.

Despite these challenges, the MENA region possesses considerable strengths and opportunities. Its strategic location at the crossroads of Europe, Africa, and Asia positions it as a potential hub for agricultural trade and innovation. The region's young population, coupled with increasing investments in education and technology, presents a demographic dividend that could drive agricultural modernization and food system transformation (AGBI., 2024, April 8).

This document aims to provide a comprehensive analysis of the current state of agrifood systems in the MENA region, identify key challenges and opportunities, and propose strategies for sustainable transformation within the Food-Water-Energy Nexus framework across the region. **It seeks to address five key objectives:**

- 1 ● To assess the current state of food production, distribution, and consumption across the MENA region, highlighting both commonalities and country-specific dynamics.
- 2 ● To examine the impact of climate change, water scarcity, and other environmental factors on regional food security and agricultural sustainability.
- 3 ● To analyse the socio-economic and political factors influencing agrifood systems, including urbanization, changing dietary patterns, and governance structures.
- 4 ● To explore innovative technologies and practices that can enhance agricultural productivity and resilience in the face of environmental constraints.
- 5 ● To identify opportunities for regional cooperation and knowledge sharing in addressing common food system challenges.



This document examines the entire MENA region, recognizing the interconnectedness of agrifood systems across borders. Taking a holistic approach, it considers not just agricultural production but also food processing, distribution, consumption, and waste management. Drawing on diverse information sources, expert analyses, and case studies, it provides a nuanced understanding of regional dynamics. Framing these challenges through the Food-Water-Energy Nexus, specifically at the regional level, this first-of-a-kind regional initiative aims to be a vital resource for policymakers, researchers, and stakeholders, fostering informed dialogue and action toward resilient, sustainable, and equitable agrifood systems for current and future generations.



This document emphasizes the critical importance of regional cooperation in addressing the complex challenges facing MENA agrifood systems. The diverse strengths and experiences across MENA countries present unique opportunities for knowledge sharing and collaborative problem-solving, as well as their potential in contributing to regional stability for years to come. For instance, countries with advanced water management technologies can share expertise with those facing acute water scarcity. Similarly, nations with successful sustainable agriculture practices can offer valuable insights to others striving for food self-sufficiency. By fostering partnerships, joint research initiatives, and shared policy frameworks, the MENA region can leverage its collective resources and expertise to tackle common challenges more effectively while strengthening regional stability in the process.



This collaborative approach not only addresses disparities within the region but also strengthens its resilience against external shocks and enhances its position in the global food system. Through cooperation, MENA countries can transform their vulnerabilities into collective strengths, paving the way for a more food-secure, sustainable, and prosperous future for all in the region.

2

Current State of Agrifood Systems in the MENA Region

Understanding today's realities is the first step toward building resilient and sustainable food systems for tomorrow



2.1. Agricultural Production

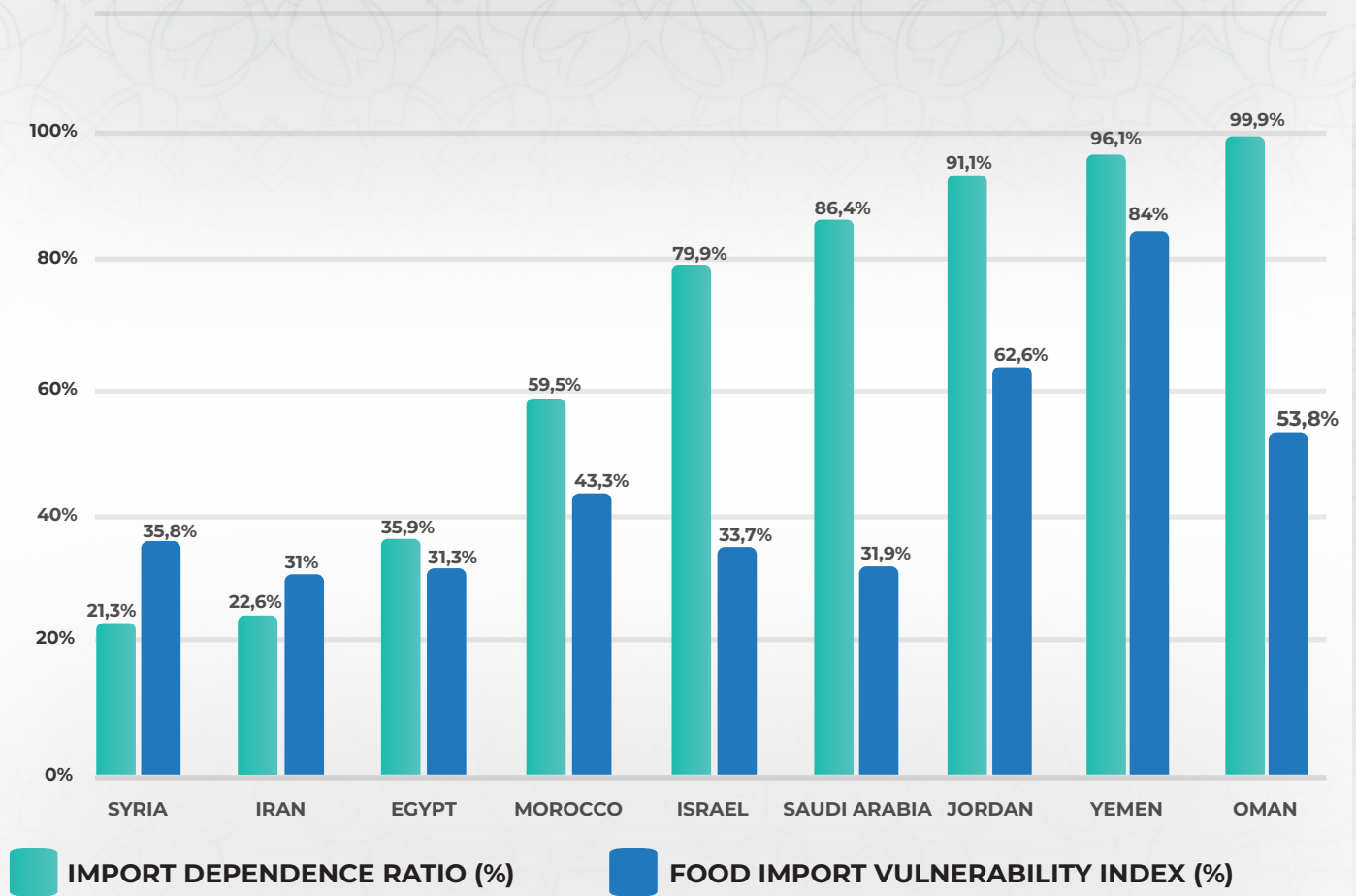
The MENA region's agricultural sector is crucial for livelihoods, food security, and national economies, characterized by an essential combination of rainfed (wheat, barley) and irrigated farming (fruits, vegetables), as well as vital livestock systems. However, this diversity and resilience are threatened by a confluence of critical factors. Water scarcity is the overriding environmental challenge, projected to worsen due to climate change, especially in arid areas (Awaad et al., 2020). This constraint, combined with socio-economic factors such as rural poverty and rapid urbanization, hinders the sector's ability to meet growing food demands, with projections indicating a catastrophic production of up to 60% by 2050 (Hejazi et al., 2023).

● Heavy Reliance on Food Imports:

It is estimated that MENA countries import an average of 68% of their food (MENA2050 Food Committee, 2025), a dependency particularly acute for staple cereals (e.g., 50% of wheat and barley, 70% of rice), exposing food security to external shocks, including global price volatility, supply chain disruptions, and geopolitical tensions (FAOStats Data Bank) [see figure 1].



FIGURE 1: IMPORT DEPENDENCE AND VULNERABILITY TO FOOD SHOCKS IN SELECTED MENA COUNTRIES



Produced by MENA2050 based on data from FAO, FAO Food Balance Sheets, and IFPRI, Food Import Dependence Ratio.

● Underutilised Potential:

Beyond subsistence and staple crops, the region demonstrates strong potential in high-value, specialized crops for export, such as dates, olive oil, and citrus fruits (UN, 2023; CGIAR, 2023). This potential, driven by favorable climate and strategic location, remains underutilised, suggesting significant opportunities to boost high-value crop production by leveraging regional expertise.

The region shows resilience through the rapid adoption of innovative practices. Digital and AI technologies are increasingly integrated into agriculture, creating an ideal environment due to MENA's high mobile penetration (GSMA, 2021). These advancements, coupled with the use of smart irrigation systems, are crucial for optimizing the use of water, which accounts for 85% of agricultural consumption. Regional investments, led by innovation hubs (KAUST Innovation) and advancements in controlled-environment agriculture such as vertical farming (AeroFarms), showcase a vital path towards sustainable resource management.

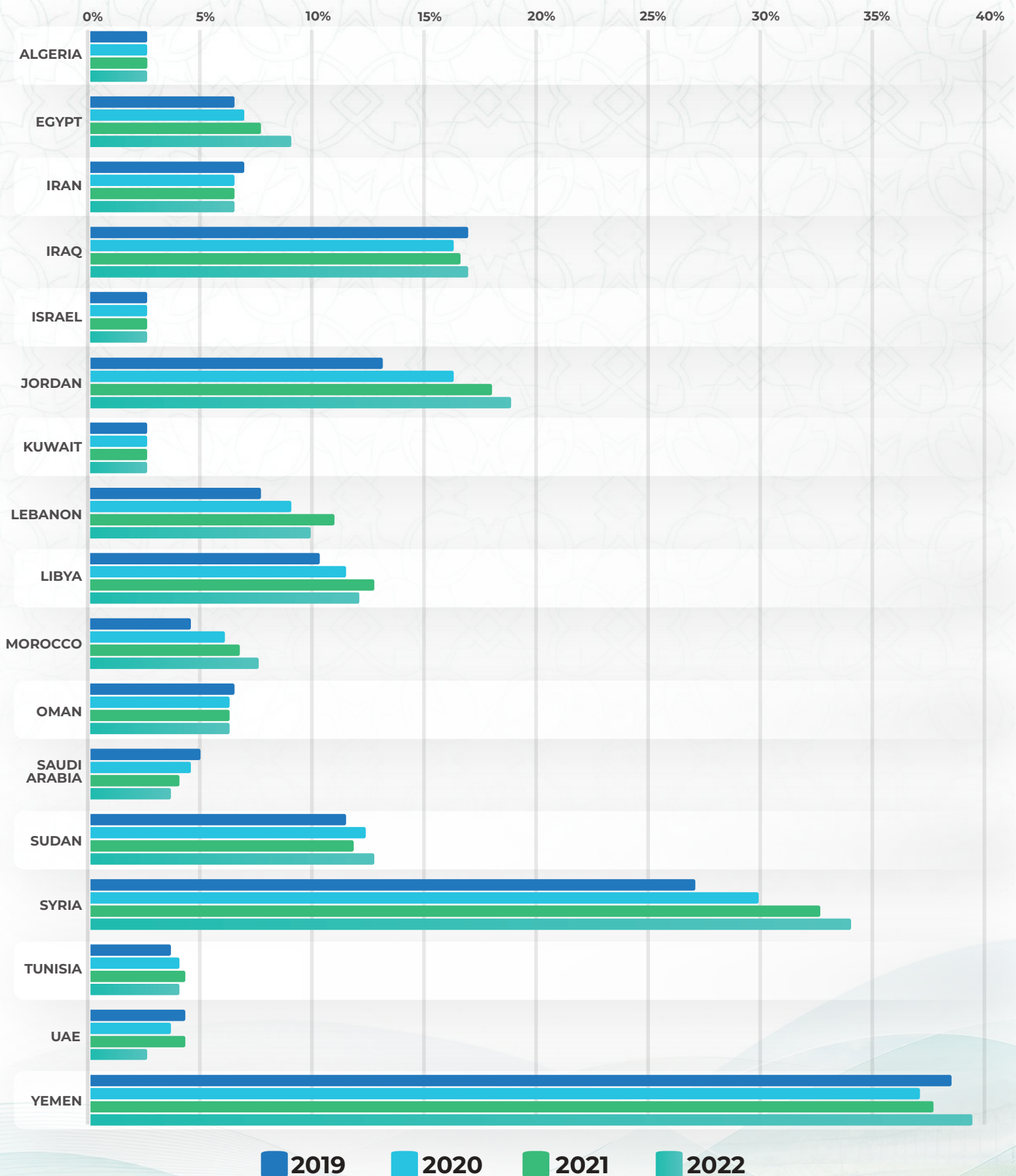
2.2 Food Security and Nutrition

Food accessibility in the MENA region is defined by stark regional disparities. While wealthier nations, such as Qatar and the UAE, maintain stable food supplies through high purchasing power and strategic investments in controlled-environment agriculture and vertical farming (GSMA, 2021), countries experiencing significant instability, such as Yemen and Syria, face severe disruptions. Yemen's food insecurity rate alone affects over 16 million people, including 5 million at risk of famine (FAO, UN Jordan, Oxfam).

SEE FIGURE 2 →

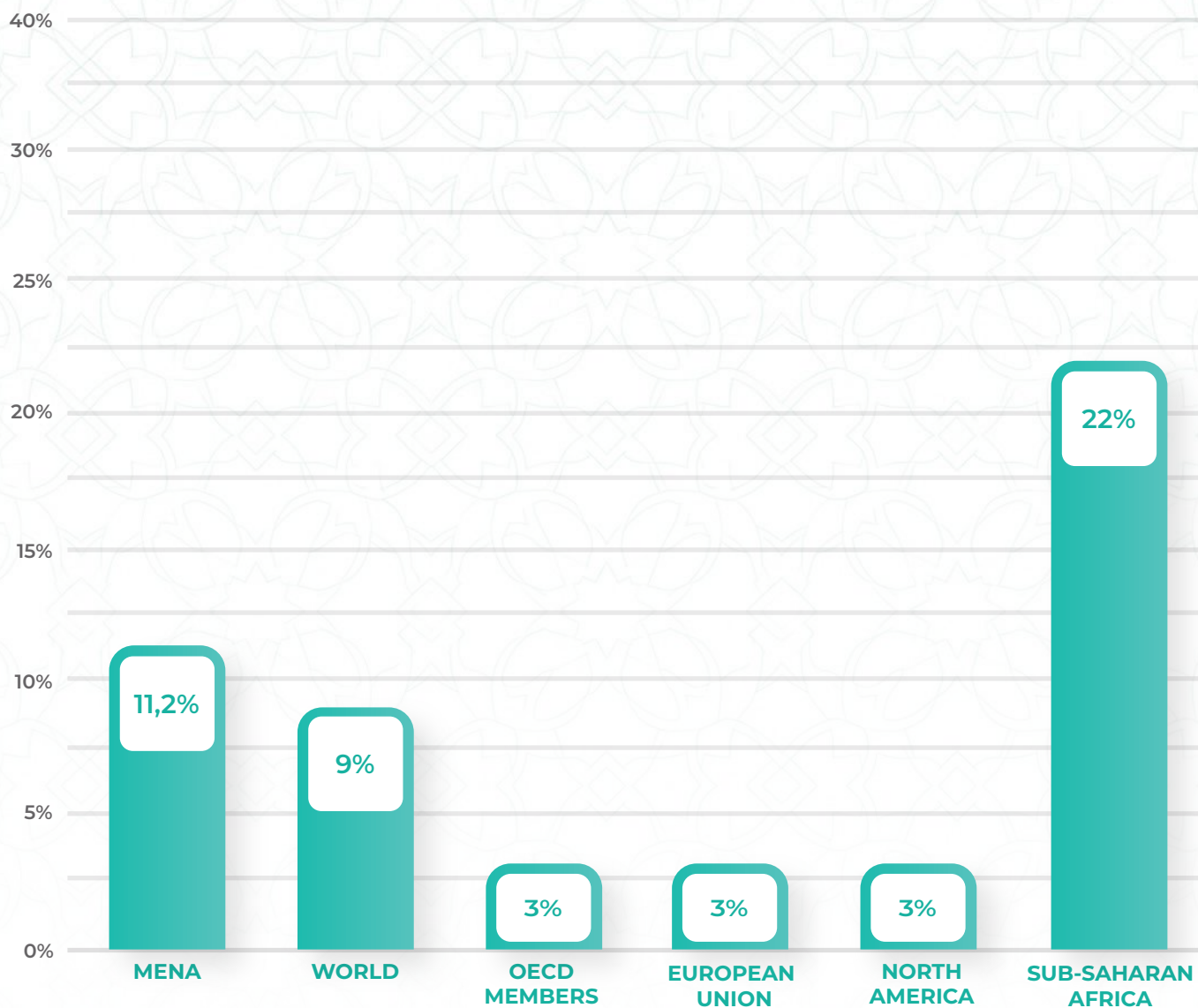


FIGURE 2: PREVALENCE OF UNDERNOURISHMENT IN MENA FROM 2019 TO 2022
 (% of total population)



Produced by MENA2050 based on data from World Bank, Prevalence of Undernourishment (% of population).

FIGURE 3: COMPARATIVE AVERAGES - PREVALENCE OF UNDERNOURISHMENT (in % of total population in 2022) - MENA, WORLD, OECD MEMBERS, EUROPEAN UNION, NORTH AMERICA, SUB-SAHARAN AFRICA



Produced by MENA2050 based on data from World Bank, Prevalence of Undernourishment (% of population).

The MENA region faces a dual burden of malnutrition



Undernutrition

Chronic malnutrition remains a critical issue in conflict-affected and poorer areas (e.g., 29% of children under five in Egypt suffer from stunted growth) (FAO).



