

Article

The Analysis of Trigger Factors of the Environmental Entrepreneurship Process in Saudi Arabia: An Innovative Approach

Wided Ragmoun ^{1,2}

¹ Department of Business Administration, College of Business and Economics, Qassim University, Buraidah 51452, Saudi Arabia; w.ragmoun@qu.edu.sa

² Department of Business Administration, Faculty of Economics and Management of Nabeul, University of Carthage, Nabeul 8000, Tunisia

Abstract: Environmental entrepreneurship is considered a critical avenue for sustainable development. Despite increasing studies on its benefits and impacts, we lack insights about its corresponding process. There is an increasing need for policymakers to know how to develop this process and what is required for its definition. This research aims to build an innovative theoretical model to explore the trigger factors for the environmental entrepreneurship process in Saudi Arabia, which is the ultimate focus point of this research. To achieve this objective, a deep literature review and a survey of expert entrepreneurs' opinions were performed. Experts and professionals in entrepreneurship validated the opportunity of readiness factors identified. Data were gathered using a combined approach based on closed-ended questionnaires and arranged interviews according to a schedule. Employing the mixed influence matrix of cross-impact multiplications applied to classification (MICMAC) and the Interpretive Structural Modeling (ISM) approach, the research identifies a hierarchical model of these factors, addressing why and how they interact according to a specific order and priorities. The investigation reveals 15 factors that are structured into three main levels of influence: (1) factors driving the adoption of environmental entrepreneurship orientation, (2) factors related to environmental entrepreneurship intention, and (3) factors for materializing environmental entrepreneurship behavior. The findings emphasize the complementarity between environmental entrepreneurship intention and orientation as a key factor in generating entrepreneurial behavior. This research pioneers the empirical exploration of environmental entrepreneurship as a process. It contributes significantly to theoretical and practical domains by offering a pragmatic framework and better understanding for policymakers and stakeholders to focus on key factors that facilitate this process. This paper is innovative because it uses the integrative ISM-MICMAC approach, supported by a primary and brief bibliometric analysis of entrepreneurship.

Keywords: economic growth; sustainable development; green growth; self-employment; SDG 8-decent work and economic growth



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1. Introduction

The environmental entrepreneurship process (EEP) is becoming increasingly important as we face growing environmental challenges, such as climate change, pollution, and resource depletion (Piwowar-Sulej et al. 2021; Avelar et al. 2024). Entrepreneurs prioritizing sustainability and creating innovative solutions to address these issues are crucial in driving positive change (Dijkstra and Planko 2023). By integrating environmental considerations into business practices, environmental entrepreneurs can help reduce ecological footprints (Karabetyan and Sart 2024), promote renewable energy sources (Koubaa 2017), and conserve natural resources (Soomro et al. 2024) while creating new economic opportunities (Alim et al. 2023), driving innovation (Makhloufi et al. 2023), and enhancing the reputation of businesses (Wang et al. 2023). As society becomes more aware of the importance

of sustainability, there is a growing demand for environmentally friendly products and services (Sarkar 2023). By supporting and promoting environmental entrepreneurs, we can help build a thriving economy that prioritizes environmental responsibility and addresses critical environmental challenges (Yasir et al. 2023; Hariram et al. 2023). Despite its significance, more research must focus on this field to explore its full potential and development (Vasilescu et al. 2023; Contreras Cruz et al. 2024). Extensive prior research attempted to define EE (Yasir et al. 2023; Contreras Cruz et al. 2024) and its effect on sustainable development (Wei et al. 2023), but there is little research on its determinants.

Moreover, environmentally oriented businesses understand how and why public consumers are becoming increasingly engaged in overcoming challenges and difficulties for a sustainable world (Avelar et al. 2024). Such difficulties can create new opportunities and, consequently, new sustainable businesses by defining new products and reducing energy use and natural resource exploration (Sarkar 2023). By doing this, the new environmental approach to entrepreneurship can create viable solutions in sustainable markets (in terms of products and services while acting as change agents (Wei et al. 2023).

Researchers have recently postulated that a new trend of entrepreneurship must be defined based on non-economic benefits, such as social benefits and environmental advantages. Existing studies further show that relevant environmental imperfections and failures due to excessive use of natural resources generate many entrepreneurial opportunities for environmental entrepreneurs to create businesses with new orientations and use new renewable energies to satisfy social needs while preserving the environment and without harming economic development (Karabetyan and Sart 2024; Alim et al. 2023; Makhoulfi et al. 2023).

In an early investigation of the existing literature, we were unable to identify a specific approach to defining the trigger factor of EE as a process, and most of these studies treat green entrepreneurship and sustainable entrepreneurship similarly (Misztal and Kowalska 2023). One of the greatest challenges in this way was to specify how to develop an EE process for identifying the environmental determinants of entrepreneurship.

During the last decade, and in the same frame of EEP, many studies were interested in identifying drivers of eco-innovation, which is directly related to EE (Fernández et al. 2021; Chaparro-Banegas et al. 2023). Also, considerable attention was given to examining determinants of eco-competitiveness (Gia Hoang et al. 2020) and environmental entrepreneurial intention (Maheshwari 2021). These papers succeeded at identifying entrepreneurship determinants using different methodological approaches, but we could not identify specific research related exclusively to EE as a process.

Our objectives are to identify determinants that can orient the adoption of such a process based on an entrepreneurial intention, make it operational based on an environmentally oriented entrepreneurial attitude, and maintain this process towards environmental behavior to define an environmental entrepreneurial process in Saudi Arabia. So, in this study, we aim to analyze and understand the various factors that influence the success and growth of the EE process as well as their interaction. By doing this, we aim to assist in the preparedness for the development of environmental entrepreneurship activity. The methodological approach used in this study employs cross-impact to rank and classify determinants of EEP according to their degree of influence and interconnectedness.

Our research seems increasingly important related to its context. In Saudi Arabia, environmental concerns are becoming increasingly important (Almulhim and Abubakar 2021; Alajmi 2021) as the country seeks to diversify its economy and address environmental challenges. Moreover, this is the first research study to investigate factors affecting the EE process in Saudi Arabia using an exhaustive and dynamic approach.

