

Entrepreneurial mindsets and sustainable ecosystem development in arid regions: a comparative analysis of North Africa and the Gulf Cooperation Council

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Abstract

Purpose – This study aims to examine how institutional, financial and cultural factors shape sustainable entrepreneurial ecosystems in North Africa and the Gulf Cooperation Council (GCC), emphasizing their role in advancing the water–energy–food–environment (WEFE) nexus. It investigates how entrepreneurship drives sustainability transitions, resource efficiency and climate resilience in arid and resource-constrained contexts.

Design/methodology/approach – A comparative qualitative framework is employed, integrating institutional theory, the resource-based view and the entrepreneurial orientation model to analyze the interaction of governance quality, access to sustainable finance and entrepreneurial behavior in promoting WEFE-oriented innovation. The analysis draws on peer-reviewed literature, government strategies and institutional reports published between 2018 and 2024.

Findings – Results indicate that the GCC benefits from coherent institutions, advanced financial systems and policy-driven innovation supporting renewable energy, water management and circular economy ventures. North African ecosystems remain constrained by fragmented governance and limited green finance, resulting in predominantly necessity-driven entrepreneurship. While both regions increasingly align entrepreneurship with sustainability objectives, WEFE integration is more advanced in the GCC.

Practical implications – The study highlights the need for institutional reforms, expanded green finance, and entrepreneurship education incorporating WEFE principles. Sustaining progress in the GCC requires deeper private-sector engagement, robust impact assessment of environmental innovation and enhanced cross-regional collaboration to transfer knowledge and best practices.

Originality/value – This research links entrepreneurial ecosystem development to the WEFE nexus in arid regions, offering a comparative framework illustrating how institutional stability, financial inclusion and innovation-oriented mindsets foster low-carbon, resource-efficient growth aligned with sustainable development goals 6, 7, 8, 9, 12 and 13.

Keywords Sustainable entrepreneurship, WEFE nexus, Green finance, Innovation ecosystems, Circular economy, Resource efficiency

Paper type Research article

1. Introduction

Entrepreneurship has emerged as a critical mechanism for promoting economic diversification, innovation, and sustainability across the Middle East and North Africa (MENA). In regions characterized by resource dependence, demographic pressures, and climate vulnerability, entrepreneurship provides pathways toward resilience, knowledge-based growth, and sustainable resource management (Awashreh, 2025; Maliki, Benghalem, Mourad, & Hilmi, 2022). Within this context, the Water–Energy–Food–Environment (WEFE)

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nexus has gained prominence as a strategic framework linking entrepreneurial activity to sustainability transitions, emphasizing resource efficiency, renewable energy adoption, and circular economy principles.

Both North African and Gulf Cooperation Council (GCC) countries recognize entrepreneurship as central to sustainable development. GCC states such as Saudi Arabia, the United Arab Emirates (UAE), and Oman have institutionalized entrepreneurship within their national transformation strategies—Vision 2030, Vision 2050; Vision 2040, thereby connecting innovation policy to renewable energy, waste management, and sustainable urbanization (Rokhsari, 2025). Similarly, Morocco and Tunisia have launched programs to stimulate startups and digital enterprises contributing to green growth and climate adaptation. However, outcomes remain uneven due to differences in institutional maturity, financial accessibility, and policy coherence across regions (Iwu, Sibanda, & Makwara, 2025).

Sustainability challenges in the MENA region are closely linked to the WEFE nexus. Water scarcity, energy dependency, food insecurity, and environmental degradation threaten socioeconomic stability and long-term growth (Pappas, Mohtar, Daher, & Ashkanani, 2025). Entrepreneurship, particularly green and technology-driven entrepreneurship, offers innovative solutions to enhance resource efficiency, promote renewable energy integration, and implement circular waste management. Yet, translating entrepreneurial intention into sustainability-oriented outcomes relies on the institutional, financial, and cultural conditions present in each ecosystem (Ahmed, Yousaf, Clavijo, & Sanders, 2024).

North African entrepreneurial ecosystems face persistent constraints. Weak governance, fragmented institutions, and limited access to green finance impede sustainable innovation. Entrepreneurs encounter bureaucratic delays, policy inconsistency, and low investor confidence, resulting in reliance on microfinance or informal networks rather than structured venture capital (VC) (Haouas, Ochi, & Labidi, 2024). In contrast, GCC ecosystems benefit from resource endowments, strategic policy frameworks, and state-backed innovation funds, creating opportunity-driven, predictable environments for entrepreneurship. Nevertheless, challenges persist in fostering private-sector engagement, reducing dependency on public financing, and developing indigenous innovation capacity (Elbanna, Younis, Soufi, & Armstrong, 2025).

Prior research on MENA entrepreneurship has largely focused on economic diversification, youth employment, or general startup promotion. Limited attention has been given to environmental and technological dimensions central to the WEFE framework (Mkandawire, 2022; Villegas-Mateos, Fahed-Sreih, Tok, & Labbaf, 2025). Few studies explicitly examine how entrepreneurial mindsets, defined as the attitudes, values, and behaviors driving opportunity recognition and responsible innovation, interact with institutional and financial structures to foster sustainability outcomes (Wales, Covin, Schüler, & Baum, 2023; Ofodile, Yekeen, Sam-Bulya, & Ewim, 2022). Comparative studies of North Africa and the GCC are particularly scarce, leaving determinants of ecosystem maturity and sustainable innovation capacity underexplored.

This study addresses these gaps by analyzing the institutional, financial, and cultural determinants shaping sustainability-oriented entrepreneurial ecosystems in both regions. It situates entrepreneurship within the broader sustainability and WEFE discourse, highlighting how governance quality, access to finance, and behavioral orientations collectively influence ecosystem performance. By integrating Institutional Theory, resource-based view (RBV), and entrepreneurial orientation model (EOM), the research develops a multidimensional framework illustrating how governance, resources, and entrepreneurial mindsets interact to promote sustainable innovation.

The study pursues four interrelated objectives.

- (1) To examine the role of entrepreneurship in promoting sustainable economic diversification within WEFE-related sectors.

- (2) To compare institutional and financial mechanisms enabling or constraining sustainable innovation in North Africa and the GCC.
- (3) To assess the influence of cultural and behavioral factors on sustainability-oriented entrepreneurship.
- (4) To propose policy recommendations to strengthen regional entrepreneurial ecosystems in alignment with sustainable development goals (SDGs) 7, 8, 9, 12, and 13.

By linking entrepreneurial ecosystem development to sustainability science, this research contributes applied knowledge supporting decision-making in resource management, innovation policy, and environmental governance in arid regions. It also provides a comparative framework guiding policymakers and practitioners in designing inclusive, technology-driven, and environmentally resilient entrepreneurship ecosystems across the Arab world.