Obesity and Non-Communicable Diseases (NCDs)

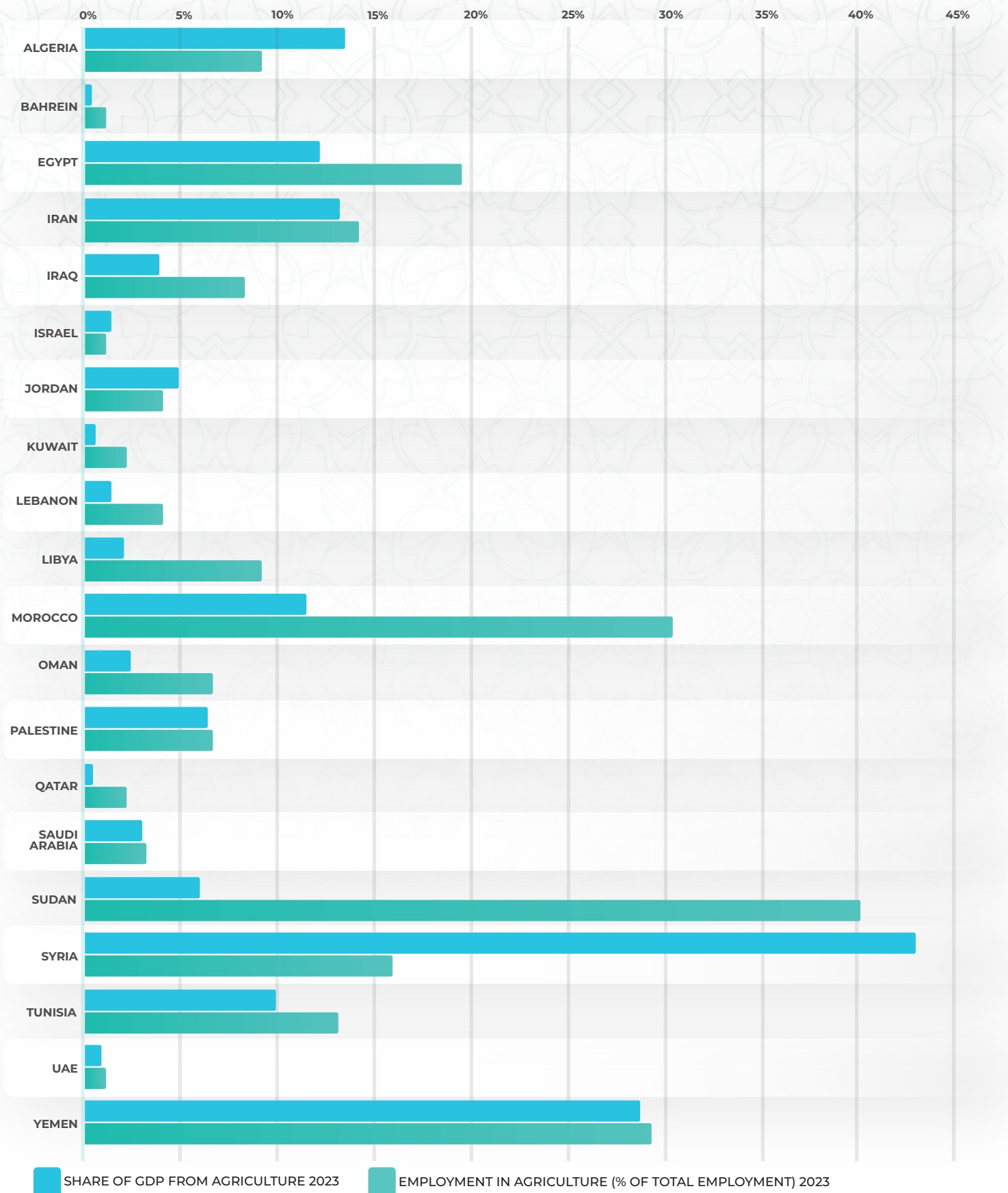
Simultaneously, rising rates of obesity (e.g. 40% of adults in Saudi Arabia) and associated NCDs such as diabetes are prevalent (FAO, NCBI).

This paradox reflects a rapid dietary transition where traditional diets rich in grains and vegetables are being replaced by Westernized diets high in fats, sugars and processed foods (FAO, n.d.; WHO), contributing to high rates of diabetes (USDA ERS; NCBI). Despite efforts to improve nutrition and promote healthier diets, data reveals that food insecurity and undernourishment are still rising across the region, maintaining rates structurally higher than global and European Union averages, highlighting deep structural inequalities in food access [see figure 3].

2.3 Economic and Social Aspects

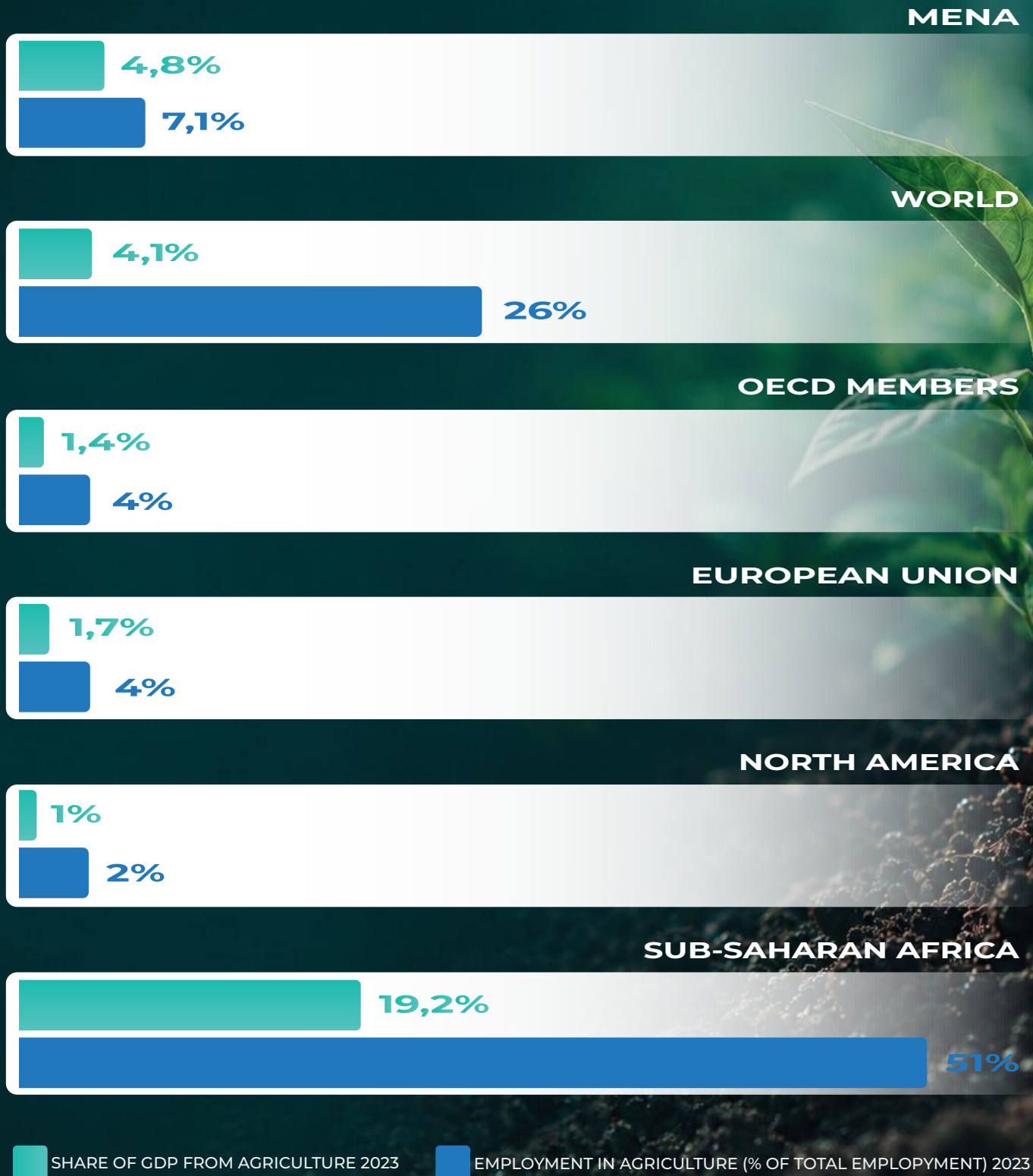
Agriculture remains a fundamental economic and social pillar, yet its performance and role vary widely. The sector is a major employment provider, e.g. up to 50% in Sudan, and contributes significantly to GDP in countries such as Morocco and Egypt (FAO; GSMA, 2021), while Gulf States are shifting towards high-tech, niche solutions.

FIGURE 4: OVERVIEW OF AGRICULTURAL SECTOR'S CONTRIBUTION TO GDP AND SHARE OF EMPLOYMENT IN THE MENA REGION (2023)



Produced by MENA2050 based on data from World Bank, Agriculture, forestry, and fishing, value added (% of GDP) and World Bank, Employment in agriculture (% of total employment).

FIGURE 5: OVERVIEW OF AGRICULTURAL SECTOR'S CONTRIBUTION TO GDP AND SHARE OF EMPLOYMENT



Produced by MENA2050 based on data from World Bank, Agriculture, forestry, and fishing, value added (% of GDP) and World Bank, Employment in agriculture (% of total employment).

← These figures show the varying impact of agriculture on GDP and employment in the MENA region. Sudan has the highest reliance, with 30% of GDP and 50% of employment, while the Gulf States have shifted towards technology-driven solutions. In terms of domestic agricultural capacity, Morocco and Egypt serve as regional leaders. Morocco's agricultural sector contributes 12% to GDP and employs 33% of the workforce, while in Egypt, agriculture accounts for 11% of GDP and 21% of employment (FAO; GSMA, 2021). Israel, although not heavily reliant on agriculture for GDP, has emerged as a global leader in agricultural innovation. The country has pioneered technologies such as drip irrigation, hydroponics, and precision farming, enabling the production of high-value crops such as citrus fruits, vegetables, and flowers.

This variability is compounded by structural inequalities that undermine the resilience of the agrifood systems:

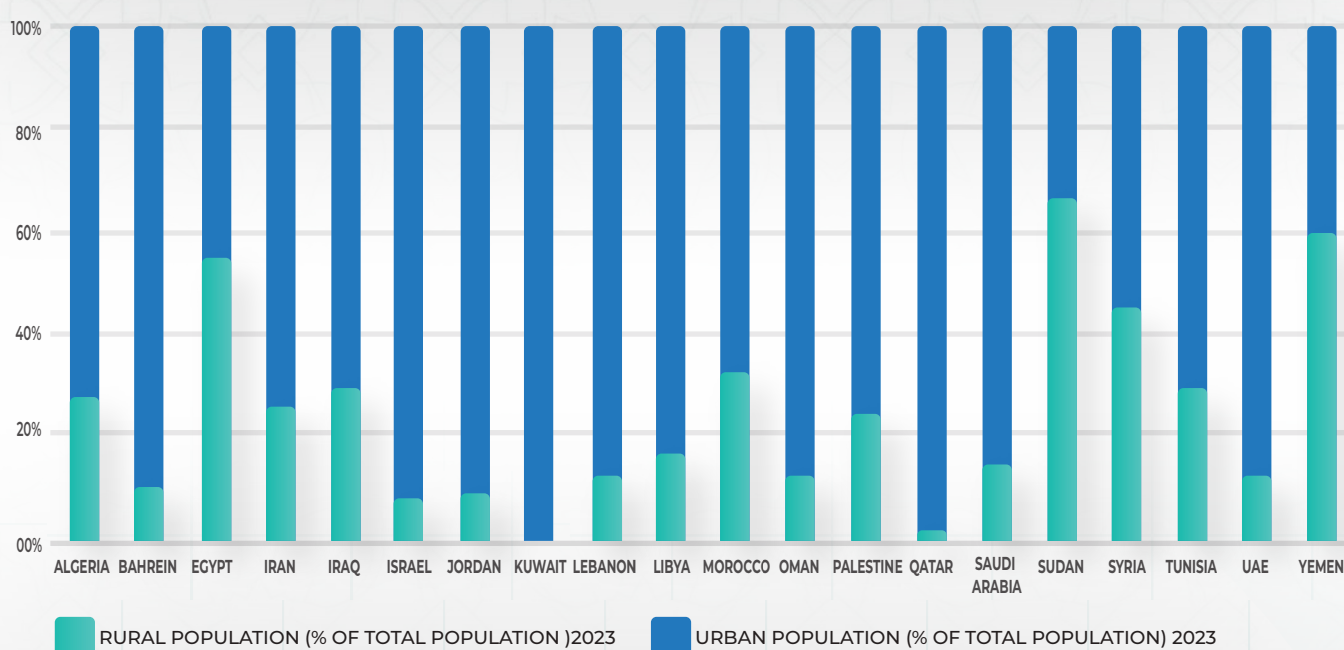
Economic Disparities and Inflation

Inequalities between wealthy nations and conflict-affected countries are increased by soaring inflation, averaging over 22% in 2023. This rate directly erodes household purchasing powers and food affordability, especially for vulnerable populations (World Bank Databank).

Rural-Urban Divide

Despite the agriculture sector's crucial role, the low proportion of the rural population relative to urban centers highlights a paradox between the sector's importance and the demographic concentration (World Bank Databank, 2024) [see figure 6]. Rural areas often lack infrastructure and access to services, hindering productivity (World Bank, 2022; FAO, 2021), while urban populations contend with price volatility of imported goods.

FIGURE 6: DISTRIBUTION OF RURAL (GREEN) AND URBAN (BLUE) POPULATION IN MENA, IN % OF TOTAL POPULATION (2023)



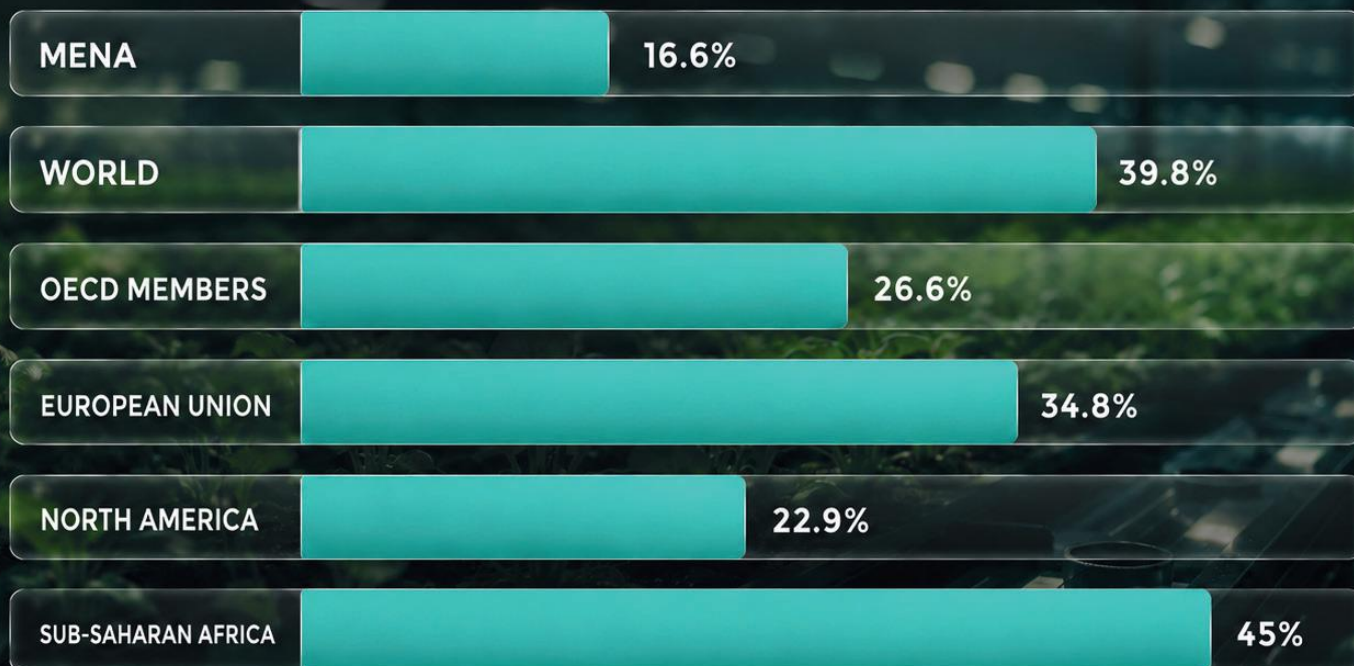
Produced by MENA2050 based on data from World Bank, Urban Population (% of total population) and World Bank, Rural Population (% of total population).



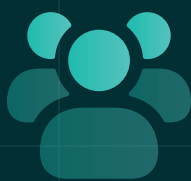
Gender Inequality

Despite their pivotal role in food production, women’s participation in agricultural employment remains notably low, estimated at 16.6%, compared to the world averages (MENA2050, 2025; World Bank, 2024) [see figure 7], reflecting persistent structural barriers. Empowering women, as demonstrated by initiatives in Tunisia and Jordan, represents a major, underutilised opportunity to drive sectoral growth and efficiency.

FIGURE 7: COMPARATIVE AVERAGES - WOMEN EMPLOYMENT IN AGRICULTURE (% of total agriculture employment) IN 2022



Produced and calculated by MENA2050 based on data from World Bank, Labor force, female (% of total labor force).



Community-Based Models

In the face of these challenges, community-based models (cooperatives, water management initiatives) represent essential bottom-up solutions (ICARDA). These initiatives integrate local expertise and participatory planning, proving crucial for resource adaptation and resilience. Examples of cross-border cooperation, particularly in water management among Palestinians, Jordanians, and Israelis, demonstrate the potential for collaboration in achieving regional security (EcoPeace Middle East, 2023).