Based on this brief analysis, three research questions can be defined to answer our main research objective: First, which key factor contributes to the development of the environmental entrepreneurship process? This is asked to identify dimensions and variables required to start the environmental entrepreneurship process. Second, how do they interact and influence each other to stimulate this entrepreneurial process? This is asked so to allow

for decisions to be made regarding priorities between factors and to focus on those that are considered essential. Third, what is each determinant's priority and its relative value? This question is asked to orient the decision made and define the final critical pathway for EEP.

The structure of this paper is as follows: First, a comprehensive literature review is presented to outline the current understanding of EEP as well as its importance and determinants with both direct and indirect effects (Section 1). Second, this is followed by a detailed explanation of the methodology, including the research design, data collection methods, and analytical tools (Section 2). Third, the paper details research findings that provide a clear and precise analysis of the determinants of EEP in Saudi Arabia (Section 3). Finally, all results are discussed in detail (Section 4), with a summary of the key findings, their theoretical and empirical implications, and potential directions for future research (Section 5).

2. The Environmental Entrepreneurship Process—Theory and Determinants: A Brief Review

2.1. Theory of Planned Behavior (TPB)

TPB is used to understand motivations determining specific behaviors (Ajzen 2011). Icek Ajzen was the first to develop such a theory in 1980. According to this theory, an international model was accepted and adopted to understand human behavior across many domains, including sustainability (Blok 2018; Si et al. 2020) and education (Hanage et al. 2024). The corresponding framework can explain specific motivations for certain determined behaviors (Ajzen 2011) and begins with the definition of behavioral intention. The main hypothesis issued from this theory supposes that if a person intends to undertake a particular behavior (in our state, an environmental entrepreneurship behavior) and other factors or determinants support it (determinants of environmental entrepreneurship), that person will undertake the predefined behavior easily. According to TPB, behavioral intention depends on three behavioral antecedents: perceptions of this behavior, beliefs about social norms, and perceptions about controls or moderators on behavior (Ajzen 2011).

2.2. Determinants of the Environmental Entrepreneurship Process (EEP)

In this research, EE is viewed as the process allowing the definition, evaluation, and exploration of economic and environmental opportunities while enabling sustainable industrial development (Dean and McMullen 2007). It refers to dual missions: entrepreneurship and environmental interest (Cesinger et al. 2023). As a process, we will suppose that an environmental entrepreneurship orientation is first required to define such a process (Guo and Wang 2022; Contreras Cruz et al. 2024). Second, an environmental entrepreneurship intention is important to evaluate and accept such an environmental tendency (Nguyen et al. 2024; Barba-Sánchez et al. 2022), and third, entrepreneurial behavior is critical to operationalizing this orientation and making the project real (Yi 2021; Pidduck et al. 2023). Environmental entrepreneurship orientation can influence the EEP (Ajzen 2011). It can be provided based on personal or entrepreneurial education, while environmental intention will assist this process (Contreras Cruz et al. 2024). This assistance is still related to many internal or external stimuli (Guo and Wang 2022). According to the level of this continuum between orientation and intention, a behavioral aspect will be automatically developed to concretize a successful EEP (Ajzen 2011; Guo and Wang 2022; Si et al. 2020; Blok 2018).

As a primary investigation, we performed a simple bibliometric analysis using a VOS viewer to identify the main factors and clusters cited in previous studies. This step was performed according to bibliographic research covering Scopus and WoS platforms using keywords, such as environmental entrepreneurship factors, determinants, and key factors. Figure 1 details results that confirm the existence of three main and interdependent clusters of determinants represented by three main colors: blue, red, and green.

Entrepreneurs' perception is supported to be an influencer of the environmental entrepreneurial orientation (Alshebami 2023; Wang et al. 2023) directly related to the relative importance of the opportunity to start a business (Yin and Wu 2023). As described above, many potential entrepreneurs will not consider starting a business if the corresponding opportunities are perceived as bad (Martínez-Cañas et al. 2023).

Legitimacy is particularly important in defining the value of new ventures for stakeholders, especially investors, and consequently it can determine the intensity of entrepreneurial opportunity (Tu et al. 2023). A growing number of studies in this field showed that pro-environmental behavior can frequently be explained by the quest for legitimacy (Liu and Green 2024).

2.2.2. Determinants of Environmental Entrepreneurship Intention (EEI)

Entrepreneurial intention (EI) is the basis for building new business activity based on a proper mindset to create a rich and innovative new business with added value to society (Kwapisz et al. 2022; Shahzad et al. 2021). An EEI is an intention with an oriented goal to start a new business while responding to an identified opportunity to provide a positive environmental externality (Vuorio et al. 2018). A recent study based on a quantitative approach (Nguyen et al. 2024) supported that EEI depends on perceived happiness in environmental entrepreneurship related to social support, social relationships, perception of employment, self-esteem, and resilience. Entrepreneurship education, by providing the opportunity to gain specific skills and knowledge for environmental business, can increase awareness and value towards sustainability (Hagebakken et al. 2021; Klapper and Fayolle 2023). External factors, such as economy, technology, socio-culture, and government regulations, can be considered threats and opportunities for ecopreneurs (Elyta and Zhan 2021; Gunawan et al. 2021; Makhouloufi et al. 2022).

According to Shabsough et al. (2021), the transformation to an environmental business needs framework depends on the relative importance of support provided by formal networking. Many empirical studies, such as Li and Islam (2021), supported this idea. Besides formal networking, eco-entrepreneurs need informal networking, such as support from family, friends, and parents, to create an environmental business (Emami et al. 2023; Hassan et al. 2024).

Environmental values are also one of the most critical motivation factors for a new environmental business (Latif et al. 2024; Vuong 2021). Using the value, eco-entrepreneurs will find the best way to define a sustainable-oriented business while sharing these values with the communities (Yasir et al. 2023).

2.2.3. Determinants of Environmental Entrepreneurship Behavior (EEB)

One of the most significant research projects in this area was conducted by Li and Islam (2021), who focused on women's green entrepreneurial intention and its influence on green entrepreneurial behavior. They investigated the impact of green entrepreneurial intention on green entrepreneurial behavior, considering the mediating effect of university entrepreneurial support and the moderating role of social support. The findings of this research offer valuable insights into the role of various support systems in fostering green entrepreneurial behavior among women, such as university-based programs and social networks, and assess their influence on green entrepreneurial intention and behavior.

