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SUSTAINABLE ENTREPRENEURSHIP IN THE KINGDOM OF SAUDI ARABIA: A SYSTEMATIC EVALUATION OF EXTANT RESEARCH

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Abstract. Sustainable entrepreneurship is crucial as it represents a proactive approach to business that seeks financial success and addresses pressing environmental and societal challenges, contributing to a more resilient and responsible global economy. Comparably, the importance of sustainable entrepreneurship in the Kingdom of Saudi Arabia (KSA) lies in its capacity to foster economic resilience, environmental stewardship, and social development, aligning with the nation's 2030 vision for a diversified and sustainable future. Despite the growing number of publications assessing sustainable entrepreneurship in recent years, there remains a need for further advancement in this field. In the context of KSA, despite notable efforts in existing studies, there is a compelling need to delve into the factors driving sustainable entrepreneurship. This exploration is crucial as it represents a departure from traditional norms in entrepreneurial practices. It is vital for comprehending the elements that can initiate and foster sustainable entrepreneurial behaviour, among other research agendas. Therefore, this systematic review focuses on identifying and analyzing publications that explore sustainable entrepreneurship in KSA to highlight current contributions to the field and suggest future research directions.

Keywords: Sustainable entrepreneurship; Saudi Arabia; women entrepreneurship; entrepreneurship ecosystems; entrepreneurial resilience; innovation

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1. Introduction

Entrepreneurship is a multifaceted concept encompassing behaviours focused on identifying and developing economic opportunities. These opportunities are owned and managed by individuals who bear the risk of establishing a business (Hoogendoorn et al., 2019). Specifically, entrepreneurship can be academically assessed regarding the methods, means, and parties involved in recognizing, evaluating, and exploiting opportunities to initiate products and services (Shane and Venkataraman, 2000). Consistent with these definitions, sustainable entrepreneurship is "the discovery, creation, and exploitation of entrepreneurial opportunities that contribute to sustainability by generating social and environmental gains for others in society" (Pinkse and Groot, 2015, p. 634). Traditionally, entrepreneurship was viewed as a tool for generating economic benefits; however, the growing importance of sustainability and its relevance to the global system have been pivotal in reshaping the purpose of entrepreneurship (Terán-Yépez et al., 2020). Sustainable entrepreneurship is closely aligned with the United Nations' Sustainable Development Goals (SDGs) (Pacheco et al., 2010).

Despite the increase in publications that evaluate sustainable entrepreneurship in the past few years, it still requires further development (Terán-Yépez et al., 2020; Volkmann et al., 2021). The broader academic literature often focuses on theoretical contributions, as a comprehensive theory of sustainable entrepreneurship has not yet been established (Terán-Yépez et al., 2020). In the context of KSA, despite the significant efforts observed in extant research (Abed, 2021; Alhothali and Al-Dajani, 2022), the examination of the drivers of sustainable entrepreneurs has become imperative, given that it signifies a departure from conventional norms observed in entrepreneurship practice. This scrutiny is essential for understanding the factors that can instigate and nurture sustainable entrepreneurial behaviour (Abed, 2021; Cardella et al., 2020; Mohamed et al., 2023). Furthermore, while several studies have assessed the primary predictors among individual factors contributing to success in sustainable entrepreneurship (Al-Tit et al., 2019), environmental and social concerns have not been adequately addressed. The studies did not explicitly investigate the lack of sustainable entrepreneurship research concerning communities, non-profit organizations, and establishments beyond the private sector. Despite scholarly efforts over the past decade to address these gaps, organizations of this nature are currently confronting escalating expectations to demonstrate entrepreneurial behaviours and explore new avenues for self-funding (Wagner et al., 2021).

Furthermore, the research on sustainable entrepreneurship in KSA is identified as fragmented and lacking cohesion. Specifically, twenty publications addressed sustainable entrepreneurship (Table 1). These studies were selected after employing rigorous criteria and a specific timeframe (2019-2023). The analysis of the studies identifies eight overarching themes—women entrepreneurship, education's role, governance and policy implications, SMEs and family-owned businesses, region-specific sustainable entrepreneurship, entrepreneurship ecosystems, innovation, and entrepreneurial resilience. Still, several notable findings emerged from the analysis. Geographical comparisons were evident, particularly in women's entrepreneurship and entrepreneurial ecosystems studies. The government's role, emphasizing top-down policy initiatives and knowledge dissemination, is featured in many studies. Economic diversification, especially in the Riyadh province, was identified as crucial for promoting sustainable entrepreneurship. Gender-based evaluations revealed limitations in existing studies, particularly in understanding gender differences in factors influencing entrepreneurial resilience and women entrepreneurs' sustainable behaviour. Theory utilization varied, with a few papers employing specific theories, which warrants more exploration of underutilized theories in the context of sustainable entrepreneurship in KSA.

Consequently, this systematic review primarily aims to identify and analyze publications investigating sustainable entrepreneurship within the Kingdom of Saudi Arabia. The objective is to underline existing contributions to the field and propose future research recommendations. To achieve this objective, the paper begins by presenting the systematic review's criteria and scope. Subsequently, the selected studies are subjected to further evaluation to discern common themes and emphasize their contributions to sustainable entrepreneurship. Each identified theme is comprehensively discussed, and inherent limitations are explicitly specified. A comprehensive discussion is presented to provide an overview of the noteworthy outcomes derived from the evaluation. The review's conclusion includes a depiction of the future research agenda tailored to the identified gaps and areas warranting further exploration.