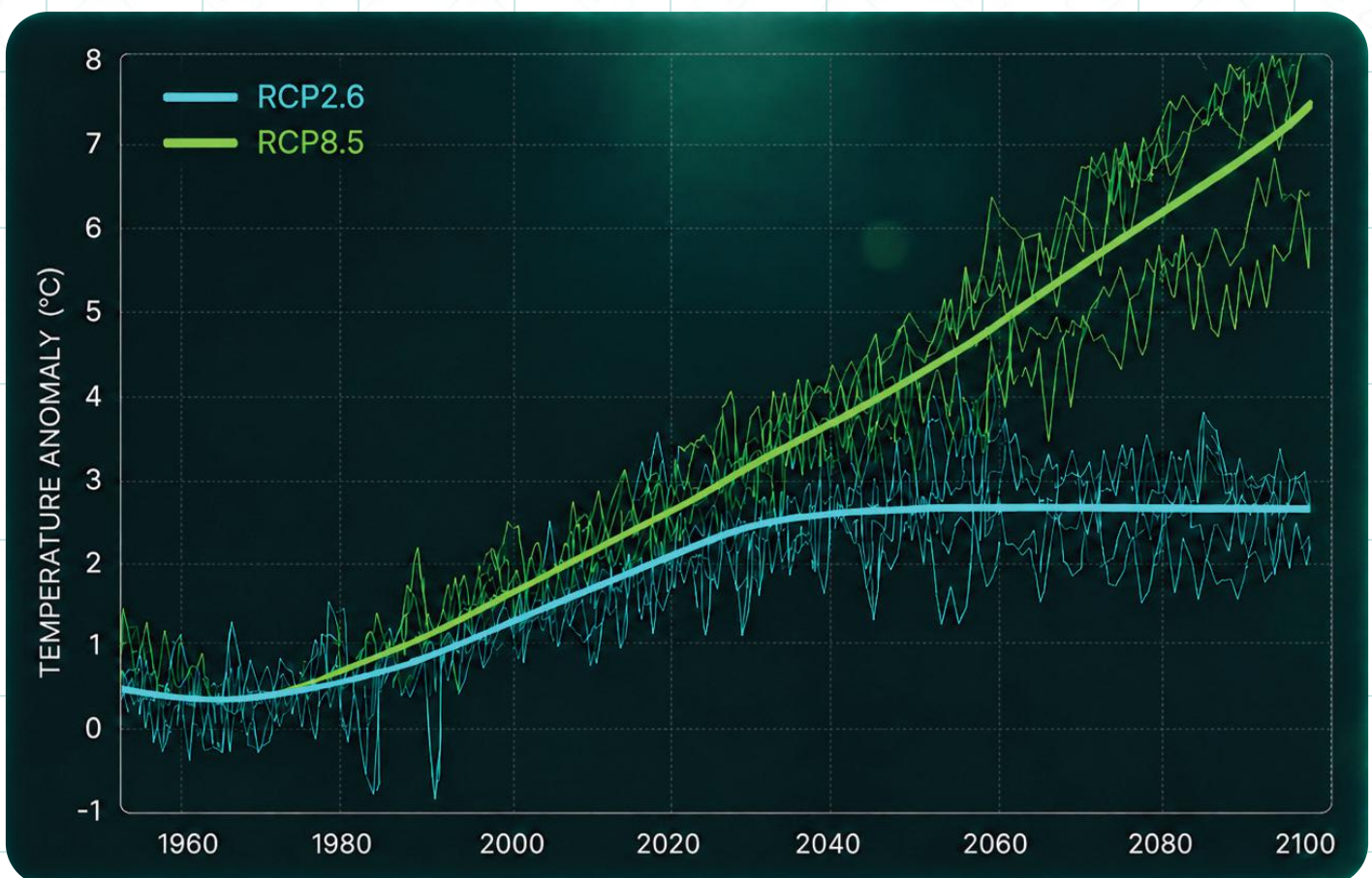
2.4 Environmental Impact

The MENA region is among the most climate-vulnerable areas globally, facing an existential threat that accelerates all other challenges to the agrifood system.

THE CLIMATE URGENCY AND PHYSICAL IMPACTS

The region is already experiencing an average temperature rise of 1.5°C, nearly double the global rate. Under a high-emissions scenario (RCP 8.5), temperatures could rise up to 4°C by the end of the century, drastically intensifying heatwaves [see figure 8] (World Bank, 2022). This accelerated warming threatens human health, infrastructure, and, critically, agricultural productivity, with projections indicating potential yield reductions of up to 60% for major crops such as wheat and barley (World Bank, 2022; IPCC, 2022).

FIGURE 8: TEMPERATURE PROJECTIONS FOR MENA, WORLD BANK



SOURCE: MENA Climate Roadmap (2021-2025), World Bank.

N.B.: RCP stands for “Representative Concentration Pathway”,

each RCP represents a scenario based on a number of greenhouse gas emissions. RCP2.6 is a scenario of very low emissions, where global warming is below 2°C and where significant mitigation measures are introduced. RCP 8.5 is a scenario of very high emissions, the “worst-case scenario”, where no mitigation measure is introduced.



The figure above illustrates the stark contrast between two potential futures: a high-emissions scenario (RCP8.5), which shows a trajectory toward a catastrophic 4°C temperature rise by 2100, and a low-emissions scenario (RCP 2.6), which aligns with international climate goals by limiting warming to approximately 1.5°C. With temperatures already high and rising at a rate nearly double the global average, this graph directly illustrates how global policy decisions on emissions will determine the severity of climate-related challenges for the region, particularly for its highly vulnerable agrifood systems, as a high-emissions future would dramatically intensify the threats of heatwaves and water scarcity already outlined. Additionally, heat-related illnesses and mortality are projected to rise three to sevenfold by 2100, particularly among vulnerable populations (UNDP , 2023) and rising cooling demands in GCC countries will strain energy systems, increasing costs.



This crisis manifests through:

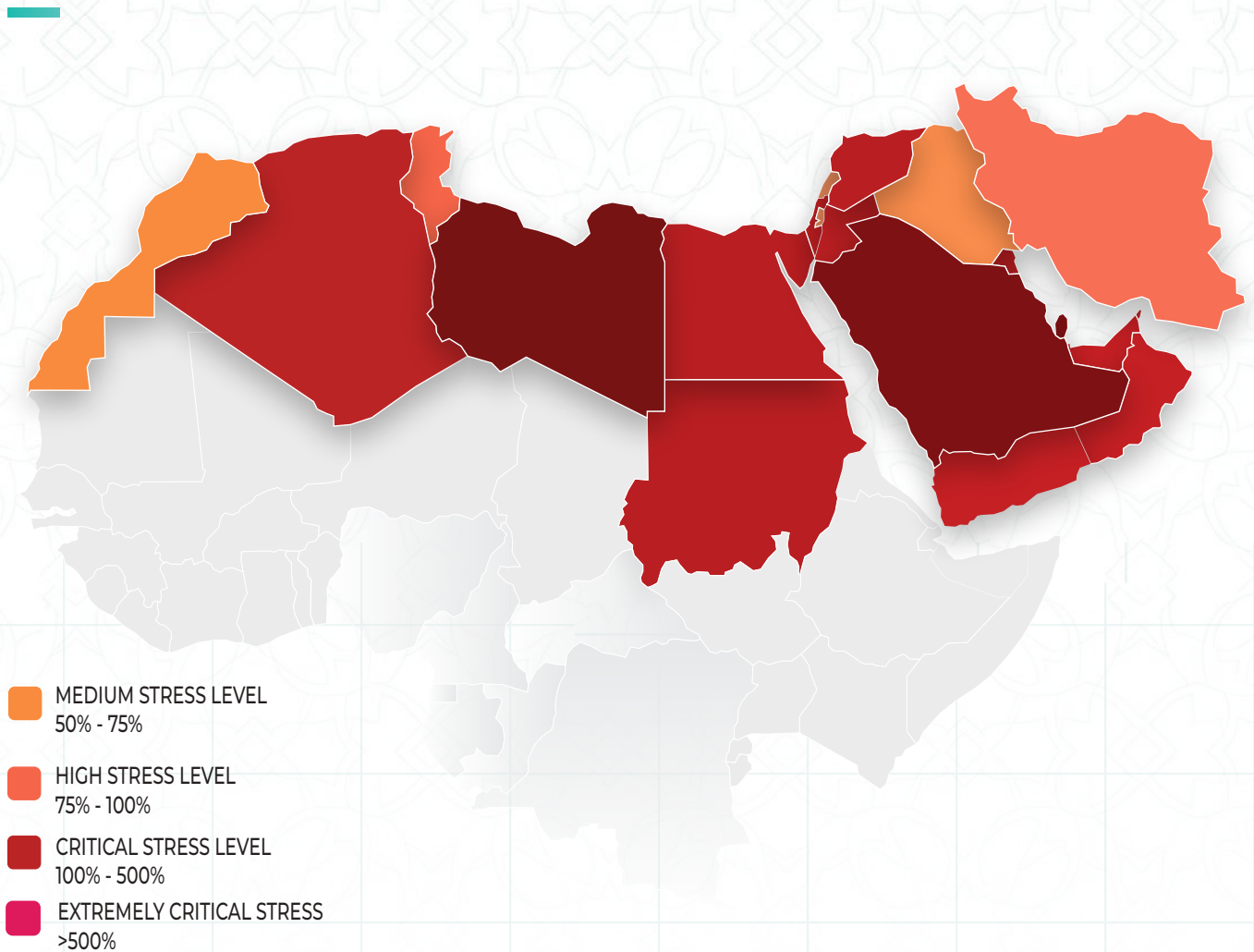
Water Scarcity and Land Degradation

MENA is the world's most water-stressed region (The Global Observatory, 2024), with per capita water availability expected to fall below the absolute scarcity threshold (500 cubic meters annually) by 2030 (World Bank, 2023).

This shortage, compounded by unsustainable practices, results in the degradation of approximately 82% of the region's land (ESCWA; Carnegie Endowment, 2024), creating a negative feedback loop that severely limits agricultural output.



MAP 1:
WATER STRESS LEVELS IN MENA (2024)



SOURCE: FAO AQUASTATS 2024



Extreme Events

Climate change is amplifying the frequency and intensity of flash floods, prolonged droughts, and severe sandstorms. Furthermore, rising sea levels threaten major coastal cities and critical agricultural areas such as Egypt's Nile Delta, risking salinization of freshwater supplies (Climate Champions, 2023; Molle et al., 2018).



SOCIOECONOMIC COSTS AND POTENTIAL

The economic toll of these environmental factors is staggering, with climate-related disasters and productivity losses potentially costing the MENA region 6 to 14% of its GDP annually by 2050 (World Bank, 2022). Climate stress is expected to drive significant population shifts, with over 20 million people potentially displaced by 2050 due to agricultural decline and coastal threats (IMF, 2023).

In order to address these challenges, the region is actively investing in key adaptation and mitigation strategies. These include expanding desalination, deploying advanced irrigation technologies, and heavily investing in renewable energy (RCREEE, 2022). Regional cooperation is essential for managing shared resources (e.g., the Nile River) and is vital for building resilience (EcoPeace Middle East, 2023).



3

Importance of Agrifood Systems Transformation

The transformation of agrifood systems in the Middle East and North Africa (MENA) region is of paramount importance for addressing multiple interconnected challenges and achieving sustainable development goals.



3.1 Public Health

The MENA region faces a complex nutritional landscape characterized by the dual burden of malnutrition, with high rates of both undernourishment and obesity. This paradoxical situation reflects the multifaceted challenges within the region's agrifood systems.

Impact on Nutrition and Reduction of Food-Related Disease

In 2023, approximately 66.1 million people, 14% of the population, in the MENA region faced hunger, while 186.5 million people, 39.4% of the population, experienced moderate or severe food insecurity (UN, 2023). The prevalence of undernourishment varies significantly across the region. In conflict-affected countries, undernourishment rates reached 26.4% in 2023, four times higher than the 6.6% within non-conflict areas (UN, 2023). Yemen, Syria, and Iraq face particularly severe challenges, with millions of people experiencing acute food insecurity due to ongoing conflicts and economic instability (CGIAR, 2023). Simultaneously, the region struggles with rising obesity rates and related non-communicable diseases (NCDs), for example Saudi Arabia reports 40% of the adult population as obese. This rise in obesity and NCDs is largely attributed to the nutrition transition occurring in the region, characterized by increased consumption of energy-dense, nutrient-poor foods; reduced physical activity due to urbanization and changing lifestyles; and limited awareness of healthy eating habits and nutrition education (B.H. Aboul-Enein, 2023). Micronutrient deficiencies remain a significant concern across the MENA region, contributing to various health issues, including impaired immune function and bone health.

Access to Safe and Healthy Food to all Populations

Ensuring equitable access to safe and healthy food is crucial for improving public health outcomes across the MENA region. Yet, economic access remains a critical issue: 151.3 million people, representing over one-third of the population in the Arab region, could not afford a healthy diet in 2022, with conflict areas rates the highest (41.2%) (UN, 2023). Addressing this requires enhanced social protection and targeted food assistance, such as Egypt's Takaful and Karama cash transfers, to increase affordability. Promoting local food production can also mitigate import dependency, a strategy proven effective during the COVID-19 pandemic (FAO, 2020), while initiatives like the World Bank's Sudan Agriculture Transformation Program demonstrate success in boosting farmer productivity by 30% (MECGA 2023). Beyond affordability, strengthening food safety regulations, traceability systems, and infrastructure (storage, transport) is essential for protecting public health.

Addressing the disparities in food access between urban and rural areas is crucial. Given the success of projects such as the Sudan Agriculture Transformation Program, the following initiatives and processes require deeper investigation:

- Developing sustainable urban agriculture initiatives to increase access to fresh produce in cities.
- Improving rural infrastructure to facilitate the transport of fresh, nutritious foods to urban markets;
- Implementing policies to support smallholder farmers and rural food producers, and enhancing food distribution networks to ensure equitable access across geographic regions.
- Promoting access to healthy food also involves addressing cultural and educational barriers.

- Developing culturally appropriate nutrition education programs, preserving and promoting traditional, nutrient-rich foods and culinary practices;
- Raising awareness about the importance of dietary diversity and balanced nutrition;
- Engaging community leaders and influencers in promoting healthy eating habits.

Focusing on these aspects of public health and food system transformation in the MENA region can significantly contribute to reducing the burden of malnutrition, food-related diseases, and health inequalities. This transformation is essential for achieving the Sustainable Development Goals (SDGs) related to Zero Hunger (SDG 2) and Good Health and Well-being (SDG 3).

3.2 Climate Action

Agrifood systems transformation plays a vital role in both mitigating greenhouse gas emissions and adapting to the impacts of climate change in the MENA region. Agriculture and food production are significant contributors to greenhouse gas emissions in the MENA region. Transforming agrifood systems can help mitigate these emissions through various strategies, including Conservation Agriculture. Implementing no-till or reduced tillage practices, crop rotation, and permanent soil cover can significantly reduce carbon emissions and improve soil health (FAO, 2025).

AGROFORESTRY

Integrating trees into agricultural landscapes can sequester carbon, improve soil fertility, and provide additional income sources for farmers (IFPR, 2024; FAO, 2018). Utilizing technologies such as GPS-guided machinery, drones, and sensors can optimize resource use, reducing emissions from excessive fertilizer and pesticide application (FarmERP, 2024).

LIVESTOCK MANAGEMENT

Enhancing the quality of animal feed and breeding for more efficient livestock can reduce methane emissions from enteric fermentation; Implementing proper manure storage and treatment systems can reduce methane and nitrous oxide emissions; Rotational grazing and improved pasture management can enhance carbon sequestration in grasslands (FAO, 2025).

REDUCING FOOD LOSS AND WASTE

Food loss and waste contribute significantly to greenhouse gas emissions. Strategies to address this include: Improving post-harvest infrastructure and enhancing storage, processing, and transportation facilities to reduce food spoilage. (FarmERP, 2024) Promoting food rescue initiatives and developing programs to redistribute surplus food to those in need, reducing waste and addressing food insecurity (Foodtank, 2019); Raising awareness about food waste reduction strategies at the household level (Kozielc, A et al., 2024).

REGENERATIVE AGRICULTURE

This process is emerging as a vital strategy in the MENA region to restore soil health, enhance water-use efficiency, and build resilience to climate change. This approach includes practices such as reduced tillage, cover cropping, crop rotation, composting, and integrating livestock, all aimed at boosting soil organic matter and sequestering carbon. Regional initiatives, such as the MENAT Regenerative Agriculture Initiative, are fostering collaboration and research to scale these practices. By improving soil fertility, increasing yields, and supporting rural livelihoods, regenerative agriculture is playing a growing role in agrifood systems transformation and climate action across MENA.

ENERGY EFFICIENCY IN AGRIFOOD SYSTEMS AND RENEWABLE ENERGY ADOPTION

Transitioning to solar, wind, and other renewable energy sources for agricultural operations and food processing; Utilising cold chain optimization and implementing energy-efficient cooling technologies throughout the food supply chain (FarmERP, 2024); Adopting water and energy-efficient irrigation technologies, such as drip irrigation powered by solar energy (FAO, 2025)

ADAPTATION STRATEGIES TO COPE WITH CLIMATE CHANGE IMPACTS

Agrifood systems transformation can enhance resilience through various adaptation strategies:

Water Management

- **Water-Efficient Irrigation**
Implementing drip irrigation, precision sprinklers, and other water-saving technologies to cope with increasing water scarcity;
- **Wastewater Reuse:**
Expanding the treatment and safe reuse of wastewater for agriculture, particularly in water-stressed areas;
- **Rainwater Harvesting:**
Developing systems to capture and store rainwater for agricultural use during dry periods (FAO, 2025; IFPRI, 2024, FAO, 2018).



Crop Resilience



Climate-Resilient Varieties:

Developing and promoting drought-resistant, heat-tolerant, and salt-tolerant crop varieties adapted to changing climatic conditions;



Crop Diversification:

Encouraging farmers to grow a wider variety of crops to spread risk and enhance food system resilience;



Protected Agriculture

Expanding the use of greenhouses, hydroponics, and other controlled environment agriculture techniques to shield crops from extreme weather events (FarmERP, 2024).



Early Warning Systems and Climate Information Services



Weather Forecasting:

Improving short-term and seasonal weather forecasting capabilities to help farmers make informed decisions (FAO, 2025);



Pest and Disease Monitoring:

Developing early warning systems for pest and disease outbreaks that may be exacerbated by climate change (IFPRI, FAO, 2018);



Climate-Smart Advisory Services:

Providing farmers with tailored advice on climate-smart agricultural practices through extension services and digital platforms (FarmERP, 2024).