Most research on EEB confirms that EEI positively and strongly impacts EEB (Nguyen et al. 2024). Great similarities between the determinants of these stages were detected and supported. Only one recent study about the effect of climate change perceived risks and psychological contracts on pro-environmental behavior was detected. In this research, Latif et al. (2024) argued that these two variables can positively moderate the effect of environmental values on pro-environmental behavior, previously admitted as a determinant of EEI.

We can conclude that EEO, EEI, and EEB interact complexly to define a successful EEP. The key problem with this brief literature review is that it does not adopt an integrative

approach to these three main stages or components. A combined approach is still needed to answer the question about the critical factors of this process.

2.3. Environmental Entrepreneurship in Saudi Arabia

Saudi Arabia adopted ambitious economic diversification strategies and enjoyed an emerging global economic development towards the definition of an extensive entrepreneurial approach to sustain entrepreneurial expansion and create new businesses based on resources other than oil (McAdam et al. 2018). Saudi Arabia is oriented to create a sustainable financial system by promoting investment, especially knowledge-based investors, and guiding itself towards a profitable future with a significant economic renaissance (Alessa and Alajmi 2017). To support the state's competitiveness, Saudi Arabia is affiliated with the economy worldwide and focuses on youth creativity by supporting entrepreneurship development for a sustainable Saudi nation (Alessa and Alajmi 2017).

In addition, the Saudi government investigates the diffusion of new tendencies among the younger generation based on the environmental entrepreneurship framework (Soomro et al. 2019) through the definition of numerous encouragements for youth to establish new businesses, such as the offer of scholarships, for example, the Most Competitive Youth Award and the Prince Salman Award for Entrepreneurship (Zaydane 2011). According to the Global Entrepreneurship Monitor (GEM) report (2019), almost 76.3% of the Saudi population believes there are better and more excellent opportunities in the country to launch new businesses. Being aware of the importance of environmental entrepreneurship on social, environmental, and economic levels contributes to the increasing number of green projects in Saudi Arabia, especially with the definition of the new business operation models for greening the Saudi Arabian economy.

Also, Saudi Vision 2030 maintains such orientation and insists on offering and defining opportunities to stimulate the economy and complementarity between different economic sectors (Thompson 2017).

Developing an environmental entrepreneurship process requires a safe and healthy environment to guarantee competitiveness and survival. Discovering new and innovative opportunities is also required. Concerning our research context, we can confirm that Saudi Arabia developed the adequate circumstances for such a process towards many actions, as cited below, in addition to new policies to help entrepreneurs and stimulate a competitive economy and growth (Nalband et al. 2016).

3. Research Methodology

The methodological approach was elaborated at different levels, according to a processual approach. Figure 2 explains our methodological approach. At each level, the relative objective and tool used are specified.

According to Figure 2, three main steps were performed. The first is based on the literature review to identify trigger factors of EEP reinforced by interviews to select major trigger factors in our research context. The second step is the ISM approach, which aims to appreciate the chronological order between variables. We proceeded to the third and final step (MICMAC) analysis to appreciate the interrelationships between variables and correspondence.

3.1. Data Collecting: Sampling and Interview

This research adopts non-probability sampling. Two sampling techniques are employed: purposive and snowball sampling. A primary respondents list was fixed. Each respondent was emailed to request their consent to participate. After getting confirmation and fixing the time, the interview was performed. We provided a closed-ended questionnaire to each respondent to rate the intensity of influences between items (determinants) from 0 to 4, in addition to semi-structured interviews used to obtain extra clarification to explain why they chose this effect between determinant A and determinant B. In this research, selected participants are entrepreneurs with at least five years of experience and

experts working in startups in the Qassim region in Saudi Arabia. All 21 respondents participated in the data collection process. Table 1 details the respondents’ characteristics.

3.2. Validity and Reliability

An expert in entrepreneurship validated the questionnaire, and the main determinants were identified. The validity and reliability of the tool used were determined by face validation. In this state, entrepreneurial experts examined the general aspect of the questionnaire, the clarity, and the comprehensibility of all questions in terms of content, response options, and content. They ensured that the questions used were clear and understandable. The questionnaire’s adequacy to the research goal, the nature of the factors used, and their significance in the entrepreneurship field were also reviewed by experts to verify that the questions covered different aspects required in the environmental entrepreneurship process.