2. Theoretical foundations of sustainable entrepreneurial mindsets in the Middle East (2018–2024)

Entrepreneurship in the Middle East and North Africa (MENA) has evolved from a purely economic activity into a strategic driver of sustainability and resource-efficient development (Maliki *et al.*, 2022). As climate pressures, population growth, and resource scarcity intensify, entrepreneurship is increasingly recognized as a mechanism for achieving integrated resource management within the WEFE nexus (Pappas *et al.*, 2025). In this study, sustainable entrepreneurship refers to the creation and scaling of ventures that simultaneously generate environmental, social, and economic value while promoting resource efficiency, renewable energy adoption, and circular economy practices (Maliki *et al.*, 2022).

To understand how entrepreneurship contributes to sustainability within the WEFE nexus, this study integrates three complementary theoretical perspectives: Institutional Theory, the RBV, and the EOM (Iqbal & Khizar, 2022). Collectively, these frameworks explain the structural, resource, and behavioral dimensions that shape sustainable entrepreneurship across North Africa and the GCC (Awashreh & Hamid, 2024; Ahmed *et al.*, 2024).

2.1 Institutional foundations of sustainable entrepreneurship

Institutional Theory posits that entrepreneurial ecosystems are structured by formal and informal rules, norms, and values, which govern economic and environmental activity (Poczek, 2022). Institutional structures—including regulatory frameworks, property rights, environmental legislation, and policy coordination mechanisms—determine the effectiveness with which entrepreneurship can advance sustainability objectives (Lemos, 2024).

In the GCC, coherent governance systems and national visions—such as Saudi Vision 2030, UAE Vision 2050; Oman Vision 2040—integrate entrepreneurship into diversification and sustainability strategies (Rokhsari, 2025). Policy instruments, including green finance frameworks, renewable energy zones, and technology incubators, promote innovation in WEFE sectors, reduce investment uncertainty, and stimulate private-sector engagement in resource-efficient ventures (Rokhsari, 2025).

By contrast, North African ecosystems often operate under fragmented institutional arrangements. Limited policy coherence, bureaucratic inertia, and weak regulatory enforcement hinder entrepreneurial growth and reduce investor confidence (Fatma & Khadidja, 2023). Algeria and Libya face persistent governance challenges, while Morocco and Tunisia have made partial progress through startup legislation and renewable energy initiatives (Michailidis, Zafeiriou, Kantartzis, Galatsidas, & Arabatzis, 2025). From an institutional perspective, predictable governance, cross-ministerial coordination, and regulatory

transparency are prerequisites for sustainable ecosystem development and WEFE-aligned entrepreneurship (Iwu *et al.*, 2025).

2.2 Resource-based view: financial and technological capacities

The RBV emphasizes that access to valuable, rare, inimitable, and non-substitutable resources, such as capital, technology, and knowledge, determines a region's competitive advantage and innovation capacity (Panda & Dash, 2014). In sustainability-driven entrepreneurship, these resources are critical for developing green technologies, renewable energy solutions, and resource-efficient business models.

GCC countries benefit from substantial financial and technological endowments, enabling investment in innovation-driven ventures. State-backed mechanisms, including the Public Investment Fund (Saudi Arabia), Qatar Development Bank, and UAE Sustainable Finance Framework, strengthen startup ecosystems in renewable energy, water desalination, sustainable agriculture, and circular economy ventures, facilitating transitions to low-carbon economies (Elbanna *et al.*, 2025).

Conversely, North African ecosystems remain resource-constrained. Limited access to VC, risk-averse banking systems, and underdeveloped sustainability-linked finance restrict scalability and impede innovation in WEFE sectors (Udohaya, 2025). Entrepreneurs often rely on microfinance, donor grants, or informal networks, reinforcing necessity-driven entrepreneurship. From an RBV perspective, expanding green financial instruments, digital infrastructure, and human capital development is essential to transform resource scarcity into innovation opportunities (Kabengele & Hahn, 2025).

2.3 Entrepreneurial orientation and sustainable mindsets

The EOM provides a behavioral lens to examine how innovativeness, proactiveness, and calculated risk-taking shape sustainability-oriented entrepreneurship (Wales *et al.*, 2023). These dimensions define how individuals and organizations identify, pursue, and sustain opportunities in green and circular economy sectors.

In the GCC, entrepreneurship education reforms, innovation hubs, and national campaigns, such as the UAE's "Entrepreneurship for Sustainability" initiatives (Awashreh & Hamid, 2024), have cultivated mindsets conducive to experimentation, technology adoption, and environmental responsibility. These behavioral attributes have accelerated the growth of green startups in renewable energy, clean technology, and circular waste management (Htet, 2023).

In North Africa, cultural attitudes remain more risk-averse, prioritizing job stability and family-based business models. This mindset constrains innovation and inhibits long-term investment in sustainable technologies (Awashreh, 2023). Embedding sustainability principles in education, incentivizing green entrepreneurship, and creating reward structures for innovation can shift behavioral patterns toward proactive, environmentally oriented entrepreneurship (Awashreh, 2023; Ofodile *et al.*, 2022).

2.4 Integrated theoretical framework for WEFE-based entrepreneurship

By integrating Institutional Theory, RBV, and EOM, this study develops a comprehensive framework linking governance quality, resource availability, and entrepreneurial behavior to WEFE-related outcomes (Silva, Pushpakumari, & Nishantha, 2024).

- (1) Institutional theory: Transparent governance, regulatory alignment, and policy integration support sustainable entrepreneurship in water, energy, food, and environmental sectors (Rahman & Natcher, 2025).
- (2) RBV: Access to financial, technological, and human capital enables startups to generate innovative solutions for resource efficiency and climate adaptation (Mailani, Hulu, Simamora, & Kesuma, 2024).

- (3) EOM: Mindset transformation fosters innovation, proactiveness, and resilience in sustainability-driven enterprises ([Rahman, Taghizadeh, Tipu, & Far, 2025](#)).

This framework explains why GCC ecosystems, with strong institutions and abundant resources, progress toward innovation-led, sustainability-aligned growth, while North African ecosystems remain constrained by institutional gaps, financial exclusion, and conservative entrepreneurial cultures. It provides an analytical foundation for understanding how entrepreneurship can support WEFE nexus management and sustainable development in arid regions ([Lee & Kim, 2025](#)).

3. Methodology

3.1 Research design

This study adopts an integrated qualitative-comparative design to analyze the evolution of sustainability-oriented entrepreneurial ecosystems in North Africa and the GCC. Entrepreneurship is treated as a driver of innovation and resource efficiency within the WEFE nexus, emphasizing applied sustainability research in arid regions.

The descriptive-comparative design enables a context-sensitive comparison of institutional strength, access to finance, innovation capacity, and cultural orientation across seven countries: Morocco, Algeria, Tunisia, Saudi Arabia, UAE, Oman, and Qatar. The design integrates three theoretical perspectives.

- (1) Institutional Theory: Governance quality, policy coherence, and sustainability alignment.
- (2) RBV: Access to financial, technological, and knowledge-based resources.
- (3) EOM: Behavioral traits—proactiveness, innovation, and risk-taking—as central to sustainability-driven entrepreneurship.