Sustainable Land Management

- **Soil Conservation:**
Implementing erosion control measures, such as terracing and contour plowing, to protect soil from degradation;
- **Desertification Control:**
Promoting reforestation, afforestation, and sustainable rangeland management to combat desertification;
- **Integrated Landscape Management:**
Adopting holistic approaches that consider the entire ecosystem to enhance resilience and biodiversity (IFPRI, FAO, 2018; FarmERP , 2024)



Coastal Zone Management

- **Mangrove Restoration:**
Protecting and restoring mangrove ecosystems to act as natural barriers against sea-level rise and storm surges;
- **Saltwater Intrusion Prevention:**
Implementing measures to prevent saltwater intrusion into coastal aquifers used for agriculture;
- **Adaptive Aquaculture:**
Developing climate-resilient aquaculture practices to ensure sustainable fish production in changing marine environments (CGIAR, 2023; IFPRI, FAO, 2018).

3.3 Economic Prosperity

Transforming agrifood systems can contribute significantly to economic prosperity in the MENA region by creating jobs, improving livelihoods in the agricultural sector, and promoting sustainable economic growth. This transformation is particularly crucial given the region's high unemployment rates and the need for economic diversification. Agriculture remains a crucial source of employment in many MENA countries, particularly in rural areas. Agrifood systems transformation can enhance job creation and improve livelihoods through various strategies:

VALUE-ADDED AGRICULTURE AND AGRO-PROCESSING

Developing Agro-Processing Industries:

Encouraging the establishment of food processing facilities can create jobs along the value chain and increase the value of agricultural products (IFPRI, FAO, 2018);

Promoting Niche and Specialty Products:

Supporting the production and marketing of high-value, region-specific products (e.g., argan oil from Morocco, dates from Tunisia) can create premium markets and higher incomes for farmers (Food Tank).

Enhancing Post-Harvest Processing:

Investing in post-harvest technologies can reduce food loss and create employment opportunities in storage, packaging, and distribution (FarmERP , 2024).

SUPPORT FOR SMALL SCALE FARMER AND AGRI-ENTREPRENEURS

Access to Finance

Developing microfinance programs and agricultural credit schemes tailored to the needs of smallholder farmers and rural entrepreneurs (UNESCWA, 2024);

Technology Adoption:

Providing support for the adoption of modern agricultural technologies, such as precision farming tools and digital platforms, to enhance productivity and profitability;

Capacity Building:

Implementing comprehensive training programs to enhance farmers' skills in sustainable agriculture, business management, and marketing (Kozielec, A et al., 2024).

YOUTH ENGAGEMENT IN AGRICULTURE

Modernization and Digitalization:

Leveraging digital technologies to make agriculture more attractive to youth, such as mobile apps for farm management and e-commerce platforms for agricultural products (FarmERP , 2024);

Agri-Entrepreneurship Programs:

Developing incubators and accelerators focused on agri-tech startups to foster innovation and youth employment in the sector (Food Tank);

Agricultural Education:

Modernizing agricultural education curricula to include digital skills, sustainable practices, and entrepreneurship to prepare youth for careers in modern agriculture (IFPRI, FAO, 2018).

WOMEN'S EMPOWERMENT IN AGRICULTURE

Gender-Inclusive Policies:

Implementing policies that promote women's access to land, credit, and agricultural inputs (UNESCWA, 2024);

Women-Led Cooperatives:

Supporting the formation and growth of women-led agricultural cooperatives to enhance collective bargaining power and market access (Foodtank, 2019);

Targeted Training Programs:

Developing capacity-building programs specifically designed for women in agriculture, focusing on both technical and leadership skills (Kozielec, A. et al., 2024).

PROMOTION OF ECONOMIC GROWTH THROUGH SUSTAINABLE AGRICULTURE

Sustainable agriculture can drive economic growth in the MENA region by increasing productivity, expanding export opportunities, and fostering innovation. This could be achieved by

Increasing Agricultural Productivity and Efficiency

- **Precision Agriculture**
Adopting precision farming techniques to optimize resource use and increase yields, leading to higher profitability (FarmERP, 2024);
- **Climate-Smart Agriculture:**
Implementing practices that increase resilience to climate change while improving productivity, such as conservation agriculture and integrated crop-livestock systems (FAO, 2025);
- **Water-Efficient Technologies:**
Investing in advanced irrigation systems and water management technologies to increase water productivity in agriculture (FAO, 2025).



Expanding Export Opportunities

- **Quality Standards and Certification:**
Implementing rigorous quality control systems and obtaining international certifications to access premium export markets (IFPRI, FAO, 2018);
- **Market Intelligence:**
Developing market research capabilities to identify and capitalize on emerging export opportunities for MENA agricultural products (Kozielec, A. et al., 2024);
- **Trade Facilitation:**
Streamlining export procedures and investing in logistics infrastructure to enhance the competitiveness of MENA agricultural exports (UNESCWA 2024).



Fostering Innovation and Research in Agriculture

- **Agricultural Research Centers:**
Establishing and strengthening regional agricultural research centers focused on developing locally-adapted, climate-resilient crop varieties and farming techniques (CGIAR, 2023);
- **Public-private Partnerships:**
Encouraging collaboration between research institutions, private sector companies, and farmers to accelerate the adoption of innovative agricultural solutions (FarmERP, 2024);
- **Agri-Tech Ecosystems:**
Developing supportive ecosystems for agri-tech startups, including incubators and venture capital funds.



Adopting Sustainable Resource Management Practices

- **Circular Economy in Agriculture**
Promoting the reuse and recycling of agricultural waste, creating new value streams, and reducing environmental impact;
- **Renewable Energy in Agriculture**
Integrating solar and wind energy solutions in farming operations to reduce costs and create new income opportunities (FAO, 2025);
- **Biodiversity Conservation:**
Developing eco-tourism and agri-tourism initiatives that capitalize on the region's unique ecosystems and traditional farming practices (Foodtank, 2019).



Reducing Food Import Dependence

- **Import Substitution:**
Identifying key food imports that can be produced locally, and developing targeted programs to increase domestic production (UNESCWA, 2024);
- **Strategic Crop Selection:**
Focusing on crops that are well-suited to local conditions and have high market demand to optimize land and water use (Kozielec, A. et al., 2024);
- **Food Processing Capabilities:**
Investing in food processing industries to add value to local agricultural products and reduce reliance on processed food imports (IFPRI, FAO, 2018).

By focusing on these aspects of job creation, livelihood improvement, and sustainable economic growth, agrifood systems transformation in the MENA region can significantly contribute to overall economic prosperity. This transformation aligns with several Sustainable Development Goals, including SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), and SDG 12 (Responsible Consumption and Production).

3.4 Regional Stability

CURRENT FOOD SECURITY SITUATION IN MENA

The food security situation in the MENA region remains a critical concern, with conflicts and crises significantly impacting progress towards hunger reduction goals. Recent data and analyses highlight the severity of the issue: food insecurity in the region has risen dramatically, with almost one out of five people in MENA likely to be food insecure in 2023, up from 11.8 percent in 2006 (FSIN, 2024). The Mashreq subregion faces the highest food insecurity rates, with countries such as Iraq, Sudan, Syria, and Yemen among the most affected (FSIN, 2024). Conflict-affected areas are experiencing particularly dire situations.

As of mid-2024, the entire population of Gaza of 2.2 million people faces acute food insecurity, with approximately half the population (1.1 million) experiencing catastrophic conditions (IPC Phase 5) in March–April 2024. Projections for June–September 2024 indicate that 22% of the population (around 470,000 people) could remain in IPC Phase 5, with a high and sustained risk of famine if humanitarian access does not improve. Sudan's situation has deteriorated significantly, with approximately 25.6 million people facing acute food insecurity between June and September 2024 (FSIN, 2024). Yemen continues to struggle with severe food insecurity, exacerbated by its high dependence on food imports (FSIN, 2024).

FOOD INSECURITY AS A CATALYST FOR CONFLICT

Food insecurity can act as a powerful trigger for social unrest and conflict. Historical precedents demonstrate the potential for food shortages to spark major upheavals (FSIN, 2024). In recent history, food insecurity may have contributed to the 1994 genocide in Rwanda and played a role in the Darfur crisis (FSIN, 2024), but food has also been used in some instances as a weapon. In the 2000s, the Sudanese government exported locally grown food and livestock, essential to the civilian population (Nobel Peace Center, 2021). The UN Secretary-General has emphasized that addressing food insecurity and related issues of resource scarcity can significantly contribute to stabilizing fragile situations (United Nations, 2024).

FOOD-ENERGY-WATER NEXUS IN CONFLICT

The interplay between food, energy, and water resources often exacerbates tensions: Climate change is expected to reduce crop yields by up to 60% in some areas, further straining the nexus (DG ECHO, 2023). Energy consumption in the MENA region more than doubled between 1971 and 2011 and continues to rise, impacting energy security (World Bank, 2022). Many countries rely on energy-intensive practices, such as groundwater pumping and desalination for agriculture, creating a complex interdependence between food and energy security (World Bank, 2022).



INSTITUTIONAL PERSPECTIVE ON FOOD SECURITY AND CONFLICT

Major institutions emphasize the link between food security and conflict resolution: the World Bank focuses on four primary measures to assess food security, including stability, highlighting its multidimensional nature (World Bank, 2022). The FAO recognizes its role as a neutral convener in coordinating multi-actor emergency responses in conflict-affected countries. The heads of FAO, IMF, World Bank Group, WFP, and WTO have called for urgent actions to rescue hunger hotspots, facilitate trade, and reform harmful subsidies (FAO, 2022).

BUILDING COOPERATION AND TRUST

Addressing food insecurity can serve as a platform for regional cooperation and conflict resolution. Regional investment in economic development can change the calculus of engaging in conflict. Developing shared food security strategies can foster cooperation among MENA countries (ReliefWeb, 2024). Cross-border initiatives demonstrate the potential for international cooperation to address food security challenges. The Arab Ministerial Water Council (AMWC) and Arab Ministerial Council for Electricity (AMCE) have issued resolutions supporting inter-sectoral and regional exchange on the water-energy-food nexus (ReliefWeb, 2024).

STRATEGIES FOR ENHANCING FOOD SECURITY AND PREVENTING CONFLICT

The intricate relationship between food security and conflict in the MENA region is a critical issue that demands urgent attention. This complex dynamic involves multiple factors, including resource scarcity, climate change, political instability, and economic challenges. Understanding these interconnections is crucial for developing effective strategies to promote regional stability and prevent further conflicts. The compounding effects of conflict, climate change, and economic shocks are evident across the region. Armed conflicts have severely impacted agricultural production, market systems, and humanitarian access (Reliefweb, 2024). Many countries in the region are grappling with high inflation, particularly in food prices, and debt stress (World Bank, 2023). Addressing these complex challenges requires a multifaceted approach, including immediate humanitarian assistance, long-term development strategies, and efforts to resolve ongoing conflicts, for example:

Sustainable agriculture practices:

Implementing climate-smart agriculture techniques; promoting crop diversification to reduce reliance on imports; investing in research and development for drought-resistant crops.

Improving water management:

Implementing water-efficient irrigation systems; developing shared strategies for equitable water use among countries.

Enhancing regional cooperation

Facilitating intra-regional trade in agricultural products; sharing best practices and technologies across countries; developing joint early warning systems for food security threats.

Addressing root causes of conflict:

Implementing targeted food assistance programs for vulnerable populations; developing policies to make nutritious foods more affordable and accessible; promoting inclusive economic growth to reduce socio-economic disparities.

Building resilience to climate change:

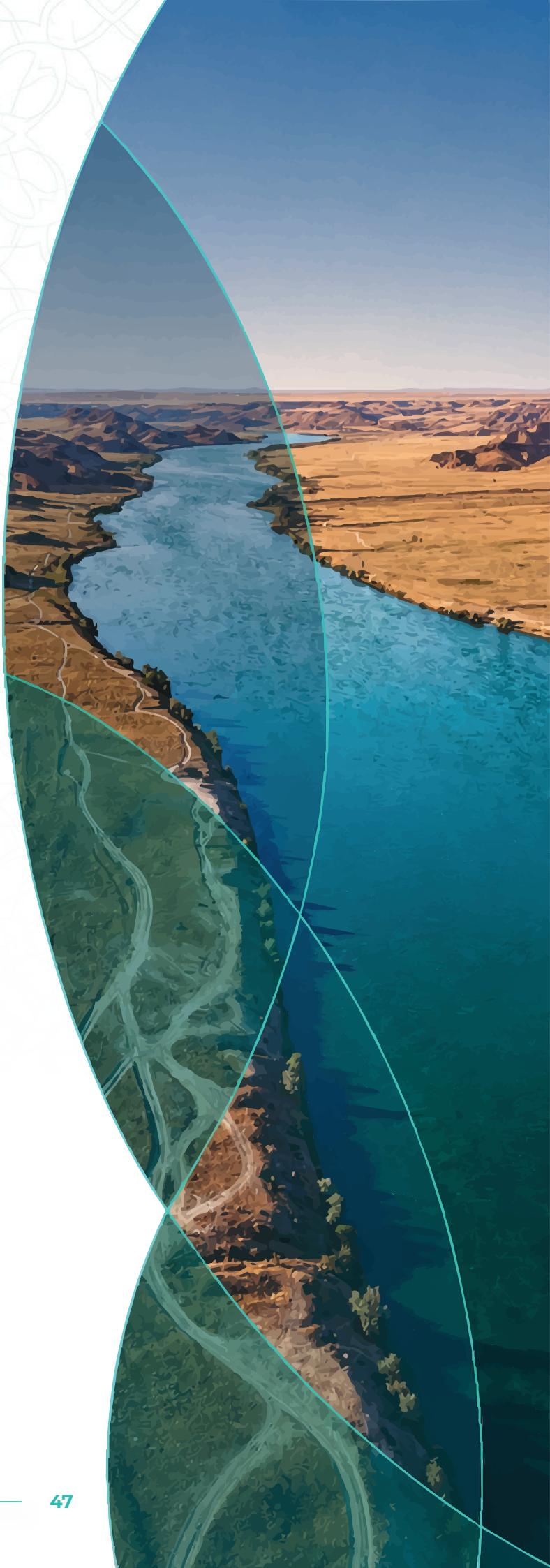
Developing early warning systems for extreme weather events; promoting conservation agriculture practices; investing in renewable energy to reduce dependence on fossil fuels (ReliefWeb, 2024).

By focusing on these strategies, MENA countries can work together to enhance food security, build trust, and contribute to long-term peace and stability in the region. This approach not only addresses immediate food needs but also lays the foundation for sustainable development and conflict prevention.

4

KEY CHALLENGES

The MENA region faces several critical challenges that significantly impact its agrifood systems and agricultural sector. The MENA2050 Policy and Advocacy Center's agrifood systems Committee identifies five key areas of concern: water scarcity, climate change, socio-political instability, economic constraints, and data interoperability and protocols for joint research.



4.1 Water Scarcity

Water scarcity is a paramount issue, with profound implications for agriculture and food security.

CURRENT WATER USAGE IN AGRICULTURE

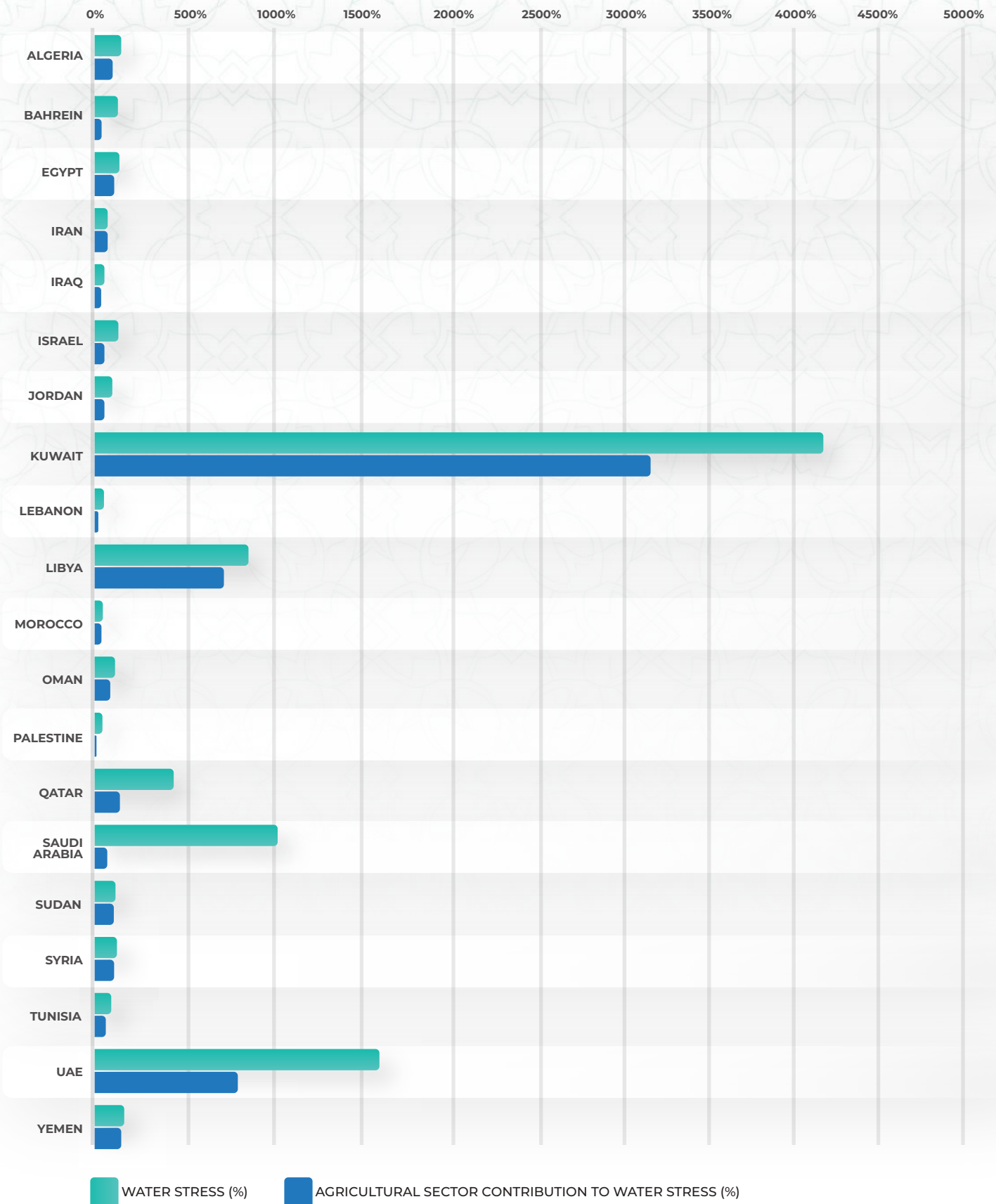
As shown in Figure 9, agriculture is the largest consumer of water in the MENA region, accounting for approximately 89% of the region's scarce water resources, compared to 70% at the global level (FAO, 2025). Irrigation farming practices in the region are often unsustainable, using up to three times more water than crops actually need (Genesis Water Tech, 2025).