2. Systematic review criteria and scope

To conduct a systematic review of existing literature, several measures were implemented to select and refine the chosen papers. First, Google Scholar was employed as the research engine, and the search query "sustainable entrepreneurship in Saudi Arabia" was utilized. Second, the timeframe was restricted to papers published between 2019 and 2023. Third, the relevance and context of the identified papers were carefully assessed, and only journals listed in the Web of Science master journal list were chosen for further analysis. This selection criterion is attributed to the stringent standards employed by the Web of Science master journal list, which includes journals demonstrating high levels of editorial diligence and best review practices. Additionally, the publications were retrieved in December 2023; hence, this paper does not consider any publications beyond the date of extraction.

After applying the aforementioned criteria, 20 papers were selected (Table 1). Notably, research on sustainable entrepreneurship in Saudi Arabia is limited and exhibits disparities in volume and perspective. Despite gaining momentum since 2019, the existing body of research, particularly those published in high-quality journals, is considered to be in its early stages. Consequently, this study aims to supplement the current literature by incorporating additional research that evaluates sustainable entrepreneurship in general. It is crucial to highlight that only studies listed in the Web of Science master journal list will be included in this evaluation.

Table 1. Publications that evaluate sustainable entrepreneurship in Saudi Arabia

#	Title	Year	Journal	Author/s
1	Critical Success Factors of Small and Medium-Sized Enterprises in Saudi Arabia: Insights from Sustainability Perspective	2019	Administrative Sciences	Al-Tit et al. (2019)
2	Cultural Antecedents of Green Entrepreneurship in Saudi Arabia: An Institutional Approach	2020	Sustainability	Alwakid et al. (2020)
3	Role of Education and Economic Growth on the CO2 Emissions in Saudi Arabia	2020	Entrepreneurship and Sustainability Issues	Alkhateeb et al. (2020)
4	Internal and External Barriers to Entrepreneurship in Saudi Arabia	2021	Digest of Middle East Studies	Abdulghaffar and Akkad (2021)
5	Entrepreneurial Ecosystem, Entrepreneurial Self-Efficacy, and Entrepreneurial Intention in Higher Education: Evidence from Saudi Arabia	2021	The International Journal of Management Education	Elnadi and Gheith (2021)
6	Women Entrepreneurs' Adoption of Mobile Applications for Business Sustainability	2021	Sustainability	Abed (2021)
7	Role of Education, Training, and E-Learning in Sustainable Employment Generation and Social Empowerment in Saudi Arabia	2022	Sustainability	Singh et al. (2022)
8	Entrepreneurial Competency, Financial Literacy, and Sustainable Performance—Examining the Mediating Role of Entrepreneurial Resilience among Saudi Entrepreneurs	2022	Sustainability	Seraj et al. (2022)
9	Green Economy Performance and Sustainable Development Achievement: Empirical Evidence from Saudi Arabia	2022	Environment Development and Sustainability	Chaaben et al. (2022)
10	An Evaluation of the Effectiveness of Innovation Ecosystems in Facilitating the Adoption of Sustainable Entrepreneurship	2022	Journal of Small Business Management	Bakry et al. (2022)
11	Emotions and Resilience in Saudi Women's Digital Entrepreneurship during the COVID-19 Pandemic	2022	Sustainability	Alhothali and Al-Dajani (2022)
12	The Role of Sustainable Entrepreneurship and Corporate Social Performance on Social Innovation: The Case of the Private Industrial Sector in Saudi Arabia	2022	Journal of the Knowledge Economy	Alfalih (2022)
13	Developing Entrepreneurial Sustainability among Saudi Arabia's University Students	2022	Sustainability	Abdelwahed (2022)
14	Women, Entrepreneurship, and Sustainability: The Case of Saudi Arabia	2022	Sustainability	Abdelwahed et al., (2022)
15	Redefining Resilience: The Case of Small Entrepreneurs in Saudi Arabia	2023	Frontiers in Environmental Science	Alshebami (2023a)
16	Green Innovation, Self-Efficacy, Entrepreneurial Orientation and Economic Performance: Interactions among Saudi Small Enterprises	2023	Sustainability	Alshebami (2023b)
17	Using the PLS-SEM Model to Measure the Impact of the Knowledge Economy on Sustainable Development in the Al-Jouf Region of Saudi Arabia	2023	Sustainability	Fahad S. Almawishir and Benlaria (2023)
18	Riyadh: Evolving to Become as One of the MENA Region's Key Entrepreneurial Ecosystems	2023	Sustainability	Roomi et al. (2023)
19	The Role of Governance in Achieving Sustainability in Family-Owned Business: Do Responsible Innovation and Entrepreneurial Culture Matter	2023	Sustainability	Al Rawaf and Alfalih (2023)
20	Born Not Made: The Impact of Six Entrepreneurial Personality Dimensions on Entrepreneurial Intention: Evidence from Healthcare Higher Education Students	2023	Sustainability	Mohamed et al. (2023)

