

TRADE WINDS *AND TIDES*

RESPONDING TO CLIMATE CHALLENGES THROUGH
ENHANCED FOOD ACCESSIBILITY IN THE ARAB
MEDITERRANEAN



Lebanese Citizen Foundation

The Lebanese Citizen Foundation (LCF) stands as a pivotal nonprofit organization committed to fostering a transformative change in Lebanon. Amid the lack of a comprehensive development model and an existing existential crisis, LCF's mandate revolves around promoting efficient and relevant public policy options that address the fundamental needs of the nation's economy, labor market, public and private investment, infrastructure, and social safety nets. With the economy in a free-fall and citizens in despair, LCF takes on the duty to provide hope through clear policy directions and rigorous mobilization towards their implementation.

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To advance this mission, the program works on:

- **Facilitating regional dialogue and cross-national coordination and cooperation on concepts and measures concerning energy and resource security as well as climate change**
- **Promoting political framework conditions and reforms to ensure resource security, stability and peace in the MENA region in the context of climate change and energy transition**
- **Supporting the development and implementation of strategies to prevent and to adapt to the (ecological, economic, social and security) consequences of climate change.**

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Acronyms & Abbreviations

ABBREVIATION	DEFINITION
4FF	Four Freedoms Framework
AADO	Arab Agricultural Development Organization
AFCFTA	African Continental Free Trade Area
AFDB	Arab Fund for Economic and Social Development
AFESD	Arab Fund for Economic and Social Development
AMIS	Agricultural Market Information System
AOA	Agreement on Agriculture
ARABMED	Arab Mediterranean countries
AU	African Union
CFS	Committee on World Food Security
COMESA	Common Market for Eastern and Southern Africa
COP29	The 29th Conference of the Parties to the United Nations Framework Convention on Climate Change
CSI	Compounded Strategic Impact
DCFTA	Deep and Comprehensive Free Trade Agreements
DSM	Dispute Settlement Mechanism
ECA	Export Credit Agencies
ENP	European Neighborhood Policy
ESCWA	Economic and Social Commission for Western Asia
EU	European Union
EUROMED / EMP	Euro-Mediterranean Partnership
FAO	Food and Agriculture Organization
FAS	Foreign Agricultural Service
FDI	Foreign Direct Investment
FTA	Free Trade Agreements
GAFSP	Global Agriculture and Food Security Program
GAFTA	Greater Arab Free Trade Area

GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GFSC	Global Food Security Cluster
GFSI	Global Food Security Index
HS	Harmonized System
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IWRM	Integrated Water Resources Management
KII	Key Informant Interviews
MCA	Multi-Criteria Analysis
MDB	Multilateral development banks
MENA	Middle East and North Africa
MMT	Million Metric Tons
OEC	Observatory of Economic Complexity
OECD	Organization for Economic Co-operation and Development
ONICL	National Interprofessional Office of Cereals and Pulses
PAFTA	Pan Arab Free Trade Agreement
PPP	Public-Private Partnerships
SOE	State-Owned Enterprises
SWF	Sovereign Wealth Funds
UAE	United Arab Emirates
UFM	Union for the Mediterranean
UN	United Nations
WEFE	Water-Energy-Food-Nexus
WFP	World Food Program
WTO	World Trade Organization

Acknowledgments

As the Executive Director and lead author of this study, it is my privilege to present «**Trade Winds and Tides: Responding to Climate Challenges Through Enhanced Food Accessibility in the Arab Med.**» This work delves into the intricate challenges posed by climate change and its impact on food security, examining these issues through the unique lens of the Arab Med's socio-economic and cultural landscape.

On behalf of the Lebanese Citizen Foundation (LCF), I express our sincere gratitude to the individuals and organizations whose expertise and unwavering support were crucial in bringing this study to fruition. Their collaborative efforts have been essential in shaping its outcomes.

This work is the result of a strong partnership with the Konrad-Adenauer-Stiftung (KAS), whose consistent support and expertise played a pivotal role in its completion. Together, we have thoroughly examined the region's trade structures, climate impacts, and food security systems, united by our commitment to fostering resilience and prosperity in the Arab Med.

This research would not have been possible without the dedication and interdisciplinary expertise of our team, under the close coordination of senior policy expert **Eng. Rodolph Saadé**. Their unwavering efforts have ensured that the study is both comprehensive and methodologically robust. Special recognition is due to **Ms. Laure Duchamp**, whose meticulous research formed the backbone of this endeavor.

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- **Mr. Thomas Schellen**, Editor-at-Large of Executive Magazine.
- **Prof. Dr. Eckart Woertz**, Director of the GIGA Institute for Middle East Studies.

This study stands as a testament to the strength of collaborative expertise and a shared commitment to addressing the critical issues facing the Arab Med. The collective insights and unwavering support of all contributors have provided a solid foundation for this research and have enabled the formulation of policy recommendations aimed at fostering sustainable development, regional cooperation, and enhanced food security across the region.

Hamad Elias

Executive Director & Lead Author

Lebanese Citizen Foundation

Foreword

As Founder and President of the Lebanese Citizen Foundation (LCF), I am pleased to introduce this comprehensive study, «**Trade Winds and Tides: Responding to Climate Challenges Through Enhanced Food Accessibility in the Arab Med.**» This study explores the intricate relationships between climate change, trade policies, and food security, offering practical insights to inform the design of adaptive and resilient actions. By identifying vulnerabilities and proposing strategic recommendations, it aims to enhance food accessibility and strengthen economic cooperations in the region.

LCF is committed to conducting rigorous research and providing innovative solutions to address the challenges facing Lebanon and the broader Mediterranean. Our skilled team, extensive network of collaborators, and strong regional and international partnerships enable us to tackle these issues effectively. We ensure that our recommendations are relevant, actionable, and grounded in the principles of inclusivity, transparency, and evidence-based policy-making.

Our longstanding partnership with the Konrad Adenauer Foundation (KAS) Regional Program on Energy Security and Climate Change in the Middle East and North Africa (REMENA) has been pivotal to the success of this study. Since LCF's founding in 2021, KAS has been a steadfast partner, providing invaluable support in our efforts to promote sustainable development and regional cooperation. We extend our sincere thanks to Ms. Veronika Ertl, Director of KAS REMENA, and Mr. Hamza Saidi, Project Manager, for their continued collaboration, expertise, and shared commitment to this initiative.

By emphasizing collaboration and knowledge-sharing, this study aims to serve as a catalyst for dialogue among policymakers, civil society actors, and the broader community, ultimately guiding the region toward a more secure and sustainable future. I firmly believe that continued cooperation, dialogue, and collective action to implement this study's recommendations will play a crucial role in strengthening food accessibility and building climate resilience in the region.

On behalf of LCF, I extend my deepest gratitude to all those who have contributed their insights and expertise to this important endeavor.

Alain Bifani,

President

Lebanese Citizen Foundation

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Executive Summary

Throughout history, civilizations have risen and fallen by their ability to feed their populations—a fundamental measure of governance efficacy and societal resilience. Today, in an era of unprecedented climate volatility, geopolitical tensions, and market uncertainties, this ancient challenge has evolved into a complex strategic imperative. The Arab Mediterranean region—encompassing nine countries: Morocco, Algeria, Tunisia, Libya, Egypt, Jordan, Palestine, Lebanon, and Syria, with a combined population of 270 million inhabitants—exemplifies this evolving challenge through interconnected vulnerabilities that systematically undermine food security.

Economic fragility forms the foundation of regional food insecurity, manifesting through severe macroeconomic instabilities: Egypt's massive \$41.8 billion trade deficit constrains import capabilities, while Lebanon's staggering 86.9% hyperinflation erodes purchasing power, and Syria's minimal 0.1% growth paralyzes economic recovery. These economic weaknesses intersect with deep socio-economic disparities, evidenced by extreme poverty rates reaching 68.6% in Lebanon and 32.2% in Egypt. The region's divergent Global Food Security Index scores—ranging from Morocco's relative stability at 69.2 to Syria's critical 26.8—further illustrate the uneven distribution of food security challenges, exacerbated by demographic pressures, particularly in Palestine (2.9% growth) and Egypt (2.4% growth).

The region's food security is anchored in the UNESCO-recognized Mediterranean diet—a complex integration of nutritional, economic, and cultural elements. Based on strategic criteria of nutritional value, cultural significance, economic importance, and sustainability, key staples emerge as critical indicators of regional vulnerability: Egypt's annual wheat consumption of 20.6 million metric tons (providing 75% of low-income household calories), Tunisia's olive oil exports, and Morocco's citrus production illustrate the intricate relationship between dietary patterns and economic stability.

The Arab Mediterranean region's dietary patterns and dependencies face challenges across the four pillars of food security: availability, access, utilization, and stability. Insufficient domestic production hinders physical availability, with Egypt's wheat production of 8.87 million metric tons meeting less than half its 20.6 million metric ton consumption. Economic access is strained by inflation, supply chain disruptions, and market volatilities, affecting household affordability. Utilization struggles to maintain nutritional quality, as evident in Egypt where bread provides up to 75% of caloric intake for low-income households, limiting dietary diversity. Stability, dependent on consistent food access, is increasingly threatened by environmental and political pressures, with climate change emerging as a fundamental disruptor.

Historical climate events have significantly damaged the region's agricultural resilience. Since the 1980s, climate-related disasters have systematically eroded food production: Egypt's 1981 floods devastated farmlands, Morocco's 1984 drought severely impacted wheat production, Algeria's 2001 flash floods and Egypt's 2004 heatwave crippled crop yields, and Syria's ongoing drought since 2021 has triggered acute food shortages. These disruptions, causing agricultural losses of 2-3% GDP in countries like Morocco, have weakened the region's agricultural foundation. Future projections paint an alarming picture for regional food security. The Mediterranean is warming 20% faster than global averages, with temperatures projected to rise 3.5°C by mid-century. This threatens to disrupt agricultural systems: North African wheat yields could plummet by 50% by 2050, while water availability may decrease by 2-15% per 2°C rise. The Nile Delta, crucial for Egypt's food production, faces submersion from rising sea levels, endangering fertile land. Key Mediterranean crops face collapse without intervention—olive oil production is disrupted by heat stress, while water-intensive citrus cultivation becomes unsustainable. These compounding climate threats risk transforming current challenges into an unprecedented food security crisis, accelerating the region's dependency on volatile global markets.

To mitigate these risks, the Arab Mediterranean has established an intricate, multi-level trade architecture. Bilateral state-to-state agreements, like Egypt's strategic wheat arrangements with Russia, are complemented by regional frameworks (GAFTA, Agadir Agreement), European-Arab partnerships (Euro-Mediterranean Partnership, UfM), continental initiatives (COMESA, AfCFTA), and intercontinental agreements (Mercosur-Arab League). Public-private partnerships and state-owned enterprises provide institutional support through strategic reserves and market stabilization, while international trading houses facilitate logistics and risk management. However, this complex trade architecture has critical vulnerabilities: agreements prioritize industrial over agricultural goods, lack climate adaptation measures, and inadequately address agricultural logistics infrastructure. Smaller economies like Lebanon and Palestine struggle to benefit from trade liberalization, while water-scarce countries like Morocco and Tunisia face unaddressed agricultural challenges. As climate change intensifies food security pressures, these structural weaknesses create a critical paradox: existing frameworks remain ill-equipped to address the fundamental interconnections between water, energy, and food security.

The structural fragility in trade frameworks highlights the critical need for incorporating a Water-Energy-Food-Ecosystem (WEFE) Nexus approach—a comprehensive analytical framework recognizing the interdependencies between these vital systems. The Nexus reveals how disruptions cascade: water scarcity affects agricultural productivity, energy-intensive processes strain resources, and ecosystem degradation undermines agricultural resilience. In the Arab Mediterranean, this manifests through critical challenges: virtual water trade creates hidden dependencies, energy costs for food distribution add economic pressures, and ecosystem deterioration reduces agricultural viability.

The convergence of vulnerabilities—from structural economic weaknesses to trade dependencies and mounting climate pressures—coupled with the insufficiency of existing agricultural and trade frameworks, underscores a fundamental strategic challenge for the

Arab Mediterranean region. As these nations navigate an increasingly complex global food security landscape, a critical question emerges: How can inherent regional vulnerabilities be reframed into strategic negotiating positions to secure sustainable access to staple foods amidst intensifying climate threats and market volatility?

To address this critical question, an innovative and tailored approach was adopted, engaging subject matter experts in participatory discussions under a practical framework that simplifies complex issues and seeks actionable solutions adapted to the unique contexts of each Arab Mediterranean country. The main approach revolves around assessing the strategic assets and resources they can leverage in reciprocity to strengthen their negotiating position, determining the most effective and context-appropriate negotiation approaches, exploring ways to transform inherent weaknesses into potential opportunities, and developing and fortifying existing strengths to counter and overcome emerging threats.

To quantify the compounded strategic impact of food security (CSI), a multidimensional approach is employed, analyzing economic dimensions, social dynamics, political landscapes, water scarcity, agricultural productivity, geopolitical influences, and security implications. Each factor is weighted based on its relative impact, with coefficients greater than 1 indicating potential threats and those below 1 signaling opportunities. For instance, Egypt's reliance on wheat imports and negative trade balance of \$41.8 billion in 2022 illustrate the economic strain of food dependency, while Lebanon's 103% inflation rate on food items in 2024 exemplifies the social instability triggered by food insecurity. Political corruption in Lebanon and the lack of modern food storage facilities in Libya underscore institutional challenges. Water scarcity intensifies vulnerabilities, with 80% of the region's freshwater used for farming, while the war in Ukraine and conflicts along the Red Sea disrupt supply chains and inflate costs. Collaborative initiatives, strategic alliances, and regional cooperation, such as the UfM's promotion of climate-resilient agriculture and the AfCFTA's diversification of trade networks, offer pathways to enhance resilience. By systematically analyzing these interconnected factors, policymakers can assess their country's specific vulnerabilities and strengths, guiding strategic decisions to mitigate risks and seize opportunities in an increasingly complex food security landscape.

The intricate interplay between the mobility of goods, services, capital, and people within the Euro-Mediterranean trade framework significantly shapes the food security landscape of the Arab Mediterranean region. Examining these dynamics through the lens of the Four Freedoms Framework (4FF) and the Water-Energy-Food-Ecosystem (WEFE) Nexus reveals critical asymmetries and vulnerabilities that hinder the region's ability to achieve long-term food security and sustainable resource management. The mobility of goods, particularly staple foods, highlights the heavy reliance of Arab Mediterranean countries on European imports due to limited domestic agricultural capacity and environmental constraints such as water scarcity, energy dependence, and ecosystem degradation. While this trade flow alleviates immediate food security needs, it perpetuates a dependency on external sources, exposing the region to global supply chain disruptions and price volatilities. The mobility of services, characterized by an uneven exchange of expertise, sees European specialists significantly enhancing resource management and agricultural efficiency in Arab Mediterranean countries. However, bureaucratic barriers and inconsistent policy implementation impede the reverse

flow of services, hindering the development of a self-sufficient agricultural service sector in the region. Capital mobility, although fueling investments in agricultural infrastructure and renewable energy projects, is marred by the inequitable distribution of climate finance and a focus on export-oriented sectors rather than domestic food security needs. The mobility of people, while crucial for addressing resource challenges through the exchange of expertise, is often constrained by migration restrictions and regulatory hurdles, limiting the potential for knowledge sharing and capacity building. This multidimensional analysis underscores the need for Arab Mediterranean countries to advocate for more equitable and sustainable trade terms that prioritize domestic food security, foster resilient local economies, and promote responsible resource management practices, ultimately strengthening their strategic position in navigating the complex global food system.

Transactionalism emerges as a pragmatic and adaptable approach for enhancing the negotiation leverage of Arab Mediterranean countries in securing essential staple foods. Recognizing the complex interplay of resource scarcity, geopolitical dependencies, and asymmetrical trade dynamics characterizing their relationships with major trading partners, transactionalism offers a versatile framework for these nations to strategically utilize their unique assets. This approach transcends traditional economic transactions, enabling countries to engage in multi-layered exchanges involving energy resources, services, or geopolitical influence to optimize the value of their strategic resources. In a region where climate vulnerability, water scarcity, and limited agricultural capacity threaten food security, transactionalism allows countries to leverage their geopolitical positioning, such as Egypt's control over the Suez Canal, or Algeria's natural gas reserves, to secure critical food imports. It also facilitates multi-lateral exchanges, exemplified by Morocco's use of phosphate and renewable energy to strengthen trade ties with both Europe and Africa. The flexibility of transactionalism lies in its adaptability to shifting global circumstances, including geopolitical realignments, supply chain disruptions, and economic downturns, enabling Arab Mediterranean countries to negotiate from a position of relative strength, even when lacking direct economic leverage. By integrating geopolitical power, resource management, and the Water-Energy-Food-Ecosystem (WEFE) Nexus, transactionalism allows these countries to maximize their bargaining power in food security negotiations, ensuring sustainable, long-term food supplies in a highly volatile global market. As such, transactionalism represents an indispensable strategy for the region, empowering nations to diversify trade partnerships, mitigate risks associated with food insecurity, and navigate the asymmetrical dynamics of Euro-Mediterranean trade agreements.

Funds and financial support mechanisms serve as vital tools for Arab Mediterranean countries to secure stable food imports, particularly during financial crises or trade disruptions. Access to international funds, financial guarantees, and credit facilities enables these nations to manage price fluctuations, mitigate risks associated with currency devaluation, and secure trade agreements when traditional financing options may be limited. International financial institutions, such as the International Monetary Fund (IMF), World Bank, and regional development banks like the African Development Bank, provide critical financial support and mechanisms to secure trade financing for countries facing food security challenges. For instance, during the COVID-19 pandemic, the IMF's Rapid Credit Facility allowed Egypt to access funds quickly, preventing major disruptions in food supplies amidst highly unstable

global markets. Export credit agencies also play a pivotal role by providing financial backing, trade insurance, and credit guarantees, allowing countries to import food on credit even during times of domestic economic crises or global trade disruptions. Multilateral development banks offer low-interest loans, grants, and technical assistance to help countries build resilient food supply chains and sustainable agricultural systems, as exemplified by Tunisia and Morocco receiving significant financial assistance from the African Development Bank to support agricultural modernization projects and improve food storage capacity. Additionally, some Arab Mediterranean countries strategically use their sovereign wealth funds to secure long-term food supply contracts by investing in food-exporting countries or foreign agricultural ventures, as demonstrated by Algeria's investments in agricultural projects in Sub-Saharan Africa. By leveraging these global financial support mechanisms and mediation platforms, Arab Mediterranean countries can mitigate structural vulnerabilities, withstand shocks in the global food market, and strengthen their strategic capacity to navigate the complexities of global food trade, ultimately bolstering their food security and geopolitical bargaining power in the face of escalating global instability and climate-related challenges.

The Quest for Equitable Food Security: Beyond Market Dynamics.

Global food security frameworks remain inherently influenced by economic and political power dynamics, despite aspirations for unbiased governance. This reality poses particular challenges for economically vulnerable countries in securing stable access to staple foods. While completely neutral regulatory bodies may be unrealistic given inherent geopolitical biases, practical solutions lie in developing strategic negotiation frameworks that create mutual benefits for both economically dominant and vulnerable nations. The traditional market-driven approach to food security requires fundamental recalibration. Economically dominant countries ultimately bear indirect costs when food insecurity in vulnerable regions triggers broader socioeconomic instability, migration pressures, and market disruptions. This interconnected impact necessitates a more comprehensive framework that quantifies not just the immediate costs of securing food supplies, but the compound global consequences of food insecurity.

While long-term solutions require coordinated action under the UN 2030 Development Agenda, Arab Mediterranean countries can take immediate strategic action by establishing a regional consortium built on shared interests and complementary resources. This approach transcends theoretical calls for economic unity, instead offering a practical framework where each country's unique assets and needs create natural incentives for collaboration. As this framework enhances collective negotiating power for staple food access, it simultaneously generates tangible benefits that motivate countries to maintain and strengthen these collaborative mechanisms.

To address these challenges effectively, three complementary strategic frameworks emerge, each building upon the other to create a comprehensive approach to food security enhancement:

1-First, the foundation must be built on precise quantitative understanding. Leverage CSI Assessment for Strategic Food Security Enhancement: Arab Mediterranean policymakers should implement a robust CSI analysis framework to identify and activate their highest-value negotiation levers for food security. By quantifying the compounded costs of food insecurity—where one ton of staple crops carries double its market value in societal impact—countries can justify and prioritize strategic investments in their strongest leverage points. For resource-rich nations like Algeria, this means leveraging energy exports for preferential food trade terms, while infrastructure-strategic countries like Egypt can capitalize on transit control for favorable agreements. The CSI framework enables policymakers to calculate precise tradeoffs between immediate investment costs against the broader socioeconomic impacts of food insecurity. This quantitative approach allows countries to strategically sequence interventions, focusing first on high-impact areas where their coefficient values indicate maximum leverage potential.

2-Building upon this analytical foundation, the second framework addresses structural implementation. Optimize Four Freedoms Integration for Food Security Enhancement: Arab Mediterranean policymakers should develop a coordinated mobility framework that strategically aligns the movement of goods, services, capital, and human resources with WEFE nexus priorities. By analyzing mobility patterns through a resource-sustainability lens, countries can identify untapped opportunities within Euro-Mediterranean relations. This means leveraging service mobility to build permanent technical capacity rather than temporary expertise transfer, strategically directing capital flows toward balanced development of both export capabilities and domestic food systems, and establishing integrated professional exchange programs that create lasting institutional knowledge. The framework should emphasize transforming current regulatory asymmetries into opportunities for enhanced cooperation, particularly in areas like agricultural certification standards and professional qualifications recognition.

3-To operationalize these frameworks effectively, the third strategic component focuses on practical implementation through transactional mechanisms. Leverage Strategic Transactionalism for Enhanced Food Security Positioning: Arab Mediterranean policymakers should implement a comprehensive transactional framework that strategically converts their geopolitical assets, regional alliances, and resource capacities into enhanced food security outcomes. By analyzing the multi-dimensional nature of potential exchanges—from energy resources to strategic infrastructure control—countries can develop sophisticated bartering mechanisms that transcend traditional monetary transactions. The framework should emphasize multi-lateral arrangements that pool regional leverage through platforms like the Union for the Mediterranean and Arab League, enabling coordinated negotiation positions that strengthen collective bargaining power. Countries should prioritize establishing reciprocal arrangements that combine immediate food security gains with long-term strategic advantages, creating resilient food security frameworks that adapt to shifting global power dynamics while maintaining regional autonomy.

Together, these three frameworks provide a comprehensive approach that moves from analytical understanding to structural implementation and finally to practical operation, offering Arab Mediterranean countries a clear pathway to enhance their food security positioning while building sustainable regional collaboration.