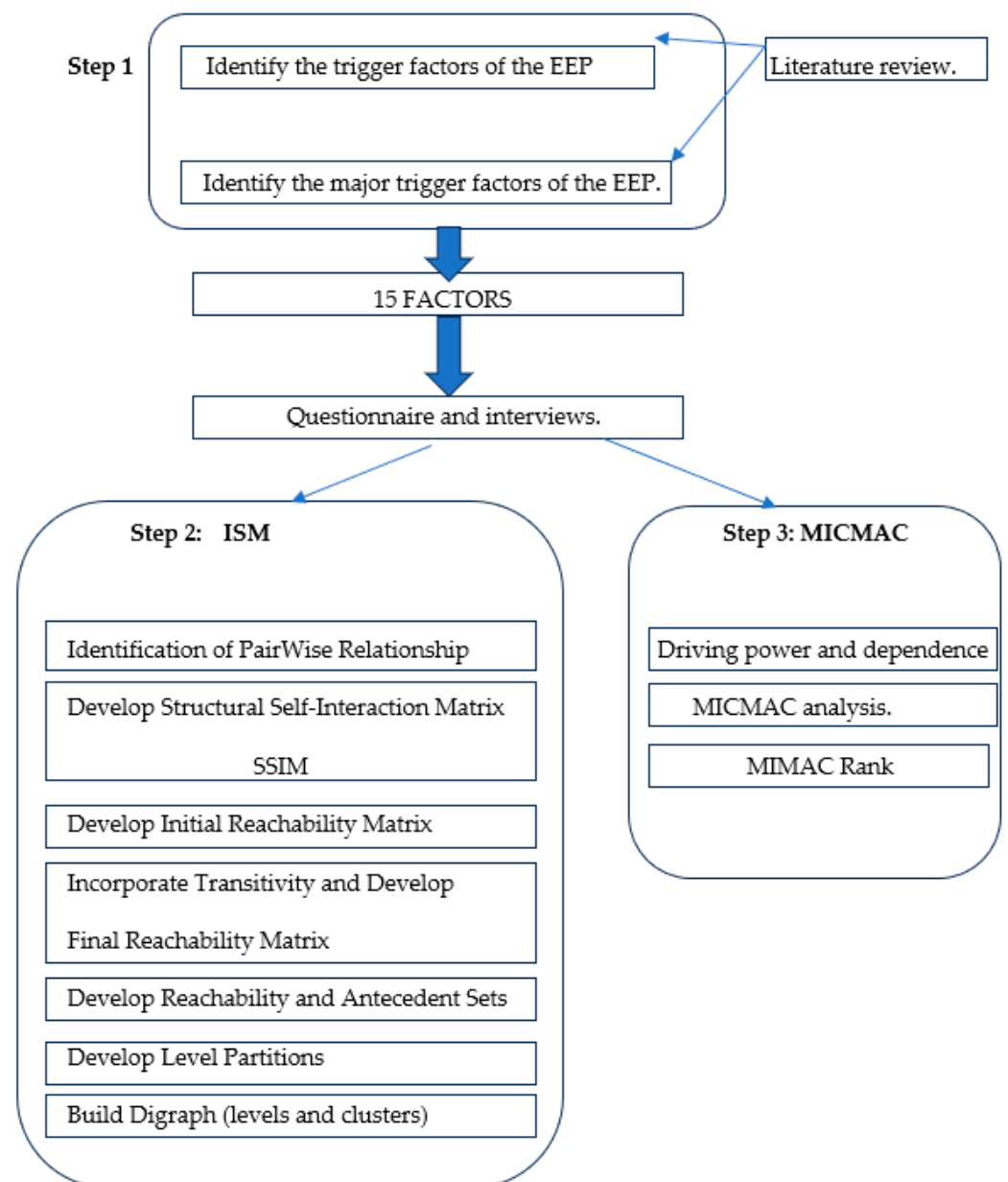


Figure 2. Research methodology process.

Table 1. Experts' characteristics.

Num	Expert Profile	Years of Experience
1	Entrepreneur	6
2	Academic researcher	5
3	Academic researcher	5
4	Entrepreneur	9
5	Coach	12
6	Entrepreneur	10
7	Trainer	7
8	Trainer	7
9	Trainer	9
10	Consultant	14
11	Consultant	11
12	Academic research	15
13	Trainer	15
14	Entrepreneur	13
15	Assistant	8
16	Assistant	8
17	Coach	12
18	Coach	10
19	Trainer	15
20	Coach	13
21	Entrepreneur	11

Furthermore, they reviewed the grading scale regarding accessibility and adequacy of response categories. They ensured that the scale provided covered all possible answers and captured all points of view. Finally, the general structure and the arrangement of questions were evaluated by experts to ensure coherence, rationality, and ease of understanding.

3.3. The Research Methodology Process: ISM-MICMAC Approach

A mixed approach is used in three main steps to achieve the research objective.

Step 1. Identification of EEP determinants.

We identified determinants and selected those related to our research context based on the survey reinforced by the pilot study and interviews to assess the relationships and interdependence between variables.

The current research focuses on environmental entrepreneurship and its process. A literature review and consultation with expert specialists were performed to identify and finalize the list of the determinants or trigger factors of the environmental entrepreneurship process. Then, a validation process was performed using a questionnaire administered to experts to evaluate the opportunity of the trigger factor, its influence, and interrelationships. A total of 21 entrepreneurial specialists and experts employed in startups and entrepreneurial organizations participated in the interviews as scheduled. The participants were selected from various regions of Qassim, encompassing entrepreneurs with long-term experience, trainers on entrepreneurship, consultant assistants, academic researchers, and coaches. They were each scheduled and interviewed for one hour. A detailed presentation and an overview of the research and its relative importance were performed in the beginning for ten minutes. The rest of the time was utilized to conduct interviews and finish answering all questions.

This research adopted a 5-point Likert scale from 0 to 4, where 0 indicated no influence and 4 a very high influence. For each question, the participant was instructed to rate their answer on the scale (0 to 4). For example, when asking about the influence between factors A and B, there were two options: when it was affirmative, they had to rate the level of this effect between 1 and 4. However, when it was negative, they were asked to assign a value of 0.

Before conducting interviews and surveys, we must remember that consent papers were presented to address ethical issues and be signed by participants. During each session, answers were saved and categorized while anonymized to avoid eventual bias during the interpretation state. The determining factors that influence this process were elaborated based on a literature review of previous studies and an interview with experts

in entrepreneurship. Table 2 synthesizes different factors identified through a rigorous literature analysis of prior studies published in Scopus and WoS, reinforced by a survey, in addition to the environmental entrepreneurship process (our dependent variable).

Table 2. Trigger factors and dimensions for the development of the EE process.

Dimensions	Factors
Environmental Entrepreneurship Orientation (EEO)	1. Level of education (LE)
	2. Income on entrepreneurial activity (IEA)
	3. Gender (Gdr)
	4. Age
	5. Governmental supports (GS)
	6. Postmaterialist values (PV)
	7. Entrepreneur's perception (EP)
	8. Legitimacy (Leg)
Determinants of Environmental Entrepreneurship Intention (EEI)	9. Entrepreneurial education (EED)
	10. Formal networking (FN)
	11. Informal networking (IFN)
	12. Environmental values (EV)
	13. External factors (economy and technology) (EF)
Environmental Entrepreneurship Behavior (EEB)	14. Climate change perceived risks (CCPR)
	15. Psychological contracts (PC)
EEP	16. Environmental entrepreneurship process

In this table, the main dimensions for developing the EE process extracted from our literature review and the brief bibliometric analysis are detailed in terms of factors.

Step 2. Trigger factors prioritization and modeling.

The research aimed to identify a model and hierarchize the trigger factors that stimulate the environmental entrepreneurship process in Saudi Arabia. We used the interpretive structural modeling (ISM) technique to attain this objective. ISM methodology can explain and simplify complex interactive relationships of different variables in a complex system and overcome the difficulties of many traditional methods used to analyze factors based on the relative importance of the weight score or the structural equation modeling (SEM) (Tarka 2018).

Figure 2 details the flow of the ISM process as supported by (Tarka 2018; Vaishnavi et al. 2019). The first step was identifying trigger factors for EEP.