3. Key themes of extant publications

The publications listed in Tables 1 and 3 were comprehensively examined to identify key themes. A significant number of studies focused on women entrepreneurship (Abdelwahed et al., 2022; Abed, 2021; Alhothali and Al-Dajani, 2022), the role of education (Alkhateeb et al., 2020; Elnadi and Gheith, 2021; Singh et al., 2022), governance and policy implications (Al Rawaf and Alfalih, 2023; Abdelwahed et al., 2022; Chaaben et al., 2022), SMEs and family-owned businesses (Al-Tit et al., 2019; Al Rawaf and Alfalih, 2023; Alshebami 2023a; Alshebami 2023b; Seraj et al., 2022), region/city specific sustainable entrepreneurship (Abdulghaffar and Akkad, 2021; Abdelwahed et al., 2022; Abdelwahed, 2022; Alhothali and Al-Dajani, 2022; Elnadi and Gheith, 2021; Fahad S. Almawishir and Benlaria 2023; Mohamed et al., 2023; Roomi et al., 2023; Singh et al., 2022), entrepreneurial ecosystem (Bakry et al., 2022; Elnadi and Gheith, 2021; Roomi et al., 2023), innovation (Al Rawaf and Alfalih, 2023; Alfalih, 2022; Alshebami 2023b; Bakry et al., 2022; Fahad S. Almawishir and Benlaria, 2023) and entrepreneurial resilience (Alhothali and Al-Dajani, 2022; Alshebami, 2023a; Seraj et al., 2022). Once the themes are examined, an overview of the methodological aspects is provided.

Women entrepreneurship

The exploration of women's entrepreneurship has been significant among scholars as women are a rapidly expanding category of entrepreneurs (Cardella et al., 2020). According to the literature, women play a crucial role in entrepreneurial activity (Noguera et al., 2013) and economic development (Hechavarria et al., 2019) by creating employment opportunities and increasing the gross domestic product (GDP) (Bahmani-Oskooee et al., 2013), which leads to poverty reduction and social inclusion (Cardella et al., 2020). Despite these significant contributions, women entrepreneurs are lower in number than men, especially as the country's level of development increases (Cardella et al., 2020).

In the context of KSA, women entrepreneurship has gained adequate attention from scholars (Abdelwahed et al., 2022; Abed, 2021; Alhothali and Al-Dajani, 2022). This can be attributed to the kingdom's substantial efforts to align its practices with the United Nation's SDG, specifically, gender equality, and to enhance the role that Saudi women play in the kingdom's social, political, and economic development (Alhothali and Al-Dajani, 2022). Based on the extant literature, three studies examined women entrepreneurship in the context of KSA (Abdelwahed et al., 2022; Abed, 2021; Alhothali and Al-Dajani, 2022); specifically, these studies examine Saudi women's awareness and adoption of sustainability practices and behaviours (Abdelwahed et al., 2022), the resilience of women that own micro-businesses in times of economic and social struggle (Alhothali and Al-Dajani, 2022), and their adoption of mobile applications (Abed, 2021).

The findings indicate that despite the level of education of the selected sample, women entrepreneurs needed to be more knowledgeable about sustainability, emphasizing that they were not pressured by their target market, society, and government to partake in sustainable practices (Abdelwahed et al., 2022). As a result, women did not perceive sustainable practices as an opportunity in relation to their business operations and business models. Therefore, policymakers should embed sustainability into the country's education system and promote sustainable practices among entrepreneurs (Abdelwahed et al., 2022). However, regarding business sustainability, women entrepreneurs showcased positive intentions to use mobile applications, which is motivated by social influence and effort expectancy (Abed, 2021). Thus, it can be deduced that once women entrepreneurs realize the benefit of sustainability, they will be more willing to adopt sustainable business practices such as digital entrepreneurship (Alhothali and Al-Dajani, 2022).

Due to the scarcity of research on women entrepreneurship in Saudi Arabia and the limited generalizability of existing studies (as indicated in Table 3), it is important to highlight the overall shortage of studies on women entrepreneurs in a broader context, as noted by Cardella et al. (2020). Most of the extant research called for studies that examine women entrepreneurship in different geographical areas (Abdelwahed et al., 2022; Abed, 2021; Alhothali and Al-Dajani, 2022), specifically in developing countries (Cardella et al., 2020). Furthermore, future research should examine the factors influencing women entrepreneurs' sustainable behaviour, as behavioural intentions have already been discussed (Abed, 2021; Cardella et al., 2020). Moreover, investigating the facilitating conditions and barriers women entrepreneurs encounter is paramount (Abed, 2021; Cardella et

al., 2020). With respect to the use of theories and research methods, current research that examines women entrepreneurship did not utilize well-founded entrepreneurship theories such as the theory of entrepreneurship (value creation), as it provides a novel and all-encompassing framework that paves the way for broader theoretical perspectives and more rigorous empirical inquiries (Mishra et al., 2015). Moreover, future research should consider using mixed methods in evaluating future research recommendations (Table 3).

The role of education

The imparting of education, training, and skill development holds substantial sway over creating employment opportunities, economic advancement, and societal empowerment (Singh et al., 2022). In the context of KSA, several studies evaluated the role of education in association with sustainable entrepreneurship (Alkhateeb et al., 2020; Elnadi and Gheith, 2021; Singh et al., 2022). Education can substantially foster social responsibility within a community (Alkhateeb et al., 2020) and entrepreneurship intentions (Elnadi and Gheith, 2021). Still, additional efforts are required to reinforce sustainability-focused education in the region and its influence on the environment and economy (Alkhateeb et al., 2020), suggesting that education, government programs and support are key factors in developing students' entrepreneurial intentions and relevant skills (Elnadi and Gheith, 2021). Furthermore, there is a notable and direct correlation between education, training, e-learning, and the sustainable generation of employment, as well as social empowerment in KSA (Singh et al., 2022).