IMPACT OF WATER SCARCITY ON FOOD PRODUCTION

Some countries may experience a drop in agricultural production of up to 60% by 2050 due to water scarcity. (University of Maryland, 2025). The Arabian Peninsula and Yemen are expected to be particularly affected, with agricultural production potentially decreasing almost threefold, and by approximately 60% in Yemen (World Bank, 2023).



FIGURE 9: AGRICULTURAL SECTOR'S CONTRIBUTION TO WATER STRESS COMPARED TO WATER STRESS LEVEL IN MENA (%)



Produced by MENA2050 based on data from FAO , AQUASTAT - Agriculture contribution to water stress and FAO, AQUASTAT - Water stress levels.

4.2 Climate Change

Climate change poses an existential threat to agriculture in the MENA region, exacerbating existing challenges and creating new ones.

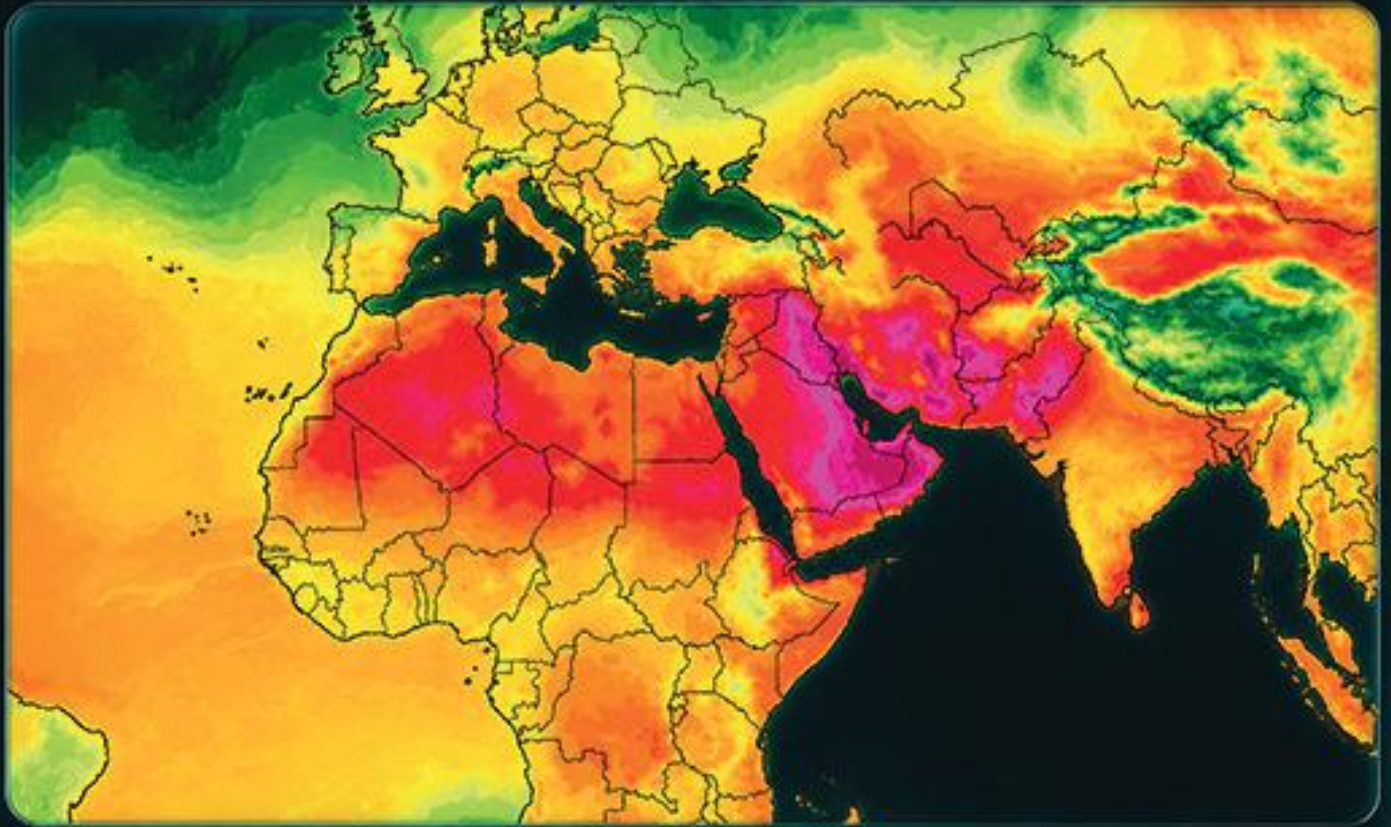
PREDICTED CLIMATE TRENDS AND THEIR IMPACT ON AGRICULTURE

The MENA region is warming at a rate nearly double the global average, with temperatures projected to rise by up to 4°C by 2100 under high-emission scenarios (UNEP, 2023). Extreme weather events, including prolonged droughts, heat waves, and flash floods, are becoming more frequent and intense. Precipitation rates have fallen by approximately 20% in some areas over recent decades, and projections suggest further declines (UNEP, 2023). These climate trends are expected to significantly reduce agricultural yields, with some estimates suggesting a decrease of up to 60% in certain areas by 2050 (IPCC, 2022).

VULNERABILITY OF DIFFERENT CROPS AND REGIONS

Crop yields are expected to decline by 30% with 1.5–2°C warming and up to 60% with 3–4°C warming (Waha et al., 2017). Reductions in crop productivity of 1.5–24% are expected for the western Maghreb and 4–30% in parts of Mashrek by mid-century (Waha et al., 2017). Legumes and maize crops are expected to be the worst affected in both regions as they are grown during the summer period. The length of growing periods for wheat in the MENA region is projected to shorten by about two weeks by mid-century (Waha et al., 2017).

MAP 2: HEATWAVE CONCENTRATION IN MENA, THE EARTHBOUND REPORTS (2020)



SOURCE: The Earthbound Report, 2020.

The red band in the map is the area of extreme heat, which runs across the Sahara Desert and into the Middle East. Parts of **Saudi Arabia**, **Oman**, and **Yemen** are considered the maximum the chart can go. Likewise, for areas of **Iran** and **Iraq**. The largest increase in the number of heatwaves has been in the Middle East, parts of Africa, and South America.

4.3 Socio-political Instability

Socio-political instability, including conflicts and forced displacement, severely impacts agrifood systems in the MENA region (Waha et al., 2017).

IMPACT OF CONFLICTS ON AGRIFOOD SYSTEMS

Ongoing conflicts in several MENA countries have directly impacted food security, disrupting production, trade, and access to resources. In conflict-affected areas such as Syria and Sudan, climate change impacts combined with conflict have led to crises in water and food security (FAO, 2024). Conflicts often result in the destruction of agricultural areas, ecosystems, and infrastructures needed for food, energy, and water distribution. In Syria, prolonged conflict has severely impacted the sector, leading to reduced output and disrupted supply chains (Hejazi et al., 2023).

MIGRATION AND ITS EFFECTS ON AGRICULTURE AND FOOD SECURITY

Forced displacement dismantles agri-food system livelihoods and reduces food production. The IMF projects that by 2050, over 20 million people in MENA could be displaced due to climate-related factors, potentially leading to social unrest (IMF, 2023). Migration can lead to the loss of traditional agricultural knowledge and practices, impacting sustainable farming methods. Urban areas are becoming hotspots of vulnerability due to the urban heat island effect and aging infrastructure, exacerbating food security challenges for displaced populations (World Resources Institute, 2023).

4.4 Economic Constraints

Economic factors significantly limit the ability of MENA countries to address food security challenges effectively. Many countries in the Middle East and North Africa (MENA) region, particularly those without significant oil resources, face substantial challenges in investing in agricultural development and food security programs. This limitation stems from a combination of factors, including financial constraints and demographic pressures. Non-oil-producing countries in the MENA region often struggle to allocate sufficient funds for agricultural development due to competing priorities and limited budgets. In many MENA countries, the agricultural sector receives limited credit support. For instance, domestic agricultural credit has been identified as a significant factor influencing Agricultural Value Added (AVA) in the region (Mordor Intelligence, 2025).

INSUFFICIENT INVESTMENT IN RESEARCH AND TECHNOLOGY

There is a lack of investment in agricultural research and technology, which hinders the region's transition towards optimizing food production (Ben Mimoune, N., & El Shehaby, H., 2023).

DEMOGRAPHIC PRESSURES AND FARM SIZES



As shown in Figure 10, the MENA region is experiencing significant demographic pressures that directly impact its agricultural sector. The region has experienced rapid population growth, reaching 2% in 2023, more than double the global average and significantly higher than growth rates in the “Global North”, as illustrated in Figure 11, but also higher than the global average for middle-income countries, at 1.3% (Rahimi et al., 2024). As a result of population growth and limited arable land, farm sizes in the MENA region have been decreasing. The region struggles with a shortage of arable land, having only about 1.07 hectares of agricultural land per person, including 0.16 hectares of cropland per person, which is lower than the global average, at 0.20 (Rahimi et al., 2024). These demographic pressures have led to an imbalance between population and agricultural resources, leading to a continuous and deepening imbalance between the growing population and the available agricultural resource base (Gam, S. IEMED, 2023).

FIGURE 10: POPULATION GROWTH IN THE MENA REGION FROM 2019 TO 2023

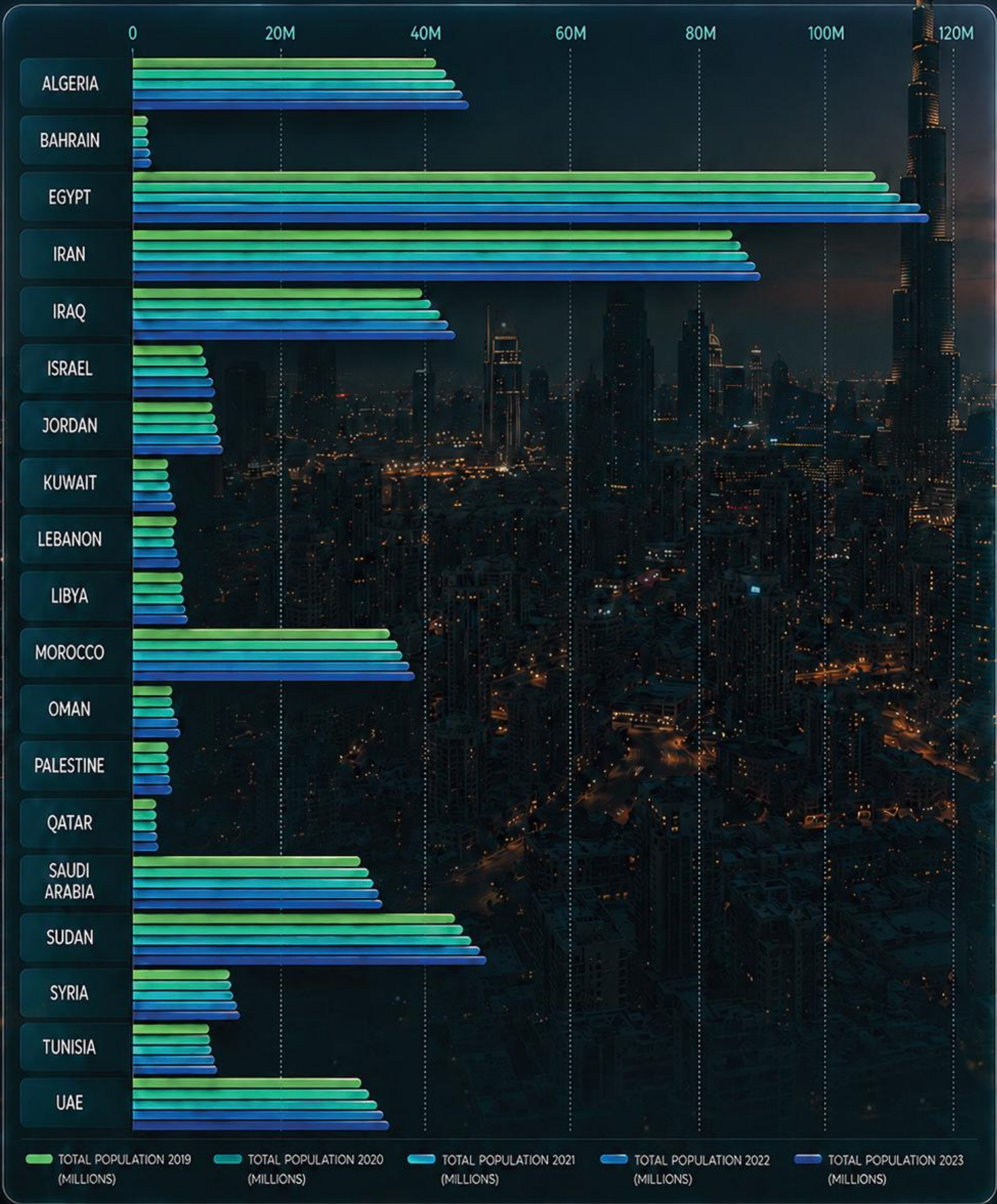
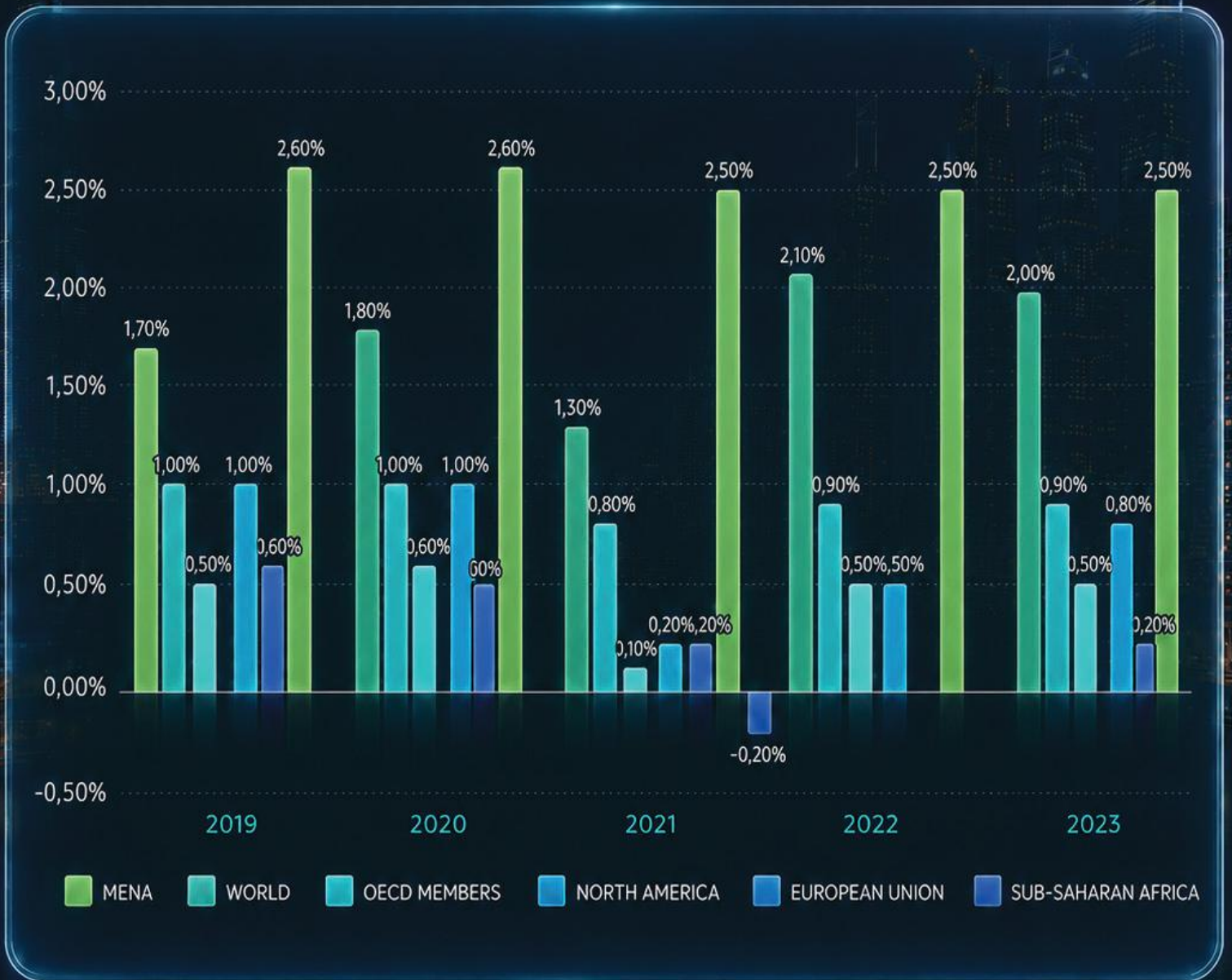


FIGURE 11: COMPARATIVE AVERAGES - ANNUAL POPULATION GROWTH FROM 2019 TO 2023



Produced by MENA2050 based on data from World Bank, population growth (annual%)

IMPACT ON AGRICULTURAL DEVELOPMENT

Financial and demographic challenges have significant implications for agricultural development in the MENA region. Limited capacity for expansion, scarce water resources, and limited arable land have led to many MENA countries facing difficulties in expanding their agricultural production to meet growing food demands (Rahimi, J. et al., 2023). The MENA region has become highly dependent on food imports, especially grains, making it vulnerable to global market fluctuations and trade disruptions (Rahimi, J. et al., 2023). Limited financial resources often result in inefficient use of available agricultural inputs. The economic toll of climate change on the MENA region will be staggering, with climate-related disasters, environmental degradation, and productivity losses estimated to cost the region 6-14% of its GDP annually by 2050 (World Bank, 2022). To address these challenges, MENA countries need to focus on increasing domestic food production capacities and using resources more efficiently. This will require further investment in agricultural research and technology that can address existing challenges (Ben Mimoune, N., & El Shehaby, H., 2023).