Subsequently, 21 responses were collected. The relationships between identified trigger factors were investigated to understand how factors interact with each other and how they influence one another (refer to Table 3), which represents the structural self-interaction (SSIM) matrix (step 2.1, relates to Table 3). This matrix defines the map of pair-wise relationships based on the group judgment technique. These relationships are coded using letters as detailed in Table 3:

- (A) If variable 2 causes variable 1.
- (V) if variable 1 causes variable 2.
- (X) if variables 1 and 2 are interdependent and cause each other.
- (O) if variables 1 and 2 are independent and there are no effects between them.

Therefore, the reachability matrix was developed (step 6, refer to Table 4). As supported by Wang et al. (2024), reachability matrix development fixes direct and indirect relationships by converting letters V, A, X, and O into binary numbers 1 and 0 according to this rule:

1. V becomes 1 and 0, respectively.
2. A becomes 0 and 1, respectively.
3. X becomes 1.
4. O becomes 0.

Table 3. SSIM matrix.

Variables1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LE	O	A	A	O	O	O	O	V	V	V	V	O	V	O	V
IEA		O	O	A	O	V	O	A	A	A	O	A	V	V	V
Gdr			O	O	V	V	O	O	V	V	V	O	V	V	V
Age				O	V	V	O	O	V	V	V	O	V	V	V
GS					O	V	V	O	V	V	V	V	V	O	V
PV						V	V	O	A	A	A	O	V	O	V
EP							V	A	A	A	A	A	V	V	V
Leg								A	A	A	A	A	O	A	V
EED									O	O	V	O	O	O	V
FN										V	V	O	V	O	V
IFN											V	O	V	V	V
EV												V	O	A	V
EF													V	A	V
CCPR														V	V
PC															V
EEP															

Table 4. Reachability Matrix (RM).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Driving Power
LE	1	0	0	0	0	0	0	0	1	1	1	1	0	1	0	1	7
IEA	0	1	0	0	0	0	1	0	0	0	0	0	0	1	1	1	5
Gdr	1	0	1	0	0	1	1	0	0	1	1	1	0	1	1	1	10
Age	1	0	0	1	0	1	1	0	0	1	1	1	0	1	1	1	10
GS	0	1	0	0	1	0	1	1	0	1	1	1	1	1	0	1	10
PV	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	1	5
EP	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	1	5
Leg	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
EED	0	1	0	0	0	0	1	1	1	0	0	1	0	0	0	1	6
FN	0	1	0	0	0	1	1	1	0	1	1	1	0	1	0	1	9
IFN	0	1	0	0	0	1	1	1	0	0	1	1	0	1	1	1	9
EV	0	0	0	0	0	1	1	1	0	0	0	1	1	0	0	1	6
EF	0	1	0	0	0	0	1	1	0	0	0	0	1	1	0	1	6
CCPR	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	3
PC	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	1	5
EEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Dependence Power	3	6	1	1	1	6	11	10	2	5	6	9	4	11	7	16	

Therefore, using transitivity, the final reachability matrix is generated from this initial matrix (step 7, refer to Table 5). This supposes that if variable (A) generates variable (B), which leads to variable (C), variable (A) and (C) are automatically related.

Table 5. Final Reachability Matrix (FRM).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Driving Power
LE	1	1*	0	0	0	1*	1*	1*	1	1	1	1	1*	1	1*	1	13
IEA	0	1	0	0	0	1*	1	1*	0	0	0	1*	1*	1	1	1	9
Gdr	1	1*	1	0	0	1	1	1*	1*	1	1	1	1*	1	1	1	14
Age	1	1*	0	1	0	1	1	1*	1*	1	1	1	1*	1	1	1	14
GS	0	1	0	0	1	1*	1	1	0	1	1	1	1	1	1*	1	12
PV	0	1*	0	0	0	1	1	1	0	0	0	1*	1*	1	1*	1	9
EP	0	1*	0	0	0	1*	1	1	0	0	0	1*	1*	1	1	1	9
Leg	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2
EED	0	1	0	0	0	1*	1	1	1	0	0	1	1*	1*	1*	1	10
FN	0	1	0	0	0	1	1	1	0	1	1	1	1*	1	1*	1	11
IFN	0	1	0	0	0	1	1	1	0	0	1	1	1*	1	1	1	10
EV	0	1*	0	0	0	1	1	1	0	0	0	1	1	1*	1*	1	9
EF	0	1	0	0	0	1*	1	1	0	0	0	1*	1	1	1*	1	9
CCPR	0	1*	0	0	0	1*	1*	1*	0	0	0	1*	1*	1	1	1	9
PC	0	1*	0	0	0	1*	1*	1	0	0	0	1	1	1*	1	1	9
EEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Dependence Power	3	14	1	1	1	14	14	15	4	5	6	14	14	14	14	16	

Note: * entries are included to incorporate transitivity.

This is followed by the level partitions that show the reachability set, which means antecedents and influences between the set of factors are defined in the reachability matrix, which comprises all the variables. Factors intersecting with the same reachability define the first level in the ISM hierarchy. Table 6 (Step 8) shows that our factors can be divided into seven primary levels.

Table 6. Level partitions.

Elements(Mi)	Reachability Set R(Mi)	Antecedent Set A(Ni)	Intersection Set $R(Mi) \cap A(Ni)$	Level
1	1	1, 3, 4	1	6
2	2, 6, 7, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15,	3
3	3	3	3	7
4	4	4	4	7
5	5	5	5	6
6	2, 6, 7, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	3
7	2, 6, 7, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	3
8	8	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	8	2
9	9	1, 3, 4, 9	9	4
10	10	1, 3, 4, 5, 10	10	5
11	11	1, 3, 4, 5, 10, 11	11	4
12	2, 6, 7, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	3
13	2, 6, 7, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	3
14	2, 6, 7, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	3
15	2, 6, 7, 12, 13, 14, 15	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	3
16	16	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	16	1

This step is followed by level partitioning iterations (Table 7) and the development of the directed graph that represents levels, corresponding variables, and interactions (Step 9, Figure 3).

Table 7. Level Partitioning Iterations.