This multidimensional lens ensures comprehensive analysis of ecosystem performance in WEFE-relevant sectors.

3.2 Data sources

The study relies exclusively on secondary data (2018–2024) to ensure breadth, triangulation, and reliability. Sources include.

- (1) Peer-reviewed journals on entrepreneurship, green innovation, and circular economy.

Institutional reports from World Bank, United Nations Development Programme, Organisation for Economic Co-operation and Development, and World Economic Forum (examples: ([World Bank Group, 2017, 2020](#); [World Economic Forum, 2014](#)))

- (2) Government strategies: Saudi Vision 2030, UAE Vision 2050, Oman Vision 2040, Morocco's Plan Maroc Digital 2020.
- (3) Gray literature from NGOs, think tanks, and regional entrepreneurship networks.

A total of 126 sources informed the analysis, of which 80 were rigorously screened for relevance and methodological quality, and approximately 73 were used to develop the article. The inclusion criteria emphasized: (1) publications from 2018 onward, (2) regional and thematic relevance to WEFE entrepreneurship, and (3) methodological transparency.

3.3 Data analysis

Qualitative content analysis combined with comparative thematic synthesis ([Humble & Mozellius, 2022](#)) was used. Three iterative stages were applied.

- (1) Initial coding: Extracted themes on governance quality, innovation capacity, green finance, cultural norms, and entrepreneurial behavior.
- (2) Thematic categorization: Aligned findings with theoretical constructs:
 - Institutional structures (Institutional Theory)
 - Resource endowments and technological capabilities (RBV)
 - Entrepreneurial orientation and sustainability mindsets (EOM)
- (3) Cross-Regional Comparison: Identified convergence and divergence between North Africa and the GCC in policy integration, financial inclusiveness, and ecosystem maturity in WEFE sectors.

Triangulation enhanced validity by integrating multiple data sources and theoretical perspectives. Iterative coding and cross-source verification reduced interpretive bias.

3.4 Analytical variables

The study analyzed five key variables influencing ecosystem performance and sustainability alignment.

- (1) Governance and institutional quality: Policy coherence, environmental integration, and governmental support.
- (2) Access to sustainable finance: VC, green investment funds, and credit for WEFE innovation.
- (3) Innovation and technology adoption: R&D capacity, renewable energy adoption, digitalization, circular economy transitions.
- (4) Cultural and social norms: Entrepreneurial attitudes toward risk, gender inclusion, and sustainability values.
- (5) Entrepreneurial mindset attributes: Creativity, resilience, proactiveness, and sustainability orientation.

National frameworks (UAE Vision, 2030; Oman Vision, 2040; Qatar National Development Strategy) were evaluated for their influence on renewable energy, water efficiency, and food security entrepreneurship.

3.5 Scope and limitations

Limitations include.

- (1) Uneven coverage of micro-level environmental entrepreneurship studies, particularly in North Africa.
- (2) Data variability in politically unstable contexts (e.g. Libya).
- (3) Structural asymmetries between high-income GCC economies and mixed-income North African economies, potentially affecting ecosystem comparability.

Triangulation and cross-referencing ensured analytical robustness, capturing both policy-level and practical ecosystem dynamics.

3.6 Ethical considerations

The study adhered to academic integrity, full source attribution, objective analysis, and contextual sensitivity. Use of secondary data eliminated risks related to human participants.

4. Results

The comparative analysis reveals substantial contrasts between sustainability-oriented entrepreneurial ecosystems in North Africa and the GCC (Naguib & Barbar, 2025). Variations in institutional governance, financial architecture, cultural norms, and policy execution collectively shape how entrepreneurial mindsets evolve and contribute to sustainability outcomes. Interpreted through the integrated framework of Institutional Theory, the RBV, and the EOM (Surin, Edward, Shaaran, & Ngah, 2023), the findings illustrate how regional structures, resource availability, and behavioral traits condition innovation capacity within the WEFE nexus.

4.1 Comparative overview of sustainable entrepreneurial ecosystems

North African entrepreneurial ecosystems remain largely formative, whereas GCC ecosystems display higher maturity and stronger integration of sustainability into national diversification agendas (Villegas-Mateos, 2023). In North Africa, initiatives such as Plan Maroc Digital 2020 and Tunisia's Startup Act have promoted digital entrepreneurship, but structural challenges persist. Limited institutional coordination, bureaucratic inertia, and scarce green finance constrain ecosystem advancement, particularly in Algeria, where hydrocarbon dependence restricts diversification (Haouas *et al.*, 2024). These constraints limit the development of ventures addressing renewable energy, sustainable agriculture, and circular waste management, key components of the WEFE nexus.

In contrast, GCC economies have institutionalized entrepreneurship within sustainability and innovation strategies. Saudi Vision 2030, UAE Vision 2050; Oman Vision 2040 actively foster renewable energy ventures, clean-tech incubation, and smart city projects. Financial and institutional instruments such as the Qatar Development Bank and Bahrain's green accelerators provide structured support to SMEs, linking entrepreneurship directly to national climate and resource strategies (Soltanifar & Smailhodzic, 2020).

Overall, GCC ecosystems exhibit strong institutional coherence, resource endowment, and WEFE alignment, positioning them ahead of North Africa in establishing innovation systems that connect entrepreneurship to climate resilience and resource efficiency (Eladawy, 2025; Al Saadi & Atef, 2024).

4.2 Government policies, governance quality, and institutional support

Institutional quality remains a decisive determinant of entrepreneurial outcomes. In North Africa, policy inconsistency, weak inter-ministerial coordination, and administrative delays limit private-sector engagement (Awashreh, 2025). Algeria's centralized governance model constrains innovation, while Morocco and Tunisia, despite regulatory improvements, still face gaps in institutional capacity to integrate environmental sustainability effectively (Atmani & Cheklekbire, 2023; Raddoui, 2024).

GCC nations, by contrast, demonstrate robust institutional synergy between economic diversification and sustainability governance (Sweidan, 2025). Reforms under Saudi Vision 2030 and innovation hubs in the UAE, such as Masdar City and Dubai Silicon Oasis, illustrate effective public-private coordination. Qatar's partnerships and Bahrain's regulatory flexibility further accelerate clean-tech enterprise creation (McSparren, Besada & Saravade, 2017). From an institutional perspective, predictable governance and policy coherence are prerequisites for translating sustainability agendas into entrepreneurial activity that directly addresses WEFE priorities (Ali & Acquaye, 2024).

4.3 Cultural and socioeconomic determinants of sustainable mindsets

Cultural norms and social attitudes strongly influence how entrepreneurial intent translates into sustainability-oriented action (Gimenez-Jimenez & Harc, 2024). In North Africa, risk-averse behaviors, job security preferences, and family-based business models inhibit experimentation and long-term investment. Entrepreneurs often pursue short-term survival rather than resource-efficient innovation (Emon & Khan, 2023). Nevertheless, younger cohorts in Morocco and Tunisia increasingly view green entrepreneurship as a viable avenue for social impact and climate adaptation.