MARKET ACCESS AND TRADE BARRIERS

Small-scale farmers in remote areas face high transport costs and poorly connected markets, limiting their ability to sell goods or purchase inputs (IFPRI, 2024). Missing supply chains, inadequate infrastructure, high prices, and a lack of brand recognition hinder small-scale farmers' access to necessary agricultural inputs (FAO, 2025).

4.5 Data Interoperability and Protocols for Joint Research

The lack of standardized data collection protocols at the country level for food energy and water significantly impedes interoperability, metadata management, and cross-border data analysis, particularly in the realm of geographical information systems (GIS). This issue is especially pronounced in regions with complex geopolitical situations.

CHALLENGES IN DATA INTEROPERABILITY

Independent data collection methods employed by different countries often result in Inconsistent data formats, Varying metadata standards, Incompatible GIS systems, and Difficulties in data integration and comparison. These discrepancies make it challenging to conduct comprehensive regional analyses, hindering collaborative research efforts and policy-making processes (European Commission, 2024).

THE NEED FOR REGIONAL PROTOCOLS

Establishing protocols at the regional level has been proposed as a solution to these challenges. Such protocols would standardize data collection methodologies, ensure consistent metadata management, facilitate seamless data sharing across borders, and enable more accurate and comprehensive GIS analyses. However, implementing these protocols has consistently faced obstacles, primarily due to a lack of cooperation among stakeholders. These challenges have significant implications for joint research initiatives. The inability to seamlessly share and integrate data across borders hinders comprehensive regional studies. Varying levels of access to technology and infrastructure lead to disparities in data quality and completeness, and the lack of standardized protocols makes it difficult for researchers from different countries to work together effectively (Ytrehus, L. et al, JRC, 2021). To address these issues, there is a pressing need for the establishment of regional data standards and protocols, investment in shared ICT infrastructure, removal of barriers to technology access, and promotion of collaborative research initiatives. While past attempts at regional cooperation have faced challenges, the potential benefits of improved data interoperability for research, policy-making, and regional development underscore the importance of continued efforts in this direction (European Commission, 2024).

5

Key Strengths of the MENA Region

Recognizing the region's assets is essential to unlocking its potential for more resilient, innovative, and sustainable agrifood systems



5.1 Geographic and Climatic Diversity

The Middle East and North Africa (MENA) region possesses remarkable geographic and climatic diversity, which presents both challenges and opportunities for its agrifood systems. This diversity serves as a key strength, enabling the cultivation of a wide variety of crops and the development of aquaculture in coastal areas.

MEDITERRANEAN CLIMATE

Morocco, Tunisia, and parts of Syria benefit from this climate, which is ideal for growing olives, grapes, citrus fruits, and various vegetables.

Arid and Semi-Arid Regions:

Despite challenging conditions, these areas have developed unique agricultural practices. Egypt's Nile Valley and Delta support the cultivation of wheat, rice, cotton, and vegetables, making it a regional agricultural powerhouse.

Highland Areas:

Countries with significant elevation differences, such as Lebanon and parts of Iran, can grow temperate crops like apples and cherries in their cooler highland regions.

Oasis Agriculture:

Traditional oasis farming systems in countries such as Oman and Tunisia demonstrate resilience and efficient water use in harsh environments. This climatic diversity not only supports a variety of crops but also contributes to the region's rich culinary heritage and potential for agricultural exports.

COASTAL REGIONS AND THEIR POTENTIAL FOR AQUACULTURE

The MENA region boasts extensive coastlines along the Mediterranean Sea, Red Sea, Arabian Gulf, and the Atlantic Ocean, offering significant potential for aquaculture development. In 2018, MENA aquaculture production was valued at USD 2.3 billion, with Egypt accounting for two-thirds and Saudi Arabia for about one-quarter of this value (FAO, 2020). There is significant room for expansion in marine aquaculture systems, particularly in Gulf states where the capacity to grow tropical marine finfish like grouper and amberjack is increasing (FAO, 2020). Bahrain, Morocco, Oman, Saudi Arabia, and the United Arab Emirates are establishing dedicated aquaculture development zones, implementing consultation processes with other resource users, and adopting the FAO Ecosystem Approach to Aquaculture (FAO, 2020). Aquaculture in the region has demonstrated its potential to improve food self-sufficiency, enhance food security, and provide employment in rural areas (FAO, 2020). The geographic and climatic diversity of the MENA region, combined with its extensive coastlines, provides a strong foundation for developing resilient and diverse agrifood systems. By leveraging these natural advantages and implementing sustainable practices, the region can enhance its agricultural productivity, improve food security, and potentially become a significant player in global aquaculture.



5.2 Cultural and Culinary Heritage and Traditional Agricultural Practices

The MENA region's culinary heritage is a vibrant tapestry that reflects its diverse geography, rich history, and cultural ingenuity. Food in this region transcends sustenance. It is an art, a communal experience, and a source of identity and resilience.

RICH CULINARY TRADITIONS AND LOCAL FOOD PRODUCTS

MENA's cuisine is renowned for its bold flavours, wholesome ingredients, and profound cultural significance, deeply rooted in the agricultural traditions of the region, shaped by local endemics and the historical exchange of spices and ingredients along ancient trade routes.

MEDICINAL BENEFITS OF REGIONAL ENDEMIC

Endemic plants and spices offer significant medicinal benefits beyond their culinary uses. For example, Nigella seeds are valued for their immune-boosting and digestive benefits. Saffron is noted for its antidepressant and antioxidant properties. Sumac is rich in antioxidants, aiding in inflammation reduction and cardiovascular health. Dates support digestion and energy levels. Thyme (za'atar) is used for its antiseptic properties, treating colds and respiratory issues.

KNOWLEDGE OF TRADITIONAL FARMING PRACTICES

The region's farming practices, many of which date back centuries, have shaped its culinary and ecological heritage. These methods, deeply intertwined with the land and its people, often provide sustainable solutions for modern agriculture:

Water Harvesting:

Ancient systems such as Iran's qanats and Yemen's terracing efficiently manage scarce water resources.

Agroforestry:

Combining trees with livestock and staple crops, this system supports biodiversity and enhances soil health.

Intercropping and Crop Rotation:

Practices such as intercropping legumes with cereals enhance soil fertility and pest resistance, ensuring sustainable productivity. Reviving and integrating these traditional methods with modern agricultural technologies can strengthen resilience to climate change while preserving cultural identity.

ECONOMIC BENEFITS FROM CULINARY AND HERITAGE TOURISM

MENA's rich culinary heritage drives economic growth through tourism and entrepreneurship.

Culinary Tourism

Popular experiences like cooking classes, food tours, and traditional dining thrive in Morocco, Lebanon, and Jordan.

Wine Production

Lebanon and Morocco's vineyards attract global attention as key tourist destinations.

Agricultural Tourism

Visits to olive farms, date plantations, and saffron cooperatives enhance appreciation for local farming while supporting rural economies.

Culinary Heritage as a Pathway to Sustainability

Preserving and promoting culinary heritage offers a dual opportunity to safeguard cultural identity and to drive sustainable economic growth. Equally, sustainable tourism centered on food and heritage can create jobs, improve livelihoods, and strengthen the region's global presence. The integration of traditional farming knowledge, modern agricultural practices, and a global appreciation for MENA's culinary traditions represents a path toward a more resilient and sustainable future for agrifood systems in the region.

5.3 Human Capital

The MENA region possesses significant human capital potential, characterized by a young, increasingly educated population and a growing interest in agricultural innovation and entrepreneurship.

EDUCATED AND YOUTHFUL POPULATION

The MENA region boasts one of the world's youngest populations, with approximately 60% of its inhabitants under the age of 30 (UNESCWA, 2024). This demographic dividend presents a unique opportunity for driving innovation and economic growth in the agricultural sector. Key aspects include:

Educational Advancements

The region has made substantial progress in education, with tertiary enrollment rates increasing from 21% in 2000 to 38% in 2019 (World Bank, 2023).

Digital Literacy

Young people in MENA demonstrate high levels of digital literacy, with over 65% of youth using the internet regularly, positioning them well for adopting agri-tech solutions (GSMA, 2021).

STEM Focus

Countries including Saudi Arabia and the UAE have heavily invested in STEM education, with the proportion of STEM graduates increasing by 8% annually since 2015 (KAUST Innovation, n.d.).

Growing Interest in Agricultural Innovation and Entrepreneurship

There is a notable surge in interest among MENA youth in agricultural innovation and entrepreneurship, driven by:



Startup Ecosystems

The emergence of agri-tech startups across the region, with Egypt and Jordan seeing a 30% year-on-year increase in agri-tech ventures since 2018 (FarmERP , 2024);



Innovation Hubs

The establishment of agricultural innovation hubs, such as the AgrInnovate Middle East program, which has supported over 100 agri-tech startups since its inception in 2019 (FAO, 2025)



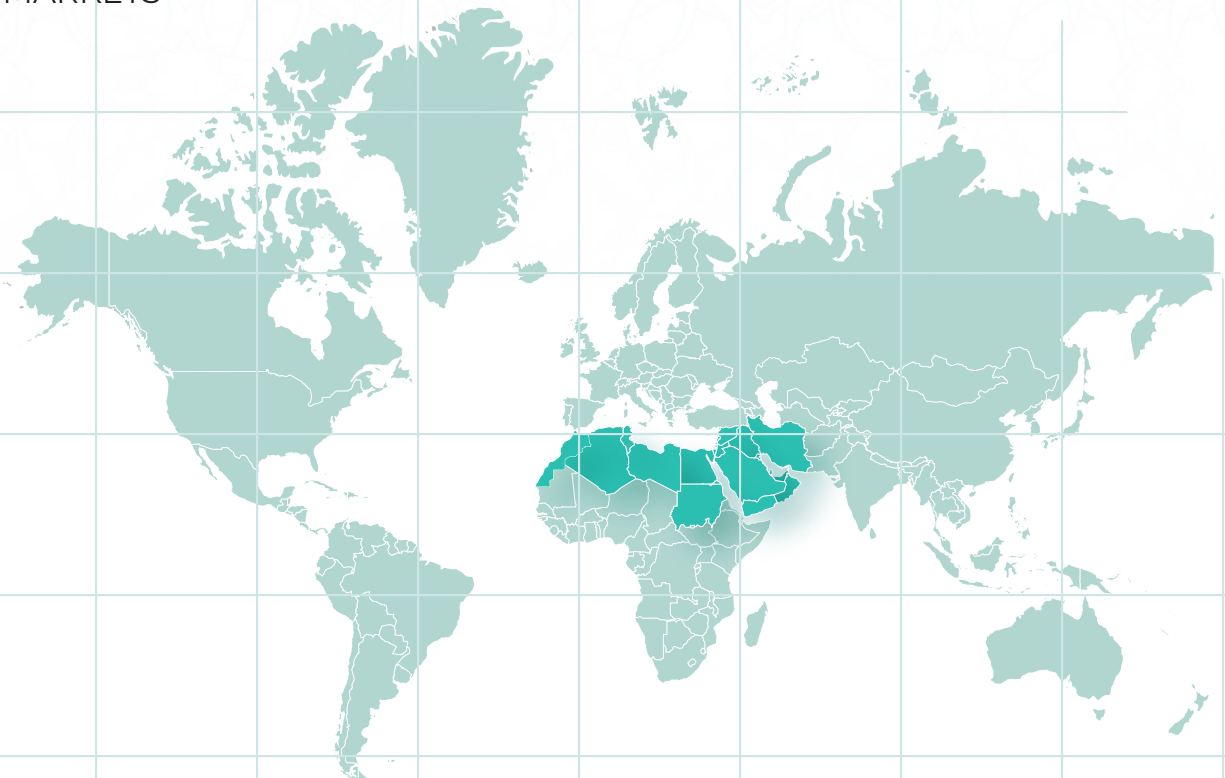
Youth Engagement Programs

Initiatives such as the ICARDA Young Agricultural Scientists Program have trained over 500 young researchers in sustainable agriculture practices since 2015 (ICARDA).

5.4 Strategic Location

The MENA region's strategic geographical position offers significant advantages for its agrifood systems and agricultural trade.

MAP 3: MENA'S STRATEGIC LOCATION, IN THE CENTER OF EUROPEAN, AFRICAN AND ASIAN MARKETS



NB: Outlined are the 20 MENA countries

PROXIMITY TO MAJOR GLOBAL MARKETS

MENA's location at the crossroads of Europe, Africa, and Asia provides unparalleled access to major global markets.

European Market Access

Morocco and Tunisia benefit from proximity to European markets, with agricultural exports to the EU increased by 15% between 2018 and 2023 (FAO, 2025).

Asian Trade Routes

Gulf countries serve as key transit points for trade between Asia and Europe, with the UAE accounting for over 60% of the region's trade with India and China (UNESCWA, 2024), and serving as a major hub for Indian agrifood exports.

African Market Potential

Egypt and Sudan are well-positioned to serve as gateways to growing African markets, with intra-African agricultural trade increasing by 20% since the implementation of the African Continental Free Trade Area in 2021 (World Bank, 2023).

The India-Middle East-Europe Economic Corridor (IMEC)

India's strategic location and its growing role in fostering international economic diversity. IMEC aims to connect India with the Middle East and Europe through an integrated network of maritime, road, and rail links (Cafiero, G., 2023; Economic Times, 2025). IMEC builds upon the I2U2 Group, a quadrilateral partnership between India, Israel, UAE, and the United States. The India-Middle East Food Corridor, part of these initiatives, seeks to enhance food security and trade between India and the Middle East (Janardhan, N., & Afterman, G., 2025).

POTENTIAL FOR BECOMING A TRADE HUB FOR FOOD PRODUCTS

The region's strategic location, combined with investments in infrastructure and logistics, positions it as a potential global food trade hub.

Logistics Infrastructure

Investments in ports and free zones, such as Jebel Ali in Dubai, have enhanced the region's capacity to handle and distribute food products efficiently (GSMA, 2021).

Cold Chain Development

The development of advanced cold chain facilities in Saudi Arabia and Oman has increased the region's capacity to handle perishable goods, with cold storage capacity growing by 25% between 2019 and 2024 (FarmERP , 2024).

Re-export Potential

The UAE has emerged as a major re-export hub for food products, with food re-exports growing by 18% annually since 2020 (FAO, 2025). While MENA is the host of significantly advanced port and logistics infrastructures, in countries such as Morocco and Israel, the region lacks a unified regional trade system, which limits its potential to become a key hub for agricultural trade. Persistent administrative and regulatory barriers, such as frequent cross-border delays, further hinder regional mobility and integration and the overall potential for MENA to become a trade hub.

5.5 Existing Initiatives and Investments

The MENA region has seen a surge in initiatives and investments aimed at transforming its agrifood systems and agricultural sector.

ONGOING PROJECTS AND INVESTMENTS IN AGRICULTURE AND TECHNOLOGY

Significant investments are being made in agricultural technology and sustainable farming practices.

DESERT AGRICULTURE

Israel's desert agriculture initiatives have increased crop yields in arid areas by up to 40% through advanced irrigation and crop selection techniques (ICARDA, n.d.).

VERTICAL FARMING

The UAE has invested over \$100 million in vertical farming projects since 2018, aiming to increase local food production by 30% by 2030 (KAUST Innovation n.d.).

PRECISION AGRICULTURE

Morocco's adoption of precision agriculture techniques has led to a 25% increase in water use efficiency in irrigated areas since 2019 (World Bank, 2023).

SUCCESSFUL PUBLIC-PRIVATE PARTNERSHIPS

Public-private partnerships (PPPs) have emerged as a key driver of innovation and investment in the region's agricultural sector.

AGROINNOVATE MENA

This partnership between governments, private sector entities, and research institutions has facilitated over \$50 million in investments in agri-tech startups across the region since 2020 (FAO, 2025).

SAUDI GREEN INITIATIVE

This public-private collaboration aims to plant 10 billion trees and reduce carbon emissions, with \$186 billion committed to climate action (UNESCWA, 2024)

EGYPTIAN RURAL DEVELOPMENT PROGRAM

A partnership between the Egyptian government and international donors has improved irrigation infrastructure for over 500,000 smallholder farmers since 2018 (World Bank, 2023). These strengths in human capital, strategic location, and ongoing initiatives position the MENA region favourably for transforming its agrifood systems. By leveraging these assets, the region can address its challenges and move towards more sustainable, resilient, and productive agricultural practices.

6

Strategic Framework for Transformation

Understanding today's realities
is the first step toward building
resilient and sustainable food
systems for tomorrow



The transformation of agrifood systems in the MENA region requires more than the sum of technological upgrades or isolated reforms. It calls for a systemic shift that recognizes the interdependence between food, water, energy, climate, and culture. These five dimensions form an inseparable nexus that determines the region's resilience and prosperity. As such, the transition toward sustainable agrifood systems must be guided by a shared vision and grounded in several cross-cutting principles that bridge science, policy, and society.

The challenges are systemic: resource depletion, climate volatility, rapid urbanization, and socio-economic disparity intersect to shape a fragile but interlinked landscape. Yet the region also holds immense potential. Across MENA, innovative farmers, scientists, entrepreneurs, and policymakers are experimenting with ways to regenerate soils, use water more wisely, valorize waste, and forge new public-private partnerships. What remains is to connect these islands of innovation into a coherent, region-wide movement for change.

This section explores the strategic domains through which such transformation can take shape—moving from the field to the policy arena, from technology to culture, linking practical solutions with long-term vision.

Throughout, it applies the food-water-energy-climate-culture nexus as a guiding lens, recognizing that sustainable agrifood systems are the cornerstone of both environmental stewardship and regional cooperation. The discussion that follows examines these domains in depth, spanning sustainable production, technological innovation, policy and financial mechanisms, and the social and cultural dimensions that together define a resilient and inclusive agrifood future for the MENA region.