INTRODUCTION

The Arab Mediterranean (Arab Med) region is at a critical juncture where climate change, geopolitical tensions, and complex trade dynamics converge to pose serious challenges to its food security. Characterized by limited arable land, severe water scarcity, and a heavy dependence on food imports, countries in this region find themselves highly vulnerable to external shocks. Against this backdrop, the Lebanese Citizen Foundation (LCF) has launched an in-depth study titled «**Trade Winds and Tides: Responding to Climate Challenges Through Enhanced Food Accessibility in the Arab Med**» aiming to gain a comprehensive understanding of the complex interplay between climate challenges, food security, and trade dynamics in the Arab Med basin.

A. About the Study

This study examines the socio-economic and trade environments in nine Arab Mediterranean countries—Morocco, Algeria, Tunisia, Libya, Egypt, Jordan, Palestine, Lebanon, and Syria (referred to herein as the Arab Med Countries)—united by cultural, linguistic, and historical ties, and influenced by shared climatic conditions that impact agricultural productivity, water resource management, and food security.

The primary aim of this research is to identify actionable strategies that enhance trade synergies, improve food accessibility, and bolster resilience against climate-induced disruptions in the Arab Med region. A key component of this study is the evaluation of food security through four pillars: availability, accessibility, utilization, and stability. This analysis emphasizes the necessity for all populations, especially vulnerable and marginalized groups, to have access to sufficient, safe, and nutritious food. By examining the interplay between regional trade dynamics, climate risks, and socio-economic conditions, the study seeks to identify vulnerabilities and opportunities within the regional trade network that influence food security outcomes. It also assesses the role of regional and bilateral trade agreements, evaluating whether these agreements support or undermine food security by perpetuating structural vulnerabilities. As climate risks intensify, the ability of Arab Med countries to negotiate fair and resilient trade agreements will be critical. As part of a broader call for fair and mutually-beneficial cross border economic cooperations, this research highlights the importance of realigning trade agreements to incorporate climate adaptation strategies and resource management practices that can strengthen regional food systems, reduce dependency on external markets, and foster long-term food security.

B. A Focus On The WEFE Nexus

One of the unique aspects of this research is its focus on the Water-Energy-Food-Ecosystem (WEFE) Nexus, a critical analytical framework that underscores the interdependencies between essential resources. In the Arab Med region, disruptions in one element—such as water scarcity—often lead to cascading effects on energy, food production, and ecosystem health. This interconnectedness is particularly significant in countries like Jordan, which are highly dependent on virtual water trade (importing water-intensive crops to alleviate domestic water stress) and are vulnerable to rising energy costs linked to food distribution and storage. By examining how climatic variables affect the WEFE Nexus, the study aims to identify strategies to maintain balance and enhance the resilience of these interconnected systems amid escalating climate threats.

This study addresses a central question: How can Arab Med countries leverage their negotiation advantage to secure sustainable access to staple foods amid escalating climate-induced threats? To answer this, the research provides actionable strategies aimed at strengthening regional food security and enhancing trade synergies through a rights-based approach. The recommendations are tailored to the unique socio-political landscape of the Arab Med region, emphasizing the need for collective action and regional solidarity to overcome shared challenges.

C. Research Objectives, Scope, and Methodology

Adopting a multi-disciplinary methodology, the study combines economic modeling, climate risk analysis, and policy assessments to offer a well-rounded perspective on the region's challenges and opportunities. Stakeholder consultations are integrated to ensure diverse viewpoints are considered, resulting in recommendations that are practical, inclusive, and sustainable. The study evaluates the evolving climate threats, particularly the increasing frequency and severity of extreme weather events, and their direct and indirect impacts on food security and trade dynamics.

This research serves as more than an academic exercise; it is a practical roadmap for policymakers, regional institutions, and development organizations working to transform the food security landscape in the Arab Med. By fostering regional cooperation and promoting efficient, rights-centric trade dynamics, the study aims to guide Arab Med countries in building resilient food systems capable of withstanding future disruptions and ensuring a sustainable, prosperous future for all.

FOOD SECURITY, CLIMATE, AND TRADE: NAVIGATING VULNERABILITIES IN THE ARAB MEDITERRANEAN

This chapter explores the complex relationship between socio-economic conditions, climate impacts, and food security in the Arab Med region. Beginning with an analysis of cultural and economic foundations, it delves into the role of the Mediterranean diet and key socio-economic indicators that shape the region's food systems. As climate change increasingly disrupts local agriculture, the reliance on imports for staple foods becomes more critical, highlighting the vulnerabilities within existing trade structures. The chapter progresses to examine regional trade dynamics and agreements, focusing on how these frameworks impact food accessibility under climate stress. It also introduces the Water-Energy-Food-Ecosystem (WEFE) Nexus, showing how these interconnected systems influence the region's capacity to manage food security amidst growing environmental and economic pressures. The analysis concludes by addressing the shared vulnerabilities that Arab Med countries face, laying the groundwork for a more integrated and resilient approach to securing their food systems.

A. Cultural and Socio-Economic Foundations of Food Security in the Arab Mediterranean

1. Socio-Economic Landscape and Key Indicators

To understand the intricate dynamics of food security in the Arab Med, it is essential to begin with a detailed examination of the socio-economic landscape that underpins the region's capacity to ensure food availability and accessibility. The Arab Mediterranean Basin, which includes countries such as Syria, Lebanon, Palestine, Jordan, Egypt, Libya, Tunisia, Algeria, and Morocco, represents a region with a profound cultural heritage, deeply intertwined with the Mediterranean diet, a UNESCO-recognized symbol of its identity. This diet is more than a culinary tradition; it encapsulates centuries of shared agricultural practices, trade, and socio-economic ties that have sustained these nations. However, the socio-economic fabric of these countries is increasingly under strain as climate change, political instability, and economic disruptions continue to escalate. These pressures test the resilience of the Mediterranean diet and broader food systems.

Key indicators such as GDP growth, trade balances, poverty rates, income inequality, and population trends offer key insights into the region's economic stability and its potential vulnerabilities. These indicators not only influence food security but also determine how effectively each country can manage external shocks, such as climate-induced disruptions, which further strain food systems.

By examining these socio-economic factors for the year 2022, we can better understand the region's food security challenges, particularly in how these factors intersect with food systems, trade mechanisms, and the cultural significance of the Mediterranean diet.

a. GDP Growth and Economic Stability

Economic growth is a fundamental measure of a country's capacity to sustain critical sectors such as agriculture, infrastructure, and trade, all essential for food security. Countries with stronger GDP growth rates can allocate resources to enhance food systems. For example, Egypt and Algeria both report GDP growth of 5.4%, suggesting some economic resilience. However, Syria's minimal growth of 0.1%, exacerbated by ongoing conflict, has led to a collapse in agricultural productivity, leaving the country increasingly reliant on food imports.

Lebanon, with its ongoing economic collapse, has seen GDP growth plummet to 2.2%, which, combined with hyperinflation of 86.9%, exacerbates food insecurity. Although Morocco experienced modest GDP growth at 0.9%, and Tunisia at 2.3%, these countries continue to face challenges due to inflation and economic disparities. Meanwhile, countries such as Jordan and Palestine continue to experience moderate GDP growth of 2.6% and 4.7%, respectively, but remain susceptible to rising food prices and trade deficits (ESCWA, 2023).

b. Trade Balances and Food Imports

Trade imbalances play a critical role in shaping a nation's food security, especially in countries heavily dependent on imports for key staples. Egypt, despite having a large agricultural sector, faces a significant trade deficit of \$41.8 billion, driven largely by its reliance on importing wheat (OEC, 2022). Similarly, Lebanon's trade deficit of \$16.1 billion reflects the nation's dependence on imported food, worsened by the 2020 Beirut port explosion, which severely disrupted food supply chains (OEC, 2022).

Morocco and Tunisia face smaller trade deficits compared to Egypt, yet they are also heavily reliant on imports for staple foods like wheat. This dependence heightens their vulnerability to global price fluctuations and supply chain disruptions, especially as global commodities become more volatile due to climate and geopolitical tensions.

c. Poverty Rates and Access to Food

Poverty directly impacts food security, as the ability to afford basic food items diminishes with rising economic hardships. In Lebanon, an alarming poverty rate of 68.6% has severely disrupted access to food, further exacerbated by the country's economic collapse. Similarly, Egypt and Palestine, with poverty rates of 32.2% and 30.1%, respectively, struggle with chronic food insecurity as large segments of their populations remain below the poverty line (ESCWA, 2023).

Countries like Morocco and Tunisia, with poverty rates of 4.7% and 17.4%, have managed relatively better, though inflation continues to erode purchasing power, further limiting access to affordable food for vulnerable populations. Income inequality, measured by the Gini index, also plays a role in exacerbating food insecurity. Lebanon's Gini index of 81.9 and Egypt's of 75.6 indicate high levels of inequality, which limit equitable access to food resources. (worldpopulationreview, 2023)

d. Population Trends and Food Demand

Population growth exerts additional pressure on food systems by increasing demand. In Egypt and Palestine, population growth rates of 2.4% and 2.9%, respectively, stretch the limits of food production and imports, increasing the risk of food shortages. In contrast, Lebanon's negative population growth of -1.9%, due to mass emigration, has temporarily reduced domestic demand for food but has also weakened the labor force, hampering agricultural productivity (World Bank, 2022).

Rapid urbanization in countries like Algeria Jordan and Syria has altered food consumption patterns, increasing demand for processed and imported foods. While some countries attempt to boost domestic food production, these efforts are often hindered by political instability, environmental constraints, and economic challenges.

e. Global Food Security Index (GFSI)

The Global Food Security Index (GFSI) offers a comprehensive framework for assessing food security across the region, measuring factors like food availability, affordability, and quality. Morocco and Tunisia score relatively high at 69.2 and 64.7, benefiting from stable agricultural systems and government safety nets that bolster food security. These nations have managed to maintain relatively robust agricultural production, though they remain vulnerable to climate change and global food price fluctuations.

Lebanon and Syria, however, report significantly lower GFSI scores of 34.5 and 26.8, respectively, reflecting severe food insecurity driven by political instability, economic collapse, and environmental degradation. These disparities underscore the importance of addressing socio-economic inequalities and reducing dependencies on food imports to stabilize food systems across the region (GFSI, 2022).

Country	GDP Growth (%)	Inflation Rate (%)	Trade Balance (USD Billion)	Poverty Rate (%)	Population Growth (%)	Gini Index (2019)	GFSI
Algeria	5.4	7.2	26.2	6.7	1.6	74.9	62.6
Egypt	5.4	18.5	-41,8	32.2	1.6	75.6	55.9
Jordan	2.6	3.9	-15,6	24.0	1.2	69.6	49.6
Lebanon	2.2	86.9	-16,1	68.6	-1.9	81.9	34.5
Libya	-17.7	26.2	16.7	N/A	1.1	65.9	49.8
Morocco	0.9	6.8	-22,2	4.7	1.0	76.6	69.2
Palestine	4.7	6.5	-9.33	30.1	2.4	N/A	41.7
Syria	0.1	51.0	N/A	41.2	3.7	69.9	26.8
Tunisia	2.3	9.1	-5.2	17.4	0.8	70.5	64.7

Data extracted from the World Bank, UNESCWA, Global Food Security Index for the year 2022 except for the GINI Index (2019)

This integrated socio-economic and food security analysis demonstrates how each Arab Med country faces distinct challenges shaped by economic, demographic, and political factors. Countries with lower GFSI scores, higher poverty rates, and greater trade imbalances are particularly vulnerable to external shocks, including climate-induced disruptions and global price fluctuations. As we transition to the next section, we will examine how these socio-economic factors intersect with cultural practices, particularly the Mediterranean diet, to shape food systems and trade dynamics in the region.

2. The Mediterranean Diet

The Mediterranean diet, renowned for its sustainability and health benefits, is integral to the cultural and nutritional identity of the Arab Mediterranean region. Celebrated as both a dietary practice and a symbol of cultural heritage, it centers on fresh, locally sourced ingredients.

However, the preservation of this diet faces significant threats due to environmental changes, global disruptions, and rising costs. This section explores the key components of the Mediterranean diet, identified through Harmonized System (HS) codes, while addressing the challenges that impact its core elements and their role in regional food security. Shaped over centuries by agricultural practices, trade, and climate adaptation, the Mediterranean diet prioritizes plant-based foods such as vegetables, fruits, legumes, cereals, and olive oil. While also incorporating moderate amounts of fish, poultry, and dairy, it maintains a balance that not only reduces the risk of chronic diseases but also aligns with the Arab Mediterranean's cultural traditions, emphasizing sustainability and local food systems.

Building on the importance of food security in the Arab Mediterranean region, the preservation of staple foods such as wheat, barley, olive oil, and fresh produce is vital for both nutrition and economic stability. These foods are deeply embedded in the cultural fabric of the region, making their stable access a strategic priority for governments, especially in the face of climate change and global price fluctuations. The criteria for selecting these staples are based on four factors: nutritional value, cultural significance, economic importance, and sustainability. These criteria ensure the resilience of food systems, cultural preservation, and economic stability. Based on these principles, the identified staple foods are:

Whole Grains (HS Code 1001,1003)

Like wheat (HS Code 1001) and barley (HS Code 1003) are central to the diet in countries such as Egypt and Morocco, where they are consumed in bread, pasta, and couscous. Wheat, particularly, is a staple in the region, with Egypt being the world's largest wheat importer, relying on over 10 million metric tons annually. Barley, while less prominent, is crucial in arid areas like Algeria and Morocco due to its drought resistance and its role in animal feed. Rice (HS Code 1006), though not traditional, is increasingly consumed in mixed dishes, adding dietary diversity and enhancing resilience in countries like Lebanon and Syria.



Fruits and Vegetables (HS Code 07,08)

Including citrus fruits (HS Code 0805) such as oranges and lemons, are vital to both health and food security. Morocco and Egypt are major producers, with citrus fruits contributing to both domestic needs and export markets, which enhances the region's economic stability. Other vegetables, including tomatoes, peppers, and leafy greens, provide essential nutrients and are grown locally, ensuring their availability across the region. For instance, Morocco is a leading exporter of tomatoes, highlighting their economic significance.



Olive Oil (HS Code 1509)

Is one of the Mediterranean diet's most culturally and nutritionally significant elements. Tunisia, a top global producer, relies on olive oil not only for domestic consumption but also as a major export product. Its health benefits, particularly for cardiovascular health, are well recognized, and its strategic importance is reflected in both national agricultural policies and international trade.



Fish and Seafood (HS Code 03)

Are essential protein sources in coastal countries like Lebanon and Algeria. Rich in omega3- fatty acids, they contribute to cardiovascular health and are a dietary staple. The fishing industry not only supports food security but also provides vital employment and economic activity in coastal areas.



These components of the Mediterranean diet reflect a balance between nutrition, culture, and the agricultural heritage of the region. They are not only integral to daily consumption but also play a critical role in maintaining food security and supporting local economies.

3. Understanding the Four Pillars of Food Security in the Arab Mediterranean Basin

The four pillars of food security—availability, access, utilization, and stability—provide a comprehensive framework for analyzing how well a population's food needs are met. These pillars, established under the FAO's global framework for food security and nutrition, ensure that food systems not only provide sufficient quantities of food but also enable people to afford and access it in a sustainable manner (CFS, 2021). This section will use this framework to assess the specific challenges faced by the Arab Med region, particularly in countries like Egypt and Morocco, where reliance on staple foods such as wheat highlights vulnerabilities in food security. By exploring how these four pillars interact, we can better understand the region's capacity to withstand external pressures such as global price fluctuations, climate change, and geopolitical instability, which directly impact the region's ability to maintain food security.

Availability of Food

The physical availability of food is fundamental. Both Egypt and Morocco face challenges in ensuring sufficient domestic production, especially for wheat. Egypt's wheat production was 8.87 million metric tons (MMT) in 2023, but domestic consumption reached 20.6 MMT, requiring substantial imports to meet the shortfall (FAS - Foreign Agricultural Service, 2023). Similarly, Morocco's wheat production was 4.1 MMT in 2023, yet consumption reached 10.8 MMT, necessitating heavy reliance on imports (FAS - Foreign Agriculture Service, 2023). Efficient storage systems, like those Egypt has invested in following supply chain disruptions, help manage these deficits, but both nations remain highly exposed to external shocks like global price fluctuations (World Bank, 2023).

Economic and Physical Access to Food

Access refers to households' ability to afford and reach food supplies. Rising inflation and global food prices have compounded access issues across the Arab Med region. In Egypt, inflation soared to 35.7% in 2023, significantly driving up the cost of food, particularly wheat (IMF, 2023). While Morocco's inflation rate was lower at 4.3% in early 2024, its government was forced to subsidize wheat imports to stabilize domestic prices (FAS - Foreign Agriculture Service, 2023). Effective storage facilities can mitigate price volatility by maintaining stable supplies, but rural populations, especially in regions with poor infrastructure, still face significant logistical barriers to accessing food.

Food Utilization

It focuses on the quality and nutritional value of food. In both Egypt and Morocco, wheat plays an outsized role in the diet. In Egypt, bread provides as much as 75% of caloric intake for low-income households' shortfall (FAS - Foreign Agricultural Service, 2023). This reliance on a single food source reduces dietary diversity, making many populations nutritionally vulnerable. Morocco faces similar issues, where rising wheat prices have forced households to opt for lower-quality products. The preservation of nutritional value through proper storage and food safety standards is crucial to ensuring that food remains safe and nutritious.

Stability

Stability ensures that food is consistently available over time, even in the face of shocks. Both Egypt and Morocco are heavily reliant on external imports, particularly from conflict-prone regions such as Russia and Ukraine. In Egypt, more than 80% of its wheat imports come from these two countries, exposing it to significant geopolitical (OEC, 2022). Morocco's reliance on cereal imports was 9.9 MMT in 2023, with 60% of its wheat sourced externally (FAS - Foreign Agriculture Service, 2023).

The reliance on wheat imports in Egypt and Morocco serves as a clear illustration of the broader structural vulnerabilities in the food security systems of Arab Med countries. Both nations depend heavily on external markets to meet domestic demand for wheat. This pattern extends beyond grains to other essential foods like dairy and fresh produce, underscoring the region's general reliance on external supply chains. This reliance, particularly on imports from geopolitically volatile regions, leaves these countries vulnerable to food insecurity, as any disruption in global trade or supply chains can significantly impact food availability and affordability. Tunisia, Lebanon, and Algeria face similar challenges, where domestic agricultural production is insufficient to keep pace with the needs of growing populations, placing increased pressure on imports to fill the gap.

These countries share structural economic challenges such as rising inflation, fragile governance, and socio-economic disparities, which further undermine their ability to provide stable access to food for all. The region's trade deficits and import dependency are compounded by volatile global markets and fluctuating commodity prices, making essential foods less affordable, especially for vulnerable populations. Governments often resort to expanding subsidy programs to alleviate these pressures, but such measures are financially unsustainable in the long term, putting additional strain on public finances. The trade deficits faced by Arab Med countries are a clear indication of their food security vulnerabilities.

By analyzing domestic production capacities and comparing them to consumption demands, it becomes evident that the growing reliance on imports not only reflects agricultural shortfalls but also exposes critical weaknesses in the broader food system. Socio-economic pressures such as rising costs, income inequality, and insufficient infrastructure make it increasingly difficult for these nations to bridge the gap between production and demand. As food prices rise, affordability becomes a key issue, particularly for low-income households, pushing governments to implement temporary, yet unsustainable, solutions.

B. Climate Change and its Impact on Food Security in the Arab Med

Having identified the region's reliance on imports and the challenges of affordability, we must now consider another critical force that threatens food accessibility—climate change. Arab Med countries, while diverse in many respects, share a common climate and thus face similar climate-related risks. As domestic production falters and trade becomes increasingly critical, evolving climate threats compound these vulnerabilities, creating a precarious situation where the region is forced to rely more heavily on uncertain and volatile trade flows. This intensifies the need for coordinated, climate-resilient strategies that secure both food availability and long-term stability.

1. Historical Climate Events: Impacts on Agriculture and Food Security

Over the past four decades, the Arab Mediterranean Basin has experienced an alarming rise in climate-related disasters, severely disrupting agriculture and worsening food insecurity. In the 1980s and 1990s, while events like floods, drought and earthquakes were less frequent, they still caused significant damage to agricultural systems. For instance, the 1981 flood in Egypt devastated large areas of farmland, significantly disrupting local food systems. Similarly, the severe drought of 1984 in Morocco reduced wheat production, pushing up food prices and straining food imports.

The frequency of such events increased markedly by the early 2000s, with more frequent hydrological disasters like the 2001 flash floods in Algeria and the 2004 heatwave in Egypt, both of which severely affected crop yields and further strained food production systems (World Bank , 2014)

By the 2010s, the variety and intensity of climate events escalated. Morocco, in 2012, suffered destructive flash floods that wiped out substantial arable land, while Lebanon's 2015 snowstorm crippled food supply chains, further increasing vulnerability. These disruptions became even more severe in the 2020s, as seen in the 2023 flood in Libya, which severely damaged agricultural systems, leaving communities even more reliant on already fragile global supply chains (WMO, 2024). Compounding these challenges, Syria experienced one of its most severe droughts since 2021, slashing wheat production and triggering acute food shortages. This drought's widespread impact strained both local resources and international aid, further destabilizing Syria's food security and intensifying ongoing humanitarian crises.

North African countries, particularly Morocco, Algeria, and Egypt, face acute vulnerability to climate events, which have intensified the region's structural weaknesses, especially its reliance on global markets for essential food staples. The cumulative impact of these recurring droughts and floods has had a substantial economic toll; in Morocco, for instance, agricultural losses from climate disruptions are estimated to account for 2-3% of GDP. These events not only disrupt the local food supply but also increase import costs, compounding economic instability for countries already navigating significant socio-political challenges.

In conclusion, the Arab Med region is highly vulnerable to climate-induced disruptions. The increasing frequency of droughts, floods, heatwaves, and other extreme weather events is amplifying the region's already significant food security challenges. As we move forward, it is essential to examine how these trends will likely evolve, setting the stage for a predictive analysis of future climatic disruptions, and exploring how these escalating risks will further impact agricultural productivity and the region's ability to secure stable food supplies.

2. Future Climate Predictions: Escalating Risks to Food Systems

Building on the extrapolated climate projections and recent climate trends from the 29th Conference of the Parties (COP29) to the United Nations Framework Convention on Climate Change (UNFCCC), held in Baku, Azerbaijan, in November 2024, the Arab Med region is facing even greater risks to its food systems due to the accelerating impacts of climate change. According to discussions at the summit, the Mediterranean Basin is warming at a rate 20% faster than the global average, making it one of the most climate-vulnerable regions globally. By mid-century, temperatures in the region are expected to rise by up to 3.5°C, significantly impacting key sectors such as agriculture, water availability, and food security (Giorgi & Lionello, 2008). This warming trend threatens to disrupt staple crops such as wheat, fruits, and olive oil, which are particularly sensitive to heat stress and form the cornerstone of the Mediterranean diet. The increased frequency and severity of extreme weather events, such as heatwaves, droughts, and floods, are projected to intensify in the region. COP29 discussions highlighted that the Middle East and North Africa (MENA) region could see a 2-4°C temperature rise by 2050, with corresponding reductions in water availability. These rising temperatures are expected to lengthen heatwaves, stressing crop yields, and worsening the already dire water scarcity. Flash floods, storm surges, and intense rainfall events are also projected to become more frequent, further compromising agricultural infrastructure and regional water resources (IPCC, 2023).