In the GCC, societal attitudes toward innovation and environmental responsibility are increasingly supportive. Education reforms, national innovation campaigns, and entrepreneurship promotion initiatives (Kim *et al.*, 2024), particularly in the UAE and Qatar, have fostered a culture valuing sustainability, digital innovation, and green leadership (Pejić Bach, Žmuk, Kamenjarska, Bašić, & Morić Milovanović, 2023). Cultural constraints remain in Saudi Arabia, where risk aversion and reliance on expatriate labor limit indigenous innovation capacity (Yasin, Khansari, & Tirmizi, 2021).

Through the EOM lens, GCC ecosystems demonstrate higher proactiveness, calculated risk-taking, and innovation orientation, supporting mindsets conducive to environmental entrepreneurship, whereas North Africa remains in an earlier phase of cultural transition toward sustainability-oriented behavior (Al-Dhobee, Goail, & Al-Dhobee, 2025).

4.4 Financial access and sustainability investment

Financial capital and technological access, interpreted through RBV, are critical for scaling sustainability-driven innovation. North African ecosystems remain constrained by conservative banking systems, underdeveloped VC markets, and limited sustainability-linked credit instruments (Mishrif, 2018). Although Morocco and Tunisia have introduced digital economy and startup funds, these rarely target WEFE sectors such as renewable energy or water efficiency, leaving entrepreneurs dependent on microfinance or donor grants (Atmani & Cheklekbire, 2023).

Conversely, GCC economies have developed robust financial architectures for sustainability. State-backed mechanisms such as the Saudi Public Investment Fund, UAE Sustainable Finance Framework (Alhowaish & Alkubur, 2025), and Qatar Development Bank provide structured financing for clean technology, circular economy, and green infrastructure ventures. Fintech innovations, green bonds, and ESG-linked platforms further diversify capital access (Soltanifar & Smailhodzic, 2020). Early-stage financing gaps and private sector risk aversion remain challenges, highlighting the need for broader non-state capital participation.

Thus, GCC ecosystems have transitioned toward opportunity-driven, innovation-based entrepreneurship, while North Africa remains largely necessity-driven, limiting the region's capacity to translate environmental challenges into viable business opportunities (Khan & Khan, 2020).

4.5 Comparative summary of ecosystem performance

Institutional coherence, financial inclusiveness, and cultural adaptability collectively determine ecosystem performance. GCC frameworks and financial mechanisms create a self-reinforcing cycle of innovation and resource efficiency within the WEFE nexus (Elbadri, 2025). North African ecosystems, constrained by fragmented institutions and limited financing, face slower integration, although initiatives in Morocco and Tunisia indicate emerging progress (Ourhalouch, Ed-dafali, Mohiuddin, Derj, & Bami, 2024).

Tables 1 and 2 summarize regional comparative performance and key ecosystem drivers, emphasizing governance, finance, and cultural attitudes as critical determinants of entrepreneurial innovation and sustainability alignment.

Table 1. Comparative overview of sustainable entrepreneurial ecosystems

Region	Entrepreneurial ecosystem	Government policies
GCC	Mature, Innovation – Driven	Strong sustainability, policies and diversification vision
North Africa	Emerging, Fragmented	Limited alignment with sustainability
Source(s): Developed by the author		

Table 2. Comparative factors of entrepreneurial ecosystems in North African and the GCC

Factor	North Africa	GCC
Access to Finance	Limited venture capital (VC), green credit, and sustainability-linked investment mechanisms; reliance on microfinance and donor programs	Expanding green finance instruments, venture capital networks, and public innovation funds supporting clean technologies and circular economy ventures
Cultural Attitudes	Generally, risk-averse with limited environmental awareness and preference for job security; entrepreneurship often necessity-driven	Growing openness to sustainable innovation, higher risk tolerance, and increasing social recognition of entrepreneurship as a driver of green growth
Institutional Support	Weak incubators, limited policy coordination, and underdeveloped sustainability linkages between government, academia, and the private sector	Advanced incubator networks, strong government–industry–academic partnerships, and clear alignment with WEFE and national sustainability strategies
Source(s): Developed by the author, 2025		

4.6 Synthesis of findings

GCC ecosystems benefit from coherent institutions, advanced financial systems, and behavioral orientations supportive of proactiveness, risk-taking, and innovation, enabling resource-efficient ventures across renewable energy, smart agriculture, and circular waste management. North African ecosystems remain constrained by fragmented governance, limited green finance, and conservative cultural norms.

Bridging these gaps requires North African reforms prioritizing institutional transparency, sustainability-linked finance, and embedding environmental entrepreneurship in education and policy frameworks (Ali & Acquaye, 2024; Rahman *et al.*, 2025).

4.6.1 Theoretical integration:

- (1) Institutional theory: Provides the governance framework enabling sustainable innovation (Poczek, 2022; Rokhsari, 2025).
- (2) RBV: Highlights the role of financial, technological, and human resources in scaling innovation (Panda & Dash, 2014; Elbanna *et al.*, 2025).
- (3) EOM: Captures behavioral enablers—proactiveness, innovation, and resilience—critical for sustainability-oriented entrepreneurship (Wales *et al.*, 2023; Al-Dhobee *et al.*, 2025).

Overall, GCC ecosystems exemplify opportunity-driven, resource-rich innovation, whereas North Africa depends on necessity-driven, small-scale entrepreneurship. Aligning institutions, resources, and cultural values within the WEFE framework is essential for fostering sustainability-oriented entrepreneurial mindsets and achieving SDGs 7, 8, 9, 12, and 13 (Ben Khaled, Dahmani, & Ben Youssef, 2024; Della Piana, Bayraktar, & Jimenez, 2024).

5. Discussion

This study demonstrates that sustainable entrepreneurship in North Africa and the GCC is shaped by the dynamic, interplay of institutional structures, resource endowments, and cultural dynamics three interdependent dimensions that collectively influence how entrepreneurial mindsets evolve and translate into sustainability outcomes (Ahmed *et al.*, 2024; Silva *et al.*, 2024). Integrating Institutional Theory, the RBV, and the EOM provides a coherent framework linking governance quality, resource availability, and behavioral traits to the development of innovation ecosystems aligned with the WEFE nexus (Takahashi & Sander, 2017).

Institutional frameworks define the policy environment and set the conditions for ecosystem evolution (Pocek, 2022). In the GCC, strategic national visions, Saudi Vision 2030, UAE Vision 2050; Oman Vision 2040, explicitly integrate entrepreneurship with climate adaptation, renewable energy, and economic diversification objectives. These frameworks create predictable governance conditions, facilitating private-sector engagement, innovation, and the operationalization of sustainability objectives through initiatives such as renewable energy incubators, free-zone innovation hubs, and circular economy clusters (Rokhsari, 2025).