The studies were conducted in the Eastern province (Elnadi and Gheith, 2021) and Hial province (Singh et al., 2022), emphasizing the limitation of the sample size and the lack of generalizability. Furthermore, the research papers utilized the theory of constructivism (Singh et al., 2022), the theory of planned behaviour, the entrepreneurial event model (Elnadi and Gheith, 2021) and the Environmental Kuznets Curve (EKC) (Alkhateeb et al. 2020), using quantitative research methods. Extant research emphasizes the need to refer to the human capital and entrepreneurial self-efficacy theories as they support the correlation between entrepreneurship education and entrepreneurial intentions (Boldureanu et al., 2020). In addition, current research emphasizes the need for tailored programs for business and non-business students, as the impact of studying successful entrepreneurial stories differs between the two groups (Boldureanu et al., 2020). Of note, the studies that exclusively focus on education and sustainable entrepreneurship echo other studies in the KSA context that call for embedding sustainable entrepreneurship in the country's education system (Abdelwahed et al., 2022).

Governance and policy implications

Researchers examined governance and policy implications in relation to sustainable entrepreneurship in the context of KSA (Al Rawaf and Alfalih, 2023; Abdelwahed et al., 2022; Chaaben et al., 2022). These studies identified a positive and significant impact of organizational governance and responsible innovation on business sustainability in family-owned businesses in the country (Al Rawaf and Alfalih, 2023). The entrepreneurial culture has also been identified as a significant and positive moderator, influencing the relationships between organizational governance, responsible innovation, and business sustainability in these family-owned enterprises (Al Rawaf and Alfalih, 2023). Moreover, the studies highlight a significant improvement in Saudi Arabia's green economy, and results emphasize that the country's performance in the green economy has been influenced by the consequences of the COVID-19 crisis and the new infrastructure that was governed by the 2030 vision (Chaaben et al., 2022).

Notably, the studies emphasize the need to promote sustainable entrepreneurship through policy initiatives starting from the top-down level (Chaaben et al., 2022), as lack of knowledge was a key finding of extant research (Abdelwahed et al., 2022). Furthermore, it was noted that these studies lacked the utilization of established theories relevant to sustainable entrepreneurship, explanatory variables used in research, and reliance on quantitative research methods and analysis techniques (Al Rawaf and Alfalih, 2023). Especially as sustainable entrepreneurs initiate their enterprises and encounter challenges in the initial stages needs to be fully comprehended, they require government support such as subsidies and incentives (Hoogendoorn et al., 2019).

SMEs and family-owned businesses

The management of family-owned businesses differs notably from non-family-owned counterparts, characterized by family involvement in decision-making, overlapping business and family activities, and transgenerational business succession (Singh et al., 2021). In addition, small and medium-sized enterprises

(SMEs) significantly impact the contemporary economy (Alshebami 2023b). The factors influencing the success of SMEs are the subject of extensive academic discussion (Alshebami 2023a). Scholars across different disciplines agree on the crucial role of SMEs' success in contributing to employment, wealth, and social and economic development (Nguyen et al., 2023). In the context of KSA, several factors to sustainable entrepreneurship that contributed to SMEs' success were identified: specifically, individual factors, business characteristics, management factors, business support, capital availability, and business environment. Business support is the most significant factor influencing SMEs' success (Al-Tit et al., 2019). This support entails financial, government, and family support (Al-Tit et al., 2019; Seraj et al., 2022).

The studies highlighted the importance of financial and government support and clarified the need to diversify the research methodology and sampling techniques (Al-Tit et al., 2019; Seraj et al., 2022; Alshebami, 2023a; Alshebami, 2023b; Al Rawaf and Alfalih, 2023). Of note, research examining SMEs and family-owned businesses in KSA, utilized a variety of theories as a foundation for their studies. For instance, the positive self-concepts of internal locus of control and self-efficacy theories (Alshebami 2023b); the resource-based view theory (Alshebami, 2023a); and the socio-emotional wealth, stewardship, and stakeholder theories (Al Rawaf and Alfalih, 2023). Despite the importance of evaluating business succession (Ahmad et al., 2020; Wang et al., 2019), extant research did not examine the issue of business succession in the family-owned businesses in KSA and how successor knowledge and willingness to succeed impact corporate sustainable innovation and successful business succession. Moreover, researchers should focus on evaluating the adoption of competitive strategies centred around stakeholders, emphasizing socially responsible behaviour (Ahmad et al., 2020).

Region-specific sustainable entrepreneurship

When examining the geographic locations in extant research, several studies explicitly stated the sample's location (Table 2). Specifically, Abdulghaffar and Akkad (2021) and Alhothali and Al-Dajani (2022) focused on the Western province of Saudi Arabia; Elnadi and Gheith (2021), Abdelwahed et al. (2022), Abdelwahed (2022), and Mohamed et al. (2023) studied the Eastern province; Singh et al. (2022) conducted research in Hail province; Fahad S. Almawishir and Benlaria (2023) explored Al Jouf province; and Roomi et al. (2023) centred their study on Riyadh province. The majority of the authors called for more diversification in terms of geographical location (Table 3). Still, a noteworthy limitation concerns the studies conducted in the Riyadh province. Even though it's crucial to examine sustainable entrepreneurship in all the regions in KSA, the entrepreneurial ecosystem in Riyadh serves as a significant catalyst for entrepreneurship and innovation within the MENA region. This is particularly crucial for Saudi Arabia's goal of achieving economic diversification within its industries and reducing reliance on oil (Roomi et al., 2023).