Water scarcity is projected to worsen in the Arab Mediterranean region. According to findings presented at COP29, every 2°C rise in temperature could lead to a 2-15% reduction in water availability, particularly in countries like Morocco, Tunisia, and Egypt, where agriculture is highly reliant on rainfall and irrigation systems. As water resources become increasingly limited, maintaining critical crops such as citrus fruits, vegetables, and legumes will become more difficult, increasing the region's dependence on food imports (IPCC, 2023).

The impact on staple foods central to the Mediterranean diet is also expected to be severe. COP29 projections shared by the FAO indicate that wheat yields in North Africa could severely by 2050 due to the compounded effects of heat stress and water shortages. Olive oil production, vital for the diets and economies of Tunisia and Morocco, is also at risk, with recurring droughts and rising temperatures threatening its production. This will directly impact food security in the region, as these staples form the backbone of local diets and economies (FAO, 2023).

Moreover, the risks of flooding and rising sea levels are significant in coastal regions of the Mediterranean, such as Egypt, Tunisia, and Lebanon. The Nile Delta, one of the region's most fertile agricultural zones, faces major risks from rising sea levels. Projections indicate that by 2050, large tracts of farmland could be submerged, significantly reducing Egypt's agricultural output and increasing its reliance on imports to meet food demand. These coastal risks could exacerbate food insecurity across the region, particularly for communities dependent on coastal agricultural lands (Red Cross Red Crescent Climate Centre, 2024) To mitigate these escalating risks, the region requires comprehensive and adaptive strategies.

These strategies should include enhancing water management practices, transitioning to climate-resilient agricultural techniques, and fostering regional cooperation to develop shared solutions to these pressing challenges. COP29 also reinforced the need for stronger climate finance commitments and international collaborations to support these efforts, helping the Arab Mediterranean region build the resilience needed to safeguard its food systems and ensure long-term food security.

3. Climate-Driven Import Needs: Increasing Reliance on Trade

As climate change continues to disrupt local agricultural production in the Arab Med region, the dependence on imports for essential staple foods is expected to grow. These staples face significant climate-related challenges, as rising temperatures, prolonged droughts, and unpredictable weather patterns severely affect both domestic production and global supply chains. The region's increasing reliance on external sources of food highlights a critical vulnerability, especially as geopolitical tensions and climate disruptions continue to destabilize food markets worldwide. Olive oil, for instance, is highly vulnerable to climate-induced risks. Rising temperatures and heatwaves during the olive ripening phase, along with unseasonal frosts, reduce both the quantity and quality of olive oil production. As a result, local availability is affected, while export revenues—crucial for balancing trade deficits—also decline. This creates a dual threat, as both local consumption and export markets face growing instability.

Similarly, wheat, another dietary staple, is threatened by climate-induced challenges in major exporting regions such as Russia, Ukraine, and the EU. With global wheat yields declining due to heat stress and droughts in rain-fed agricultural areas, countries like Egypt and Morocco are increasingly reliant on imports. Egypt, the world's largest wheat importer, faces heightened risks as global wheat markets become more volatile, driven by both geopolitical tensions and environmental changes. The impact extends to other staples, such as fruits, legumes, and fish, which are critical for both daily nutrition and food security in the Arab Med region. Countries such as Lebanon, Tunisia, and Morocco depend on irrigation for fruit production, but water scarcity and climate-induced droughts present growing challenges. Fruits like citrus and grapes are especially vulnerable to extreme weather events, including heatwaves, frosts, and storms, which disrupt tree flowering and harvest periods, reducing yields and driving up prices. Legumes such as chickpeas and lentils, which are integral to local diets, are also becoming more expensive due to prolonged droughts in major export countries like India and Argentina. The fisheries sector is similarly under threat. Rising sea temperatures and ocean acidification are disrupting fish migration patterns, reducing fish stocks in key exporting regions such as Turkey and the Eastern Mediterranean. As a result, coastal nations like Lebanon and Syria, which rely heavily on local fish supplies for both food security and economic stability, are finding it increasingly difficult to maintain stable fish stocks.

The Arab Med countries face significant challenges in securing food for their populations, driven by a complex mix of socio-economic factors, rising inflation, and geopolitical instability. These nations already struggle with high poverty rates, growing demand for staple foods, and deepening trade imbalances, as they increasingly rely on imports to

meet domestic food needs. The situation is further aggravated by global food price hikes, intensified by events like the COVID-19 pandemic and the regional conflict and war threats, which have disrupted global supply chains and inflated prices. Compounding these difficulties is the accelerating impact of climate change, which threatens local agricultural production through droughts, water scarcity, and unpredictable weather patterns. As a result, the region's dependence on imported staples is growing, making it critical for these countries to navigate trade negotiations with major exporters effectively. Understanding the trade dynamics and leveraging their negotiation edge in securing stable, affordable food imports is now more important than ever for ensuring regional food security.

C. Regional Trade Dynamics and Food Access in a Climate-Stressed World

In the Arab Med region, securing food access amidst climate stress and geopolitical volatility hinges on a complex web of trade dynamics. State actors, public-private partnerships, and private sector players collectively shape the region's food security, leveraging various trade structures, agreements, and economic cooperation schemes. Key trading relationships—whether through state-to-state agreements or multilateral frameworks like the Greater Arab Free Trade Area (GAFTA) and Agadir Agreement—play a crucial role in stabilizing food imports and managing risks associated with supply disruptions. Additionally, economic cooperation platforms, such as the Union for the Mediterranean (UfM), foster regional resilience by promoting climate-resilient agricultural practices and trade policies. However, significant vulnerabilities remain due to limited emphasis on agricultural trade, inadequate climate adaptation measures, and infrastructure deficiencies, underscoring the need for a holistic approach that integrates water, energy, food, and ecosystem (WEFE) considerations to ensure sustainable food security in the face of climate challenges.

1. Trading Agents and Structures

State-to-State Trade Agreements have been essential in ensuring food security in the Arab Mediterranean region, particularly between Arab Med countries and key global food suppliers such as Russia, Ukraine, and the EU. For example, Egypt has established long-term wheat import agreements with Russia to stabilize its food supply. These agreements are designed to secure consistent wheat imports, but they also involve considerations such as pricing, logistics, and risk management, ensuring food security even during geopolitical disruptions. Similarly, Jordan has engaged in direct negotiations with suppliers to ensure a steady flow of essential food items, especially in times of global instability or regional tension. In Morocco, the National Interprofessional Office of Cereals and Pulses (ONICL), a public institution, plays a central role in managing the country's grain market and strategic food reserves. While ONICL does not directly engage in state-to-state agreements, its role is crucial in stabilizing domestic food markets and ensuring the country's preparedness against supply chain disruptions, complementing international trade agreements. By working in tandem with State-to-State agreements, institutions like ONICL enhance the overall food security strategy, ensuring that the region is better prepared to manage crises and fluctuations in food availability.

Public-Private Partnerships (PPP) and State-Owned Enterprises (SOEs) are hybrid models that enhance food security in the Arab Mediterranean region, combining governmental regulation with private sector efficiency. SOEs play a central role in stabilizing food imports and ensuring the efficient distribution of food. These enterprises are responsible for regulating key markets, managing strategic reserves, stabilizing food prices, and mitigating risks related to supply chain disruptions. In this context, SOEs help ensure a steady supply of essential food staples. These models provide the agility needed to respond to climate-induced or geopolitical challenges while effectively managing food security risks. By blending state oversight with the operational flexibility of the private sector, both SOEs and PPPs are instrumental in securing stable food imports and optimizing food distribution across the region.

Private-Sector Trade in the Arab Med region, the private sector plays a crucial role in ensuring food security by managing the logistics, financing, and distribution of food imports, with trading houses acting as key intermediaries. These trading houses facilitate the movement of staple foods like wheat, olive oil, and legumes by offering services such as logistics management, risk mitigation, and market access, particularly in volatile global markets. By bridging the gap between global suppliers and local markets, trading houses like Cargill and Louis Dreyfus Company help secure food flows, even when domestic production is insufficient due to environmental or economic disruptions. They also provide financing mechanisms, allowing countries to purchase large quantities of staple goods on credit or through futures contracts, thereby managing risk associated with fluctuating prices and supply chain disruptions. In Lebanon, private-sector involvement is crucial for ensuring food availability, especially as it depends heavily on imports to meet domestic needs. The private sector's ability to respond quickly and efficiently to market changes makes it an indispensable part of the region's food security infrastructure.

Intra-Regional Trade Cooperation among Arab Mediterranean countries holds substantial potential for bolstering food security. Over the years, trade within the region has faced challenges due to logistical, regulatory, and political barriers. However, recent initiatives such as the Greater Arab Free Trade Area (GAFTA) and the Agadir Agreement have paved the way for improved agricultural trade by reducing tariffs, harmonizing customs procedures, and enhancing economic collaboration. GAFTA, established in 1997, aims to foster free trade among 18 Arab nations, eliminating trade barriers and enhancing the movement of goods, including agricultural products, across borders. Similarly, the Agadir Agreement, signed in 2004 by Morocco, Tunisia, Egypt, and Jordan, aims to deepen trade integration among these Mediterranean countries and promote alignment with European Union standards. These agreements have already begun to improve regional synergies, facilitating the free flow of essential food items and reducing trade barriers. The integration of agricultural trade within the region not only ensures a more consistent food supply but also helps mitigate the risks posed by climate-induced disruptions

and geopolitical uncertainties. However, challenges such as political instability and fragmented regulatory frameworks continue to limit the full potential of intra-regional trade. Strengthening these trade frameworks, alongside improving regional cooperation and resilience against climate-related impacts, could significantly enhance food security in the Arab Mediterranean region, creating a more stable and sustainable food system for the future.

Global Trading Relationships The Arab Med region's reliance on global trading relationships is pivotal in securing staple food imports, such as wheat, legumes, and olive oil, from key suppliers across the world. Countries like Morocco and Tunisia are highly dependent on trade agreements with the European Union for agricultural products, benefiting from the EU's proximity and established trade routes. However, the geopolitical dynamics in the Mediterranean, particularly tensions surrounding migration, maritime disputes, and resource control, have affected these trade relationships. For instance, growing diplomatic tensions between the EU and countries like Libya and Turkey over Mediterranean territorial claims and energy exploration have introduced uncertainties in supply chains. These geopolitical tensions, combined with protectionist policies within the EU, create fluctuations in trade dynamics that impact the steady flow of staple foods to Arab Med countries. The increasing fragility of these relationships highlights the region's vulnerability and the need for adaptive trade strategies to maintain food security amidst these geopolitical shifts.

2. Trade Agreements: Forms and Functions

Bilateral trade agreements are essential for fostering economic cooperation and securing food imports across the Arab Med region. Countries such as Morocco and Egypt have entered into several significant agreements with their regional counterparts, aiming to strengthen trade relations, particularly in the agricultural sector. These agreements not only promote economic integration but also serve as safeguards against global supply chain disruptions, allowing countries to negotiate favorable trade terms with their neighbors. However, challenges such as political instability and varying economic policies can limit the effectiveness of these agreements, underscoring the need for enhanced regulatory frameworks and more harmonized trade practices across the region. These improvements would ensure that such agreements better serve the shared goal of long-term food security.

Continental and intercontinental trade agreements are vital in shaping the trade landscape for Arab Med countries, offering access to new markets and diversifying sources for food imports. Beyond the Euro-Mediterranean Partnership, other

key agreements include the Common Market for Eastern and Southern Africa (COMESA) and the African Continental Free Trade Area (AfCFTA), which link countries like Egypt and Algeria to regional markets within Africa. Rather than the Euro-Mediterranean Partnership, another significant intercontinental agreement relevant for food trade in the Arab Med region is the Mercosur-Arab League Agreement. Mercosur, a trade bloc in South America that includes Brazil, Argentina, Paraguay, and Uruguay, has established preferential trade agreements with some Arab countries such as Egypt. Through this agreement, countries benefit from preferential terms for the import of essential food commodities, including grains and meat, which are critical to their food security strategies. Brazil, in particular, is a leading supplier of meat and grains to Arab Med countries, supporting regional efforts to secure stable food supplies amidst growing demand and climate-related agricultural challenges. This agreement enhances food security by providing Arab Med nations with diversified and reliable sources of staple foods, further reducing their reliance on more volatile regions for imports.

3. Economic Cooperation Schemes: Platforms for Trade and Food Security

Global and regional economic cooperation schemes serve as essential platforms for enhancing food security in the Arab Med region, particularly in the face of climate change and socio-economic challenges. The World Trade Organization (WTO) provides the framework for reducing barriers to agricultural trade, enabling Arab Med countries to access international markets more efficiently and diversify their food imports. WTO agreements like the Agreement on Agriculture (AoA) promote open trade and reduce tariffs, which is crucial for countries reliant on staple food imports such as wheat and olive oil. Similarly, regional initiatives like the Greater Arab Free Trade Area (GAFTA) facilitate intra-regional trade by eliminating tariffs on agricultural products among member states, fostering more integrated food markets and improving the flow of staple goods across borders.

In addition, platforms like the Union for the Mediterranean (UfM) and Euro-Med agreements contribute to deeper trade cooperation between Europe and the Arab Med, supporting agricultural modernization and sustainable trade practices. These agreements not only help ensure food accessibility but also promote the adoption of climate-resilient agricultural technologies, such as advanced irrigation systems and climate-adaptive crops.

Finally, various United Nations (UN) agencies—including the FAO, IFAD, and WFP—play pivotal roles in supporting food security by funding infrastructure projects, improving

water management, and promoting rural development. These organizations provide critical resources and technical assistance, ensuring that the Arab Med countries can better manage food security challenges through sustainable agricultural practices and more resilient trade networks. Together, these economic cooperation schemes form a multi-layered approach to securing food supplies and building climate-resilient food systems in the region.

4. Common Food Security Vulnerabilities in Trade Agreements across the Arab Med

Trade agreements across the Arab Med region, despite their broad economic aspirations, consistently fail to prioritize agricultural trade and food security, making the region vulnerable to food supply disruptions. The key agreements—such as the Agadir Agreement, Greater Arab Free Trade Area (GAFTA), Euro-Mediterranean (EuroMed) partnership, and Common Market for Eastern and Southern Africa (COMESA)—share several vulnerabilities that expose Arab Med countries to increased risks, especially in the context of climate-induced threats and global trade volatility.

Limited Focus on Agricultural Trade: The dominant focus of most trade agreements within the Arab Med region remains on industrial and manufactured goods, leaving agricultural products underrepresented. This is a critical shortfall, as the region relies heavily on imports of staple foods. Agreements such as the Agadir Agreement and Greater Arab Free Trade Area (GAFTA) prioritize tariff reductions on non-agricultural goods, neglecting the food security challenges inherent in the region. This absence of agricultural emphasis limits the capacity of these frameworks to support robust food supply chains during global market disruptions, climate shocks, or geopolitical crises. For example, GAFTA, established to foster intra-Arab trade, does little to alleviate the agricultural trade imbalances that continue to threaten food security in vulnerable nations like Egypt and Lebanon.

Lack of Climate Adaptation Measures: None of the major trade agreements across the Arab Med region adequately incorporate climate adaptation measures. As climate change accelerates, increasing the frequency of droughts, heatwaves, and floods, the region's agricultural systems—especially those dependent on water-intensive crops—are at heightened risk. The absence of climate-resilient strategies in agreements such as GAFTA and EuroMed leaves the region ill-equipped to deal with the agricultural impacts of climate variability. Integrating climate-resilient provisions into these frameworks could ensure stable agricultural trade and bolster the capacity of local systems to withstand environmental shocks. The EU's Green Deal, for example, which aims to incorporate sustainability into its trade frameworks, could serve as a model for Arab Med trade policies to better account for climate risks.

Infrastructure Deficiencies: Another significant vulnerability in the region's trade agreements is the lack of attention to infrastructure, particularly in terms of agricultural trade logistics. Poor transportation networks, inadequate cold chain facilities, and limited storage capacity undermine the efficiency of agricultural trade, making it difficult to transport and store perishable goods like fruits and vegetables. The Common Market for Eastern and Southern Africa (COMESA), for example, highlights agricultural trade but does not address the critical infrastructure needs that could improve the region's ability to move agricultural products efficiently. During climate-induced crises, these logistical bottlenecks exacerbate food supply disruptions, particularly in rural and underserved areas.

Trade Inequalities and Asymmetry of Benefits: The unequal distribution of benefits from trade agreements disproportionately affects smaller or less-developed Arab Med nations. Countries with larger economies, such as Egypt and Morocco, are better positioned to take advantage of trade liberalization, while smaller economies like Lebanon and Palestine struggle to capitalize on trade opportunities. This imbalance exacerbates existing socio-economic disparities and hinders equitable food access across the region. For instance, while EuroMed and Agadir aim to open markets for Mediterranean nations, barriers to agricultural integration persist, keeping small-scale farmers and agricultural exporters from benefiting from these trade flows.

Absence of the WEFE Nexus Approach: One critical oversight in these agreements is the lack of integration between water, energy, food, and ecosystem (WEFE) dynamics. In a region already burdened by water scarcity, the exclusion of sustainable water and energy management measures from trade agreements leaves agricultural sectors vulnerable to environmental degradation. For instance, water scarcity in Morocco and Tunisia significantly undermines the production of wheat and other essential crops, yet trade agreements like GAFTA and EuroMed do not address the water-management practices necessary to sustain agricultural productivity under climate stress.

The compounded challenges facing Arab Med countries—including trade imbalances, socio-economic instability, and global market volatility—underscore that food security cannot be addressed through transactional trade alone. As these nations face mounting pressures from both internal and external forces, trade dynamics must be understood in conjunction with strategic factors beyond mere goods exchange. Water scarcity, energy dependency, food production, and ecosystem health are all critical components that influence the sustainability of food imports and exports. This is where the Water-Energy-Food-Ecosystem (WEFE) Nexus comes into play, offering a holistic approach to understanding the region's food security landscape. By examining the intricate interdependencies between these elements, the WEFE Nexus framework provides key

insights into how resource management directly affects agricultural resilience, food trade, and overall sustainability. This analysis is crucial for developing strategies that mitigate the vulnerabilities of Arab Med countries and secure their future in an increasingly climate-stressed world.

D. The Water-Energy-Food-Environment (WEFE) Nexus: Interdependencies and Trade Implications

1. Introducing the WEFE Nexus: A Systemic Approach to Food Security

The Water-Energy-Food-Ecosystem (WEFE) Nexus offers a comprehensive framework for understanding how these four interconnected systems shape food securities, particularly in the Arab Med region. The nexus highlights how disruptions in one sector—such as water shortages—can cascade into other areas, influencing agricultural productivity, energy consumption, and ecosystem health. In a region already grappling with water scarcity, energy dependency, and environmental degradation, the WEFE Nexus provides a systemic approach to addressing food security challenges.

Water, as a critical resource, is central to agricultural production. In the Arab Med, where water scarcity is already an issue, managing this resource is vital to sustaining crop yields for staples like wheat and olives. The energy required for desalination, irrigation, and other agricultural processes adds another layer of complexity. The nexus also considers how degraded ecosystems, whether from over-farming or desertification, reduce agricultural land's viability, further straining the food system. The concept underscores that these sectors are not isolated; rather, they are deeply interconnected, and any strategy to address food insecurity must also account for water management, energy efficiency, and ecosystem restoration.

The increasing threat of climate change exacerbates these challenges, making it more difficult to maintain food security. As climate-related events like droughts, heatwaves, and water scarcity become more frequent, understanding and addressing the WEFE Nexus becomes even more critical. For Arab Med countries, this systemic approach to managing these interdependencies is essential for building resilience in their food systems. Adopting policies that integrate sustainable water use, renewable energy, and ecosystem preservation will be vital to mitigating the impacts of climate change on food production.

2. Trade and the WEFE Nexus: Managing Interdependencies Under Climate Stress

The WEFE Nexus not only impacts domestic food production but also plays a crucial role in shaping trade dynamics, especially as climate change intensifies. Arab Med countries

are increasingly dependent on food imports to meet growing domestic demand, and this reliance on external sources makes them vulnerable to disruptions in global food markets. As climate risks such as water scarcity and energy insecurity rise, the ability to manage these interdependencies becomes crucial for maintaining resilient food trade systems.

A key concept tied to the WEFE Nexus is virtual water—the water embedded in the production and trade of agricultural products. For countries like Egypt, Jordan, and Lebanon, which import large amounts of water-intensive crops such as wheat and legumes, virtual water trade can alleviate domestic water scarcity but also creates dependencies on external suppliers. As climate change reduces water availability in both importing and exporting regions, virtual water trade could become less reliable, heightening the risk of food insecurity. Managing this virtual water dependency through trade agreements that account for water and energy resources is essential.

Moreover, energy costs linked to food distribution, cold chain management, and transportation further complicate trade dynamics. Rising energy prices, driven by global fluctuations, increase the cost of importing food, adding to the burden on already stretched economies in the Arab Med. In parallel, the degradation of ecosystems—such as declining soil quality and biodiversity loss—threatens local agricultural resilience, forcing countries to rely even more on imports. These challenges highlight the critical need for integrated trade policies that consider the WEFE Nexus as a central component of food security strategies.

Incorporating the WEFE Nexus into trade frameworks can help countries better navigate these interdependencies and build resilience. This includes fostering partnerships with water-rich countries, investing in renewable energy sources, and promoting sustainable ecosystem management practices that enhance the capacity of Arab Med nations to secure stable food supplies in a climate-stressed world.

E. The Complex Web of Vulnerabilities in Arab Med Food Security

The Arab Med region stands at the intersection of multiple challenges that severely undermine its ability to secure stable food supplies. Socio-economic fragility, characterized by high poverty rates, rising inflation, and economic instability, is compounded by an overwhelming reliance on food imports to meet domestic demand. Trade deficits and insufficient local agricultural production, exacerbated by demographic pressures and political unrest, only deepen this vulnerability. The region's inability to produce enough staple foods like wheat to meet the needs of a growing population puts it in a precarious position, making it heavily dependent on external food supplies.

Climate change amplifies these vulnerabilities by severely disrupting local agricultural production through rising temperatures, frequent droughts, and water scarcity. This has direct consequences on food availability and affordability, forcing the Arab Med nations

to further increase their reliance on volatile global markets. Moreover, current trade agreements—while reducing tariffs and facilitating trade—fail to address the critical intersections of water, energy, food, and ecosystems (WEFE), leaving the region highly exposed to climate-induced risks.