North African ecosystems face fragmented governance, bureaucratic inertia, and inconsistent regulatory enforcement (Iwu *et al.*, 2025). While Morocco and Tunisia have introduced startup legislation and digitalization programs, policy volatility and limited inter-ministerial coordination hinder the translation of environmental goals into entrepreneurial activity (Atmani & Cheklekbire, 2023; Raddoui, 2024). These findings confirm that institutional predictability, regulatory transparency, and cross-sectoral coordination are prerequisites for fostering sustainability-oriented entrepreneurship in resource-sensitive contexts.

Resource availability critically determines the scale and impact of sustainability-driven enterprises. GCC ecosystems benefit from financial, technological, and human capital abundance, supported by state-backed mechanisms such as the Public Investment Fund (Saudi Arabia), UAE Sustainable Finance Framework, and Qatar Development Bank, which stimulate opportunity-driven entrepreneurship in renewable energy, clean technology, and resource-efficient business models (Elbanna *et al.*, 2025).

In contrast, North African entrepreneurs operate under resource-constrained conditions, where limited access to green finance, conservative banking systems, and underdeveloped VC markets restrict innovation capacity (Kabengele & Hahn, 2025). Reliance on microfinance and donor grants fosters necessity-driven entrepreneurship, constraining the translation of environmental challenges into scalable business opportunities. Expanding sustainability-linked finance, enabling technology transfer, and investing in human capital development are essential to unlocking innovation potential in these contexts (Mailani *et al.*, 2024).

Cultural norms and social attitudes mediate how entrepreneurial intention translates into sustainability-oriented action. In North Africa, risk aversion, preference for job security, and family-based business structures inhibit experimentation and long-term investment in green sectors (Ofodile *et al.*, 2022). Nevertheless, younger entrepreneurs in Morocco and Tunisia are increasingly adopting green innovation as a vehicle for social impact and climate adaptation, indicating emerging shifts in entrepreneurial culture.

In the GCC, societal attitudes support innovation, environmental responsibility, and digital entrepreneurship (Pejić Bach *et al.*, 2023; Htet, 2023). From the EOM perspective, proactiveness, calculated risk-taking, and innovation orientation facilitate sustainability-driven entrepreneurship (Al-Dhobee *et al.*, 2025). Persistent constraints, including reliance on expatriate labor and social stigma associated with failure (Yasin *et al.*, 2021), highlight that behavioral readiness must align with institutional and resource capacities to fully operationalize green innovation.

The synthesis of institutional, resource, and behavioral dimensions explains regional divergence in ecosystem performance. GCC ecosystems leverage coherent policy frameworks, abundant resources, and supportive cultural orientations to generate opportunity-driven, innovation-based sustainability ventures (Al-Sulaiti, Hamouda, Al-

Yafei, & Abdella, 2024). North African ecosystems, by contrast, remain necessity-driven and resource-limited, although initiatives in Morocco and Tunisia provide early evidence of progress toward environmental entrepreneurship (Dodoo, Ko, Ma, & Guo, 2025).

Ecosystem infrastructure, including incubators, accelerators, and innovation clusters, mediates the translation of entrepreneurial intention into tangible outcomes. GCC initiatives such as Masdar City, Dubai Silicon Oasis, and Qatar Digital Incubation Center illustrate how well-designed infrastructure fosters sustainable business development (Soltanifar & Smailhodzic, 2020). In North Africa, platforms such as Startup Tunisia and Morocco's Technopark remain limited in reach and funding autonomy, emphasizing persistent gaps between entrepreneurial aspiration and environmental impact (Haouas *et al.*, 2024; Ourhalouch *et al.*, 2024).

Policy implications are twofold. For North Africa, bridging the gap requires multi-dimensional reforms: enhancing institutional transparency, strengthening cross-ministerial coordination, expanding sustainability-linked finance, and embedding environmental entrepreneurship in education and youth engagement programs (Ali & Acquaye, 2024; Rahman *et al.*, 2025). For the GCC, ecosystem maturation depends on deepening private-sector participation, diversifying non-state green finance mechanisms, and establishing robust impact measurement frameworks to evaluate environmental outcomes (Villegas-Mateos *et al.*, 2025).

These findings confirm that sustainable entrepreneurial transformation in the MENA region depends on harmonizing institutions, resources, and cultural mindsets within a coherent WEFE framework. The GCC demonstrates successful alignment of policy, finance, and innovation, whereas North Africa illustrates the consequences of fragmented governance and limited resource access. Achieving climate resilience, resource efficiency, and sustainable innovation requires converging governance, inclusive financing, and cultural adaptation, directly supporting the achievement of SDGs 7, 8, 9, 12, and 13 in arid and resource-sensitive contexts (Ben Khaled *et al.*, 2024; Della Piana *et al.*, 2024).

6. Conclusion

This study examined how institutional, financial, and cultural conditions shape sustainable entrepreneurial ecosystems in North Africa and the GCC, within the framework of the WEFE nexus. The comparative analysis demonstrates that while both regions recognize entrepreneurship as a mechanism for advancing sustainability, the GCC's coherent policy frameworks, integrated financial systems, and strategic national visions have facilitated stronger WEFE alignment, particularly in renewable energy, water efficiency, and circular economy innovation.

North Africa's fragmented governance, inconsistent policies, and limited access to green finance continue to constrain ecosystem development and the scaling of sustainability-oriented ventures. Nevertheless, targeted reforms, including transparent sustainability-linked regulations, incentives for green investment, and the integration of environmental entrepreneurship into education and innovation policies, can strengthen WEFE-related innovation and climate adaptation capacity.

For the GCC, advancing sustainability-oriented entrepreneurship requires.

- (1) Deepening private-sector engagement to complement state-led initiatives,
- (2) Diversifying funding mechanisms through VC, green bonds, and ESG-linked platforms,
- (3) *Establishing robust impact assessment frameworks* to monitor outcomes across water, energy, food, and environmental sectors.

Cross-regional collaboration between GCC and North African countries offers further opportunities for.

- (1) Innovation transfer,
- (2) Circular waste management solutions,
- (3) Integrated approaches to food–water–energy security across arid regions.

Overall, effective WEFE management depends not solely on technological solutions but on well-aligned entrepreneurial ecosystems that integrate governance, finance, and innovation. Embedding WEFE principles into entrepreneurship policy, education, and ecosystem development can accelerate climate resilience, resource security, and sustainable economic diversification, thereby directly contributing to the realization of SDGs 7, 8, 9, 12, and 13 in arid and resource-sensitive contexts.

References

Ahmed, T., Yousaf, A., Clavijo, R. C., & Sanders, K. (2024). Entrepreneurial pathways to sustainability: A theoretical paper on green human resource management, green supply chain management, and entrepreneurial orientation. *Sustainability*, 16(15), 6357. doi: [10.3390/su16156357](https://doi.org/10.3390/su16156357).

Al Saadi, A., & Atef, R. (2024). The complex relationship between leadership, innovation, education, and sustainable development: A review in the Arabian Gulf region. *Cultural Conflict and Integration*, 1(1), 41–53. doi: [10.55121/cci.v1i1.345](https://doi.org/10.55121/cci.v1i1.345).