Table 2. Geographical location of extant research

	Author/s	Region
1	Abdulghaffar and Akkad (2021)	Western Province
2	Elnadi and Gheith (2021)	Eastern province
3	Singh et al. (2022)	Hail Province
4	Alhothali and Al-Dajani (2022)	Western Province
5	Abdelwahed (2022)	Eastern province
6	Abdelwahed et al. (2022)	Eastern province
7	Fahad S. Almawishir and Benlaria (2023)	Al-Jouf
8	Roomi et al. (2023)	Riyadh province
9	Mohamed et al. (2023)	Eastern province

Entrepreneurial ecosystem

Scholars define an entrepreneurial ecosystem as a multidimensional set of interacting factors that moderate the effects of entrepreneurial activity on economic growth (Bruns et al., 2017).

The concept of entrepreneurial ecosystems has become a prominent topic in entrepreneurship research. However, more attention needs to be paid to how these ecosystems promote sustainable entrepreneurship and contribute to the SDGs set by the United Nations (Volkman et al., 2021). In the context of KSA, these factors are considered essential in fostering entrepreneurial intentions, namely, availability of funding, governmental policies and regulations supporting the establishment and expansion of businesses, government initiatives and

assistance for emerging companies, availability of physical infrastructure, cultural elements, social considerations, and educational and training aspects (Elnadi and Gheith, 2021). Other factors were examined in the capital city of KSA; the results indicate that notable improvements were observed in factors such as connectivity, talent, physical infrastructure, and formal institutions, whereas other factors did not exhibit comparable development, which is leadership, funding, and knowledge (Roomi et al., 2023). Furthermore, Bakry et al. (2022) provided a comprehensive assessment framework for entrepreneurship and innovation ecosystems. Specifically, the framework aims to enhance the integration of innovation in sustainable entrepreneurship. The research concentrates on policies and strategies that foster various forms of innovation, presenting a model encompassing a comprehensive set of measures to guide the development of effective policies and strategies.

Of note, in alignment with other studies in KSA, the authors emphasized the need to evaluate the entrepreneurial ecosystem in different geographical locations (Elnadi and Gheith, 2021), and enhance the generalizability of the findings by improving the sample size (Bakry et al., 2022; Roomi et al., 2023). Furthermore, future research should consider shifting from a narrow economic focus to encompass larger societal and ecological contexts as extant research highlights the role of entrepreneurs in fostering non-economic benefits to society and catalyzing larger-scale socioeconomic transformations towards sustainability (Volkman et al., 2021).

Innovation

Innovation is a crucial element in entrepreneurship. It simultaneously influences an organization's ability to uphold its competitive advantages, enabling it to effectively respond to swift and unexpected changes in the market and economy in which it operates (Ionescu et al., 2020). Sustainable innovation is viewed as a solution to foster sustainable development, and it is an integral part of sustainable entrepreneurship (Anand et al., 2021). Companies aware of these obligations and practising responsible innovation across various business functions (including inventory, production, sales, and risk management) can enhance their social and environmental performance and profitability. This, in turn, will positively affect their business's sustainability (Al Rawaf and Alfalih, 2023; Silva et al., 2018). However, the potential integration of innovation and sustainability in entrepreneurship faces various challenges related to sustainability innovation, social justice, and environmental issues. These challenges encompass funding, economic downturns, intellectual property laws, social awareness, and educational levels (Alfalih, 2022; Bakry et al., 2022). In KSA, Fahad S. Almawishir and Benlaria (2023) specified that innovation was not deemed as a crucial dimension in public and private institutions, as it was placed last with research and development. Therefore, evaluating the barriers to innovation adoption across institutions in KSA is instrumental, emphasizing the need for knowledge and government incentives.

Entrepreneurial resilience

Resilience refers to a business's capacity to sustain operational continuity and recover despite disruptions (Iyengar et al., 2021). In the context of entrepreneurship, research indicates that resilience stems from three dimensions, namely, hardiness, resourcefulness, and optimism. These dimensions predict entrepreneurial success, with resourcefulness emerging as the pivotal factor (Ayala et al., 2014). With respect to sustainable entrepreneurship in KSA, several studies examined entrepreneurial resilience (Alhothali and Al-Dajani, 2022; Alshebami, 2023a; Seraj et al., 2022). These studies examined factors such as entrepreneurial competency (Seraj et al., 2022), passion (Alhothali and Al-Dajani, 2022) and self-efficacy (Alshebami, 2023a). Specifically, the examined research indicated that entrepreneurial competency is crucial in enhancing SMEs' entrepreneurial resilience and sustainable performance in Saudi Arabia. Notably, entrepreneurial resilience is a significant mediator, influencing sustainable performance and mediating the impacts of financial literacy and competency on sustainable performance within Saudi SMEs (Seraj et al., 2022). Furthermore, entrepreneurs motivated by passion tend to experience positive emotions and thoughts, contributing to increased resilience in the face of difficulties (Alhothali and Al-Dajani, 2022). Moreover, the findings indicated that the ability to believe in one's entrepreneurial capabilities could mediate how an internal locus of control influences entrepreneurial resilience (Alshebami, 2023a). Still, the studies reported several limitations, such as limitations in relation to sample size, sampling method, and lack of generalizability (Alhothali and Al-Dajani, 2022; Alshebami, 2023a; Seraj et al., 2022).