Trade structures across the Arab Med region, whether through bilateral or multilateral agreements, prioritize industrial goods over essential agricultural products, leaving a gap in securing the food staples that are central to the region's diet and cultural heritage. Furthermore, the absence of climate adaptation strategies within these agreements creates additional strain on already fragile food systems, limiting the region's resilience against the cascading impacts of climate change.

As the region faces these compounded challenges, it becomes evident that food security in the Arab Med is not only a matter of improving agricultural productivity but also a question of strengthening trade dynamics, aligning economic cooperation with climate resilience, and managing the interdependencies within the WEFE Nexus. These multifaceted and intertwined issues prompt a critical inquiry: How can Arab Med countries strengthen their negotiation edge and trade agreements to secure sustainable access to Mediterranean staple foods in a future increasingly shaped by climate threats and global food market volatility? This essential question underpins the region's pathway to navigating its complex food security landscape, which is now more vulnerable than ever to external shocks.



STRATEGIC LEVERAGE IN FOOD SECURITY NEGOTIATIONS FOR THE ARAB MED

How can Arab Med countries strengthen their negotiation edge and trade agreements to secure sustainable access to Mediterranean staple foods in a future increasingly shaped by climate threats and global food market volatility? This question echoes a timeless struggle. Since the dawn of human civilization, the pursuit of securing food has been a driving force in shaping societies. Early hunter-gatherer communities, driven by the need for survival, roamed vast terrains, migrating with seasonal food sources and water supplies. Over time, as agricultural practices took root, humanity transitioned from nomadic lifestyles to settled communities, creating the foundations for early states and structured civilizations. This ability to produce and manage food resources not only allowed societies to thrive but also sparked the first power structures, from small villages to expansive empires.

As history unfolded, food security remained at the core of political and economic power. Ancient civilizations like Mesopotamia, Egypt, and Rome demonstrated how control over arable land and grain production was synonymous with power and stability. States that managed their agricultural resources effectively could sustain growing populations, while others were driven to war or conquest to access fertile lands. As we moved into the Industrial Revolution, the advent of food processing and preservation—along with expanding global trade networks—transformed food security from a localized concern into a complex international dynamic.

Governments continued to play an essential role in this process, adopting various methods to secure food supplies for their populations. From promoting local agriculture to colonizing new territories rich in resources, rulers leveraged both diplomacy and force. Over time, food security evolved into a matter of global strategy, and the present-day Arab Med region is no exception. For these nations, the challenge is not only ensuring domestic production but also navigating international trade systems to secure a reliable supply of staple foods like wheat, olive oil, and legumes.

Today, the challenges are even more pressing. Climate change exacerbates water scarcity, alters growing seasons, and increases the frequency of extreme weather events, adding new layers of complexity to securing food supplies. Combined with global food price volatility, political instability, and rising demand due to population growth, Arab Med countries are facing a confluence of historical, economic, environmental, and geopolitical challenges. These challenges demand a new strategic approach to food security, one that moves beyond traditional trade dynamics and takes a holistic view of the factors influencing negotiation power.

This chapter delves into unconventional approaches for enhancing the negotiation leverage of Arab Med countries in securing sustainable access to Mediterranean staple foods amid escalating

climate-induced challenges. Building on the vulnerabilities identified in Chapter 1, it explores the compounded strategic value of staple food constituents, focusing on the marginal utility of key staples by quantifying the cost of their absence during periods of scarcity. This approach offers a unique framework for understanding how food security needs can be leveraged in negotiations, positioning food not just as isolated goods but as components of broader strategic interests, such as water, energy, and ecosystem management.

The chapter then introduces the Four Freedoms Framework—mobility of goods, services, capital, and people—arguing that securing access to food cannot be separated from other forms of economic mobility. It emphasizes how investment in agriculture, the movement of labor in production, and the flow of services within food supply chains are essential for reshaping food security strategies.

Additionally, the chapter investigates potential transactionalism scenarios, exploring how Arab Med governments could secure food through exchanges within the Water-Energy-Food-Ecosystem (WEFE) Nexus or by leveraging geopolitical alliances. These transactional strategies offer a fresh approach to food security negotiations, proposing alternatives to traditional trade models by exploiting interdependencies between critical sectors like energy and water resources, both of which are vital for regional stability.

Finally, the role of trade diplomacy and financial support mechanisms is assessed to understand their effectiveness in protecting food trade-vulnerable Arab Med countries. It examines whether these tools can offer long-term resilience in food trade relationships or if their efficacy is limited by ongoing geopolitical tensions and climate risks.

To address these challenges, the methodology combines a multi-layered analytical framework that integrates expert insights through Key Informant Interviews (KIIs) and quantitative assessments. Six experts in food security, trade dynamics, and Mediterranean geopolitics provide qualitative data, structured around the economic, social, and political impacts of food security, the geopolitical context of Mediterranean staple foods, and the climate-adaptation measures shaping trade negotiations. The insights from these interviews are validated through triangulation with data from global food security databases and authoritative reports.

In parallel, a quantitative assessment evaluates the strategic impact of food security across economic, social, political, environmental, and geopolitical dimensions. This multi-criteria analysis (MCA) uses key performance indicators (KPIs) from international indices like the FAO and WFP, synthesizing expert recommendations to evaluate the strategic importance of staples like wheat, olive oil, and legumes, and the vulnerabilities introduced by climate change and geopolitical shifts.

These findings are consolidated into a structured framework analysis, which includes impact pathways tracing the influence of geopolitical events and climate risks on food security, as well as scenario-building exercises exploring potential disruptions to food access. Strategic recommendations grounded in the WEFE Nexus principles leverage system dynamics modeling to examine the interconnections between water, energy, food, and ecosystems in a trade context. This comprehensive, multidimensional approach equips policymakers with the tools needed to craft strategic, data-driven decisions. By combining qualitative expert insights, quantitative assessments, and a structured framework approach, this chapter provides a solid foundation for analyzing food security in the context of trade agreements, geopolitical alliances, and climate resilience in the Arab Med region.

A. Quantitative Assessment of the Compounded Strategic Impact (CSI) of Food Security

The ability to quantify the aggregate strategic impact of food security is vital for policymakers in the Arab Med region as it allows for an informed decision-making process based on the compounded consequences of failing to secure essential staple foods. This section focuses on assessing the total cost that would be incurred by a country if it fails to secure a sufficient supply of key staples, such as wheat, olive oil, and legumes. These costs extend far beyond the price of the food itself, encompassing economic inflation, social unrest, healthcare burdens, and disruptions in political stability.

For example, the market price of one ton of wheat may be \$400, but the absence of that ton could result in a compounded strategic cost of \$800 to the country. This cost would include the broader impacts of food shortages, such as rising inflation due to scarcity, increased healthcare costs as malnutrition sets in, social instability stemming from food insecurity, and the heightened risk of political unrest or conflict. By quantifying this compounded impact, countries are empowered to compare the cost of securing a food item against the potential economic, social, and political costs of its absence.

This approach offers a clear, data-driven framework for governments to assess the marginal utility of securing their food supply and prioritize trade negotiations and resource allocation accordingly. It provides a practical methodology for evaluating when it is more cost-effective to invest in securing staple foods, rather than facing the cascading effects of food insecurity.

Central to this method is the valuation of the compounded strategic impact of food security, which takes into account multiple dimensions. These dimensions include Economic Dimensions, Social Dynamics, Political Landscape, Environmental Considerations, Geopolitical Influences, Energy Factors, Security Implications, WEF Nexus Interdependencies, Collaborative Opportunities, and Strategic Alliances. For each of these factors, policymakers will apply a coefficient—greater than 1 if the factor presents a potential threat to their negotiation power, and less than 1 if it represents an opportunity.

Each factor is then weighted based on its relative impact on the country in question. Using these coefficients and weights, a Compounded Strategic Impact (CSI) value for food security is calculated through a weighted average, providing a quantitative measure for the country's strategic decision-making. By following this model, governments can proactively navigate the trade landscape and ensure food security in a volatile global environment.

1. Economic Dimensions

The economic dimension of food security is paramount in shaping the Arab Med countries' capacity to navigate global food supply dynamics. According to the majority of interviewed experts, the impact of food security on macroeconomic stability is evident through its influence on inflation rates, trade balances, and overall national productivity. Countries like Egypt, where over 55% of wheat is imported, serve as clear examples of how fluctuations in global food prices can lead to significant economic disruptions. Egypt's negative trade balance of \$41.8 billion in 2022 illustrates the strain that heavy dependence on food imports places on national economies, a concern echoed by multiple experts (OEC, 2022).

Price Volatility

Price volatility has a direct and significant impact on food security in the Arab Mediterranean region, where countries like Egypt and Morocco are highly sensitive to fluctuations in global food prices. Most of the interviewed experts emphasized the elasticity of demand for staples such as wheat, which makes these economies particularly vulnerable to even slight increases in global prices. For example, Egypt's heavy reliance on wheat imports means that price spikes, as seen in previous global food crises, lead to higher domestic food prices, pushing inflation rates and straining trade balances. These countries' ability to absorb price changes is limited due to their high dependency on external food sources, making it essential to develop strategies for mitigating these fluctuations and building trade resilience.

Import-Export Imbalances

Most experts agreed that these countries' food security strategies heavily depend on securing stable trade relationships to offset domestic production gaps. Countries like Algeria and Lebanon, which face growing trade deficits, must navigate volatile international markets, where geopolitical factors and climate change frequently increase the cost of food imports. The experts underscored that countries with greater fiscal imbalances are less capable of managing sudden surges in food prices, which could strain their already fragile economic structures.

Impact on National Resilience

The compounded economic impact extends to broader national resilience, particularly in countries with slower GDP growth or weaker fiscal positions, like Lebanon (2.2% real GDP growth in 2022) and Jordan (2.6% real GDP growth in 2022). These countries are more vulnerable to external shocks, such as price volatility in food markets, which directly affects their ability to sustain essential imports. As the experts suggested, a balanced approach that includes strong trade agreements and diversified sources of food imports could mitigate these vulnerabilities.

Most experts agreed that when evaluating food security, policymakers should apply a coefficient greater than 1 if they perceive food insecurity as an imminent economic threat, which would reduce their bargaining power in global trade negotiations. Conversely, if they view specific trade relationships or agricultural reforms as opportunities to enhance food security, a coefficient below 1 might be justified.

2. Social Dynamics

The social dynamics surrounding food security highlight its significant impact on public well-being, social cohesion, and population stability. Experts interviewed emphasized that food insecurity is a catalyst for social instability, affecting everything from health outcomes to civil unrest and migration patterns. The effects of food scarcity and price surges are particularly evident in countries like Lebanon, where a 103% inflation rate on food items in 2024 exacerbated an already fragile social fabric. The correlation between rising food prices and public discontent was also seen during the Arab Spring, where surging costs of staple foods in Tunisia contributed to mass protests.

Impact on Public Health

Food insecurity often leads to malnutrition, which not only reduces the caloric intake of vulnerable populations but also has cascading effects on labor productivity and the broader economy. For instance, a reduction in daily caloric intake can weaken public health, leading to higher healthcare costs and lower workforce participation. Most experts noted that malnutrition is a direct consequence of food insecurity in countries like Egypt and Jordan, where a significant portion of household income is spent on food.

Social Unrest and Governance

Interviewed experts also observed that food shortages and price spikes often lead to social unrest, which further strains governance and public institutions. In Lebanon and Tunisia, for example, food insecurity contributed to major civil protests, with ripple effects destabilizing the political environment. The unrest that follows food price hikes undermines trust in governmental institutions and can lead to broader destabilization, as seen during the economic collapse in Lebanon.

Migration and Population Mobility

Migration flows in the Arab Mediterranean region illustrate a complex relationship with food insecurity, where migration acts both as a cause and consequence of the issue. As food insecurity deepens, people often migrate in search of better living conditions and more stable food systems. This trend is particularly evident in countries like Syria and Lebanon, where prolonged conflicts and economic instability have severely disrupted food production and access. For instance, the migration of people Syria, Iraq, and Palestine to Europe is often driven by the desire for improved socio-economic conditions, which include securing better food access. Furthermore, migration from sub-Saharan Africa to the Arab Med countries adds another layer of complexity. Migrants from these regions, often fleeing extreme poverty and climate-induced droughts, arrive in the Arab Med, further stressing food systems in already vulnerable areas. As a result, this demographic shift creates a feedback loop where food insecurity in both origin and host countries fuels migration, while the influx of migrants exacerbates food security challenges in receiving countries. As stipulated by most of the experts, this cyclical relationship underscores the need for integrated policies that address both migration and food security, ensuring sustainable agricultural development, and enhancing trade resilience in the region.

Given these challenges, the majority of experts agreed that social dynamics must be heavily weighted in any quantitative assessment of the compounded strategic value of food security. Policymakers are encouraged to apply a coefficient greater than 1 if social instability is deemed a significant threat. Conversely, a lower coefficient can be applied if robust social programs are in place. This methodology allows for a more nuanced understanding of how social stability is intertwined with food security, helping policymakers to prioritize the protection of public well-being in their broader food security strategies.

3. Political Landscape and Policy Frameworks

The political landscape, shaped by governance structures, policy decisions, and international diplomacy, plays a critical role in determining a country's food security. Experts interviewed consistently emphasized the importance of political stability, effective agricultural policies, climate resilience strategies, and the development of food storage infrastructure. These elements directly influence a nation's capacity to manage its food supply sustainably, especially amid escalating climate threats.

Governance and Agricultural Policies

A well-developed agricultural policy is vital for reducing reliance on imports and bolstering local production. Countries like Morocco and Tunisia have enacted agricultural reforms aimed at boosting the domestic production of staples such as wheat, olives, and fruits. These policies not only stabilize food supply but also create a buffer against global market fluctuations. However, political instability, as seen in Lebanon and Syria, undermines the consistent implementation of these policies. Experts highlighted how subsidies and incentives for local farmers are key to enhancing food security, yet widespread corruption and inefficiency often diminish their impact.

Public Investment in Food Storage and Distribution Infrastructure

Effective food storage and distribution are critical components of a national food security strategy. Investment in food storage facilities—such as grain silos and cold storage for perishable goods—can significantly mitigate the impact of supply chain disruptions and global price volatility. In countries with inadequate infrastructure, like Libya, the lack of modern food storage facilities exacerbates food insecurity, particularly during crises. Experts agreed that modernizing storage and distribution networks is a priority for policymakers seeking to enhance their country's food resilience.

Climate Resilience Policies

The increasing severity of climate change necessitates comprehensive climate resilience strategies, which are being integrated into agricultural policies in countries like Egypt and Jordan. These policies promote the adoption of drought-resistant crops, efficient irrigation practices, and research into climate-smart agriculture. Experts underscored the urgency of this integration, stressing that without such policies, countries face growing risks from extreme weather events, diminished agricultural output, and escalating food prices. A robust climate resilience strategy is essential for long-term food security.

Corruption and Inequality

Political corruption and institutional inefficiency further complicate food security efforts. Corruption skews the equitable distribution of resources, inflates prices through monopolistic

practices, and limits access to essential food products. During political unrest in Lebanon, for example, favoritism in the allocation of subsidized food products led to widespread shortages and public unrest. Experts emphasized that addressing corruption is crucial for maintaining fair access to food.

A coefficient greater than 1 may be used when political instability and corruption significantly threaten food security, while a coefficient less than 1 is appropriate when political stability, strong governance, and effective policy frameworks present opportunities. This strategic evaluation aids in determining how political conditions shape a nation's ability to secure its food supply in both domestic and international contexts.

4. Water Scarcity and Agricultural Productivity

Water scarcity is a key challenge for agriculture in the Arab Mediterranean, where 80% of freshwater is used for farming. Climate change intensifies this issue, with vital crops like wheat, olives, and citrus fruits increasingly vulnerable to droughts and erratic rainfall. While countries like Israel have successfully implemented water-saving technologies, many Arab Med countries face insufficient investment due to low water prices and outdated policies. In places like Morocco, water recycling and wastewater treatment show promise but remain underdeveloped. Though drought-resistant crops can help, they are not a long-term solution without systemic reforms in water management. The region's heavy reliance on food imports exposes it to global trade disruptions, making comprehensive water and agricultural policy reform essential for long-term food security.

Energy Demands in Agricultural Systems

The Arab Med region's agricultural systems are also energy-intensive, from irrigation to processing and transportation. As Dr Maha Al-Zu'bi pointed out, innovations like desalination plants offer a lifeline for regions such as Morocco's Souss-Massa, which faces severe droughts, but they require significant energy inputs. The reliance on fossil fuels for powering these systems creates a dual vulnerability, as energy prices fluctuate, and carbon emissions intensify climate risks. Renewable energy sources like solar and wind present a promising alternative. Morocco and Egypt have already invested heavily in renewable energy, which could reduce the cost of energy-intensive agricultural processes while also enhancing climate resilience. Nevertheless, many nations in the region remain dependent on fossil fuels, underscoring the need for further investment in sustainable energy solutions to secure food production in the long term.

Ecosystem Degradation and Food Security

Healthy ecosystems provide essential services that underpin agricultural productivity, including maintaining soil fertility, filtering water, and supporting biodiversity. However, these ecosystems are under threat from deforestation, overgrazing, pollution, and urbanization. As ecosystems degrade, the region's ability to produce food diminishes, increasing its reliance on imports and heightening its strategic vulnerability.

Soil degradation, specifically, erodes the capacity of countries to grow staple crops domestically. Sustainable farming practices, such as crop rotation and organic farming, must be prioritized to restore soil fertility. Protecting ecosystems, particularly wetlands and forests, is equally important, as these areas contribute to water conservation and resilience against climate shocks. As explained by Eckart Woertz, the depletion of underground water reserves (aquifers) further limits agricultural expansion and highlights the importance of ecosystem preservation for long-term food security.

The WEFE Nexus and Interdependencies

The Water-Energy-Food-Ecosystem (WEFE) Nexus offers a systemic approach to understanding how these critical sectors are interconnected. As water scarcity intensifies, energy demands for desalination and irrigation rise, which in turn influences agricultural output. Degraded ecosystems reduce the availability of fertile land and clean water, while food production consumes both water and energy. These interdependencies mean that disruptions in one area can cascade into others, compounding the risks to food security.

Virtual Water and Trade Implications

The concept of virtual water—water embedded in food and goods that are traded internationally—is particularly relevant for water-scarce countries like Jordan and Egypt. As noted by Philippe de Fontaine Vive Curtaz, water is essentially traded through commodities like tomatoes, which helps reduce domestic water use. This reliance on virtual water allows countries to offset their limited water supplies by importing food from regions with more abundant resources. However, this strategy increases the vulnerability of Arab Med countries to fluctuations in global markets and supply chain disruptions. While importing virtual water can alleviate immediate pressures on water resources, it highlights the need for robust trade agreements that can safeguard reliable access to food without exacerbating domestic water shortages.

The Arab Mediterranean region faces significant food security risks driven by water scarcity, energy demands, and ecosystem degradation. These factors are interconnected and can be quantitatively assessed using a coefficient to evaluate their compounded impact on food security. A coefficient greater than 1 indicates heightened vulnerability, where outdated water policies, dependence on fossil fuels, and ecosystem degradation exacerbate agricultural inefficiencies. In contrast, a coefficient below 1 signals effective mitigation measures, such as investments in renewable energy and water-saving technologies, which enhance resilience. The Water-Energy-Food-Ecosystem (WEFE) Nexus demonstrates how disruptions in one area—such as water scarcity—can escalate energy demands and strain food systems, further raising the coefficient. Similarly, ecosystem degradation increases reliance on food imports, amplifying exposure to global market volatility. Conversely, strategies like strengthening trade agreements, improving resource management, and ecosystem conservation can lower the coefficient, fostering greater food security. Virtual water trade, while alleviating immediate water constraints, also underscores the region's vulnerability to global market disruptions. Thus, analyzing these coefficients helps policymakers understand the dynamic relationship between water, energy, ecosystems, and food security, guiding more effective and sustainable solutions.

5. Geopolitical and Security Dynamics

The geopolitical and security dynamics of the Arab Med region are crucial in determining food security outcomes. These dynamics not only shape trade relations but also have far-reaching effects on political stability, resource control, and military alliances. In this section, we explore the multifaceted geopolitical power balance, conflicts, regional alliances, and the security implications that influence the Arab Med's ability to secure food supplies.

Geopolitical Power Balance in the Mediterranean

The Mediterranean is a critical geopolitical region, with numerous global and regional powers vying for influence. Arab Med countries, such as Egypt, Tunisia, and Lebanon, must navigate the intricate power balance between the European Union, Russia, the United States, and regional actors like Turkey and Israel. As highlighted by Maroun Kayrouz, «the geopolitical balance shapes both trade agreements and the negotiation edge of these countries, influencing their ability to secure essential food imports in a competitive global market.» This balance also dictates the stability of trade relations, particularly for staple goods like wheat and olive oil.

Impact of Conflicts and Rising Shipping Costs on Food Supply Chains

Geopolitical conflicts in critical regions such as the Black Sea and Red Sea are severely disrupting food supply chains, leading to rising shipping and insurance costs and contributing to food price inflation. The ongoing war in Ukraine, which has halted grain exports via the Black Sea, is a stark example of how such conflicts directly undermine food security in the Mediterranean. Countries like Egypt, heavily reliant on these routes, experienced immediate wheat shortages. Additionally, conflicts in Yemen and along the Red Sea have exacerbated logistical challenges, pushing up shipping and insurance premiums. Vulnerable trade routes like the Suez Canal and the Strait of Gibraltar also face heightened risks of piracy and blockades, further inflating costs. As Philippe de Fontaine Vive Curtaz noted, «higher insurance premiums and shipping costs inflate food prices, particularly for nations like Lebanon and Jordan.» These rising costs weaken the negotiation power of Arab Med countries, making them increasingly dependent on external food supplies.

Geopolitical Conflicts Over Strategic Resources

Water scarcity is becoming an increasingly critical issue, with disputes over control of key water sources like the Nile River. Interviewees confirmed the significance of the geopolitical struggle over the Nile between Egypt, Sudan, and Ethiopia's Grand Ethiopian Renaissance Dam, which has deep implications for food security, as water scarcity directly affects agricultural productivity. Similarly, Jordan faces severe water shortages, increasing its reliance on food imports and elevating the geopolitical stakes around water access.

Regional Alliances and Political Stability

Geopolitical alliances within the Arab Med, such as those formed through the Arab League and the Union for the Mediterranean (UfM), play a key role in stabilizing or destabilizing the region. Jean Eric Aubert observed that «alliances with European nations under the UfM framework have helped strengthen food trade agreements but remain fragile due to regional tensions.» Frictions between Turkey and Greece, for example, complicate food logistics through the Mediterranean Sea, while the tensions between Israel and neighboring Arab states further strain regional cooperation.