Al-Dhobee, Y. A., Goail, M., & Al-Dhobee, S. (2025). Impact of entrepreneurial orientation dimensions—innovation, proactiveness, and risk-taking—on social performance of small and medium enterprises: Does charismatic leadership moderate these relationships?. *International Review of Management and Marketing*, 15(2), 171–179. doi: [10.32479/irmm.17881](https://doi.org/10.32479/irmm.17881).

Al-Sulaiti, A., Hamouda, A. M. S., Al-Yafei, H., & Abdella, G. M. (2024). Innovation-based strategic roadmap for economic sustainability and diversity in hydrocarbon-driven economies: The Qatar perspective. *Sustainability*, 16(9), 3770. doi: [10.3390/su16093770](https://doi.org/10.3390/su16093770).

Alhawaish, A. K., & Alkubur, F. S. (2025). Unlocking the potential of the circular economy at municipal levels: A study of expert perceptions in the Dammam metropolitan area. *Sustainability*, 17(10), 4323. doi: [10.3390/su17104323](https://doi.org/10.3390/su17104323).

Ali, S. M., & Acquaye, A. (2024). An examination of water-energy-food nexus: From theory to application. *Renewable and Sustainable Energy Reviews*, 202, 114669. doi: [10.1016/j.rser.2024.114669](https://doi.org/10.1016/j.rser.2024.114669).

Atmani, S., & Cheklekbire, M. (2023). Contribution of entrepreneurial innovation to the Moroccan economy. *European Journal of Theoretical and Applied Sciences*, 1(6), 52. doi: [10.59324/ejtas](https://doi.org/10.59324/ejtas).

Awashreh, R. (2023). Enhancing innovation among business colleges at Omani universities: A theoretical framework. *Seybold Report*, 18(2), 182–196. Available from: <https://seybold-report.com/wp-content/uploads/2023/07/Read-182rev.pdf>

Awashreh, R. (2025). Advancing innovative entrepreneurship in higher education: Suggested framework. In *Sustainable innovation in the Middle East and North Africa (MENA) region* (pp. 121–154). IGI Global. doi: [10.4018/979-8-3373-0908-8.ch005](https://doi.org/10.4018/979-8-3373-0908-8.ch005).

Awashreh, R., & Hamid, A. A. (2024). A proposed framework for predicting the psychological determinants of youth entrepreneurship success: Gulf region perspective. In R. El Khoury (Ed.), *Anticipating Future Business Trends: Navigating Artificial Intelligence Innovations. Studies in Systems, Decision and Control* (Vol. 536, pp. 51–60). Cham: Springer. doi: [10.1007/978-3-031-63402-4_5](https://doi.org/10.1007/978-3-031-63402-4_5).

Ben Khaled, M. W., Dahmani, M., & Ben Youssef, A. (2024). Overcoming barriers to energy transition in the MENA region: New institutional dynamics. HAL Id. hal-04527197. Available from: <https://hal.science/hal-04527197v1>

Della Piana, B., Bayraktar, S., & Jimenez, A. (2024). Entrepreneurial mindsets across cultures. In A. Botti, & R. Parente (Eds.), *Humane Entrepreneurship and Innovation* (pp. 175–191). Emerald Publishing. doi: [10.1108/978-1-83797-374-320241010](https://doi.org/10.1108/978-1-83797-374-320241010).

- Dodoo, A. N., Ko, J., Ma, Y., & Guo, C. (2025). Revisiting sustainable development in Africa through a national economic, environmental, social, and governance perspective. *Discover Sustainability*, 6(1), 1426. doi: [10.1007/s43621-025-02079-8](https://doi.org/10.1007/s43621-025-02079-8).
- Eladawy, A. (2025). *Climate governance in MENA and Africa: Knowledge, policies, and cooperation*. Carnegie Endowment for International Peace. Available from: <https://carnegieendowment.org/research/2025/02/climate-governance-mena-africa?lang=en>
- Elbadri, H. (2025). Designing entrepreneurial ecosystems for a greener future through review of frameworks, policies, and practices with insights from Oman. doi: [10.69481/NBDP6382](https://doi.org/10.69481/NBDP6382).
- Elbanna, S., Younis, H., Soufi, M., & Armstrong, L. (2025). Navigating entrepreneurship ecosystems in the UAE, Qatar, and the UK. In E. Zaidan, E. Tok, A. Al-Fadala, & L. Cochrane (Eds.), *The future of education policy in the State of Qatar (Gulf Studies)* (Vol. 21, pp. 419–444). Springer. doi: [10.1007/978-981-97-9667-0_21](https://doi.org/10.1007/978-981-97-9667-0_21).
- Emon, M. M. H., & Khan, T. (2023). The impact of cultural norms on sustainable entrepreneurship practices in SMEs of Bangladesh. *Indonesian Journal of Innovation and Applied Sciences*, 3(3), 201–209. doi: [10.47540/ijias.v3i3.962](https://doi.org/10.47540/ijias.v3i3.962).
- Fatma, M., & Zerigui, K. (2023). Comparative studies of North African financial markets. *Financial Markets, Institutions and Risks*, 7(4), 105–112. doi: [10.61093/fmir.7\(4\).105-112.2023](https://doi.org/10.61093/fmir.7(4).105-112.2023).
- Gimenez-Jimenez, D., & Harc, M. (2024). Students' sustainable entrepreneurship intentions: The role of sustainable values and culture. *Journal of Entrepreneurship*, 33(1), 118–154. doi: [10.1177/09713557241232246](https://doi.org/10.1177/09713557241232246).
- Hauuas, A., Ochi, A., & Labidi, M. A. (2024). Sources of Algeria's economic growth, 1979–2019: Augmented growth accounting framework and growth regression method. *Regional Science Policy & Practice*, 16(3), 12448. doi: [10.1111/rsp3.12448](https://doi.org/10.1111/rsp3.12448).
- Htet, A. (2023). Ethnocentrism and country of origin effects. In K. Al-Sulaiti, I. Al-Sulaiti, J. Abbas, & H. Al Halbusi (Eds.), *Ethnocentrism and Country of Origin Effects* (pp. 1–818). doi: [10.1108/K-07-2023-1345](https://doi.org/10.1108/K-07-2023-1345).
- Humble, N., & Mozeliuss, P. (2022). Content analysis or thematic analysis: Similarities, differences and applications in qualitative research. In *European Conference on Research Methodology for Business and Management Studies* (Vol. 21, pp. 76–81). doi: [10.34190/ecrm.21.1.316](https://doi.org/10.34190/ecrm.21.1.316).
- Iqbal, M. J., & Khizar, H. M. U. (2022). The epistemology of entrepreneurial responsible orientation (ERO): Theory, conceptualization, and future research. *Sage Open*, 12(2), 21582440221089320. doi: [10.1177/21582440221089320](https://doi.org/10.1177/21582440221089320).
- Iwu, C. G., Sibanda, L., & Makwara, T. (2025). African entrepreneurial ecosystem resource constraints: A COVID-19 perspective. *Journal of Entrepreneurship and Innovation in Emerging Economies*, 12(1), 9–26. doi: [10.1177/23939575251361581](https://doi.org/10.1177/23939575251361581).
- Jol, G., & Stommel, W. (2016). Ethical considerations of secondary data use: What about informed consent?. *Dutch Journal of Applied Linguistics*, 5(2), 180–195. doi: [10.1075/dujal.5.2.06jol](https://doi.org/10.1075/dujal.5.2.06jol).
- Kabengele, C., & Hahn, R. (2025). Venture capital funding in Africa: A mixed-methods study of evolving ecosystems and financial discrimination. *Journal of International Business Studies*, 56(6), 777–794. doi: [10.1057/s41267-025-00788-w](https://doi.org/10.1057/s41267-025-00788-w).
- Khan, M. K., & Khan, M. B. (Eds.) (2020), *Research, innovation and entrepreneurship in Saudi Arabia: Vision 2030* (1st ed.). Routledge. Available from: <https://www.routledge.com/Research-Innovation-and-Entrepreneurship-in-Saudi-Arabia-Vision-2030/KhurramKhanBabarKhan/p/book/9781032237145?srsltid=AfmBOoq-LABfLcBw6M9igg3VPG90vSfWb1BYvSzQ1WtR4ISEFVT8IQL>
- Kim, S., de Guzman, M. R. T., Nicholas, C., Wang, Y., Padasas, I., & Kennedy, O. (2024). Youth entrepreneurship education: Insights from social science research. In M. R. T. de Guzman, & H. Hatton (Eds.), *Extension education and the social sciences: Uplifting children, youth, families, and communities* (pp. 185–202). Cambridge University Press. doi: [10.1017/9781108980562.011](https://doi.org/10.1017/9781108980562.011).
- Lee, J., & Kim, J. (2025). Analyzing determinants' priorities of entrepreneurial ecosystems for ICT start-ups in Sub-Saharan Africa: A path toward sustainable development. *Sustainability*, 17(5), 2044. doi: [10.3390/su17052044](https://doi.org/10.3390/su17052044).