Table 3. Summary of the theoretical foundation, sample size, region/city, contributions and limitations of the examined studies

#	Author/s	Theoretical Foundation	Method/analysis	Sample size	Region/city	Contributions	Limitations
1	Al-Tit et al. (2019)	Not specified	Quantitative CFA-SEM	347	Not specified	Business support is the most significant factor that influences the success of SMEs	The sample was a cross-sectional sampling design from SMEs that benefit from funding sources
2	Alwakid et al., (2020)	Not specified	Quantitative Fixed Effect Models	84	21 cities	Environmental actions, environmental consciousness, and temporal orientation positively influence the extent of green entrepreneurial activity in various cities in Saudi Arabia	Incorporate city-specific variables Secondary data was used for the analysis Lack of cross-country comparisons Lack of data sources
3	Alkhateeb et al., (2020)	Environmental Kuznets Curve (EKC)	Quantitative ARDL equation	Sample period of 1971- 2014	Not specified	Increased level of education has a positive influence on the reduction of CO2 emissions	More initiatives are needed to support sustainability-related education in the kingdom and its impact on the environment
4	Abdulghaffar and Akkad (2021)	Theory of planned behaviour Institutional economic theory	Quantitative SEM	235	Jeddah	Personal characteristics and the business environment are crucial in shaping an entrepreneurial mindset.	Limited sample size in the city of Jeddah Utilize qualitative research design Lack of gender-specific assessment
5	Elnadi and Gheith, (2021)	The authors mentioned several theories in the theoretical background section, such as the theory of planned behaviour and the entrepreneurial event model.	Quantitative SEM	259 undergraduate students	Eastern province	Students with a favourable outlook on the factors within the entrepreneurial ecosystem also exhibit elevated levels of entrepreneurial intention. The pivotal factor influencing students' entrepreneurial intention is their self-efficacy. Significant differences were observed across genders	Limited sample from one university in one region Lack of cross-cultural perspective
6	Abed (2021)	The unified theory of acceptance and use of technology	Quantitative CFA-SEM	330 women entrepreneurs	Not specified	Social influence and effort expectancy exerts the most substantial impact on the intention to use mobile applications. Conversely, facilitating conditions were identified as an insignificant predictor of intention among female entrepreneurs.	The study focused on observing behavioural intention rather than actual usage behaviour. The study concentrated on entrepreneurs' intentions to use mobile applications rather than exploring the intentions of their consumers. The study's population was confined to respondents in Saudi Arabia, limiting the generalizability of the findings to other populations. The study did not explore the potential moderating effects of age, gender, experience, and voluntariness.
7	Singh et al. (2022)	Constructivism theory	Quantitative SEM	396 students	Hail	The results reveal a significant direct relationship between education, training, e-learning, sustainable employment generation, and social empowerment. Government policies are found to have a significant moderating effect, while national culture directly relates to social empowerment rather than sustainable employment generation.	Limited sample size scope to students that attend the University of Hail Examining moderation effects is limited to only two factors, namely government policies and national culture.
8	Seraj et al. (2022)	Not specified	Quantitative SEM	220 small business entrepreneurs	Not specified	The findings indicate a positive and significant relationship between financial literacy and entrepreneurial competency, where financial literacy positively influences entrepreneurial competency and resilience. Entrepreneurial competency significantly impacts the entrepreneurial resilience and sustainable performance of small and medium-sized enterprises (SMEs) in Saudi Arabia. Entrepreneurial resilience emerges as a significant mediator, simultaneously influencing sustainable performance and mediating the effects of financial literacy and competency on sustainable performance within Saudi SMEs	Limited factors that reflect SME performance Lack of cross-country examination Sample size and demographic diversity
9	Chaaben et al., (2022)	Green Economy Index Quintuple Helix Innovation Model	Quantitative Z-score/T-score	Secondary data was used	Not specified	The observed data indicates substantial advancement in the Green Economy index score for Saudi Arabia Moreover, the results affirm that the kingdom's performance in the realm of the green economy has been impacted by the aftermath of the COVID-19 crisis	The study does not explicitly state its limitations; still, recommendations are provided to policymakers to increase the score of the kingdom
10	Bakry et al. (2022)	Hierarchical decision	Qualitative Conceptual construction	11 experts	Not specified	The methodology illustrates a model that can be applied universally for evaluating innovation ecosystems.	Limited sample size