6.1 Sustainable and Regenerative Agriculture

Agriculture remains the backbone of food security in the Middle East and North Africa, yet it operates within one of the planet's most water-stressed and climate-exposed environments. More than 85 percent of the region's freshwater is already used for agriculture, while rising temperatures and soil salinity threaten both yields and livelihoods (FAO 2025; World Bank 2023). Transforming this sector is therefore central to any credible regional strategy: sustainable agriculture is where resilience begins.

BUILDING RESOURCE-EFFICIENT SYSTEMS

The future of MENA agriculture depends on doing more with less. Less water, less energy, and less waste. Across the region, innovative examples demonstrate that this is possible. In Egypt's Nile Delta, integrated drip-irrigation systems supported by digital sensors have reduced water use by up to 30 percent while maintaining yields (ICARDA 2025). In Israel, the reuse of treated wastewater for irrigation, covering over 85 percent of agricultural land, has become a model for circular water management. In the Gulf, solar-powered desalination and vertical farms in the UAE and Saudi Arabia are showing how renewable energy can close the loop between water and food production.

Yet adoption of such technologies remains uneven. Smallholders often lack access to finance or the technical capacity to deploy advanced systems. While public programs and development partners can play a catalytic role, long-term transformation must be economically self-sustaining. Governments should therefore focus on creating enabling conditions, such as risk-sharing guarantees, affordable credit lines, and transparent water-pricing policies, that make efficiency pay for itself (World Bank, 2023). Blended-finance models and cooperative ownership schemes can lower initial barriers, but the goal must be a system in which farmers invest because it improves their profitability and resilience, not because of perpetual subsidy.

6.2 Technology and Innovation as Enablers

Technology is one of the most powerful levers for transforming agrifood systems across the Middle East and North Africa. Yet technology alone is not transformation. Innovation becomes transformative only when it is accessible, adapted to local realities, and embedded within a wider ecosystem that aligns incentives, governance, and markets. The MENA region already possesses a vibrant base of scientific institutions, entrepreneurs, and start-ups; the challenge lies in connecting these assets into a cohesive innovation architecture that delivers impact at scale.



HARNESSING DIGITAL TRANSFORMATION

Digital agriculture is reshaping how farmers manage land, water, and inputs. Precision tools, ranging from soil sensors and satellite imagery to mobile-based advisory platforms, enable smarter decisions that optimize both resources and yields. In Morocco, the AgriEdge platform uses satellite analytics and AI to guide irrigation scheduling and fertilizer use, helping farmers cut water consumption by up to 25 percent. In Egypt, mobile-based irrigation alerts developed under the T2NZ initiative allow farmers to adjust watering cycles in real time, saving energy and fuel costs.

These successes highlight a broader truth: innovation succeeds where enabling infrastructure exists. Many smallholders across the region still lack affordable broadband, data access, or digital literacy. Bridging this divide requires coordinated investment in connectivity and in human capital. Tunisia's Digital Agriculture 2030 program, which merges public extension services with telecom-based advisory tools, offers an example of how technology and education can move together to close gaps between rural and urban innovation capacity (FAO, 2023)

INTEGRATING THE WATER-ENERGY-FOOD NEXUS WITH TECHNOLOGY

Because agriculture in MENA is both energy-intensive and water-dependent, technological progress must serve both goals at once. New systems are demonstrating that resource efficiency can go hand-in-hand with productivity. In Jordan's Mafrq region, agro-voltaic greenhouses now generate solar power while shielding crops from extreme heat, cutting irrigation demand by roughly 20 percent. The UAE's Food Tech Valley brings vertical farming, solar-powered cooling, and renewable-energy logistics together to prove that food can be produced sustainably even in arid conditions.

Such integrated systems are still exceptions rather than the rule. High upfront costs and fragmented regulations slow adoption, while energy subsidies often obscure the true value of efficiency. Policy reform and blended-finance mechanisms, green procurement standards, concessional loans, and cooperative ownership models, can align incentives so that sustainable energy and water management become profitable choices rather than relying only on philanthropic ones (RCREEE, 2022).

BIOTECHNOLOGY AND CLIMATE-RESILIENCE CROPS

As temperatures rise and rainfall patterns shift, biotechnology and genetic innovation offer one of the most powerful tools for adaptation across the MENA region. From the Nile Delta to the Maghreb, research centers are developing crop varieties able to thrive in increasingly arid, saline, and heat-stressed environments. Egypt's Agricultural Research Centre and ICARDA have produced heat-tolerant wheat that maintains yields above 40 °C, while Morocco's National Institute for Agronomic Research is advancing salt-resilient barley suited to coastal soils. These examples demonstrate the value of locally tailored science, yet they also expose the fragmentation that limits regional progress.

Most MENA countries still operate under isolated research mandates and uneven biosafety frameworks, which restrict data sharing, private-sector participation, and technology transfer. A coordinated regional approach is needed to turn these

national efforts into shared resilience. Establishing common biosafety standards, regional seed and germplasm repositories, and cross-border research programs would allow scientists, investors, and policymakers to pool knowledge while safeguarding transparency and food safety. The success of ICARDA's dryland breeding programs shows how collaboration across borders can reduce duplication and accelerate adaptation (CGIAR, 2023). With clear governance and open communication, biotechnology can become a unifying regional asset: enhancing food sovereignty, supporting smallholder adaptation, and positioning MENA as a global hub for climate-smart crop innovation.



EXPANDING PROTEIN INNOVATION AND NEW VALUE CHAINS

Protein diversification illustrates how technological innovation can open new markets while easing environmental pressure. The Saudi Arabia and UAE Food Innovation Ecosystems are investing in precision-fermentation and cultivated-meat facilities to meet rising regional demand for protein without expanding livestock herds or imports for other regions. Using local crops: chickpeas, lentils, and fava beans, as raw materials for complementary proteins links these emerging industries directly to regional agriculture, ensuring that value creation benefits domestic farmers as well as consumers (Singh, 2025).

However, for this sector to move beyond experimentation toward commercial viability, regulatory harmonization and the right research infrastructure are essential. Currently, each country follows its own food-safety and novel-food approval processes, creating uncertainty for investors and slowing innovation. Establishing a regional regulatory framework for novel food, coordinated among food-safety authorities, standards bodies, and scientific institutions, would provide clarity on safety, labeling, and trade. Such alignment would allow companies to test and scale innovations across borders, expanding the market base and attracting global capital.

At the same time, scaling these technologies demands purpose-built R&D and scale-up infrastructure, pilot bioreactors, fermentation facilities, and shared laboratories where start-ups and research teams can collaborate cost-effectively.

Regional innovation hubs and university partnerships could serve this role, pooling resources to lower entry barriers and accelerate commercialization. Together, harmonized regulation and shared infrastructure would transform today's fragmented initiatives into a coordinated regional industry capable of supplying sustainable proteins to local communities and export markets alike.



BUILDING THE DATA AND INFRASTRUCTURE BACKBONE

No technology can flourish without the physical and digital infrastructure that supports it. Reliable broadband, resilient power systems, and interoperable data platforms remain uneven across MENA, constraining the reach of precision farming, climate-information services, and supply-chain traceability. The absence of standardized data protocols for soil quality, water use, and climate variables limits regional collaboration and evidence-based policymaking.

A Regional Agrifood Data Framework, underpinned by shared metadata standards and open-source repositories, would allow countries to exchange information securely and plan investments more effectively. Comparable initiatives, such as Africa's Digital Agriculture Platforms, show how harmonized data governance accelerates innovation and trade. Governments can act as catalysts by aligning national digital-agriculture strategies with regional standards, mandating open-data policies for publicly funded research, and incentivizing private companies to contribute anonymized datasets.

FROM INNOVATION PILOTS TO SYSTEMIC CHANGE

Across the region, hundreds of pilot projects showcase ingenuity yet seldom scale beyond their initial funding cycles. To move from experimentation to transformation, innovation must become an ordinary feature of agrifood systems, anchored in markets, supported by infrastructure, and reinforced by policy coherence. Governments should focus less on subsidizing equipment and more on rewarding performance: resource efficiency, climate adaptation, and productivity gains.

Morocco's Green Generation 2020–2030 illustrates this shift. By combining digital extension platforms with private investment and state-backed guarantees, the program has expanded technology adoption while reducing reliance on permanent subsidies (World Bank, 2023). Similar approaches, linking blended finance with measurable outcomes, can make innovation economically self-sustaining.

Finally, innovation policy must be embedded within education and culture. Integrating sustainability, digital literacy, and entrepreneurship into agricultural curricula will ensure that tomorrow's farmers and engineers treat innovation not as external aid but as a natural part of how the region feeds itself and thrives. Equally important is to map the regional innovation landscape, identifying the comparative strengths of each MENA country, from research excellence and industrial capabilities to financing ecosystems and local know-how. Such mapping would enable targeted capacity building and technology transfer, allowing countries to specialize where they are strongest while collectively covering the entire agrifood innovation chain. This coordinated approach would make regional collaboration not only aspirational but also operational, an ecosystem where knowledge, investment, and impact flow in every direction.

6.3 Governance and Policy Alignment

Transforming the MENA region's agrifood systems will depend as much on governance as on technology. The region's technical capacity is advancing rapidly, yet progress remains uneven because policies, mandates, and investments are often fragmented across ministries, sectors, and borders. Achieving scale therefore requires a new governance architecture, one that unites agriculture, water, energy, trade, and climate policy under a coherent and data-driven vision.

FROM FRAGMENTATION TO COHERENCE

In most countries, responsibilities for food security, water management, and energy supply fall under separate authorities. This institutional siloing limits the ability to design coordinated responses to systemic challenges such as drought or input volatility. Effective transformation begins with whole-of-government approaches, where cross-ministerial task forces set joint targets and share data. Examples are emerging: Jordan's National Water–Energy–Food Security Committee integrates planning across ministries, while Morocco's Green Generation 2020–2030 Program aligns agricultural productivity with climate and education policy. These initiatives show that policy coherence enhances resource efficiency, investor confidence, and public trust (FAO 2023). Still, most MENA countries lack a formal mechanism to connect national priorities with regional objectives. Without coordination, strategies risk duplication, conflicting regulations, and inefficient use of scarce public funds.

TOWARDS A REGIONAL R&D AND INNOVATION FRAMEWORK

To overcome these gaps, MENA needs a Regional R&D Framework that coordinates research priorities, funding, and knowledge sharing across borders. Such a framework would link universities, public research institutes, industry, innovation authorities, and private actors in a single collaborative ecosystem. Modelled conceptually on elements of the EU Horizon Europe Framework, the regional platform would:

- Define shared thematic priorities: climate-smart agriculture, circular water management, digital infrastructure, and sustainable protein value chains, based on the sustainable development and regional challenges rather than national silos.
- Launch competitive, co-funded calls for proposals open to multidisciplinary and cross-border consortia, ensuring that knowledge flows where it is most needed.
- Create shared research infrastructures: testing facilities, pilot plants, open-data platforms—that serve multiple countries and reduce duplication of costly investments.
- Promote capacity building by mapping regional strengths and designing training programs aligned with each country's comparative advantage, allowing specialization while ensuring regional balance.

Such a framework would not only attract global partners and investors but also anchor ownership within the region itself. By coordinating funding decisions and research agendas, it would enable the MENA region to shape its own innovation pathway and become less dependent on fragmented donor programs and more driven by common purpose.

ESTABLISHING A REGIONAL INNOVATION AUTHORITY

To implement the R&D framework, governments could jointly establish or mandate a Regional Innovation and Technology Authority, or alternatively, create a network linking existing national innovation agencies. The authority's role would be dual: managing competitive R&D programs and steering innovation policy and critical infrastructure investments. Its responsibilities could include:

- Administering regional R&D funds, ensuring transparent selection and performance-based allocation;
- Coordinating standards for data interoperability, intellectual-property protection, and technology transfer;
- Guiding investment in strategic infrastructure—digital backbones, testing laboratories, cold-chain logistics, and renewable-energy integration;
- Monitoring progress through shared indicators and open dashboards, ensuring accountability across public and private actors.

Several countries already offer partial models. The UAE's Advanced Technology Research Council and Saudi Arabia's Research, Development and Innovation Authority have begun linking research priorities with national industrial strategies. Scaling this concept to a regional level could create an integrated policy and funding ecosystem, where evidence from R&D directly informs trade, sustainability, and food-security planning.

HARMONIZING POLICY AND REGULATION

Governance also requires harmonization of standards to create efficient regional markets. Today, differences in food-safety rules, sustainability certification, and data-privacy legislation create barriers to trade and collaboration. Establishing mutual-recognition agreements and shared sustainability metrics, for example, on carbon and water footprints or regenerative-agriculture benchmarks, would reduce transaction costs and enhance trust among partners.

The same logic applies to digital-data governance. Implementing the Regional Agrifood Data Framework proposed earlier will require common metadata standards and legal protocols for secure data exchange. Harmonization does not mean uniformity: countries can retain sovereignty while agreeing on minimal interoperability rules, enabling both innovation and protection of national interests (European Commission 2024).



EVIDENCE-BASED AND INCLUSIVE POLICYMAKING

Effective governance must rest on evidence and inclusion. Policies built on reliable data and stakeholder participation are more resilient and legitimate. Establishing a Regional Agrifood Policy Observatory could help compile and analyze cross-country indicators on productivity, water use, emissions, and nutrition outcomes, providing decision-makers with actionable insights.

At the same time, incorporating farmers' organizations, women's associations, academia, and private industry into policy dialogues ensures that reforms reflect on-the-ground realities. Participatory approaches, as seen in Tunisia's consultative agricultural strategy reviews, have proven that inclusive processes build ownership and accelerate adoption of new policies.

FINANCING AND ACCOUNTABILITY

Governance reform is inseparable from financing reform. Regional and national financing mechanisms should reward performance, not only compliance. Aligning agricultural subsidies and concessional loans with sustainability outcomes can redirect billions of dollars toward regenerative practices and innovation uptake. Regional climate-finance facilities, supported by development banks and sovereign funds, could adopt standardized ESG metrics, enabling investors to compare projects transparently and scale what works (World Bank 2023).



INSTITUTIONAL COORDINATION FOR THE FUTURE

A sustainable governance model ultimately requires an institutional home. A MENA Agrifood Policy and Innovation Council could convene ministers, innovation authorities, research leaders, and private-sector representatives to review progress, align priorities, and coordinate financing. Meeting annually and supported by a permanent secretariat, the council would maintain policy coherence, disseminate best practices, and oversee the Regional R&D Framework's implementation.

By embedding innovation governance within formal institutions, the region can move from project-based collaboration to long-term cooperation grounded in shared accountability.

6.4 Economic and Financial Mechanisms

The transformation of agrifood systems in MENA will depend not only on policy reform and technological innovation, but on how effectively capital is mobilized, structured, and directed. For decades, the region has relied heavily on public subsidies and donor programs to maintain food security. While these mechanisms have provided stability, they have also discouraged efficiency, limited innovation, and constrained long-term asset formation.

The next phase requires a structural shift: from subsidy to investment, from fragmented aid to coordinated capital ecosystems, and from short-term stabilization to long-term resilience. Capital must accelerate regeneration, inclusion, and productivity rather than reinforce dependency.

FROM PUBLIC SPENDING TO INVESTMENT ECOSYSTEM

Most agricultural budgets in the region still prioritize input subsidies and price supports over long-term resilience. Redirecting even a modest share of these expenditures toward risk-sharing instruments, blended-finance vehicles, and catalytic guarantees could unlock substantial private investment.

Public capital should evolve from direct subsidization toward strategic de-risking. Governments can absorb early-stage risk, provide guarantees, co-invest alongside private actors, and link incentives to verified improvements in water efficiency, soil health, emissions reduction, and rural employment.

Egypt's Nexus of Water, Food and Energy (NWFE) initiative demonstrates the potential of integrated frameworks. By aligning climate finance, renewable-energy investment, and development finance under a unified structure, it has attracted multi-billion-dollar commitments from regional and international partners (World Bank 2023). Similar frameworks, adapted to national contexts, could help countries transition from fragmented donor programs to coordinated investment platforms.

AGRIFOOD AS STRATEGIC INFRASTRUCTURE WITHIN THE FOOD-WATER-ENERGY NEXUS

A deeper transformation requires reframing agrifood systems not merely as policy domains, but as essential regional infrastructure.

Water-efficient irrigation systems, climate-resilient processing facilities, cold-chain logistics, storage hubs, renewable-powered desalination for agriculture, controlled-environment agriculture, and digital supply-chain platforms operate within structurally non-discretionary demand environments. Food, water, and energy are foundational economic services with persistent local demand. These characteristics provide inflation-resilient revenue dynamics and defensive demand profiles attractive to long-term capital.

When supported by structured procurement agreements, cooperative aggregation mechanisms, service contracts, or long-term offtake arrangements, many of these assets can generate visible and durable cash flows. Properly structured, they exhibit infrastructure-like characteristics compatible with long-duration investment horizons. To attract institutional capital at scale, financing must be anchored in cash-flow visibility, contractual enforceability, collateral security, and asset-level underwriting discipline.

Reframing selected agrifood segments in this way enables a transition from short-cycle funding models toward long-term capital aligned with institutional balance sheets and long-duration liability structures.

MOBILIZING STRUCTURED PRIVATE CREDIT AND BLENDED CAPITAL

The principal barrier to private participation in MENA agrifood systems is not capital scarcity, but insufficient structuring of risk.

Climate exposure, commodity price volatility, regulatory uncertainty, and counterparty risk can be segmented and priced when approached through disciplined underwriting and layered capital participation. Clear differentiation of risk layers allows capital to be matched precisely to investor mandate, duration, and return profile, strengthening participation without diluting credit standards. Structured private credit, embedded within a broader blended-finance architecture, can provide long-term financing for infrastructure-grade agrifood assets while preserving public-interest safeguards. Robust legal documentation, enforceable security frameworks, and standardized covenant structures are essential to sustaining institutional participation. Such structures must prioritize capital preservation, downside protection, and covenant discipline in order to align with institutional fixed-income mandates.