Strategic Resource Control and Trade Leverage

Control over natural resources, such as oil, gas, and renewable energy, provides some Arab Med countries with leverage in trade negotiations. As Thomas Shellen noted, «resource-rich nations like Algeria use energy as a bargaining tool in securing favorable food import terms, though this leaves them vulnerable to global market fluctuations.» The reliance on fossil fuels further complicates the region's food security strategies, as shifts in global energy markets can exacerbate food import costs.

Security Implications: Civil Unrest, and Terrorism

Security implications in the Arab Mediterranean region are deeply intertwined with food insecurity, as both civil unrest and terrorism are often exacerbated by scarcity. As food shortages become more acute, vulnerable populations are more susceptible to radicalization, with extremist groups leveraging these vulnerabilities by offering resources in exchange for loyalty. As Eckart Woertz highlighted, «terrorist organizations capitalize on food shortages to recruit members in regions where the government fails to provide adequate food supplies.» This exploitation of food insecurity not only fuels instability but also destabilizes the broader geopolitical landscape, as it challenges the ability of governments to maintain control and secure vital resources. The security challenges posed by food insecurity are thus a significant factor in shaping the region's political stability, requiring comprehensive responses that address both immediate humanitarian needs and long-term strategic resilience.

The geopolitical and security dynamics of the Arab Mediterranean region significantly influence its food security, and the coefficient approach provides a lens to assess these impacts. A coefficient above 1 signals that political instability, regional conflicts, and resource disputes intensify vulnerabilities to food insecurity. For instance, ongoing geopolitical power struggles and the control of strategic resources—such as water—amplify risks to agricultural productivity, making the region highly dependent on external food sources. Conversely, a coefficient below 1 would indicate that stable political alliances and strong governance frameworks could mitigate these risks, yet the reality of fragile alliances complicates this potential. The interplay of these dynamics underscores the need for comprehensive strategies to strengthen the region's resilience, focusing not just on immediate security challenges but also on long-term governance reforms and regional cooperation to secure sustainable food systems.

6. Collaborative Opportunities, Strategic Alliances, and Regional Cooperation for Food Security

In the face of growing challenges such as climate change, water scarcity, and food insecurity, Arab Med countries must increasingly rely on collaboration, strategic alliances, and regional cooperation. These frameworks not only strengthen trade and agricultural resilience but also enhance negotiation leverage in securing food supplies. By fostering collective action, countries in the region can address systemic vulnerabilities, pool resources, and promote innovation to safeguard food security. This section consolidates the themes of collaborative opportunities, strategic alliances, and cooperation into a unified analysis of how these efforts impact food security across the Arab Med.

Collaborative Opportunities for Food Security

Collaborative opportunities between Arab Med countries and broader regional actors offer a significant pathway toward enhancing food security. Most experts interviewed agreed that collaborative initiatives—such as joint agricultural research, technology transfer, and shared resource management—create a strong foundation for mitigating climate impacts on agriculture. These collaborative models can enhance local agricultural productivity while reducing reliance on food imports. Furthermore, collaboration with international development organizations and multilateral agencies provides additional support. Organizations like the Food and Agriculture Organization (FAO) and the International Fund for Agricultural Development (IFAD) help Arab Med countries secure funding, knowledge, and technology for food security projects. These partnerships enable countries to better respond to water scarcity, desertification, and shifting climate patterns, all of which significantly impact the agricultural output of the region.

Strategic Alliances for Trade Resilience and Political Support

Strategic alliances, both within the Arab Med and with external partners, are key drivers of food security resilience. These alliances often focus on securing trade agreements, technological support, and political backing in times of crisis. As noted by Jean-Eric Aubert, «strategic partnerships with regional powers like the European Union or Gulf states can provide crucial support for food imports during periods of market volatility.» For instance, trade alliances between Egypt and the Gulf countries enable the flow of staple foods like wheat, mitigating supply shortages during global disruptions. Additionally, military and defense alliances play an indirect but important role in securing food supply routes and critical infrastructure. Alliances such as NATO's presence in the Mediterranean help protect sea lanes that are vital for food imports, especially during times of heightened geopolitical tension. These strategic military alliances ensure that essential maritime routes, such as the Suez Canal, remain open for the uninterrupted flow of goods, including food supplies. Eckart Woertz highlighted that without these protections, the risk of supply chain disruptions would significantly increase, raising food prices and threatening food availability across the region.

Regional Cooperation Frameworks for Sustainable Food Systems

Regional cooperation frameworks, such as the Union for the Mediterranean (UfM), Greater Arab Free Trade Area (GAFTA), and Agadir Agreement, offer structured platforms for addressing shared food security challenges. These frameworks allow member countries to coordinate trade policies, enhance food security measures, and collectively address environmental and agricultural vulnerabilities. The UfM, in particular, promotes the integration of climate resilience into agricultural policies, encouraging countries to adopt practices like drought-resistant crops and efficient irrigation systems that align with regional climate goals. Dr Maha Al Zu'bi argued that regional cooperation can also extend to energy and water management, crucial aspects of the Water-Energy-Food-Ecosystem (WEFE) Nexus. Moreover, participation in larger continental and global frameworks, such as the African Continental Free Trade Area (AfCFTA), opens new opportunities for North African countries to diversify their food trade networks, accessing alternative markets and reducing dependence on volatile global markets. Through these cooperative mechanisms, the Arab Med region can strengthen its position in global food supply chains while ensuring that its food systems are better insulated from climate and economic shocks.

The coefficient approach in analyzing collaborative opportunities, strategic alliances, and regional cooperation in the Arab Med region emphasizes the critical role these frameworks play in mitigating food security risks. A coefficient greater than 1 reflects a situation where the region's strategic alliances and collaborative frameworks are not only reactive but proactive, amplifying the collective bargaining power of member countries. This can significantly reduce vulnerability to external shocks such as global market volatility and climate change. The collaborative initiatives, such as joint agricultural research and shared resource management, exemplify how pooled resources can enhance agricultural resilience and reduce dependency on food imports. Conversely, a coefficient less than 1 would indicate a weaker framework, where fragmented cooperation and insufficient coordination may hinder progress. In this case, regional and external partnerships could fail to achieve meaningful impact, leaving the region more exposed to food security threats. Therefore, enhancing strategic alliances and fostering deeper regional cooperation remains essential for ensuring long-term food security in the face of growing challenges. As demonstrated in the quantitative assessment, the compounded strategic impact of food security reaches far beyond immediate economic and social costs, affecting political stability, environmental resilience, and national security. However, to fully understand the complexity of food security within the Arab Med, it is crucial to examine how mobility—of goods, services, capital, and people—intersects with the Water-Energy-Food-Ecosystem (WEFE) Nexus. This interconnected mobility framework will further illuminate the regional dynamics of food access, and the negotiation edge Arab Med countries can leverage within the Euro-Mediterranean trade system. In the next section, we explore how these freedoms of mobility shape food security strategies and resilience in the face of escalating climate risks and geopolitical challenges.

B. Interconnected Mobility: Analyzing Food Security Through the Four Freedoms and WEFE Nexus in Euro-Mediterranean Relations

The Euro-Mediterranean relationship aims to strengthen political, economic, and social ties between the European Union and its Arab Med counterparts. However, this relationship is marked by significant asymmetries, with Arab Med countries facing economic and environmental challenges that hinder their ability to secure food sovereignty. These countries heavily rely on staple food imports due to geographic limitations, such as water scarcity and declining agricultural productivity, particularly in countries like Egypt, Tunisia, and Morocco.

The Barcelona Process, alongside subsequent Free Trade Agreements (FTAs) within the Euro-Med framework, was designed to facilitate the mobility of goods, services, capital, and people. These agreements were expected to foster economic integration and contribute to sustainable development in the region. Nevertheless, the structural imbalances—such as market access barriers for Arab Med agricultural products and the subsidization of EU agriculture—continue to place these countries at a disadvantage. While the agreements enable the Arab Med countries to access European markets, they also expose them to the volatility of global food prices and geopolitical risks. This reliance on imports, coupled with external pressures like climate change and geopolitical instability, heightens food security risks in the region.

In 2022, EU agri-food trade reached €28.3 billion, reflecting an 18% year-on-year growth (Directorate-General for Agriculture and Rural Development, 2022), underscoring the critical role of the EU as a primary supplier of staple foods like wheat, oilseeds, and dairy products to the Arab Med region. The Arab Med countries are increasingly reliant on these imports due to their domestic limitations. As climate change further exacerbates these vulnerabilities, the need for a deeper understanding of how the Euro-Med trade dynamic affects the food security of Arab Med nations becomes urgent.

Analyzing the Euro-Med relationship through the Four Freedoms Framework (4FF)—the mobility of goods, services, capital, and people—integrated with the Water-Energy-Food-Ecosystem (WEFE) Nexus provides a comprehensive lens for assessing food security dynamics. This approach is not limited to bilateral or multilateral trade agreements but also serves as a diagnostic tool for identifying broader structural power imbalances and vulnerabilities in existing frameworks. Given the significance of EU-Arab Med trade in agricultural products, understanding the intricacies of these interactions is essential for enhancing the Arab Med countries' negotiation leverage in securing staple foods. Moreover, pinpointing the shortcomings of frequently applied FTAs, such as asymmetric benefits or lack of climate adaptation strategies, offers valuable insights that can be used

to better structure future intra-Arab trade agreements. These insights can ultimately serve as lessons learned, guiding policymakers in prioritizing intra-regional trade over external dependencies, thereby strengthening regional food security and resilience.

This section uses the Euro-Med relationship as a focused case study to understand how food trade dynamics shape negotiation power, resource management, and sustainability for Arab Med nations. This analytical approach uncovers how these countries can position themselves strategically to bolster food security amid growing climate risks.

Examining the mobility of goods within Euro-Med agreements reveals a critical vulnerability: while these agreements facilitate food imports, they also create dependency on European markets, making Arab Med countries vulnerable to price fluctuations and supply chain disruptions. Similarly, services and capital mobility offer opportunities to enhance agricultural productivity; however, regulatory hurdles and financial barriers prevent the full benefits of these resources from being realized. The mobility of people, essential for the exchange of agricultural expertise and labor, is further constrained by migration policies and geopolitical tensions, which exacerbate existing food security challenges.

This analysis evaluates whether Euro-Med trade agreements genuinely address the economic, environmental, and social needs of Arab Med countries or whether they perpetuate inequities and dependencies. The findings serve as a foundation for policy recommendations, offering benchmarks to assess the fairness and sustainability of future trade dynamics, particularly in light of negotiations for the Deep and Comprehensive Free Trade Agreements (DCFTAs) with countries like Tunisia and Morocco.

1. Mobility of Goods and the WEFE Nexus

The mobility of goods in Euro-Mediterranean trade reflects a critical paradox: while essential for regional food security, it exposes fundamental resource vulnerabilities across the Water-Energy-Food-Ecosystem (WEFE) Nexus, particularly for Arab Mediterranean nations dependent on food imports.

Water Dimension

Water scarcity fundamentally shapes regional trade dynamics, with countries like Libya, Jordan, and Egypt operating well below the critical threshold of 1,000 cubic meters per person annually. This constraint forces strategic trade-offs: Egypt, heavily reliant on wheat import, must balance limited water resources between domestic agriculture and other needs. While Euro-Med trade agreements offer partial relief—illustrated by Morocco's strategic wheat imports from France—they create hidden vulnerabilities through virtual water trade and exposure to global market volatility, as demonstrated during the 2022 Russia-Ukraine conflict.

Energy Dimension

The region presents a stark energy dichotomy: fossil fuel-rich nations (Algeria, Libya) versus energy importers (Tunisia, Lebanon). However, both face common challenges in energy-intensive food logistics and storage. Egypt's Green Hydrogen project exemplifies an innovative response, aiming to decouple food logistics from fossil fuel dependence through renewable energy integration. This approach addresses both immediate food security needs and long-term sustainability goals.

Food Trade Dynamics

Trade policy adaptations, such as Morocco's 2021 suspension of wheat import duties, reveal deeper structural imbalances. European agricultural subsidies create asymmetric competition, undermining local production capacity—evident in Tunisia's declining domestic wheat sector. This dependency exposes fundamental vulnerabilities in regional food security architecture, particularly during geopolitical disruptions.

Ecosystem Implications

The pursuit of agricultural competitiveness drives unsustainable practices, creating a vicious cycle of environmental degradation. Morocco's over-irrigation of export crops illustrates how trade pressures accelerate ecosystem deterioration. The European Green Deal, while promoting sustainability, paradoxically disadvantages Arab Mediterranean producers through stringent standards they lack resources to meet. Jordan's «Water-Energy Nexus Council» represents an emerging institutional response, attempting to balance trade requirements with ecosystem preservation.

The analysis of goods mobility through the WEF E Nexus lens reveals critical imperatives for Arab Mediterranean countries. While current trade frameworks facilitate essential food access, they create systemic vulnerabilities that demand strategic recalibration. Integration of sustainable resource management—from water-saving practices to renewable energy adoption—offers pathways to enhance supply chain resilience. However, true food security requires fundamental transformation of Euro-Mediterranean trade agreements to emphasize sustainability, diversify supply sources, and strengthen regional self-reliance. As stressed upon by Dr. Maha Al Zu'bi, by embedding WEF E Nexus principles into trade frameworks, these nations can balance immediate food security needs with long-term resource sustainability, creating more resilient and equitable trade relationships that protect both agricultural productivity and ecosystem health.

2. Mobility of Services and the WEF E Nexus

The mobility of services emerges as a critical enabler of food security in the Arab Mediterranean region, facilitating essential cross-border transfers of expertise, technology, and management capabilities within the WEF E Nexus framework. This service mobility shapes resource management efficiency while revealing structural challenges in regional cooperation.

Water Services

Strategic water management services demonstrate transformative potential through targeted interventions. Jordan's adoption of European irrigation technologies and Morocco's MADFORWATER project illustrate how service mobility can enhance agricultural efficiency. However, regulatory misalignment—particularly evident in Morocco's export barriers—highlights the need for harmonized water management standards.

Energy Services

Technical expertise transfer in energy management has enabled critical infrastructure developments, particularly in post-harvest systems. Egypt and Tunisia's implementation of solar-powered storage facilities and energy-efficient cold chains exemplifies how specialized service mobility can optimize energy use while improving food preservation capabilities.

Agricultural Services

The EU-Mediterranean agricultural service exchange reveals structural asymmetries. While initiatives like Jordan's Dutch agricultural support program (2023-2026) enhance local capabilities, regulatory barriers and professional migration create unbalanced knowledge flows, undermining regional expertise development.

Ecosystem Services

European expertise in ecosystem management has enabled specific regional improvements, from Tunisian olive grove restoration to sustainable water management systems implementation. This specialized knowledge transfer strengthens environmental resilience while supporting agricultural sustainability.

The mobility of services within the WEF E Nexus framework reveals both opportunities and structural challenges in Arab Mediterranean food security. While European technical expertise has enabled critical improvements in resource management and agricultural efficiency, persistent regulatory asymmetries and capacity gaps limit regional development potential. Strategic imperatives emerge: harmonizing service standards, building local expertise, and creating more equitable knowledge exchange frameworks. Success requires transforming current dependencies into collaborative partnerships that enhance regional resilience while preserving local agricultural heritage. This evolution demands not just technical cooperation but fundamental recalibration of service mobility frameworks to ensure sustainable, mutually beneficial development.

3. Mobility of Capital and the WEF E Nexus

Capital mobility emerges as a decisive enabler in addressing WEF E Nexus challenges across the Arab Mediterranean region, yet its impact reveals critical disparities between export-oriented development and domestic food security needs.

Water Capital Flows

Morocco's Green Plan (Plan Maroc Vert) demonstrates transformative potential of targeted capital investment in water infrastructure, enabling widespread adoption of water-saving technologies. However, political instability in countries like Lebanon and Libya creates investment disparities, highlighting how governance frameworks determine access to climate finance.

Energy Investment Patterns

Strategic renewable energy investments, exemplified by Morocco's Noor Solar Plant, showcase potential for agricultural sustainability. The EU-Tunisia Memorandum of Understanding further illustrates opportunities for energy infrastructure development, though bureaucratic obstacles impede full implementation. This reveals a critical gap between investment potential and operational reality.

Agricultural Capital Distribution

Foreign Direct Investment patterns, particularly through European Neighborhood Policy, demonstrate structural imbalances. The DCFTAs negotiations with Tunisia and Morocco illustrate this challenge, where investments primarily benefit European investors and export-oriented sectors while potentially marginalizing local food security needs. The focus on energy-intensive projects for high-value export crops risks prioritizing external economic gains over internal food resilience, creating systemic vulnerabilities in domestic food systems.

Ecosystem Investment Framework

European capital flows support critical ecosystem restoration initiatives, exemplified by Lebanon's land restoration projects and Morocco's €15 million Terre Verte program. However, implementation challenges in fragile states like Libya and Syria reveal how political instability undermines environmental investment effectiveness.

Capital mobility within the WEF E Nexus reveals a fundamental tension between market-driven investment and strategic food security needs. While European investment frameworks demonstrate significant potential for regional development—evidenced by successful initiatives in Morocco and Tunisia—current patterns perpetuate systemic vulnerabilities. The critical imperative becomes rebalancing capital flows to serve both export capabilities and domestic resilience. This requires fundamental reforms in three areas: strengthening governance frameworks to attract climate finance, streamlining bureaucratic processes to accelerate project implementation, and developing mechanisms to ensure equitable distribution between export-oriented and domestic food security investments. Success depends not merely on increasing capital flows but on strategically directing them to build comprehensive food system resilience.

4. Mobility of People and the WEF E Nexus

The mobility of people within the Euro-Mediterranean framework represents a distinct dimension from service provision, encompassing permanent migration, seasonal labor movements, and expertise transfer through physical relocation. This human mobility increasingly responds to resource pressures—where water scarcity, energy costs, and environmental degradation reshape migration patterns and professional displacement.

Water-Related Mobility

Climate-induced water scarcity drives rural-to-urban migration, particularly evident in Morocco's agricultural regions where reduced water availability forces farming communities to relocate. Unlike water management services, this involves permanent population displacement. Simultaneously, specialized water engineers' relocation enables long-term capacity building, as shown in Jordan's permanent recruitment of international irrigation specialists for sustained technological transfer.

Energy Sector Mobility

Physical relocation of energy professionals differs fundamentally from service provision through its lasting impact on institutional capacity. Tunisia's renewable energy sector demonstrates this through its «brain circulation» pattern—where nationals trained in European institutions return to implement long-term energy projects in their home countries. This creates permanent knowledge transfer rather than temporary service delivery.

Agricultural Population Movements

Seasonal agricultural labor flows, exemplified by Morocco-Spain bilateral agreements, highlight the distinction between service provision and human mobility. These arrangements facilitate not just labor provision, but skills transfer through human movement. The reverse flow of agricultural scientists and researchers through programs like Erasmus+ creates permanent knowledge networks distinct from consultancy services.

Environmental Expertise Exchange

Long-term relocation of environmental scientists enables sustained ecosystem management beyond project-based service delivery. Lebanon's forest restoration initiatives demonstrate how permanent environmental expert placement creates institutional memory and continuous knowledge transfer, contrasting with temporary consultation services.

Human mobility within the WEF E Nexus transcends service provision by creating lasting demographic, professional, and knowledge transfer patterns. This mobility—whether through permanent migration, seasonal labor movements, or professional relocation—fundamentally reshapes regional capabilities and vulnerabilities. The critical challenge becomes managing

these human flows to build permanent regional capacity while addressing immediate resource pressures. Success requires distinguishing between temporary service needs and long-term expertise development through human mobility, creating frameworks that support both immediate labor requirements and sustained knowledge transfer.

5. Mobility Dynamics and Food Security in Euro-Mediterranean Trade

The analysis of the four mobilities—goods, services, capital, and people—through the WEFE Nexus lens reveals fundamental asymmetries in Euro-Mediterranean trade relations that both enable and constrain Arab Mediterranean food security. While these mobility frameworks facilitate essential resource flows, they simultaneously create structural vulnerabilities: goods mobility exposes import dependencies and virtual water trade risks; service mobility demonstrates regulatory misalignment despite technical transfer benefits; capital mobility prioritizes export-oriented development over domestic food security; and people mobility reflects complex patterns of permanent versus temporary knowledge transfer. These intersecting mobilities create a critical paradox where frameworks designed to enhance regional integration often perpetuate resource vulnerabilities. The Euro-Mediterranean relationship thus emerges not merely as a trade partnership but as a complex system where resource management, climate resilience, and food security converge. This understanding compels a fundamental reconsideration of how mobility frameworks can be reconstructed to serve both immediate food security needs and long-term regional resilience. The strategic imperative becomes not just improving individual mobility channels but reformulating their interconnections to create more equitable, sustainable, and resilient food security architectures in an increasingly resource-constrained Mediterranean basin.

C. Transactionalism

As the Arab Med countries navigate complex and unequal trade dynamics within the Euro-Mediterranean framework, they face significant challenges in securing food security on equitable terms. The structural imbalances that shape the current trade agreements, particularly regarding the movement of goods, services, capital, and people, have placed these nations in a position of dependency, especially concerning essential food imports. At the same time, Arab Med countries must contend with growing pressures from environmental constraints, water scarcity, and climate vulnerability, all of which impact their ability to produce sufficient domestic food supplies.

Against this backdrop, the strategic focus must shift toward leveraging negotiation skills to reshape these trade relations. Arab Med countries, by recognizing the interconnections between resource management, global supply chains, and geopolitical positioning, can better position themselves in future trade discussions. This requires a deep understanding of the broader socio-economic factors that influence trade, and the structural adjustments needed to ensure that trade agreements reflect a fairer, more sustainable partnership. Moving forward, it becomes

critical to explore how Arab Med countries can actively reshape these dynamics to secure better terms for their food security needs and reduce long-term dependencies.

Transactionalism in global trade refers to the reciprocal exchanges between nations or entities, where negotiations are not solely based on monetary value but on a strategic assessment of resources, geopolitical positioning, and interdependencies. This concept transcends traditional trade agreements, emphasizing the multi-dimensional nature of these exchanges, including economic, environmental, political, and social factors. In an increasingly interconnected global landscape, transactionalism reflects the way countries barter non-economic assets—such as natural resources, technological expertise, and geopolitical influence—in exchange for critical goods, services, or strategic benefits.

The Arab Med region, characterized by resource scarcity and complex geopolitical landscapes, faces significant food security challenges. Water scarcity, exacerbated by climate change, combined with limited agricultural capacity, forces countries like Morocco and Egypt to import substantial amounts of staple crops such as wheat to meet domestic demand. This reliance on external sources makes their participation in global trade heavily transactional, requiring Arab Med nations to leverage other strategic assets—such as energy resources, geopolitical influence, or environmental concessions—to secure essential food imports. These transactional dynamics are further complicated by geopolitical shifts, including conflicts that disrupt supply chains and trade routes, and by climate-induced pressures that heighten the need for sustainable resource management. Consequently, Arab Med countries must balance immediate food security needs with long-term sustainability goals, navigating a complex interplay between local vulnerabilities and global dependencies. This context necessitates an integrated approach to understanding trade, resource management, and strategic resilience, particularly as the region seeks to fortify its negotiation leverage and ensure sustainable access to essential food supplies.