Elements(Mi)	Reachability Set R(Mi)	Antecedent Set A(Ni)	Intersection Set R(Mi)∩A(Ni)	Level
1	1, 2, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	1, 3, 4	1	
2	2, 6, 7, 8, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	
3	1, 2, 3, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	3	3	
4	1, 2, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	4	4	
5	2, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16	5	5	
6	2, 6, 7, 8, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	
7	2, 6, 7, 8, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	
8	8, 16	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	8	
9	2, 6, 7, 8, 9, 12, 13, 14, 15, 16	1, 3, 4, 9	9	
10	2, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16	1, 3, 4, 5, 10	10	
11	2, 6, 7, 8, 11, 12, 13, 14, 15, 16	1, 3, 4, 5, 10, 11	11	
12	2, 6, 7, 8, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	
13	2, 6, 7, 8, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	
14	2, 6, 7, 8, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	
15	2, 6, 7, 8, 12, 13, 14, 15, 16	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15	2, 6, 7, 12, 13, 14, 15	
16	16	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	16	1

1 2 3 4 5 6 7

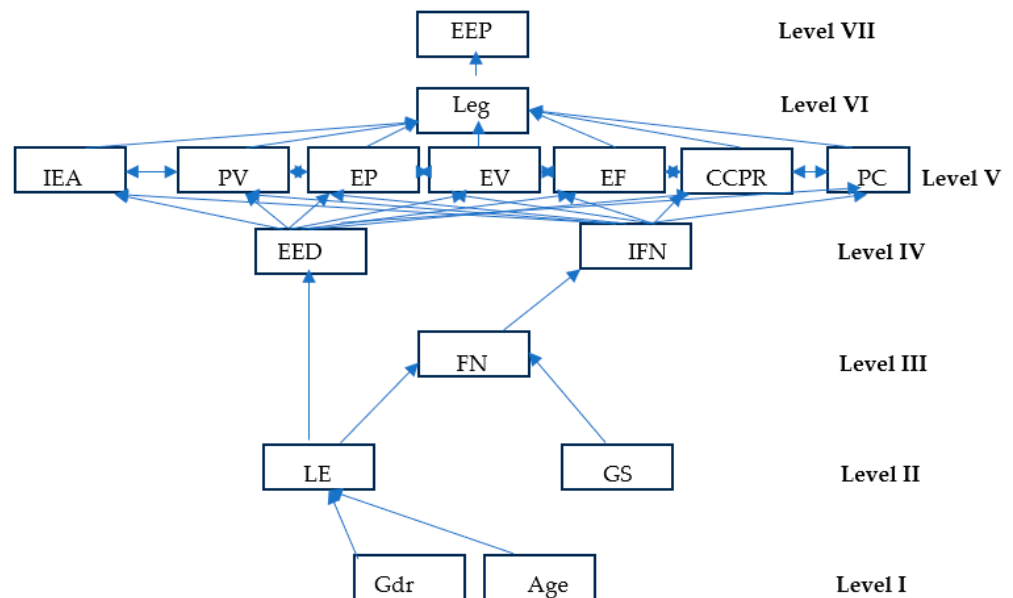


Figure 3. Digraph of EEP enablers.

The ISM hierarchy provides a digraph with different transitive links (direct and indirect). Figure 3 details the digraph of EEP enablers or trigger factors. Seven levels were identified, and a group of variables was associated with each. This directed graph also defines the relationships and interactions between variables and levels.

Step 3. Factor classification into four groups and establish their linkage.

This research uses cross-impact matrix multiplication (MICMAC) to classify different factors. Its primary purpose is to find the significance and the nature of factors' dependence and driving power to identify the highest factor (Vaishnavi et al. 2019). A matrix with four main parts is issued from this approach based on the driving and dependence power of each factor, and four possible outcomes can be deduced: (1) independent factors, (2) autonomous factors, (3) dependent factors, and (4) linkage factors.

4. Results and Interpretation

4.1. Results of ISM

Referring to Figure 3, there are seven levels:

The first level is rooted in demographic variables, such as age and gender. These essential attributes can have a ripple effect, often influencing individuals' educational attainment, which aligns with the research performed by (Ragmoun 2019). This insight establishes the intricate interplay between personal characteristics and institutional frameworks.

The second level confirms the influence of governmental support in catalyzing entrepreneurial ventures. The study by Hesselbarth and Schaltegger (2014) strongly admits the role of the government in crafting an environment conducive to entrepreneurship, emphasizing the importance of sustainable attitudes and the effect of legislation on entrepreneurial intentions. This underlines the critical nature of government policy and institutional framework in cultivating an entrepreneurial mindset.

The third level supports the formal network, which is supported and issued from the educational and governmental levels. This network is a nexus, connecting entrepreneurs with resources, mentorship, and opportunities. Ragmoun (2019) reinforce the importance of this level by illustrating how government regulations, alongside market pressures, drive the adoption of a green entrepreneurial orientation. Moreover, Yang et al. (2023) highlight the salience of macro and micro factors in recognizing opportunities for sustainable enterprise.

Progressing to the fourth level, we observe the development of the informal network, an ecosystem of personal connections, peer influence, and community engagement. This network thrives on exchanging ideas and support, which is pivotal for entrepreneurial progress. Martins et al. (2023) support the importance of such networks, identifying entrepreneurial self-efficacy and social support as critical predictors of social entrepreneurial intentions. They illustrate the necessity of robust informal networks for entrepreneurial success.

At the fifth level, the focus shifts to the individual's postmaterialist values and entrepreneurship education. These are personal traits and competencies that shape the entrepreneur's approach to business and life. Wu et al. (2021) delve into this by exploring the impact of self-awareness and individual characteristics on the willingness to engage in innovation and entrepreneurial activities, highlighting the significance of these individual-level factors within our comprehensive model.

The sixth level captures diverse elements, including entrepreneurial income, perception, environmental values, external influences, perceived risks related to climate change, and psychological constructs. In this line of ideas, Ragmoun (2022) showed the instrumental role of entrepreneurial self-efficacy and the extensive reach of social media marketing in shaping entrepreneurial intentions.

Legitimacy emerges as the critical factor on the seventh level, based on a cumulative impact of all previous preceding factors. Ragmoun (2019) offers a perspective on the pivotal role of green customer values and attitudes towards sustainable brands in consumer decision making, directly contributing to green ventures' legitimacy.

Ultimately, the eighth level marks the culmination of all these factors, resulting in the environmental entrepreneurship process. This process hinges on the assurance of legitimacy, a notion supported by Liu and Green (2024), whose work suggests that consumer legitimacy, driven by attitudes, subjective norms, and altruism, is essential for the success of environmentally focused entrepreneurial behavior.