A regional approach could combine:

- Senior secured financing aligned with institutional risk mandates
- Subordinated or mezzanine capital absorbing defined commercial risks
- Catalytic or first-loss capital from public or philanthropic sources
- Risk-sharing facilities supported by multilateral development bank

In this framework, sustainability performance becomes integral to credit quality. Water-use efficiency, climate adaptation, renewable-energy integration, and operational resilience directly influence asset durability and long-term repayment capacity.

Such structuring allows capital to be matched precisely to investor mandates while maintaining transparency, accountability, and developmental objectives.

ALIGNING FINANCE WITH SUSTAINABILITY OUTCOMES

Finance that does not measure impact cannot drive transformation.

Establishing green taxonomies and ESG frameworks tailored to agrifood systems would help investors distinguish projects that genuinely contribute to sustainability. Green-bond programs in countries such as Jordan and Egypt demonstrate how transparent criteria can attract global impact capital.

Expanding these tools to agriculture, supported by regional sustainability metrics for water efficiency, soil health, emissions reduction, and job creation, would create accountability and comparability across markets.

Aligning agricultural credit systems, insurance products, guarantees, and subsidies with these frameworks ensures that public and private finance reinforce the same resilience objectives.

EMPOWERING SMALLHOLDERS AND SMEs

Smallholders and agrifood SMEs form the backbone of regional food systems yet face the greatest financing constraints. Most operate outside formal banking networks and lack collateral or formal credit histories.

An inclusive financial transition requires:

- Digital-credit platforms linked to farm-level performance data
- Cooperative lending and aggregation models
- Micro-insurance products tied to climate risk
- Preferential rates for verified adoption of water-efficient or renewable technologies

Regulatory innovation can unlock capital flows. Tunisia's Start-Up Act illustrates how simplified registration and targeted incentives can attract venture capital to early-stage enterprises.

Integrating smallholders and SMEs into climate-finance programs through cooperatives, group certification schemes, and value-chain contracts ensures that transformation occurs at the base of the pyramid, not only among large agribusinesses.

REGIONAL COOPERATION AND FINANCIAL GOVERNANCE

Financial fragmentation mirrors policy fragmentation. A MENA Agrifood Finance Platform, convened by finance ministries, development banks, sovereign funds, and innovation authorities, could serve not only as a coordination mechanism but as a regional structuring and origination hub, aggregating transactions, standardizing risk assessment methodologies, and facilitating disciplined cross-border capital deployment.

Such a platform could:

- Develop a regional repository of bankable projects
- Harmonize risk-assessment methodologies
- Align financing criteria with shared sustainability indicators
- Provide training in impact measurement and sustainable-finance structuring

Institutional capital requires institutional governance insulated from political allocation pressures. Any regional credit mechanism must operate with professional asset management, independent investment oversight, fiduciary discipline, and a clear separation between policy dialogue and capital allocation decisions.

Embedding financial literacy, impact measurement, and sustainable-finance expertise into university and vocational curricula would further strengthen the human capital required to manage complex blended instruments.

FROM CAPITAL TO COMMITMENT

Financing the transition is not about raising more money, but about structuring existing resources more intelligently.

By reframing agrifood as strategic infrastructure, aligning finance with measurable sustainability outcomes, empowering smallholders and SMEs, and coordinating regional capital flows through shared frameworks, the MENA region can transform investment from a short-term stabilization tool into a long-term engine of resilience.

In this model, governments enable, capital is structured with discipline, institutions govern transparently, and communities participate productively creating a virtuous cycle where sustainability and profitability reinforce one another, securing food and economic stability for the region's future.



6.5 Social and Cultural Transformation

Transforming agrifood systems in the MENA region is not only a technical or economic challenge, it is a social one. Food systems are human systems: they reflect how communities share resources, organize livelihoods, and express identity through food and culture. Without inclusive participation, education, and social trust, even the most advanced technologies or financial instruments will fall short. True transformation must therefore start with people, how they produce, consume, and connect through food.

EMPOWERING YOUTH AND WOMEN

Women and young people are the region's greatest untapped assets. Women make up nearly half of the agricultural workforce yet remain under-represented in leadership, land ownership, and access to finance. Youth, meanwhile, face high unemployment despite bringing digital fluency and entrepreneurial potential to the sector. Empowering both groups is an economic strategy. Studies show that equal access to resources for women could raise agricultural output in developing regions by up to 4 percent (FAO 2023).

Inclusive policy reforms should therefore guarantee women's rights to land and credit, expand access to vocational training, and mainstream gender-responsive budgeting across agricultural and innovation programs. Youth-focused incubators, such as digital-agriculture hubs emerging in Egypt and Morocco, show how targeted support can convert frustration into opportunity. By recognizing women and youth as innovators rather than beneficiaries, MENA can unlock a generation of local change-makers equipped to lead the transition toward sustainable food systems.

BUILDING HUMAN CAPITAL FOR RESILIENCE

The knowledge and skills that sustained traditional farming are no longer sufficient in the face of climate stress, market volatility, and technological disruption. Resilience today depends on a new kind of human capital, one that combines scientific literacy, digital proficiency, and ecological understanding.

Integrating sustainability and agri-technology into school curricula, universities, and vocational programs will create a pipeline of professionals who can manage the complex food-water-energy nexus. Partnerships between ministries of education, innovation authorities, and private industry can ensure training reflects real-world needs. Regional exchange programs, linking students, entrepreneurs, and researchers across countries, could further accelerate peer learning and cross-border collaboration.

Education, however, extends beyond formal institutions. Farmer-to-farmer networks, digital learning platforms, and community demonstration sites can bring innovation to those outside academic settings. When farmers see neighbors profit from regenerative practices or efficient irrigation, knowledge spreads faster than any policy directive.

REVIVING FOOD CULTURE AND UNLOCKING OPPORTUNITY

Food is not only nourishment but also identity, and in the MENA region, it is one of the world's most powerful cultural assets. The region's cuisine: rich in grains, legumes, olive oil, spices, and communal traditions, embodies centuries of adaptation to drylands and resource constraints. These same traits that made it resilient in the past can now define its role in a climate-conscious future.

Reviving and rebranding MENA's food heritage is both a sustainability and an economic opportunity. Global demand for Mediterranean and Middle Eastern foods: from hummus and freekeh to dates, couscous, and spice blends, is growing rapidly. When marketed as climate-smart, traceable, and locally sourced, these products can position the region as a leader in "climate culture", where taste, heritage, and sustainability reinforce one another. Dubai's emergence as a global gourmet and innovation hub, turning simple products such as "Dubai Chocolate" into international brands, demonstrates the power of combining cultural storytelling with modern entrepreneurship.

Yet in pursuing global markets, the region must also protect its identity. The rapid westernization of diets, characterized by ultra-processed foods, imported ingredients, and homogenized taste, has led to rising health burdens and environmental costs. The MENA region has the chance to chart a different course: one that honors local flavors, biodiversity, and traditional preparation methods as part of a sustainable future. Maintaining and celebrating local and regional food cultures is not resistance to modernization, it is smart resilience, blending innovation with authenticity.

Shifting consumption patterns toward local and sustainable diets can simultaneously reduce emissions, generate export value, and strengthen cultural pride. Public procurement policies, such as farm-to-school programs or "Made in MENA" labeling, can amplify these efforts. Culinary diplomacy, regional food festivals, and creative industries that celebrate sustainable regional cuisine could transform MENA's food systems into a global showcase of climate-conscious prosperity.

STRENGTHENING SOCIAL COHESION AND LOCAL GOVERNANCE

Social transformation also means restoring trust between citizens, institutions, and markets. Local cooperatives, producer organizations, and community-supported agriculture models can help farmers negotiate better prices, share resources, and adopt sustainable practices collectively. These structures are particularly vital for smallholders, who individually have limited bargaining power but collectively represent the backbone of regional food security.

Inclusive governance, where civil-society groups, women's associations, and private companies participate in decision-making, can increase accountability and ensure that policy reflects local realities.

CULTURAL RENEWAL AS A DRIVER OF REGIONAL RESILIENCE

The cultural fabric of MENA is diverse yet deeply interconnected. Shared cuisines, trade routes, and traditions of hospitality can be powerful foundations for regional cooperation and creative economy growth. Food, art, and storytelling are vehicles not only of identity but also of diplomacy, tools that can humanize collaboration in a region too often defined by its divisions.

By aligning cultural pride with sustainability values, the region can turn its creative sectors, culinary arts, design, tourism, and media, into amplifiers of climate action and inclusive growth. Regional collaboration in gastronomy, creative entrepreneurship, and sustainable tourism can strengthen both local economies and shared identity. This cultural renewal is ultimately an investment in soft power: presenting MENA to the world not as a region of scarcity, but as a region of creativity, resilience, and abundance. Rooted in authenticity yet open to innovation, it can transform cultural exchange into a strategic driver of peace, prosperity, and climate-conscious development.

6.6 From Vision to Implementation: A Call for Collective Action

The transformation of agrifood systems in the Middle East and North Africa can no longer remain a vision, it must become a regional commitment. The science is clear, the technologies exist, and the resources are within reach. What is needed now is coordination, courage, and collective purpose.

This chapter outlined the building blocks of a new food future: regenerative agriculture, innovation and infrastructure, coherent governance, smart finance, and social inclusion. Together they form a foundation for a resilient and self-sustaining regional food system. But frameworks alone will not feed people or restore ecosystems. Implementation requires aligning political will, public investment, and private initiative around a shared direction.

Resilience

must guide every decision. Climate shocks, market volatility, and geopolitical instability will continue to test the region's capacity to adapt. Policies and investments must therefore anticipate risk rather than react to crisis, through early-warning systems, diversified value chains, and regional reserves that protect the most vulnerable.

Circularity

offers the means to regenerate rather than deplete. Water reuse, waste valorization, renewable energy, and nutrient recycling should move from pilot projects to standard practice, supported by regulations and incentives that reward efficiency and restoration.

Inclusion

is the measure of legitimacy. Transformation will only succeed if women, youth, and smallholders see tangible benefits and participate in shaping change. Empowering them through access to land, finance, and knowledge is not charity, it is the foundation of productivity and social stability.

Innovation

is the engine of scale. Regional collaboration on research, data, and technology must turn discovery into deployment. Building digital and scientific infrastructure, harmonizing standards, and protecting intellectual property will make innovation both locally relevant and globally competitive.

Cooperation

is the glue that holds the system together. Food security is a shared regional interest that transcends politics. Cross-border research programs, trade corridors for sustainable products, and coordinated climate adaptation plans can transform fragmentation into strength.

A REGIONAL MOMENT OF CHOICE

The MENA region stands at a pivotal moment. Climate stress and economic uncertainty pose real risks, yet they also create unprecedented opportunity. With its strategic geography, youthful population, financial capacity, and cultural wealth, the region can position itself as a global hub for climate-smart agriculture, sustainable cuisine, and green innovation.

This transition will not be achieved through isolated national efforts or temporary donor projects. It requires sustained political leadership, transparent governance, and the engagement of farmers, businesses, researchers, and citizens working toward common goals.

Every country can act now: align agricultural incentives with sustainability outcomes, integrate climate metrics into investment decisions, and invest in human capital that bridges tradition and technology. Every city can reduce waste, celebrate local food culture, and connect consumers to regional producers. Every household can make choices that honor both heritage and planet.

The future of food in the Middle East and North Africa will be determined not by scarcity, but by solidarity. Acting together, with urgency and conviction, the region can transform its food systems into engines of stability, dignity, and shared prosperity.

7

Conclusion

The transformation of agrifood systems in MENA is no longer a policy option, it is an imperative of survival and opportunity. The region stands at the frontline of climate change, resource scarcity, and demographic pressure. Yet it also holds extraordinary potential: a rich cultural heritage, vast renewable resources, a young and innovative population, and growing financial and technological capacity. The question is no longer whether to transform, but how fast and how far the region is willing to go.



THE CHALLENGE AND OPPORTUNITY

The challenges are well documented. Agriculture consumes up to 89 percent of freshwater in some countries. Climate change is accelerating at nearly twice the global average, with heatwaves and droughts threatening productivity and livelihoods. Over 66 million people across the region face food insecurity, while diets are becoming increasingly dependent on imported and ultra-processed foods. The MENA region imports over half of its calories, leaving it vulnerable to market volatility and geopolitical disruptions.

However, these challenges also create opportunity. The region's constraints: water scarcity, heat, and fragile ecosystems, make it an ideal testbed for the world's most advanced sustainable technologies. Every challenge in MENA's food system can become a driver of innovation: turning scarcity into efficiency, tradition into competitive advantage, and regional cooperation into global leadership.

REFRAMING THE PATH FORWARD

Transforming agrifood systems requires more than new crops or technologies, it demands new thinking. The integrated vision presented in this paper calls for coordinated action across five interconnected domains:

1. Regenerative agriculture that restores soils and biodiversity while increasing productivity.
2. Innovation and infrastructure that connect data, research, and technology to real-world impact.
3. Governance and policy alignment that replace fragmentation with coherence and accountability.
4. Smart finance that mobilizes capital toward sustainability rather than subsidy.
5. Social and cultural renewal that empowers people and reclaims regional food identity.

These domains converge on five guiding principles: resilience, circularity, inclusion, innovation, and cooperation. Together, they form a framework for implementation, one that integrates scientific evidence, human values, and economic pragmatism.



IMMEDIATE PRIORITIES FOR COLLECTIVE ACTION

To move from vision to impact, regional stakeholders should focus on a set of near-term priorities:

- 1 ● Reorient public policy toward sustainability by embedding food, water, and climate targets into national strategies and budgetary frameworks.
- 2 ● Establish a Regional R&D and Innovation Framework that links universities, innovation authorities, and private sector partners to accelerate joint research and technology transfer.
- 3 ● Create blended-finance mechanisms and green taxonomies that align investment with measurable environmental and social outcomes.
- 4 ● Empower smallholders, SMEs, women, and youth through targeted access to land, finance, training, and markets.
- 5 ● Strengthen regional data interoperability and knowledge sharing, ensuring that evidence and insight guide every policy and investment decision.
- 6 ● Celebrate and protect regional food cultures, leveraging culinary heritage and creative industries as engines of climate-friendly growth and soft power.

THE VISION OF A SHARED FUTURE

The vision for a sustainable food future in MENA is one of self-sufficiency through collaboration. It is a region where:

Water is managed as a shared asset, reused efficiently, and governed equitably.

Agriculture is climate-smart and regenerative, powered by clean energy and circular systems.

Agrifood systems are inclusive, offering dignified livelihoods and innovation opportunities for women and youth.

Regional cooperation turns borders into bridges: sharing data, markets, and resilience strategies.

Cultural identity and creativity power global recognition of MENA cuisine as both delicious and sustainable.

A CALL TO COURAGE AND COORDINATION

The transformation of food systems in the MENA region is not only possible, it is already underway. Across the region, farmers are adopting water-saving technologies, entrepreneurs are building agritech ventures, and communities are rediscovering the value of local, healthy foods. What remains is to connect these efforts, scale them, and sustain them.

Governments must lead with vision and coordination, aligning agricultural, water, and climate agendas. The private sector must invest not only for profit but for long-term resilience. Civil society must advocate for inclusion, transparency, and accountability. And international partners must support regionally owned strategies rather than fragmented projects.

This is the moment for shared resolve. The region's future will be defined not by the limits of its environment but by the depth of its collaboration. By acting together, guided by evidence, equity, and creativity, the MENA region can transform its food systems into a model of sustainable prosperity for the world.

FINAL NOTES

A central insight emerging from this white paper, and from the regional dialogues that informed it, is that the transformation of MENA's agrifood systems begins with the transformation of knowledge. Across the region, fragmented and outdated data continue to hinder coordinated policymaking. Without reliable, harmonized, and region-specific information, even the best-intentioned strategies risk misalignment.

Building a regional data center, integrating food, water, energy, and climate systems, is therefore not a technical detail but a strategic imperative. Such a platform would allow governments, researchers, and investors to align priorities, monitor impact, and make decisions grounded in evidence generated from the region, for the region.

This white paper represents the culmination of a collaborative, iterative process. A preliminary draft was presented at a regional workshop on food and water security, where leading agrifood and water experts from across the MENA region reviewed its findings, challenged assumptions, and contributed valuable recommendations. Their feedback was carefully incorporated into this final version, ensuring that it reflects the collective intelligence, priorities, and realities of the region rather than any single perspective.

These exchanges reinforced a common conviction: data, cooperation, and trust are the foundation of stability and prosperity in MENA. Anchoring food, water, and climate as permanent platforms for cooperation will allow the region to transform its vulnerabilities into shared strengths. Through collective investment in data, innovation, and trust, the MENA region can turn its agrifood systems into instruments of resilience, integration, and long-term peace.





MENA2050

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INSTITUTIONAL DATABANKS

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KEYWORDS

Core Keywords: agrifood systems, agriculture, sustainability, climate change, food security, nutrition, water scarcity, land degradation, resilience, innovation, governance, socio-economic disparities, food availability, dietary patterns, economic development, regional collaboration.

Technical and Thematic Keywords: Water-efficient irrigation, regenerative farming, soil conservation, precision agriculture, digital farming, biotechnology, complementary proteins, public-private partnerships (PPPs), microfinance, climate finance, greenbonds, supply chains, agroforestry, intercropping, crop rotation, traditional farming practices.

Cultural and Social Keywords: Culinary heritage, medicinal plants, local food products, community-based approaches, participatory planning, gender equality, inclusion and diversity, cultural preservation, heritage tourism, wine production, food festivals. Regional and Global Keywords: MENA region, Middle East and North Africa, EU Green Deal, Horizon Europe, LIFE Programme, PRIMA (Partnership for Research and Innovation in the Mediterranean Area), Union for the Mediterranean (UfM), USAID, Islamic Development Bank, World Bank, Green Climate Fund (GCF), Adaptation Fund, Sustainable Development Goals (SDGs), Arab Agricultural Revolution, trade routes.

Analytical and Process-Oriented Keywords: Stakeholder engagement, monitoring and evaluation, logical frameworks, policy reforms, regional integration, knowledge sharing, climate adaptation, innovation ecosystems, economic and financial mechanisms, pathways to sustainability.



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FOOD SYSTEMS COMMITTEE

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