This need for a more flexible and strategic trade approach is especially critical when integrating the Water-Energy-Food-Ecosystem (WEFE) Nexus into the conversation. The interconnected nature of these resources means that Arab Med countries must not only negotiate goods and capital but also resource flows that ensure their long-term sustainability. For instance, regional agreements like the Union for the Mediterranean's Water Agenda show how water scarcity and energy needs are increasingly becoming central to diplomatic and trade negotiations, particularly for countries such as Jordan and Lebanon, where water resources are severely limited.

1. Transactionalism Between WEFE Nexus Elements for Food

In transactionalism focused on Water-Energy-Food-Ecosystem (WEFE) Nexus elements, the exchange centers around the resources that are fundamentally interdependent—water, energy, food, and the surrounding ecosystems that support them. Countries, particularly those facing resource constraints or environmental vulnerabilities, may engage in transactions that involve trading access to one WEFE element for another. In the Arab Med region, where water scarcity, energy demands, and food security are tightly interconnected, the importance of leveraging these resources in strategic negotiations cannot be overstated.

a. Tunisia: Balancing Water and Ecosystem Management for Food

In Tunisia, transactionalism within the WEFE Nexus has involved using ecosystem management to improve agricultural yields while also preserving water resources. Tunisia faces significant water shortages but also struggles with land degradation and soil erosion. By working with European partners through Euro-Med agreements, Tunisia has implemented programs aimed at restoring degraded agricultural lands using sustainable farming practices such as agroforestry and drip irrigation.

These initiatives not only conserve water but also improve the resilience of ecosystems that support agriculture. In return, Tunisia's ability to maintain productive agricultural lands reduces its dependency on food imports, contributing to its food security. This exchange—improving ecosystems to secure food production—demonstrates how the transactionalism within the WEFE Nexus can enhance resource sustainability and agricultural productivity simultaneously.

Transactionalism within the WEFE Nexus provides a framework through which Arab Med countries can balance their limited resources while ensuring the sustainability of their food security strategies. By exchanging energy for water, ecosystem management for food, or agricultural efficiency for energy savings, these countries can navigate resource dependencies and environmental constraints more effectively. The interconnectedness of the WEFE Nexus allows for multi-layered transactions that not only address immediate needs but also foster long-term resilience against external shocks, such as climate change and global market disruptions.

2. Transactionalism Between 4FF Framework Elements for Food

The Four Freedoms Framework (4FF)—mobility of goods, services, capital, and people—serves as a foundational element of the Euro-Mediterranean trade agreements and shapes the ways Arab Med countries interact with the European Union and other global trade partners. In this form of transactionalism, the elements of the 4FF are not traded in isolation but rather integrated into multi-dimensional exchanges that help nations secure critical resources like food by leveraging their strengths in other areas such as services, capital investment, or human resources. Arab Med countries, given their geopolitical position and resource constraints, often negotiate across multiple elements of the 4FF to secure better access to food, which is central to their national security.

a. Egypt: Capital Mobility and Labor for Food Imports

In Egypt, the mobility of capital and people play a crucial role in securing food imports. Egypt is heavily reliant on importing wheat and other staple foods, especially from Russia and Ukraine. In recent years, Egypt has leveraged its labor mobility agreements with the

European Union and Gulf countries to secure both financial remittances and capital flows, which are essential for supporting its food import strategy.

Labor migration, particularly to the Gulf States and Europe, allows millions of Egyptian workers to send remittances back home, which in 2022 accounted for approximately 5.9% of Egypt's GDP. These remittances provide a significant source of capital that Egypt can use to fund food imports, ensuring that its population remains food-secure despite agricultural challenges. Additionally, foreign capital inflows into Egypt's energy sector and infrastructure development create further opportunities for the country to diversify its economy, making it less vulnerable to global food supply disruptions.

Moreover, Egypt's Suez Canal revenues, which generate significant foreign currency, also enhance its ability to purchase essential food items. By capitalizing on the mobility of capital and human resources, Egypt engages in multi-dimensional transactionalism where both capital flows and labor mobility help bolster its ability to negotiate favorable food import terms.

b. Mobility of People and Services for Food

The Arab Mediterranean region has strategically positioned itself within two distinct yet interconnected labor mobility streams that enhance its food security negotiation leverage. This dual position manifests through a sophisticated transactional framework operating along both southern and northern vectors.

In the southern dimension, Arab Mediterranean countries, particularly Tunisia and Morocco, have developed strategic approaches to Sub-Saharan migration, transforming labor inflows into agricultural productivity gains. This positions them as crucial intermediaries in regional food production systems while simultaneously strengthening their negotiating position with European partners. The integration of Sub-Saharan agricultural labor addresses immediate production needs while creating broader economic linkages that support food security objectives.

Along the northern vector, Arab Mediterranean countries leverage their position as both labor providers to European agricultural markets and managers of migration flows. This dual role creates significant negotiation leverage in Euro-Mediterranean trade relations, particularly regarding food security arrangements. For instance, Morocco and Tunisia's ability to provide agricultural labor to Spain and France while simultaneously managing broader migration flows enhances their position in negotiations over food trade terms and agricultural cooperation agreements.

This bi-directional mobility framework transforms traditional labor migration patterns into strategic assets. Rather than representing simple workforce movements, these flows

become sophisticated instruments for enhancing food security negotiation capacity. The Arab Mediterranean region thus emerges not merely as a transit zone but as a strategic actor capable of leveraging both inward and outward labor mobility to strengthen its food security position in regional and international negotiations.

This transactional leverage is particularly significant in an era of increasing food security challenges, where the ability to negotiate favorable trade terms becomes as crucial as domestic production capacity. The region's unique position—as both recipient and provider of agricultural labor—creates multiple points of leverage in food security discussions, enabling more nuanced and potentially advantageous negotiating positions in both African and European contexts.

c. Lebanon and Jordan: Mobility of Capital for People

The Lebanon-Jordan case exemplifies a sophisticated capital-for-people transaction model, where refugee hosting creates unique leverage for securing international support and enhancing food security capabilities. This dynamic operates through three interconnected mechanisms:

International Support Leverage

Both countries transform their humanitarian role as major refugee hosts into strategic economic advantage. By emphasizing this global public service, they secure significant international aid and development assistance, particularly from the European Union. This capital inflow directly supports food import capabilities and agricultural sector development, creating a clear link between refugee hosting and food security enhancement.

Agricultural Sector Dynamics

The refugee presence contributes to agricultural productivity through a dual impact. First, refugees provide crucial agricultural labor, addressing sector workforce needs. Second, international development programs targeting refugee-dense areas often focus on agricultural infrastructure and capacity building. Jordan, for example, has successfully channeled international capital into agricultural modernization projects that benefit both host and refugee communities.

Economic Stability Framework

The model creates a sustainable cycle where international capital supports both refugee hosting and domestic food security. Development assistance enables infrastructure improvements and public service maintenance, while refugee labor participation in agriculture enhances domestic food production capabilities. This integration transforms what could be an economic burden into a strategic asset for food security negotiation.

However, challenges persist in fully optimizing this transaction model. The informal nature of much refugee labor in agriculture requires formalization strategies that balance worker protection with sector productivity. Additionally, ensuring that international support translates effectively into enhanced food security capabilities demands more sophisticated monitoring and implementation frameworks.

d. Lebanon: Mobility of Services and Expertise for Energy

Lebanon's oil-for-expertise deal with Iraq is a pragmatic response to its ongoing energy crisis and financial instability. Instead of depleting scarce foreign reserves, Lebanon leverages its technical and medical expertise to secure vital crude oil from Iraq during the COVID crisis. This barter arrangement allows Lebanon to maintain power generation despite its economic limitations, reflecting a strategic use of non-monetary exchanges. However, the deal faces significant challenges, as Lebanon's power plants require a different grade of oil, forcing the country to exchange Iraqi crude on the international market. This dependency on intermediaries not only increases transactional costs but also introduces risks of inefficiencies, delays, and corruption, similar to the pitfalls experienced in Iraq's oil-for-food program during Saddam Hussein's regime.

Nevertheless, the oil-for-expertise agreement offers Lebanon a critical lifeline in its pursuit of energy stability. By trading services for resources, Lebanon addresses immediate infrastructure needs without exacerbating its financial crisis. The success of this arrangement hinges on Lebanon's ability to minimize intermediary involvement and enhance transparency. Streamlining the exchange process, ensuring accountability, and reducing opportunities for mismanagement will be key to optimizing the benefits of the deal.

In essence, Lebanon's oil-for-expertise transactionalism illustrates how countries with limited financial capacity can still leverage their strategic assets—whether resources or expertise—to secure essential needs. If managed effectively, this approach could provide a sustainable pathway for Lebanon's long-term energy security, while also serving as a model for other nations facing similar constraints.

e. Arab Med countries: Mobility of Services and Capital for Food Security

Arab Med countries, such as Lebanon and Tunisia, are increasingly exploring potential forms of transactionalism that leverages the mobility of digital services to secure greater access to food imports. With growing challenges in food security, these nations are recognizing the potential of AI-driven outsourcing as a means of exchange. As European corporations adopt more AI technologies, Arab Med countries can offer specialized IT outsourcing, digital support, and AI services in return for vital food imports, addressing their domestic needs. However, the automation of services may reduce the demand for lower-skilled labor, compelling these countries to diversify their service offerings.

By focusing on upskilling their workforce in AI and digital technologies, Arab Med nations can position themselves as key outsourcing hubs, similar to Tunisia's role in modernizing its agricultural practices through the mobility of services. In return, these countries attract foreign direct investment (FDI) in their digital infrastructure, further strengthening their economic standing and improving their capacity to secure food imports.

This services-for-food transactionalism allows Arab Med countries to adapt to shifting global trends while integrating service mobility into the broader trade framework. By diversifying their offerings and building stronger digital capabilities, they enhance their negotiating leverage in trade agreements, ensuring that food security remains a central focus in their economic strategy.

f. Strategic Implications of 4FF-Based Transactions

The mobility of goods, services, capital, and people within the Euro-Med agreements creates a multi-faceted platform for Arab Med countries to negotiate beyond traditional trade terms. By integrating multiple elements of the 4FF framework into their trade strategy, Arab Med countries can optimize their resource allocation, secure critical food imports, and strengthen their long-term resilience. For these countries, multi-dimensional transactionalism within the 4FF framework allows them to leverage non-food assets—such as labor, services, and capital flows—to ensure food security, particularly in times of external economic shocks or geopolitical tensions.

Transactionalism within the Four Freedoms Framework allows Arab Med countries to negotiate complex exchanges that involve goods-for-services, capital-for-food, and labor mobility. By capitalizing on the interconnectedness of these elements, countries like Tunisia, Egypt, and Morocco can secure food supplies while enhancing their domestic economic growth and improving their ability to navigate global market fluctuations. As these nations continue to face challenges related to climate change, resource constraints, and global trade imbalances, their ability to engage in multi-layered transactionalism across the 4FF framework becomes essential to their food security strategies.

3. Transactionalism: Geopolitical Support for Food Security

Geopolitical transactionalism involves countries leveraging their geopolitical influence, military alliances, or strategic positioning to secure critical resources, particularly food. This form of transactionalism is not simply about direct exchanges of goods or services but about how geopolitical power—whether through diplomatic clout, military strength, or regional influence—can be used as a bargaining chip to secure food security. In the Arab Med region, where food security is often threatened it is crucial to leverage geopolitical relationships to ensure stable food supplies is crucial.

a. Egypt: Geopolitical Influence for Food Aid and Trade

One of the most prominent examples of geopolitical transactionalism in the Arab Med region is Egypt's role as a key player in the Middle East's geopolitics. Egypt's strategic location—controlling the Suez Canal, a vital global trade route—gives it leverage in negotiating favorable trade terms with both Western powers and regional players. This has allowed Egypt to secure food aid and favorable trade agreements for staple food imports like wheat, particularly with countries like the United States and European nations.

Egypt's geopolitical importance in the region—both as a military power and as a stabilizing force in the Middle East—has made it a key recipient of foreign aid. For decades, Egypt has received significant amounts of food aid from the U.S. through programs like PL 480 (Food for Peace), which has ensured that Egypt can import essential wheat supplies in exchange for its strategic alliance with the U.S. This geopolitical relationship highlights how military cooperation, and diplomatic influence can be leveraged to secure food security in a country that heavily depends on food imports.

Furthermore, during times of regional conflict, such as the Russia-Ukraine war, Egypt's ability to secure alternative sources of wheat from Europe and Asia was facilitated by its geopolitical alliances with Western and Gulf countries. These alliances enable Egypt to diversify its food supply chain and mitigate the risks posed by global market fluctuations.

b. Algeria: Geopolitical Alliances and Energy for Food Trade

Algeria, with its abundant natural gas resources, exemplifies how geopolitical positioning can be leveraged to secure food supplies through strategic energy exports. As a key energy supplier to Europe, particularly France, Spain, and Italy, Algeria holds substantial influence in its trade relationships. This influence enables the country to negotiate favorable terms for food imports, using energy exports as a bargaining tool to secure essential commodities like wheat and other food staples, especially during periods of price volatility in global markets. Historically, Algeria has relied heavily on European countries for its staple food imports. The EU has been Algeria's primary trading partner, accounting for nearly 50% of Algeria's total trade volume. However, geopolitical alliances have allowed Algeria to maintain strategic flexibility in its food trade. For instance, during periods of strained EU-Algeria relations, such as political disagreements over human rights or migration policies, Algeria has leveraged its gas exports as a diplomatic tool to maintain access to critical food supplies. This dynamic is particularly evident in its ability to secure wheat imports at competitive prices, despite fluctuations in global markets.

Moreover, Algeria's partnerships with Russia, although relatively recent and not historically centered on food trade, have started to gain relevance in the context of the changing global geopolitical landscape. Algeria began importing Russian wheat in 2023, diversifying its food supply sources amid EU trade constraints and sanctions. While Europe remains its primary food trade partner, this developing relationship with Russia offers Algeria an alternative supply chain, reducing its vulnerability to EU-driven market shocks.

Additionally, Algeria's growing role within African regional organizations, such as the African Union (AU), has further enabled it to diversify its food sources. By strengthening political alliances with other African nations, Algeria has expanded its import networks beyond Europe and positioned itself as a critical player in multi-lateral food trade discussions. This strategic diversification not only enhances Algeria's food security but also strengthens its bargaining position within the Euro-Mediterranean trade framework.

In essence, Algeria's ability to balance its energy export leverage, geopolitical alliances, and participation in regional organizations exemplifies a sophisticated approach to using geopolitical influence to secure its food needs. This interconnected strategy allows Algeria to mitigate risks associated with global supply chain disruptions, maintaining a stable food supply even amidst external geopolitical shifts.

c. Syria: Geopolitical Support Amid Conflict

Syria's prolonged civil war illustrates the complex interplay between conflict, geopolitical alliances, and food security. With the country's agricultural production devastated and supply chains severely disrupted, Syria has become heavily reliant on geopolitical alliances for securing essential food supplies. Strategic partnerships, particularly with Russia and Iran, have been instrumental in enabling Syria to maintain access to staple foods, such as wheat and other basic goods, despite the ongoing conflict and international sanctions.

A significant portion of Syria's staple food imports—nearly 100% for some items—comes from neighboring Turkey. However, the geopolitical context complicates this dependency, as relations between Syria and Turkey have fluctuated dramatically due to the conflict and differing political interests. This dependency on Turkey for food imports presents a critical vulnerability, as it places Syria's food security at the mercy of its geopolitical rival.

Russia, a key ally, has used its position as both a political and military backer to ensure continued food shipments to Syria, bypassing international sanctions that otherwise limit Syria's access to global markets. In exchange for this support, Syria has remained strategically aligned with Russian interests in the region, allowing Moscow to maintain its influence in the Middle East. This geopolitical transactionalism demonstrates how military and political alliances can serve as lifelines for countries facing severe food shortages during crises.

Similarly, Iran's support, though more focused on providing fuel and military aid, has also included food shipments to ensure that Syria's basic needs are met. This mutual support has fortified the Syria-Iran alliance, further complicating the geopolitical landscape of the region. These alliances underscore the critical role that political and military support play in securing food supplies for conflict-affected countries like Syria, offering a stark reminder of how geopolitical dependencies shape food security strategies during prolonged conflicts.

d. Strategic Implications of Geopolitical Transactionalism

In all these cases, geopolitical support for food security underscores how countries can use their diplomatic relationships, military alliances, and strategic positioning to secure critical food supplies in the face of resource shortages or political instability. For Arab Med countries, leveraging geopolitical influence allows them to navigate global trade imbalances and secure food in times of economic distress or supply chain disruptions.

The intersection of geopolitics and food security is particularly significant for countries with limited domestic agricultural capacity and those exposed to external shocks such as climate change and conflict. By fostering strong geopolitical alliances and maintaining a strategic role in regional and international politics, Arab Med countries can enhance their ability to negotiate favorable food trade deals, ensuring that food security remains a central focus of their national strategy.

Geopolitical transactionalism plays a vital role in shaping the food security of Arab Med countries, where geopolitical alliances and strategic positioning often determine access to critical food imports. From Egypt's wheat imports, secured through military alliances and diplomatic clout, to Algeria's use of energy exports to maintain steady food supplies, geopolitical factors are deeply intertwined with food security strategies. In times of crisis, as seen in Lebanon and Syria, geopolitical support becomes even more critical, demonstrating the importance of maintaining diplomatic and military alliances to ensure food access. As Arab Med countries continue to face resource constraints and political challenges, the ability to leverage geopolitical influence will remain a key factor in securing long-term food security.

4. Multi-Lateral Transactionalism: Multiple Entities with Interdependencies

Multi-lateral transactionalism occurs when several countries or entities engage in interconnected transactions, each leveraging its own unique resources or strategic advantages to gain access to essential goods such as food. This form of transactionalism involves multiple parties, each with different interdependencies, where the dynamics of trade go beyond simple bilateral exchanges. In the Arab Med context, multi-lateral transactionalism often emerges in situations where countries engage in regional trade agreements, coalitions, or geopolitical alliances that involve complex negotiations to secure food security, energy, or other vital resources. Experts often point out that the asymmetrical power dynamics, political instabilities, and ongoing conflicts in the region, such as those in Libya and Syria, add layers of complexity, making such frameworks challenging to operationalize. Therefore, while theoretically appealing, multilateral transactionalism in the Arab Med remains constrained by the intricate realities of regional geopolitics, limiting its practical application.

a. The Role of the Arab League in Multi-Lateral Transactionalism

The Arab League, founded in 1945, serves as one of the most prominent regional organizations for promoting economic, political, and social collaboration among its 22 member states, including many Arab Med nations. It plays a critical role in multi-lateral transactionalism by providing a platform for negotiating and implementing multi-party agreements that address shared regional priorities, such as food security, energy exchange, and water resource management.

However, the effectiveness of the Arab League in facilitating multi-lateral agreements has historically been limited by several factors, including political fragmentation, inconsistent policy implementation, and conflicting national interests. For example, while the Arab League established the Pan-Arab Free Trade Area (PAFTA) in 1998 to promote intra-regional trade, the lack of harmonized trade policies and persistent non-tariff barriers have impeded its full potential. Despite these challenges, PAFTA offers a framework through which Arab Med countries can theoretically engage in more complex trade and resource-sharing agreements, thereby enhancing their collective negotiation power and reducing dependency on external partners.

One of the most relevant initiatives within the Arab League for multi-lateral transactionalism is the Joint Arab Economic Action Charter, which seeks to unify member states' policies on food security, water management, and energy exchange. The League's strategic initiatives, such as the Arab Agricultural Development Organization (AADO) and the Arab Water Council, focus on fostering cooperation in agriculture and water management, respectively. For example, the AADO has explored cross-border agricultural investment projects, which could theoretically support food security through shared agricultural ventures, while the Arab Water Council works on promoting shared water governance frameworks in a region facing acute water scarcity.

Yet, political tensions and diverging national priorities often hinder the practical application of such initiatives. A prime example is the longstanding rift between countries like Egypt and Sudan over the management of the Nile River, which complicates the implementation of broader, multi-lateral water-sharing agreements. Similarly, the lack of political stability in countries like Syria, Libya, and Yemen further weakens the Arab League's capacity to act as a unified entity in regional negotiations.

Despite these limitations, the Arab League remains a vital component of multi-lateral transactionalism in the Arab Med region. By serving as a mediator and platform for dialogue, it can potentially facilitate agreements that address complex interdependencies among water, energy, and food resources, thereby enhancing the collective negotiation edge of its member states. Through revitalized initiatives, improved regulatory coherence, and strengthened political will, the Arab League could transform from a symbolic body into an effective mechanism for implementing multi-lateral resource transactions that bolster regional food security and sustainable development.

b. The Role of the Union for the Mediterranean (UfM)

A broader example of multi-lateral transactionalism can be seen in the workings of the Union for the Mediterranean (UfM), which fosters cooperation between EU countries and their Mediterranean neighbors on issues related to sustainable development, water management, food security, and energy transition. The UfM facilitates multi-lateral agreements that address the needs of multiple countries by promoting trade frameworks that integrate energy-for-food exchanges and resource-sharing partnerships.

For example, Jordan and Palestine both benefit from multi-lateral water-for-energy agreements under the UfM framework, where they exchange access to energy infrastructure

for water resources. This type of transactionalism enables countries with different resource needs to come together and create mutual benefits, ensuring that food security and resource management remain central to regional cooperation efforts.

c. Strategic Implications of Multi-Lateral Transactionalism

Multi-lateral transactionalism presents an advanced form of negotiation, where countries leverage not only goods and services but also their geopolitical influence, natural resources, and regional alliances to ensure food security. In the Arab Med region, this form of transactionalism is critical as it allows nations to engage in regional and global coalitions that offer more complex interdependencies. By forming multi-lateral agreements, Arab Med countries can diversify their access to food and energy, reduce dependency on single suppliers, and create a more resilient trade network.

Multi-lateral transactionalism offers Arab Med countries the opportunity to engage in broader, interconnected trade agreements that go beyond simple bilateral exchanges. By leveraging their geopolitical positioning, natural resources, and regional alliances, countries such as Egypt, Morocco, and Lebanon can secure essential food imports through strategic multi-lateral agreements. This form of transactionalism also highlights the importance of regional cooperation frameworks like the Union for the Mediterranean, which facilitates multi-dimensional exchanges across sectors such as food, energy, water, and finance. As these countries continue to navigate complex geopolitical landscapes and resource challenges, multi-lateral transactionalism provides a powerful tool for enhancing food security and resource resilience.