In sum, the current study has meticulously unraveled the complexity of factors supporting the emergence and growth of environmental entrepreneurship. It has illuminated that idea that fundamental demographic variables can set the stage for higher educational achievements, which, when coupled with targeted governmental support, can foster a fertile environment for entrepreneurial activities. The synthesis of formal and informal networks forms a robust support system for entrepreneurs, while individual values and education refine their approach to sustainable business. The interplay between EEO, EEI, and EEI is essential for generating a successful EEP.

4.2. Results of MICMAC Analysis

As mentioned, this analysis defines clusters according to their dependence and driving power. Figure 4 represents the MICMAC diagram to help identify crucial factors to design adequate interventions for EEP development. The main interesting primary result confirms that all enablers of EEP are interconnected, and no factors were identified as autonomous. We found that Leg and EEP have a high dependence power as dependent variables: Leg at the seventh level and EEP at the high and final level. Leg is the main determinant of EEP and depends on many other factors. Therefore, to generate EEP, we must guarantee Leg

1. Cluster I—no factors.
2. Cluster II—Leg, EEP.
3. Cluster III—EV, EF, CCPR, PC, EP, IEA.
4. Cluster IV—Age, Gdr, FN, IFN, LE, EED, GS, PV.

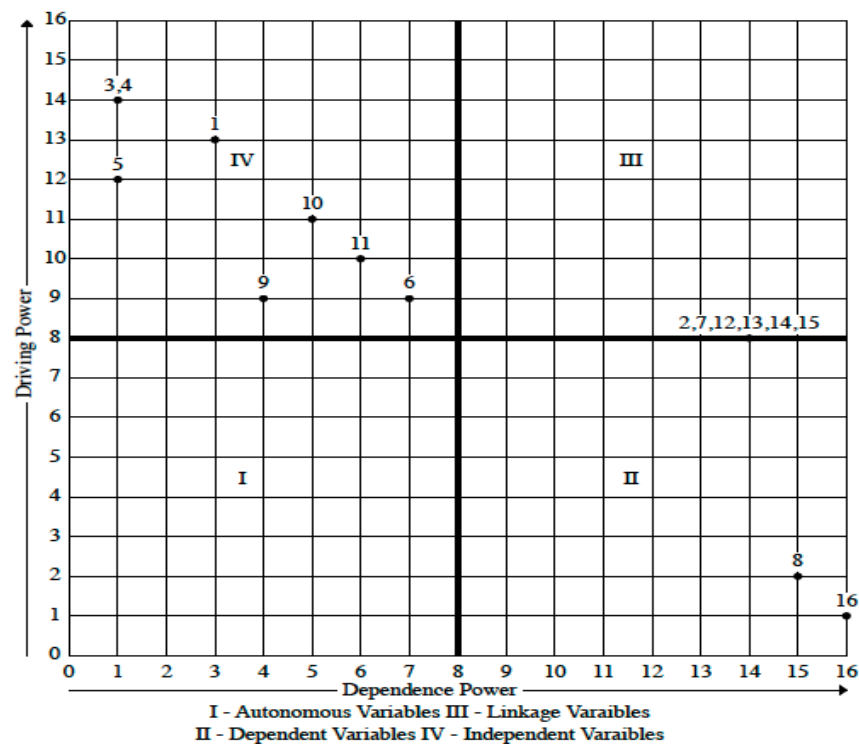


Figure 4. Diagram of trigger factors of EEP according to driving power and dependence.

The present study aimed to provide fresh evidence of the environmental implications of GTI, renewable energy, and oil rents in Saudi Arabia between 1988 and 2021. One of the main contributions of this study is that it considers a broad measure of the environmental quality, i.e., the load capacity factor. The empirical analysis entails the estimation of a quantile regression, which considers the distribution of LCF and yields more accurate findings.

This figure illustrates different variables according to their driving and dependence power. It is a matrix that helps us classify variables into four main categories: autonomous

variables (no variable), dependent variables (two variables), linkage variables (six variables), and independent variables (seven variables). These variables determine the EEP proportionally to their corresponding roles.

5. Conclusions, Implications, and Limits

5.1. Conclusions

As a process, environmental entrepreneurship generates a new business that prioritizes sustainability and defines innovative solutions to drive positive change (Dijkstra and Planko 2023). Under these aspects, researchers and practitioners are striving to explore and sustain the development of the environmental entrepreneurship process. Furthermore, this process depends on many critical trigger factors to release it. According to our theoretical and empirical investigation, each EEP begins with the definition of an orientation towards environmental opportunities, followed by an entrepreneurial intention to be operationalized as a behavior.

The development of a successful EEP increases the environmental entrepreneurship activity and the number of projects that address environmental challenges and stimulate sustainability.

This study investigated the EEP concept in Saudi Arabia according to expert opinions. This research examined the influence of environmental entrepreneurship orientation on the development of EEP. Results confirm the priority of such dimensions and the importance of the entrepreneurial mindset for entrepreneurial success. In this context, developing and stimulating a specific positive awareness about environmental problems can enhance the recognition of the entrepreneur's responsibility to provide adequate solutions. An entrepreneurial environmental intention is a determinant of EEP but is still directly related to an entrepreneurial orientation at the first level, as supported by (Alfalih and Ragmoun 2020b). Environmental entrepreneurship behavior results from the interaction and complementarity between orientation and intention and can mitigate environmental damage.

Our study focused on defining a critical pathway for EEP by identifying its trigger factors, the relative importance of each one, and their eventual relationships. This research treated environmental entrepreneurship as a process based on three main stages: EEO, EEI, and EEB determination.

We found that this process depends, in an empirical way, on seven levels, as discussed below. Two main critical aspects are identified: the importance of legitimacy in the development of such a process, where this point is related to the importance of environmental issues worldwide, and the necessity to alternate intention and orientation to start this process. Based on the final research model, governmental support has to consider the education level related to the development of an EEI as one determinant of EEO to start EEP. Another important aspect is communication and sharing information in the formal and informal states to define a synergetic effect between EEO and EEI, previously supported by (Alfalih and Ragmoun 2020a; Ragmoun 2022), and to move forward with the EEP.