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#	Author/s	Theoretical Foundation	Method/ analysis	Sample size	Region/ city	Contributions	Limitations
		model (HDM)	of a model validated by pairwise comparisons				
11	Alhothali and Al-Dajani, (2022)	The broaden-and-build theory	Qualitative longitudinal approach	8 women	Western region	The results indicate that digital entrepreneurship played a role in supporting micro businesses during challenging times. Entrepreneurs driven by passion also experience positive emotions and thoughts, fostering resilience in the face of hardship	The study is gender-specific and located in one region Lack of generalizability due to qualitative outcomes
12	Alfalih, (2022)	The authors mentioned several studies in the hypothesis section	Quantitative SEM	180 Employees in the industrial private sector	Not specified	The findings specify that corporate social performance serves as a mediator between extrinsic motivation in sustainable entrepreneurship and its outcomes, particularly social innovation.	Limited sample size The measurement tool can be improved Lack of control variables
13	Abdelwahed (2022)	Theory of planned behaviour Shapero-Krueger model	Quantitative SEM	292 Students	Al-Ahsaa	Favourable and noteworthy impact of attitudes toward sustainability, perceived desirability, and perceived feasibility on both sustainable entrepreneurial intentions and opportunity recognition	Limited sample size Use of cross-sectional data
14	Abdelwahed et al., (2022)	Not specified	Qualitative	20 Saudi women and entrepreneurs	Eastern province	A lack of knowledge about sustainability was observed among the sample The importance of top-down policy to foster sustainable entrepreneurship	The study is gender-specific and located in one region
15	Alshebami (2023b)	The positive self-concepts of internal locus of control and self-efficacy	Quantitative SEM	284 small business entrepreneurs	Various regions	There is a positive correlation between both green entrepreneurial self-efficacy and green entrepreneurial orientation with green innovation The findings indicated that green innovation serves as a mediator in the connection between green entrepreneurial self-efficacy, green entrepreneurial orientation, and economic performance	Limited sample size Lack of control variables Under-represented female participants
16	Alshebami (2023a)	The resource-based view theory	Quantitative SEM	284 small business entrepreneurs	Various regions of Saudi Arabia	The findings illustrated that entrepreneurial self-efficacy has the potential to act as a mediator in the connection between internal locus of control and entrepreneurial resilience	Limited sample size Sampling method Lack of generalizability
17	Fahad S. Almajwishir and Benlaria (2023)	The authors mentioned several studies in the hypothesis section	Quantitative SEM	162 employees	Al-Jouf	The findings suggest that information and communication technology stands out as the most crucial dimension in both public and private institutions, whereas the dimension of innovation, research, and development is positioned last.	Limited sample size Unavailability of data relevant to the knowledge economy Need for more qualitative research
18	Roomi et al. (2023)	The Stam Model	Quantitative Chi-square tests ANOVA	Secondary data was used from the Global Entrepreneurship Monitor project, which included a significant number of entrepreneurs in the region.	Riyadh	Four pillars exhibited the most improvement in the entrepreneurial ecosystem of Riyadh. These include two systemic pillars (networks and talent) and two environmental pillars (physical infrastructure and formal institutions). The systemic pillars, specifically leadership, demonstrated noteworthy enhancements	Lack of generalizability
19	Al Rawaf and Alfalih (2023)	The socio-emotional wealth, stewardship and stakeholder theories	Quantitative SEM	87 family enterprises	Different regions in Saudi Arabia	The findings indicate that business sustainability in family-owned businesses in Saudi Arabia is positively and significantly influenced by organizational governance and responsible innovation. Entrepreneurial culture significantly and positively moderates the relationships between organizational governance, responsible innovation, and business sustainability in these family-owned businesses.	Analysis technique The utilization of limited explanatory variables
20	Mohamed et al. (2023)	The theory of planned behaviour	Quantitative SEM	329 students at King Faisal University	Al-Ahsaa	The internal locus of control positively influences entrepreneurial intention. Innovativeness, proactiveness, and problem-solving personality dimensions showed positive impacts on entrepreneurial intention. However, risk-taking propensity did not exhibit a significant effect on entrepreneurial intention.	More personality dimensions can be examined Lack of generalizability Lack of examination of moderating and mediating variables Need for more qualitative research

Examination of methodological facets

Table 3 outlines the research methodologies, sample sizes, and analysis techniques employed in the studies. Notably, a majority of the studies utilize quantitative research methods and apply diverse analytical techniques such as Confirmatory Factor Analysis-Structural Equation Modelling (CFA-SEM), Fixed Effect Models, Environmental Kuznets Curve (EKC) analysis, ARDL equation, and Z-score/T-score analysis. Sample sizes vary across studies, ranging from 8 individuals in a qualitative longitudinal approach to 396 students in a quantitative SEM study. The samples encompass diverse groups, including undergraduate students, women entrepreneurs, small business entrepreneurs, industrial private sector employees, family enterprises, and experts. In one study, secondary data from the Global Entrepreneurship Monitor project is utilized, incorporating many entrepreneurs in the region.

Consequently, the studies exhibit various theoretical perspectives, emphasizing the diverse theoretical foundations in entrepreneurship research. The prevalence of quantitative methods such as SEM and regression analysis indicates a concentration on statistical modelling. Therefore, considering additional qualitative approaches could enhance comprehension of the context and dynamics surrounding sustainable entrepreneurship.

4. General Discussion

This study evaluates twenty publications addressing sustainable entrepreneurship within the Kingdom of Saudi Arabia. The selection of these papers adheres to rigorous systematic criteria and a well-defined timeframe. The analysis reveals the existence of eight overarching themes, encompassing women entrepreneurship, the role of education, governance and policy implications, SMEs and family-owned businesses, region-specific sustainable entrepreneurship, entrepreneurship ecosystems, innovation, and entrepreneurial resilience. The examination extends to relevant studies associated with each identified theme, incorporating additional publications that met the established evaluation criteria.

The commonalities across these themes highlight a general approach to sustainable entrepreneurship in Saudi Arabia. Emphasis on cross-geographical comparisons, top-down policy initiatives, economic diversification, knowledge dissemination, gender-specific evaluations, theory utilization, and consideration of societal and ecological contexts reflects a comprehensive and interconnected research agenda for promoting sustainable entrepreneurship in the region. These shared elements highlight the importance of addressing multiple dimensions for a well-rounded understanding and advancement of sustainable entrepreneurship.

Specifically, it was noted that geographical comparison was evident in multiple studies, specifically studies that focus on women entrepreneurship (Abdelwahed et al., 2022; Abed, 2021; Alhothali and Al-Dajani, 2022) and entrepreneurial ecosystems (Bakry et al., 2022). Comparably, the role of the government is considered a focal point in a significant number of studies in KSA, where the promotion of sustainable entrepreneurship is needed through top-down policy initiatives and government incentives. Of note, the role of the government in encouraging the dissemination of knowledge pertinent to sustainable entrepreneurship has been emphasized in most of the studies. Moreover, economic diversification is important to promote sustainable entrepreneurship in KSA, especially in the Riyadh province (Roomi et al., 2023).