5. Transactionalism: A Flexible Framework for Enhancing Arab Mediterranean Food Security

The concept of transactionalism emerges as the most practical and adaptive tool for enhancing the negotiation edge of Arab Med countries in securing staple food needs. Given the complex interplay of resource scarcity, geopolitical dependencies, and the unequal trade dynamics that characterize their relationships with major trading partners, transactionalism provides a flexible framework for Arab Med nations to leverage their strategic assets. Whether through the exchange of energy resources, services, or geopolitical influence, transactionalism allows these countries to optimize the value of their unique resources in ways that extend beyond traditional economic transactions.

In regions like the Arab Med, where climate vulnerability, water scarcity, and limited agricultural capacity threaten food security, transactionalism enables countries to engage in multi-layered exchanges. These include leveraging geopolitical positioning—such as control over strategic trade routes like the Suez Canal—or utilizing energy resources, such as natural gas in Algeria, to secure critical food imports. Transactionalism also facilitates multi-lateral exchanges, where Arab Med countries can engage in regional coalitions and interdependent agreements, as seen in Morocco's use of phosphate and renewable energy to strengthen trade ties with both Europe and Africa.

The practicality of transactionalism lies in its ability to adapt to shifting global circumstances, including geopolitical realignments, supply chain disruptions, and economic downturns. It provides Arab Med countries with the flexibility to negotiate from a position of relative strength, even in situations where they lack direct economic leverage. By integrating geopolitical power, resource management, and the WEF Nexus, transactionalism enables these countries to maximize their bargaining power in food security negotiations, ensuring they can secure sustainable, long-term food supplies in a highly volatile global market.

Thus, transactionalism stands as an essential strategy for the Arab Med region, allowing nations to diversify their trade partnerships, mitigate risks associated with food insecurity, and balance the asymmetrical dynamics in Euro-Mediterranean trade agreements.

D. The Global Guarantor for Food Security and Trade

The increasingly complex and interconnected nature of global food security challenges has underscored the need for a global regulatory authority capable of overseeing, preventing, and mitigating conflicts that threaten access to staple foods. Arab Med countries, which are heavily dependent on food imports, are particularly vulnerable to trade disruptions, geopolitical crises, and global supply chain volatility. The absence of a singular global guarantor dedicated to regulating food trade highlights a gap in the international system that these countries could benefit from. While existing food-security-centric programs provide vital resources and support, they lack the centralized enforcement power necessary to regulate global food security conflicts effectively.

Existing global institutions such as the World Trade Organization (WTO) and Food and Agriculture Organization (FAO) provide frameworks for mediating agricultural trade disputes and promoting fair food trade, but they fall short in resolving crises where food security is directly impacted by export restrictions or other trade barriers. For example, during the Russia-Ukraine war, 28 countries imposed export restrictions, affecting global food supplies and causing price spikes that disproportionately harmed food-import-dependent nations like Egypt and Morocco (Gustafson, 2023).

The WTO's Agreement on Agriculture (AoA) provides guidelines to reduce trade-distorting subsidies and increase market transparency, but during crises, countries often prioritize national interests, exacerbating global food insecurity. Enhancing the role of the WTO or establishing a more specialized global food security regulatory body could help mediate trade conflicts, ensure market stability, and prevent harmful export bans during global disruptions.

1. Food-Security-Centric Programs and Initiatives

Several international programs are in place to address food security challenges, providing emergency support, policy frameworks, and market monitoring systems. Key initiatives include:

World Food Programme (WFP): The WFP provides emergency food assistance and strengthens food systems in times of crisis. It plays a crucial role in negotiating food imports

and coordinating aid during humanitarian disasters. As a frontline organization, the WFP offers critical relief but is not equipped to address long-term trade disputes.

Committee on World Food Security (CFS): The CFS acts as an intergovernmental platform where countries can discuss policy coordination to improve global food security. It focuses on creating guidelines that ensure trade policy aligns with food security goals, promoting policy coherence across borders.

Agricultural Market Information System (AMIS): Launched by the G20, AMIS plays a key role in monitoring global food markets and ensuring transparency during periods of price volatility. Its real-time market data helps prevent supply chain shocks by allowing countries to make informed decisions about food imports and exports.

Global Food Security Cluster (GFSC): The GFSC facilitates coordination between the WFP, FAO, and other UN bodies to respond to food crises. Its focus is primarily on humanitarian aid, providing rapid responses to food shortages but lacking in trade dispute resolution.

The scope of these programs ranges from emergency food aid to long-term policy development and market transparency. For instance, the WFP focuses on crisis management, ensuring that food reaches populations affected by conflict or natural disasters, while the CFS provides a more strategic policy framework for addressing the structural causes of food insecurity. AMIS, on the other hand, acts as a market surveillance system, providing timely information on key staple crops to reduce market disruptions during periods of volatility.

Despite their valuable contributions, these programs operate in silos, addressing different aspects of food security without a centralized authority to oversee and regulate global food trade comprehensively. For Arab Med countries, which face vulnerability to external shocks such as climate change and trade disruptions, the ability to rely on a more integrated global mechanism would be invaluable in mitigating food shortages and ensuring fair access to essential food imports.

The absence of a singular global regulatory authority to oversee food security-related trade conflicts leaves Arab Med countries at risk during global crises. Although initiatives like the WFP, CFS, and AMIS provide important support, they do not function as a cohesive global regulatory body capable of resolving trade disputes or preventing export bans that exacerbate food insecurity. By expanding the scope and integration of these programs, or establishing a dedicated global food security guarantor, Arab Med countries could better navigate global trade dynamics and ensure resilience in the face of future crises.

2. Global and Regional Conflict Resolution Mechanisms: Protecting the Negotiation Power of Arab Med Countries

Global and regional conflict resolution mechanisms play a crucial role in ensuring that Arab Med countries maintain their negotiation power in the global food trade, especially during crises that threaten their food security. These mechanisms are designed to resolve trade disputes, prevent export restrictions, and provide a platform for negotiating fairer trade terms. By engaging with

these mechanisms, Arab Med countries can safeguard their access to essential food imports and navigate unequal power dynamics in the global market.

a. The Role of the World Trade Organization (WTO) in Agricultural Disputes

The WTO's Dispute Settlement Mechanism (DSM) serves as a crucial tool for Arab Med countries to contest unfair trade restrictions and safeguard their food security. The DSM enables countries to address conflicts arising from export bans, trade barriers, and other restrictive measures that disrupt agricultural imports. This is particularly significant for Arab Med nations like Egypt, Tunisia, and Morocco, which are highly dependent on wheat imports and other staple foods from global suppliers.

The mechanism was designed to provide a fair and transparent platform for resolving trade disputes and ensuring that the principles of equitable trade are upheld. For example, during the 2007-2008 and 2010-2011 food crises, Russia imposed export taxes and later outright bans on grain exports, which led to severe disruptions in wheat supplies for major importers, including Egypt and other Arab Med countries. Such restrictions exacerbate food insecurity and diminish the negotiation power of these nations in global markets. By leveraging the WTO's DSM, affected countries can challenge these barriers, seek exemptions, or negotiate alternative terms to maintain a stable food supply.

For Arab Med countries, utilizing the WTO's dispute resolution tools is not only about securing immediate access to food but also about reinforcing their negotiation power in the global food trade. It allows these countries to counteract the actions of larger exporting nations that might prioritize their own domestic needs during global crises, thereby protecting the food security of smaller, more vulnerable economies. Consequently, the DSM remains a vital instrument for ensuring that the global trade environment remains fair and predictable, even amid geopolitical tensions and market disruptions.

b. Mediation in Climate-Related Trade Conflicts

The International Food Security Organizations (such as the FAO and WFP) and regional frameworks like the African Union also provide mechanisms for addressing climate-related trade conflicts. Tunisia and Jordan, which are highly vulnerable to water scarcity and climate change, rely heavily on food imports. These countries could face disruptions in food access due to droughts, crop failures, or regional conflicts over water resources.

In this context, regional conflict resolution mechanisms can mediate disputes over shared water resources and trade agreements, ensuring that Arab Med countries maintain access to food despite environmental challenges. Lebanon's 1997 conflict with Hochtief over the expansion of Beirut's Rafic Hariri International Airport demonstrates the critical role of mediation in international contract disputes. The dispute, stemming from conflicting

interpretations of contract clauses under Lebanese and international laws, led to significant delays and cost overruns. This case highlights how ambiguities in international contracts can complicate negotiations and resolutions, underscoring the need for clear and efficient mediation mechanisms.

Both the Hochtief case and climate-related conflicts, such as the Red Sea-Dead Sea project, illustrate the importance of robust mediation frameworks for resolving disputes over critical resources. Whether dealing with water-sharing agreements or international contracts, the effective use of arbitration and conflict resolution ensures that vital projects and food access are not jeopardized by prolonged legal and political conflicts.

c. Conflict Resolution Mechanisms as Catalysts for Food Security in the Arab Med Region

Global and regional conflict resolution mechanisms provide Arab Med countries with crucial strategic leverage in their quest to secure stable food access. By addressing power imbalances, mitigating trade barriers, and ensuring transparency, these platforms enable Arab Med nations to counteract external disruptions that could undermine their food security. The WTO's Dispute Settlement Mechanism (DSM) exemplifies how Arab Med countries can protect their food accessibility by legally contesting trade restrictions and export bans that jeopardize their import-dependent food systems. Such mechanisms empower them to assert their rights, maintain continuous food supply chains, and navigate global crises that would otherwise put them at a disadvantage.

Moreover, by leveraging platforms like the Union for the Mediterranean (UfM) and regional climate frameworks, Arab Med countries can address disputes over shared natural resources, such as water, that are critical for sustainable agricultural productivity. These mediation channels foster cooperation and prevent geopolitical tensions from escalating into full-scale resource conflicts, which would severely impair food production and access.

Additionally, conflict resolution frameworks enhance Arab Med countries' capacity to secure fairer trade agreements. By engaging in these mechanisms, countries can negotiate for trade terms that reflect their specific needs, thereby reducing their dependency on volatile global markets. This is particularly relevant during periods of climate-induced disruptions, where food supply chains are vulnerable to breakdowns. The ability to contest unfair practices, seek recourse, and ensure compliance with international norms strengthens the Arab Med countries' positions in multilateral negotiations, ultimately supporting their broader food security strategies.

In essence, conflict resolution mechanisms do more than just resolve disputes; they act as strategic tools that enhance the resilience, equity, and sustainability of food systems in the Arab Med region. Through these platforms, Arab Med countries can secure their rights, protect their access to critical food supplies, and build a more robust foundation for long-term food security amid an increasingly complex and competitive global landscape.

3. Trade Agreement Mediation Mechanisms: Enhancing Negotiation Power of Arab Med Countries

Trade agreement mediation mechanisms are vital tools for Arab Med countries as they navigate the complexities of global food trade. These frameworks provide structured platforms for addressing power imbalances and ensuring more equitable outcomes in trade negotiations between developed and developing nations.

The World Trade Organization's (WTO) Dispute Settlement Mechanism (DSM) plays a crucial role in this context. The DSM allows Arab Med countries, such as Egypt and Morocco, to challenge unfair trade practices and seek remediation when export restrictions or other barriers compromise their access to critical food supplies. The WTO also facilitates the mediation of disputes related to agricultural subsidies, which can distort global markets and disadvantage import-dependent nations like Tunisia and Jordan.

Within the framework of the Union for the Mediterranean (UfM), Arab Med countries can further leverage bilateral and multilateral trade agreements to secure preferential access to European agricultural markets. The UfM offers mediation platforms where these nations can negotiate favorable terms, as seen in Morocco's use of strategic resources like phosphates to secure food imports. Additionally, regional cooperation facilitated by the UfM helps reduce trade barriers between Arab Med countries themselves, strengthening intra-regional food trade and overall food security resilience.

By actively engaging with these trade agreement mediation mechanisms, Arab Med countries can effectively address power imbalances and safeguard their food security, even during times of global volatility. During crises such as the COVID-19 pandemic, when major exporting nations imposed trade restrictions, Arab Med countries were able to utilize platforms like the WTO and the League of Arab States to contest such discriminatory practices and secure exemptions or preferential terms.

The strategic leveraging of these mediation tools empowers Arab Med countries to not only protect their immediate food needs but also to build long-term economic stability and geopolitical influence. By fostering collective bargaining and prioritizing regional alliances, these mechanisms transform trade relations, promoting a more balanced and sustainable food security environment in the Arab Med region.

4. Funds and Financial Support Mechanisms: Enhancing Trade Guarantees for Arab Med Countries

Funds and financial support mechanisms play a vital role in ensuring that Arab Med countries can secure stable food imports even during financial crises or trade disruptions. Access to international funds, financial guarantees, and credit facilities allows these countries to manage price fluctuations, mitigate the risks of currency devaluation, and secure trade agreements when traditional financing options may not be available. These mechanisms help guarantee food imports, ensuring that even when global trade dynamics become unstable, Arab Med countries have the necessary financial backing to protect their food security.

a. The Role of International Financial Institutions

International financial institutions like the International Monetary Fund (IMF), World Bank, and regional development banks (such as the African Development Bank) provide critical financial support and mechanisms to secure trade financing for countries facing food security challenges. Arab Med countries, many of which are net food importers, can rely on these institutions to provide credit or financial guarantees when needed, especially during global crises that increase the cost of importing essential goods such as wheat and grains.

For instance, during the COVID-19 pandemic, the IMF provided emergency financing to several Arab Med countries, including Egypt, to help them manage the economic fallout and ensure they could continue to import food. The IMF's Rapid Credit Facility allowed these countries to access funds quickly, preventing a major disruption in food supplies at a time when global markets were highly unstable.

Similarly, the World Bank offers guarantee mechanisms for food-importing countries through its Global Agriculture and Food Security Program (GAFSP), which supports low-income countries in managing food import risks by providing credit lines and financial risk management tools. Arab Med countries, such as Morocco, can use these programs to secure long-term trade agreements with food-exporting nations while reducing their exposure to price volatility.

b. Financial Guarantees from Export Credit Agencies

Export credit agencies (ECAs) also play a pivotal role in guaranteeing food import trade by providing financial backing to food-importing countries. These agencies, typically backed by national governments, offer trade insurance and credit guarantees that allow countries to import food on credit even when financial conditions are unstable. For Arab Med countries, ECAs provide an essential buffer, ensuring that they can secure food imports during times of domestic economic crises or global trade disruptions.

For example, Egypt has benefited from export credit guarantees from European ECAs that ensure the flow of wheat imports from countries like France and Ukraine, even when Egypt faced internal financial struggles. This financial support allows countries to maintain stable food supplies without the need for immediate payment, reducing the risk of food shortages during periods of crisis.

c. Role of Multilateral Development Banks

Multilateral development banks (MDBs), such as the African Development Bank (AfDB) and the Arab Fund for Economic and Social Development (AFESD), offer financial support mechanisms specifically designed to help Arab Med countries address food security challenges. These banks provide low-interest loans, grants, and technical assistance to help countries build resilient food supply chains and sustainable agricultural systems.

For instance, Tunisia and Morocco have both received significant financial assistance from the AfDB to support agricultural modernization projects and improve their food storage capacity, ensuring they are better prepared to manage food imports during global market volatility. In addition, these development banks offer financial tools that can help Arab Med countries hedge against currency risks and price fluctuations in global food markets, further securing their food supply chains.

d. Strategic Use of Sovereign Wealth Funds and Reserves

In addition to international financial mechanisms, some Arab Med countries, like Algeria and Libya, have used their sovereign wealth funds (SWFs) to secure long-term food supply contracts by investing in food-exporting countries or foreign agricultural ventures. By using sovereign reserves to invest directly in food-producing regions, these countries can ensure a more reliable flow of staple foods like wheat and corn.

For example, Algeria has invested in agricultural projects in Sub-Saharan Africa, securing food imports through strategic investments that provide long-term trade guarantees. This not only diversifies Algeria's food supply but also reduces its dependence on European markets during periods of high food price volatility.

e. Leveraging Global Mechanisms for Strategic Resilience in the Arab Med Region

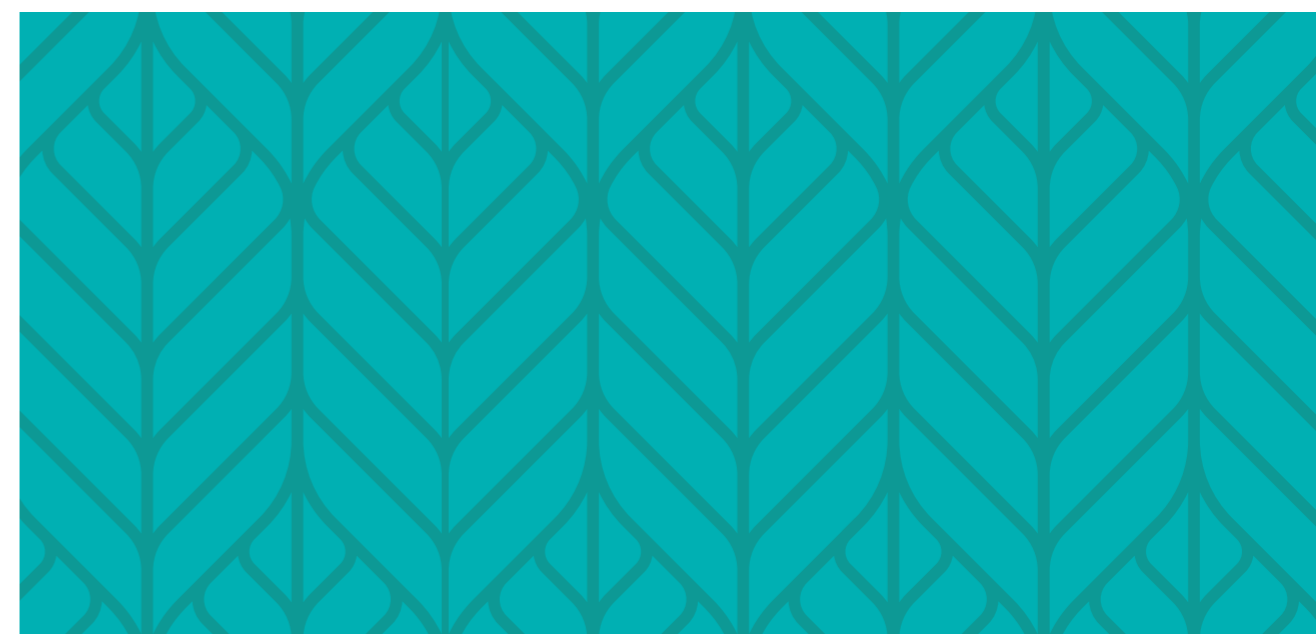
Global financial support mechanisms and mediation platforms are pivotal in mitigating the structural vulnerabilities faced by Arab Med countries in their pursuit of food security. Multilateral financial institutions like the IMF, World Bank, and sovereign wealth funds provide a safety net that enables these countries to withstand shocks in the global food market. They ensure continued access to essential imports during crises by providing emergency financing, export credit insurance, and targeted funding for food-specific stabilization programs. Additionally, by earmarking funds for agricultural infrastructure, Arab Med nations can proactively enhance their food production capacity, thereby reducing dependency on volatile global markets and strengthening their negotiation position in international trade.

Beyond financial stability, global mediators such as the World Trade Organization (WTO), the World Food Programme (WFP), and regional entities like the Union for the Mediterranean (UfM) play a crucial role in leveling the playing field for Arab Med countries. These platforms provide structured systems for resolving trade disputes, managing global supply chain risks, and ensuring that the rights of smaller economies are upheld against the backdrop of powerful global actors. For example, the WTO's Dispute Settlement Mechanism (DSM) offers a legal avenue for Arab Med countries to contest unfair export restrictions and trade barriers, which is particularly relevant during global disruptions, as witnessed during the Russia-Ukraine conflict.

In parallel, these global mediators enhance transparency in food markets, which is essential for smaller economies that often lack access to real-time market intelligence. Programs like the Agricultural Market Information System (AMIS) not only track commodity flows but also provide early warnings and policy advisories that empower Arab Med nations to make informed decisions amidst changing global conditions. This access to accurate market data is crucial for reducing vulnerability to price manipulations and ensuring that Arab Med countries can negotiate equitable trade agreements.

Humanitarian bodies like the WFP provide a safety net during acute food crises, stepping in as intermediaries to ensure food aid reaches vulnerable populations despite logistical and geopolitical barriers. In conflict-affected nations such as Syria and Yemen, WFP's role is indispensable for stabilizing food supplies and preventing humanitarian catastrophes. Similarly, the UfM fosters dialogue between the EU and Arab Med countries, providing a platform for negotiating food security agreements that compensate for economic asymmetries, enhance regional cooperation, and promote long-term resource sustainability. Strengthening these mechanisms can further protect Arab Med countries by tailoring support to address their specific vulnerabilities. For example, establishing food-specific dispute mechanisms within the WTO and creating regional food security funds under the UfM framework would provide direct support for Arab Med nations, enabling them to respond more effectively to food crises. Additionally, expanding AMIS to include advisory services tailored to small economies would allow Arab Med countries to proactively safeguard their food security through better market positioning.

Overall, these multi-layered support systems not only provide financial resilience and legal recourse but also enhance the strategic capacity of Arab Med countries to navigate the complexities of global food trade. By leveraging these tools, Arab Med nations can bolster their food security, strengthen their geopolitical bargaining power, and ensure access to critical food supplies, even in the face of escalating global instability and climate-related challenges.



RECOMMENDATIONS

A. Strategic Recommendations for Enhancing the Compounded Strategic Impact (CSI) of Food Security in the Arab Med Region

1. Economic Dimensions

1. Develop Long-Term Food Supply Agreements to Mitigate Price Volatility Arab Med countries, like Egypt and Morocco, should focus on negotiating long-term food supply agreements that include price stabilization clauses to protect themselves against sudden global food price fluctuations. This recommendation addresses the high price elasticity of demand for staple foods and the region's vulnerability to inflation spikes. By securing these agreements, Arab Med nations can maintain a stable supply of critical food items and avoid the economic strain caused by sudden market shifts, thereby reducing the compounded costs of food insecurity.

2. Enhance Trade Balance through Diversification and Value-Added Agricultural Exports Policymakers should prioritize diversifying their agricultural exports and investing in value-added production processes to counteract the negative impact of import-export imbalances. This approach strengthens the economic resilience of Arab Med countries, reducing their dependency on staple food imports while enhancing their export profiles. For example, Morocco's investment in expanding its high-value fruit and olive oil exports has helped mitigate its negative trade balance. This strategy will help other countries in the region secure stronger negotiating positions and leverage their agricultural outputs to gain more favorable terms in international trade agreements.

2. Social Dynamics

1. Establish Social Safety Nets to Stabilize Food Access During Price Shocks Arab Med countries should implement comprehensive social safety nets that include vulnerable-focused food subsidies, targeted cash transfers, and community food programs. These measures help buffer vulnerable populations against food price spikes and ensure that

social stability is maintained even during economic turbulence. This approach reduces the risk of civil unrest and contributes to a more resilient social fabric, thereby safeguarding governance and minimizing the broader social costs of food insecurity.