- Lemos, M. C. (2024). Legal aspects of sustainable development: Governance mechanisms to balance growth and environmental protection. *Mayo Communication Journal*, 1(2), 97–107. Available from: <https://www.researchcorridor.org/index.php/mcj/article/view/161>
- Mailani, D., Hulu, M. Z. T., Simamora, M. R., & Kesuma, S. A. (2024). Resource-based view theory to achieve a sustainable competitive advantage of the firm: Systematic literature review. *International Journal of Entrepreneurship and Sustainability Studies*, 4(1), 1–15. doi: [10.31098/ijeass.v4i1.2002](https://doi.org/10.31098/ijeass.v4i1.2002).
- Maliki, S., Benghalem, A., Mourad, K., & Hilmi, N. (2022). Entrepreneurship and economic development in the MENA region. *Economic Research Forum*. Available from: <https://theforum.erf.org/2022/01/10/entrepreneurship-economic-development-mena-region/> (accessed 1 October 2025).
- McSparren, J., Besada, H. G., & Saravade, V. (2017). Qatar's global investment strategy for diversification and security in the post-financial crisis era. Centre on Governance, University of Ottawa. (Report No. 978-0-9949034-7-1). Available from: <http://socialsciences.uottawa.ca/governance>
- Michailidis, M., Zafeiriou, E., Kantartzis, A., Galatsidas, S., & Arabatzis, G. (2025). Governance, energy policy, and sustainable development: Renewable energy infrastructure transition in developing MENA countries. *Energies*, 18(11), 2759. doi: [10.3390/en18112759](https://doi.org/10.3390/en18112759).
- Mishrif, A. (2018). Introduction to economic diversification in the GCC region. *Economic diversification in the Gulf region*, 1, 1–10. doi: [10.1007/978-981-10-5783-0_1](https://doi.org/10.1007/978-981-10-5783-0_1).
- Mkandawire, R. (2022). *Youth entrepreneurial ecosystem for sustainable development in Sub-Saharan Africa*. Michigan State University. Available from: https://aap.isp.msu.edu/files/1316/4916/9659/AAP_Youth_Report_FINAL_DIGITAL_04.05.2022.pdf
- Naguib, R., & Barbar, J. (2025). Factors shaping sustainability through female entrepreneurship in the GCC: A systematic review with multi-level and institutional perspective. *Sustainability*, 17(5), 2163. doi: [10.3390/su17052163](https://doi.org/10.3390/su17052163).
- Ofodile, O. C., Yekeen, A. O., Sam-Bulya, N. J., & Ewim, C. P. M. (2022). Business models for sustainability: Challenges and opportunities for Africa. *Open Access Research Journal of Multidisciplinary Studies*, 4(1), 102–116. doi: [10.53022/oarjms.2022.4.1.0090](https://doi.org/10.53022/oarjms.2022.4.1.0090).
- Ouralouch, M., Ed-dafali, S., Mohiuddin, M., Derj, A., & Bami, A. (2024). Green pioneers in emerging markets: Morocco's strategic integration of green finance and entrepreneurship for sustainable development. In *Competitiveness in the new era [Working title]*. IntechOpen. doi: [10.5772/intechopen.115154](https://doi.org/10.5772/intechopen.115154).
- Panda, S., & Dash, S. (2014). Constraints faced by entrepreneurs in developing countries: A review and assessment. World review of entrepreneurship. *Management of Sustainable Development*, 10(4), 405–421. doi: [10.1504/WREMSD.2014.064951](https://doi.org/10.1504/WREMSD.2014.064951).
- Pappas, K., Mohtar, R., Daher, B., & Ashkanani, Z. (2025). Securing our future: A water-energy-food nexus approach to climate risks, resource scarcity, and human mobility in the Middle East. In *Security enhancement for climate change impacting urban resources - SECCURE* (pp. 349–367). Springer. doi: [10.1007/978-94-024-2345-7_20](https://doi.org/10.1007/978-94-024-2345-7_20).
- Pejić Bach, M., Žmuk, B., Kamenjarska, T., Bašić, M., & Morić Milovanović, B. (2023). The economic and sustainability priorities in the United Arab Emirates: Conflict exploration. *Journal of Enterprising Communities: People and Places in the Global Economy*, 17(5), 966–998. doi: [10.1108/JEC-04-2022-0067](https://doi.org/10.1108/JEC-04-2022-0067).
- Poczek, J. (2022). Tendencies towards integration and disintegration of the entrepreneurial ecosystem: An institution-based view of the dynamics. *European Planning Studies*, 30(12), 2575–2594. doi: [10.1080/09654313.2022.2077361](https://doi.org/10.1080/09654313.2022.2077361).
- Raddoui, F. (2024). Inclusive innovation in Tunisia: Main challenges and policies implemented. *Economics*, 11(2), 2653–2683. doi: [10.47772/IJRISS.2024.803184](https://doi.org/10.47772/IJRISS.2024.803184).
- Rahman, H. M. T., & Natcher, D. (2025). Addressing gaps in integrative water-energy-food forest (WEFF) nexus governance. *Environmental Science & Policy*, 172, 104195. doi: [10.1016/j.envsci.2025.104195](https://doi.org/10.1016/j.envsci.2025.104195).