Gender-based evaluation was a prominent area, as it was considered a limitation of many studies. Specifically, it aims to assess gender differences in the factors that influence entrepreneurial resilience and the factors that influence women entrepreneurs' sustainable behaviour. With respect to theory utilization, a limited number of papers utilized the theory of planned behaviour and the institutional economic theory; however, the rest of the studies used various theories to test their research hypotheses and answer their research questions (Table 3). Therefore, it was noted that significant theories were not examined, such as the theory of market failure (Dean and McMullen, 2007), game theory (Pacheco et al., 2010), transition management theory (ONeill et al., 2014), human capital and self-efficacy theories (Boldureanu et al., 2020). Most prominently, since the first studies examining sustainable entrepreneurship were published, there is still a need for a meta-theory of purposeful entrepreneurship (Muñoz and Cohen, 2018).

Moreover, it has been observed that research on sustainable entrepreneurship in KSA is fragmented and lacks cohesion. Often in the broader literature, studies focus on theoretical contributions as an all-encompassing theory of sustainable entrepreneurship is yet to be established (Terán-Yépez et al., 2020). Despite the efforts of extant researchers (Abed, 2021; Alhothali and Al-Dajani, 2022), examining the drivers of sustainable entrepreneurs has become essential as they represent a departure from the conventional norms observed in entrepreneurship practice. This analysis is crucial for comprehending the factors that can initiate and cultivate sustainable entrepreneurial behaviour (Abed, 2021; Cardella et al., 2020; Mohamed et al., 2023). Moreover, several studies have evaluated the primary predictors among individual factors for achieving success in sustainable entrepreneurship (Al-Tit et al., 2019); environmental and social concerns were not present. The studies did not explicitly examine the lack of sustainable entrepreneurship research concerning communities, non-profit organizations, and other organizations outside the private sector. Over the past decade, scholars have made efforts to fill these gaps. Yet, organizations of this nature now face growing expectations to exhibit entrepreneurial behaviours and discover new avenues for self-funding (Wagner et al., 2021).

Concluding remarks and future research agenda

The shared characteristics among these themes highlight the commendable research endeavours dedicated to sustainable entrepreneurship in KSA. Emphasis on cross-geographical comparisons, top-down policy initiatives, economic diversification, knowledge dissemination, gender-specific evaluations, theory utilization, and consideration of societal and ecological contexts reflects a comprehensive and interconnected research agenda for promoting sustainable entrepreneurship in the region. These shared elements emphasize the importance of addressing multiple dimensions for a well-rounded understanding and advancement of sustainable entrepreneurship. Accordingly, Table 4 summarizes the recommendations for each key theme identified in the review to facilitate future research progress in this area.

Table 4. Future research agenda

#	Key theme	Research Recommendations
1	Women entrepreneurship	<ul style="list-style-type: none"> Compare sustainable practices relevant to women entrepreneurs in different geographical locations with an emphasis on developing countries. Examine the factors that influence women entrepreneurs' sustainable behaviour. Investigate the facilitating conditions and barriers that women entrepreneurs come across. Utilize well-grounded entrepreneurship theories, such as the theory of entrepreneurship, using mixed research methods.
2	The role of education	<ul style="list-style-type: none"> Evaluate how policymakers and government officials can embed sustainability in KSA's education system. Utilize qualitative research to tailor relevant programs for business and non-business students. Investigate the association between education and entrepreneurship intentions using the human capital and entrepreneurial self-efficacy theories.
3	Governance and policy implications	<ul style="list-style-type: none"> Establish a governance model for sustainable entrepreneurship in the context of KSA. Encourage sustainable entrepreneurship by implementing policy initiatives, beginning with top-down approaches. Encourage the dissemination of knowledge pertinent to sustainable entrepreneurship through governmental efforts. Identify the barriers to sustainable entrepreneurship.
4	SMEs and family-owned businesses	<ul style="list-style-type: none"> Promote sustainable entrepreneurship through the adoption of top-down policy initiatives. Identify the predictors and barriers of sustainable entrepreneurship in SMEs and family-owned businesses. Explore the business succession in family-owned businesses in Saudi Arabia and its connection to the influence of the successor's knowledge and willingness to succeed in corporate sustainable innovation and successful business succession. Evaluate successful competitive strategies for stakeholders.
5	Region-specific sustainable entrepreneurship	<ul style="list-style-type: none"> Explore the evolving entrepreneurial ecosystem in Riyadh as a critical driver for entrepreneurship and innovation in the MENA region.

6	Entrepreneurial ecosystems	<ul style="list-style-type: none"> Evaluating the entrepreneurial ecosystem in different geographical locations in alignment with studies in KSA. Improving the generalizability of findings by increasing the sample size. Future research should consider moving beyond a narrow economic focus and include larger societal and ecological contexts, aligning with existing research that underlines the role of entrepreneurs in generating non-economic benefits for society and driving broader socioeconomic transformations towards sustainability.
7	Innovation	<ul style="list-style-type: none"> Future research should assess barriers to innovation adoption across institutions in KSA and stress the necessity for knowledge and government incentives. Future research should consider using the business models for sustainability innovation (BMfSI) framework (Lüdeke-Freund, 2020).
8	Entrepreneurial resilience	<ul style="list-style-type: none"> Evaluate gender differences in the factors that influence entrepreneurial resilience in the context of KSA.

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