2. Invest in Public Health and Nutrition Programs to Address Malnutrition Investing in public health initiatives focused on nutrition education and food supplementation programs can mitigate the health impacts of food insecurity, especially in countries where malnutrition is prevalent. By ensuring that even the poorest households have access to sufficient and nutritious food, Arab Med countries can prevent the long-term public health costs associated with malnutrition, which include reduced workforce productivity and increased healthcare expenditures.

3. Political Landscape and Policy Frameworks

1. Develop Integrated Agricultural Policies Focused on Self-Sufficiency Arab Med countries should prioritize integrated agricultural policies that promote self-sufficiency in staple foods, combining subsidies for local farmers with investments in climate-resilient agriculture. This approach reduces the political vulnerability associated with high dependency on food imports, especially during times of global trade disruptions. By promoting self-sufficiency, countries like Tunisia and Morocco can reduce their exposure to global food price fluctuations and reinforce their political stability.

2. Implement Anti-Corruption Reforms to Ensure Equitable Resource Distribution Addressing political corruption and inefficiency is critical for enhancing the effectiveness of agricultural subsidies and public investment in food security. Implementing transparent governance reforms can ensure that resources are allocated fairly, preventing monopolistic practices that drive up food prices and exacerbate inequality. Anti-corruption measures would also strengthen public trust in governmental institutions, thereby contributing to broader political stability and reducing the risk of social unrest.

4. Water Scarcity and Agricultural Productivity

1. Expand Investment in Water-Saving Technologies and Efficient Irrigation Systems Arab Med countries should increase investments in water-saving technologies, such as drip irrigation and treated wastewater reuse, to mitigate the impact of water scarcity on agricultural productivity. For example, Jordan's successful implementation of advanced irrigation technologies has significantly reduced water usage while maintaining crop yields. This approach will help other water-scarce countries in the region ensure that limited freshwater resources are used efficiently, thereby supporting sustainable agricultural output and reducing dependence on food imports.

2. Promote the Adoption of Drought-Resistant Crop Varieties Developing and promoting drought-resistant crop varieties is essential for enhancing the resilience of Arab Med

agricultural systems. Governments should invest in research and development programs that focus on crops suited to the region's arid climate, such as drought-resistant wheat, olives, and legumes. By increasing the adoption of these varieties, countries can sustain agricultural productivity even during periods of severe water stress, strengthening their overall food security.

5. Energy Demands in Agricultural Systems

1. Transition to Renewable Energy Sources for Agricultural Operations Arab Med countries should invest in renewable energy sources, such as solar and wind, to power agricultural operations, including irrigation and food storage. This recommendation is particularly relevant for countries like Morocco and Egypt, which have already begun integrating renewables into their agricultural sectors. By reducing reliance on fossil fuels, these countries can lower the operational costs of agriculture and decrease their vulnerability to global energy price fluctuations.

2. Promote Energy-Efficient Technologies to Reduce Agricultural Costs Encouraging the adoption of energy-efficient technologies, such as solar-powered water pumps and cold storage facilities, will enhance the cost-efficiency of agricultural production. For example, solar-powered cold storage has proven effective in reducing post-harvest losses and ensuring that food reaches markets in optimal condition. These technologies can significantly lower energy costs, increase agricultural profitability, and contribute to the sustainability of the food supply chain.

6. Ecosystem Degradation and Food Security

1. Implement Sustainable Agricultural Practices to Prevent Soil Degradation Arab Med countries should promote sustainable agricultural practices, such as crop rotation, organic farming, and agroforestry, to prevent soil degradation and restore soil fertility. By investing in these practices, countries can enhance long-term agricultural productivity and reduce dependency on food imports. Sustainable practices also contribute to ecosystem preservation, which is critical for maintaining the environmental conditions necessary for food production.

2. Protect and Restore Key Ecosystems to Support Agricultural Output Protecting and restoring critical ecosystems, such as wetlands, forests, and watersheds, should be prioritized to secure the natural resources needed for agriculture. Governments should implement reforestation projects, establish buffer zones, and regulate activities that threaten ecosystem health. These initiatives will support water conservation, soil fertility, and biodiversity, creating a more resilient foundation for food security.

7. Geopolitical and Security Dynamics

1. Establish Regional Food Security Councils to Manage Geopolitical Risks Creating a dedicated regional food security council under the League of Arab States or the Union

for the Mediterranean (UfM) can help manage geopolitical risks and coordinate collective responses to food security threats. Such councils would enable Arab Med countries to jointly monitor food supply routes, negotiate shared trade agreements, and establish strategic food reserves, thereby reducing the geopolitical vulnerabilities associated with food imports.

2. Strengthen Military and Defense Cooperation to Protect Food Supply Chains Arab Med countries should enhance military and defense cooperation to secure critical food supply routes, such as the Suez Canal and the Strait of Gibraltar. Collaborating with NATO and regional security alliances to protect these maritime chokepoints from piracy and blockades will ensure the uninterrupted flow of essential food supplies, thereby reinforcing national food security.

8. Collaborative Opportunities, Strategic Alliances, and Regional Cooperation

1. Create a Regional Agricultural Research Network to Share Knowledge and Technology Arab Med countries should establish a regional agricultural research network that focuses on developing climate-resilient agricultural techniques, sharing best practices, and facilitating technology transfer. This collaborative effort would enable countries to address shared challenges, such as water scarcity and soil degradation, while enhancing their collective food production capacity.

2. Formulate a United Economic Front for Food Security To enhance negotiation leverage for Arab-Med countries in securing food imports, it is crucial to establish an intra-regional coordination mechanism under the League of Arab States. This mechanism would allow Arab-Med nations to align their food security strategies, factoring in country-specific conditions, while presenting a united economic front in trade negotiations. By coordinating efforts on food supply management and shared resources, the region would strengthen its bargaining power, making it harder for external powers to impose unfavorable trade terms.

B. Strategic Recommendations for Strengthening Food Security Through Interconnected Mobility in the Euro-Mediterranean Relations

Enhance Intra-Regional Trade for Greater Resilience: To mitigate the vulnerabilities associated with heavy reliance on European imports, Arab Med countries should prioritize the development of robust intra-regional trade networks. Establishing dedicated trade corridors that link North African and Middle Eastern countries can help diversify their food supply sources and reduce exposure to external shocks such as global price fluctuations and supply chain disruptions. This recommendation involves creating more flexible tariff agreements within the Greater Arab Free Trade Area (GAFTA) and investing in transportation and logistics infrastructure that facilitates the seamless movement of staple foods across the region. By enhancing intra-regional trade, Arab Med countries can better safeguard their food security by building a diversified food supply network, thereby reducing the risk of dependency on a limited number of external suppliers.

Implement the Water-Energy-Food-Ecosystem (WEFE) Nexus Approach in Trade

Policies: Integrating the WEFE Nexus into Euro-Med trade agreements can serve as a critical strategy for addressing the interdependencies of water, energy, and food resources. Arab Med countries should advocate for the inclusion of sustainability clauses that promote efficient water use, renewable energy integration, and ecosystem conservation in bilateral and multilateral trade frameworks. This could be achieved by establishing a dedicated working group under the Union for the Mediterranean (UfM) that focuses on aligning agricultural practices with environmental goals, while also ensuring that any sustainability measures introduced in trade agreements consider the region's financial and infrastructural limitations. Through this approach, Arab Med countries can strengthen their negotiation power by positioning themselves as proactive agents in sustainable resource management, ultimately making a stronger case for receiving climate finance and development assistance targeted at enhancing the sustainability of their food systems.

Develop Regional Climate-Resilient Agriculture Strategies: Given the escalating climate risks in the region, Arab Med countries need to adopt regional strategies that enhance agricultural resilience. This involves investing in research and development for drought-resistant crop varieties, efficient irrigation systems, and climate-smart agricultural practices. Establishing a joint research platform with the European Union, under initiatives like Horizon Europe, would allow for collaborative innovation and knowledge-sharing. Such partnerships can create a foundation for addressing shared climate challenges while also enhancing agricultural productivity in the region. By positioning themselves as leaders in climate-resilient agriculture, Arab Med countries can secure stronger bargaining power in international climate negotiations and attract climate adaptation funds.

Expand Access to Climate Finance and Investment in Agricultural Infrastructure: Arab Med countries need to attract more equitable climate finance to enhance their agricultural and water infrastructure. This can be achieved by strengthening their regulatory frameworks to create a more favorable investment climate, particularly in politically unstable nations like Lebanon and Libya. Establishing regional climate finance facilities that pool resources from wealthier Arab states, international donors, and development banks would provide a more stable and accessible source of funding for critical projects. By channeling these funds into the development of irrigation systems, water storage facilities, and renewable energy integration in agriculture, Arab Med countries can build the resilience of their food systems and reduce dependency on external food sources.

Leverage the Mobility of Agricultural Services to Build Local Expertise: To reduce over-reliance on foreign expertise, Arab Med countries should focus on building local capacity in agricultural technology, water management, and renewable energy. This can be done by setting up regional centers of excellence and vocational training programs that focus on the needs of the local agricultural sector. Such initiatives should be supported by the European Union through the Erasmus+ program or similar capacity-building projects that allow Arab Med professionals to gain hands-on experience in European research institutions. By enhancing local expertise, Arab Med countries can reduce the costs associated with importing foreign services and build a more self-sufficient agricultural sector.

Promote the Mobility of Skilled Professionals Across the Region: The movement of water and energy specialists, agricultural scientists, and ecosystem management experts is essential for addressing the complex challenges faced by the Arab Med region. Creating specialized visa programs and facilitating professional exchanges under the Union for the Mediterranean (UfM) framework would help build the technical capacity needed to implement sustainable resource management practices. By lowering the barriers to professional mobility, Arab Med countries can enhance their access to critical expertise, enabling the region to respond more effectively to climate challenges, agricultural productivity issues, and water management needs. This enhanced professional mobility would strengthen the region's collective resilience and ensure that the necessary human capital is available to support sustainable food security strategies.

Advance Equitable Professional Mobility and Expertise Exchange in Euro-Med Relations:

Arab Med countries should pursue comprehensive mobility frameworks within Euro-Med relations that combine robust professional exchange programs with equitable market access for agricultural and environmental services. These frameworks should establish reciprocal arrangements that facilitate both the exchange of expertise and the recognition of Arab Med professional certifications and standards. Through structured training programs and professional exchanges with European partners, local specialists in agricultural technology, water management, and sustainable resource practices can enhance their capabilities while maintaining strong ties to their home regions. Simultaneously, the framework should ensure that Arab Med professionals and service providers can access European markets on equitable terms, creating opportunities for knowledge transfer while preventing brain drain. This dual approach would strengthen domestic capabilities in sustainable agriculture and resource management while building a more competitive regional service sector. By balancing capacity building with market access, Arab Med countries can develop resilient local expertise that reduces dependence on external technical support while fostering sustainable agricultural practices and food security initiatives. The resulting ecosystem of mobile yet locally-anchored expertise would enhance the region's ability to address food security challenges independently while maintaining beneficial professional connections with European partners.

Establish an Arab-Med Managed Food Security Data Platform: Transparency and access to real-time data are crucial for making informed decisions about food security. Arab Med countries should establish and maintain sovereign control over a comprehensive food security data platform, hosted and managed within the region while offering open access to global traders and stakeholders. This platform, while integrated with initiatives like the Agricultural Market Information System (AMIS), would be independently operated by Arab Med institutions to track commodity flows, monitor market trends, and provide early warnings about potential disruptions. By maintaining ownership of data infrastructure while ensuring transparency, Arab Med countries can enhance their collective bargaining power in trade negotiations, anticipate supply chain risks, and respond more proactively to global market shifts. The platform would serve as a transparent observatory for Euro-Mediterranean trade relations, enabling evidence-based policy decisions while preserving regional autonomy. This regionally-owned but globally accessible initiative would reduce information asymmetries, strengthen the region's position in international markets, and enhance the overall resilience of its food security strategies. information asymmetries and strengthen the overall resilience of its food security strategies.

C. Strategic Recommendations for Leveraging Transactionalism to Enhance Negotiation Leverage for Food Security in the Arab Med Region

Leverage Strategic Assets and Geopolitical Alliances through Formal Exchange Frameworks:

Arab Med countries should establish comprehensive transactional frameworks that strategically align their geopolitical influence and strategic assets with food security objectives. These frameworks should formalize goods-for-food exchanges through multi-year agreements with major trading partners, while simultaneously leveraging geopolitical alliances to secure preferential terms. These frameworks should be structured to include specific provisions for price fluctuations, supply chain disruptions, and geopolitical tensions, ensuring continuous food security even during market volatility. By formalizing these strategic exchanges through comprehensive agreements that combine both commodity exchanges and geopolitical considerations, Arab Med countries can significantly enhance their negotiating position and create more resilient food security systems. This integrated approach ensures that countries can maximize the value of their strategic assets—whether energy resources, critical infrastructure, or diplomatic influence—while building stable, long-term food security arrangements that are resistant to global market disruptions and shifting power dynamics.

Leverage WEFE Nexus-Based Agreements for Sustainable Resource Management: Arab Med countries should adopt a WEFE Nexus-based approach to transactionalism, where the interconnected nature of water, energy, food, and ecosystems is leveraged in regional and international negotiations. By establishing agreements that facilitate the exchange of one WEFE element for another, countries can address multiple vulnerabilities simultaneously. In Tunisia, integrating ecosystem management services into trade negotiations—such as offering ecosystem restoration in exchange for access to advanced agricultural technologies—would enhance agricultural resilience and contribute to long-term food security. Implementing these nexus-based agreements allows Arab Med countries to optimize resource use, reduce dependencies on external food sources, and strengthen their position in negotiating sustainable trade terms that benefit all parties involved.

Implement Multi-Layered Trade Strategies Through the Four Freedoms Framework (4FF): Arab Med countries should capitalize on the Four Freedoms Framework (4FF) to create complex, multi-layered trade strategies that go beyond traditional goods-for-goods exchanges. By leveraging the mobility of services, capital, and people in addition to goods, countries like Tunisia and Morocco can enhance their negotiating leverage. For instance, Tunisia's focus on becoming a digital outsourcing hub can be strategically linked to food import agreements, where European companies gain access to Tunisia's skilled IT workforce in exchange for favorable food trade terms. Similarly, leveraging capital flows through infrastructure investments in agriculture can enable these countries to build domestic food production capacities. This multi-dimensional strategy would diversify their trade relationships, reduce the risks associated with over-reliance on a single trading partner, and ultimately provide a stronger foundation for negotiating more balanced and equitable food security agreements.

Strengthen Multi-Lateral Transactional Agreements Within Regional Cooperation Platforms:

To enhance their collective bargaining power, Arab Med countries should strengthen their participation in multi-lateral transactional agreements within regional platforms like the Union for the Mediterranean (UfM) and the Arab League. For example, countries can jointly negotiate WEFE Nexus agreements that address shared vulnerabilities, such as water scarcity, by pooling resources and expertise to create mutually beneficial exchanges. The UfM's Water Agenda, which facilitates the exchange of water management technologies, can be expanded to include energy and food components, allowing countries like Egypt, Jordan, and Morocco to engage in multi-dimensional resource-sharing agreements that reduce dependency on external markets. Additionally, the Arab League's Pan-Arab Free Trade Area (PAFTA) should be leveraged to harmonize trade policies and reduce intra-regional tariffs, facilitating greater trade flows of staple foods. This collaborative approach would enable Arab Med countries to present a unified front in external trade negotiations, thereby increasing their ability to secure favorable food import terms and ensuring long-term food security for the region.

Leverage Seasonal Agricultural Labor Flows for Enhanced Food Security Partnerships:

Arab Med countries should strategically integrate seasonal agricultural labor mobility into their food security negotiations with European partners. By formalizing arrangements that combine skilled agricultural labor provision during peak European farming seasons with technology transfer and market access commitments, Arab Med countries can strengthen their negotiating position. For example, countries like Egypt and Morocco could negotiate agreements where their agricultural workers support critical harvest periods in Southern European countries, while securing commitments for off-season preferential access to European agricultural markets and technology. These agreements should include provisions for knowledge transfer, where workers gain expertise in advanced farming techniques and post-harvest technologies during their seasonal work, which they can then apply in their home countries' agricultural sectors. The framework should also incorporate reverse mobility channels, where European agricultural specialists provide technical training and support during Arab Med growing seasons, creating a year-round cycle of mutual benefit. Such bi-directional labor mobility arrangements would transform traditional seasonal worker programs into strategic assets for food security negotiations, allowing Arab Med countries to leverage their workforce capabilities to secure both immediate economic benefits and long-term food security advantages. This approach would create a more balanced partnership where labor mobility serves as a powerful negotiating tool for securing favorable terms in broader food security agreements.

D. Recommendations for Enhancing Food Security in the Arab Med Through Conflict Resolution Mechanisms

Establish Regional Legal Frameworks for Export Ban Mitigation: Arab Med countries should leverage platforms like the League of Arab States to create a Regional Food Security

Legal Framework that would allow member states to address the impact of export restrictions more effectively. This framework should be integrated into trade agreements to ensure that, during crises, member states can collectively negotiate exemptions or compensations. Utilizing the WTO's Dispute Settlement Mechanism (DSM) as a complementary tool, the framework would enable countries like Egypt, Tunisia, and Morocco to challenge restrictive policies that could threaten food supply continuity, thereby protecting their strategic interests and negotiation power.

Create Predictability and Stability Through Regional Trade Pacts: Arab Med countries should promote the establishment of regional food security agreements under multilateral bodies such as the Union for the Mediterranean (UfM). These agreements should focus on building structured and predictable food supply chains by setting clear guidelines for managing crises, stockpiling essential food items, and coordinating emergency response measures. This would reduce the risk of sudden trade disruptions and provide a safety net for countries dependent on food imports, enhancing their capacity for long-term food security planning.

Develop Tailored Trade Agreements to Ensure Equitable Trade Terms: To mitigate the disadvantages faced in global markets, Arab Med nations should push for the inclusion of food security clauses in international trade agreements, especially in DCFTAs (Deep and Comprehensive Free Trade Agreements) with the EU. These clauses should address unique regional vulnerabilities, including limited water and energy resources, ensuring that Arab Med countries can secure preferential terms for staple food imports. This will prevent the imposition of tariffs and other trade barriers that could jeopardize food security during crises, helping maintain balanced and fair-trade relations.

Establish an Integrated Food Security and Resource Dispute Resolution Center: The Union for the Mediterranean (UfM), in partnership with the Arab League and the WTO, should establish a comprehensive Dispute Resolution Center that combines food security arbitration with resource-based conflict mediation. This integrated center should maintain specialized units for both immediate food trade disputes and long-term resource management conflicts, ensuring a holistic approach to food security-related tensions in the region. The center would be empowered to mediate critical issues ranging from water-sharing agreements between countries like Jordan and Palestine to trade disputes over agricultural commodities, while also addressing interconnected challenges such as energy resource management and land use conflicts. By housing both trade and resource mediation functions under one roof, the center would be uniquely positioned to understand and address the complex relationships between resource access, agricultural production, and food trade dynamics. This consolidated approach would strengthen the region's capacity to prevent resource-based conflicts from escalating into broader geopolitical tensions while simultaneously providing a structured platform for resolving food trade disputes according to international standards. The center should be equipped with binding arbitration capabilities and staffed by experts in both resource management and international trade law, ensuring that resolutions are both practical and legally sound. This comprehensive conflict resolution mechanism would provide Arab Med countries with a powerful tool for protecting their food security interests while maintaining regional stability and promoting cooperative resource management.

Leverage Global Humanitarian Networks for Emergency Support and Crisis Mitigation:

Arab Med countries should formalize partnerships with global humanitarian organizations like the World Food Programme (WFP) and the Food and Agriculture Organization (FAO) to create a Rapid Food Crisis Response Mechanism. This would enable a swift mobilization of food aid and resources in times of acute crisis, such as conflict outbreaks or severe climate events, minimizing the impact on vulnerable populations. By ensuring that such mechanisms are integrated into national and regional food security strategies, Arab Med countries can build resilience against sudden disruptions and enhance their capacity to manage short-term crises without sacrificing long-term stability.

Promote Transparency and Real-Time Market Intelligence Sharing:

Arab Med countries should advocate for the expansion of regional market intelligence initiatives similar to the Agricultural Market Information System (AMIS) to include real-time data on regional food production, stock levels, and price trends. This system would reduce the risk of information asymmetry, enabling Arab Med countries to respond proactively to shifts in global markets. By enhancing transparency, these nations can improve their ability to negotiate fairer trade agreements, prevent price manipulation, and plan more effectively for food import needs.

By adopting these recommendations, Arab Med countries can better navigate the complexities of global food trade, enhance their negotiation power, and build resilient food security frameworks capable of withstanding future global disruptions and geopolitical challenges.



TAILORING STRATEGIES FOR ARAB MED FOOD SECURITY IN AN ERA OF CLIMATE UNCERTAINTY

The Arab Mediterranean region's pursuit of food security represents more than a quest for stable food supplies—it embodies a fundamental shift in how vulnerable regions can reshape global trade dynamics through strategic leverage. This study has demonstrated that traditional market-based approaches to food security are insufficient in an era marked by climate uncertainty, geopolitical tensions, and resource scarcity. Instead, the path forward demands a sophisticated integration of quantitative analysis, mobility frameworks, and strategic transactionalism.

The proposed frameworks—from CSI assessment to integrated mobility mechanisms and transactional strategies—offer Arab Mediterranean countries a comprehensive toolkit for transforming their current vulnerabilities into negotiation advantages. These tools enable policymakers to move beyond reactive responses to food insecurity and toward proactive strategies that capitalize on their unique strategic assets. Whether through energy resources, transit control, or professional expertise, each country possesses distinct leverage points that, when properly utilized, can secure more favorable terms in food trade negotiations.

Perhaps most significantly, this research reveals that food security in the Arab Mediterranean context cannot be addressed through isolated national efforts. The interconnected nature of water, energy, food, and ecosystem challenges demands collective action that transcends traditional state boundaries. By establishing mechanisms for regional collaboration while maintaining individual strategic advantages, Arab Mediterranean countries can create a more resilient food security architecture that serves both national and collective interests.

Looking ahead, the success of these strategies will depend on policymakers' ability to:

- **Transform theoretical frameworks into actionable policies that reflect local realities**
- **Build institutional capacity for implementing sophisticated negotiation strategies**
- **Foster regional cooperation while maintaining national strategic advantages**
- **Adapt quickly to emerging challenges in global food markets and climate patterns**

The future of food security in the Arab Mediterranean region lies not in overcoming power asymmetries, but in strategically navigating them through intelligent framework application, resource leverage, and collective action. As climate change continues to reshape global food systems, the ability to convert strategic assets into food security advantages will become increasingly crucial for regional stability and prosperity.



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