- Rahman, S. A., Taghizadeh, N. S. K., Tipu, S. A. A., & Far, S. M. (2025). Leveraging dynamic capabilities for digital transformation: Exploring the moderating role of cost in environmental performance of SMEs. *Journal of Open Innovation: Technology, Market, and Complexity*, 11(2), 100523. doi: [10.1016/j.joitmc.2025.100523](https://doi.org/10.1016/j.joitmc.2025.100523).
- Rokhsari, S. (2025). A study of GCC economic visions through magnitude thinking. *Journal of Business, Communication & Technology*, 4(2), 18–34. doi: [10.56632/bct.2025.4202](https://doi.org/10.56632/bct.2025.4202).
- Silva, M., Pushpakumari, M. D., & Nishantha, B. (2024). Development of an integrated conceptual framework for entrepreneurial intention and nascent entrepreneurial behavior. *The Bottom Line: Managing Library Finances*, 37(4), 434–453. doi: [10.1108/BL-05-2023-0157](https://doi.org/10.1108/BL-05-2023-0157).
- Soltanifar, M., & Smailhodzic, E. (2020). Developing a digital entrepreneurial mindset for data-driven, cloud-enabled, and platform-centric business activities: Practical implications and the impact on society. In M. Soltanifar, M. Hughes, & L. Göcke (Eds.), *Digital Entrepreneurship : Impact on Business and Society* (pp. 3–21). Future of Business and Finance. Springer. doi: [10.1007/978-3-030-53914-6_1](https://doi.org/10.1007/978-3-030-53914-6_1).
- Surin, E. F., Edward, O. T., Shaaran, S., & Ngah, R. (2023). Understanding entrepreneurial orientation-based research: A proposed new theoretical framework. *Information Management and Business Review*, 15(3), 23–35. doi: [10.22610/imbr.v15i3\(si\).3454](https://doi.org/10.22610/imbr.v15i3(si).3454).
- Sweidan, O. D. (2025). Economic challenges of economic diversification and sustainability in the GCC countries. *Review of Political Economy*, 1–23. doi: [10.1080/09538259.2025.2493269](https://doi.org/10.1080/09538259.2025.2493269).
- Takahashi, A., & Sander, J. A. (2017). Combining institutional theory with resource based theory to understand processes of organizational knowing and dynamic capabilities. *European Journal of Management Issues*, 25(1), 43–48. doi: [10.15421/191707](https://doi.org/10.15421/191707).
- Udohaya, N. (2025). The concept impact investing. In *Impact investing and financial inclusion: Examining the innovations that empower the underserved* (pp. 49–236). Palgrave Macmillan. doi: [10.1007/978-3-031-87841-1_2](https://doi.org/10.1007/978-3-031-87841-1_2).
- Villegas-Mateos, A. (2023). Toward a sustainable entrepreneurial ecosystem in Qatar. *Sustainability*, 15(1), 127. doi: [10.3390/su15010127](https://doi.org/10.3390/su15010127).
- Villegas-Mateos, A., Fahed-Sreih, J., Tok, E., & Labbaf, H. (2025). Global, regional, and national entrepreneurial ecosystems: Exploring the interplay within the MENA region. In A. Villegas-Mateos, A. Akaak, J. Fahed-Sreih, G. Guéneau, R. D. Manning, B. Ramdani, & E. Tok (Eds.), *Global, regional, and national entrepreneurial ecosystems: Exploring the interplay within the MENA region*. Emerald Publishing. doi: [10.1108/978-1-83608-208-820251002](https://doi.org/10.1108/978-1-83608-208-820251002).
- Wales, W. J., Covin, J. G., Schüller, J., & Baum, M. (2023). Entrepreneurial orientation as a theory of new value creation. *The Journal of Technology Transfer*, 48(5), 1752–1772. doi: [10.1007/s10961-023-10021-1](https://doi.org/10.1007/s10961-023-10021-1).
- World Bank Group (2017). Social entrepreneurship in Tunisia: Achievements and ways forward. Available from: <https://openknowledge.worldbank.org/server/api/core/bitstreams/2c97a254-4b77-5b12-bfaa-2034ec91a5d0/content>
- World Bank Group (2020). Libya financial sector review. Available from: <https://thedocs.worldbank.org/en/doc/2885216004448372890280022020/original/LibyaFinancialSectorReviewEnglishFinal.pdf>
- World Economic Forum (2014). Entrepreneurial ecosystems around the globe and early-stage company growth dynamics: The entrepreneur's perspective. World Economic Forum. Available from: https://www3.weforum.org/docs/WEF_II_EntrepreneurialEcosystemsEarlyStageCompany_Report_2014
- Yasin, N., Khansari, Z., & Tirmizi, K. (2021). Exploring the challenges for entrepreneurship business incubator hubs in the United Arab Emirates. *International Journal of Globalisation and Small Business*, 12(2), 190. doi: [10.1504/IJGSB.2021.114575](https://doi.org/10.1504/IJGSB.2021.114575).

Further reading

- Bodolica, V., Spraggon, M., & Badi, H. (2021). Extracurricular activities and social entrepreneurial leadership of graduating youth in universities from the Middle East. *International Journal of Management in Education*, 19(2), 100489. doi: [10.1016/j.ijme.2021.100489](https://doi.org/10.1016/j.ijme.2021.100489).

- Jabeen, F., Faisal, M. N., & Katsioloudes, M. I. (2017). Entrepreneurial mindset and the role of universities as strategic drivers of entrepreneurship: Evidence from the United Arab Emirates. *Journal of Small Business and Enterprise Development*, 24(1), 136–157. doi: [10.1108/JSBED-07-2016-0117](https://doi.org/10.1108/JSBED-07-2016-0117).
- Kreiser, P. M., Marino, L. D., Dickson, P. H., & Weaver, K. M. (2010). Cultural influences on entrepreneurial orientation: The impact of national culture on risk taking and proactiveness in SMEs. *Entrepreneurship Theory and Practice*, 34(5), 959–983. doi: [10.1111/j.1540-6520.2010.00396.x](https://doi.org/10.1111/j.1540-6520.2010.00396.x).
- Leitão, J., Pereira, D., & Gonçalves, Â. (2022). Business incubators, accelerators, and performance of technology-based ventures: A systematic literature review. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(1), 46. doi: [10.3390/joitmc8010046](https://doi.org/10.3390/joitmc8010046).
- Reimers, F., Dyer, M., & Chung, C. K. (2018). Learning to improve the world: How Injaz Al Arab helps youth in the Middle East develop an entrepreneurial mindset. ResearchGate. Available from: <https://www.researchgate.net/publication/327945219>

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