5.2. Implications and Limits

This research provides some important theoretical implications in the field of EEP. It fills the identified theoretical and empirical research gap related to developing a comprehensive framework that enumerates key trigger factors of this process and their relative importance in facilitating the generation of a successful EEP. From a theoretical point of view, research results offer a critical review of the EEP as an emergent research subject and introduce a new definition of the environmental entrepreneurship process and its basics. By completing important information for analyzing the critical determinants of environmental entrepreneurship, we demonstrate that a successful process depends on the interaction between external and internal factors (related to the entrepreneur).

The constructed and tested framework enriches the EE research agenda and contributes to defining its critical pathway based on a dynamic and exhaustive approach. It defines rules and indicators to point out the possibilities of the development and success

of the corresponding process. Tryptic analysis, based on the entrepreneurial orientation, intention, and behavior, was implemented in an attempt to approach this process with an empirical aspect to make it real and to effectively achieve the development of a new environmental business with valuable insight for all stakeholders, including policymakers, entrepreneurs, and researchers interested in promoting and understanding EE in Saudi Arabia.

Although studies on environmental entrepreneurship have been abundant in recent literature, they do not sufficiently extend to the context of Saudi Arabia. Therefore, this study covers a small part of this theoretical and empirical gap by analyzing the trigger factors of environmental entrepreneurship from a dynamic processual perspective to be more pragmatic.

Regarding empirical implications, our main contribution is the help and assistance we provide to policymakers by introducing factors to create an environmental entrepreneurship process that is the main determinant of a higher entrepreneurial activity serving economic development and environmental preservation. In addition, our findings increase opportunities to promote alternatives for environmental support as one of the main goals of sustainable development.

Also, the methodology used in this research permits the definition of the relative importance of each factor, which facilitates the introduction of new strategies and solutions to support the development of multiple environmental initiatives while introducing a tested and proven functional plan.

Besides the findings and implications, this research presents some relevant limitations, which should be mentioned and can be considered as topics for further studies. First, the methodologic approach permits the identification of the causal factors for a successful EE process. Still, it does not reflect or consider the individual experiences of entrepreneurs considered important for environmental entrepreneurship development. Second, different interrelationships identified in this study are still the result of an individual reflection; a quantitative approach to measure and quantify each impact is needed using structural equation models or simply correlation. Lastly, results are still related to a specific context, and a comparative approach can be more useful in guaranteeing the generalization of different findings or the identification of other determinants.

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References

- Ajzen, Icek. 2011. The theory of planned behaviour: Reactions and reflections. *Psychology & Health* 26: 1113–27.
- Alajmi, Reema Gh. 2021. Factors that impact greenhouse gas emissions in Saudi Arabia: Decomposition analysis using LMDI. *Energy Policy* 156: 112454. [\[CrossRef\]](#)
- Alessa, Adlah, and Shayma Alajmi. 2017. The development of Saudi Arabian Entrepreneurship and Knowledge society. *International Journal of Management Excellence* 9: 1155–68. [\[CrossRef\]](#)
- Alfalih, Abdul Aziz, and Wided Rigmoun. 2020a. Drivers of sustainable entrepreneurship orientation for students at business school in Saudi Arabia. *Journal of Entrepreneurship Education* 23: 1–6.
- Alfalih, Abdulaziz, and Wided Rigmoun. 2020b. The role of entrepreneurial orientation in the development of an integrative process towards entrepreneurship performance in entrepreneurial university: A case study of Qassim university. *Management Science Letters* 10: 1857–72. [\[CrossRef\]](#)

- Alim, Md Abdul, Kim-Lim Tan, Teck Weng Jee, Boo Ho Voon, Md Julhaz Hossain, and Md Uzzal Mia. 2023. To explain and to predict: Analysis of opportunity recognition on the relationship between personal factors, environmental factors and entrepreneurs' performance. *Asia-Pacific Journal of Business Administration* 15: 772–94. [CrossRef]
- Aljarodi, Abdullah, Tojo Thatchenkery, and David Urbano. 2023. The influence of institutions on early-stage entrepreneurial activity: A comparison between men and women in Saudi Arabia. *Journal of Entrepreneurship in Emerging Economies* 15: 1028–49. [CrossRef]
- Almulhim, Abdulaziz I., and Ismaila Rimi Abubakar. 2021. Understanding public environmental awareness and attitudes toward circular economy transition in Saudi Arabia. *Sustainability* 13: 10157. [CrossRef]
- Alshebami, Ali Saleh. 2023. Green innovation, self-efficacy, entrepreneurial orientation and economic performance: Interactions among Saudi small enterprises. *Sustainability* 15: 1961. [CrossRef]
- Arifin, Arifin, S. S. Suryaningsih, and Opan Arifudin. 2024. The Relationship between Classroom Environment, Teacher Professional Development, and Student Academic Performance in Secondary Education. *International Education Trend Issues* 2: 151–59. [CrossRef]
- Avelar, Sónia, Teresa Borges-Tiago, António Almeida, and Flávio Tiago. 2024. Confluence of sustainable entrepreneurship, innovation, and digitalization in SMEs. *Journal of Business Research* 170: 114346. [CrossRef]
- Barba-Sánchez, Virginia, María Mitre-Aranda, and Jesús del Brío-González. 2022. The entrepreneurial intention of university students: An environmental perspective. *European Research on Management and Business Economics* 28: 100184. [CrossRef]
- Blok, Vincent. 2018. Information asymmetries and the paradox of sustainable business models: Towards an integrated theory of sustainable entrepreneurship. In *Sustainable Business Models: Principles, Promise, and Practice*. Cham: Springer, pp. 203–25.
- Cesinger, Beate, Katherine Gundolf, Mathew Hughes, Anis Khedhaouria, and Francesco Montan. 2023. The bright and dark sides of the Dark Triad traits among senior managers: Effects on organizational commitment. *Review of Managerial Science* 17: 1731–63. [CrossRef]
- Chaparro-Banegas, Nuria, Alicia Mas-Tur, Han Woo Park, and Norat Roig-Tierno. 2023. Factors driving national eco-innovation: New routes to sustainable development. *Sustainable Development* 31: 2711–25. [CrossRef]
- Chaudhary, Sanjay, Amandeep Dhir, Nicola Farronato, Melita Nicotra, and Marco Pironti. 2023. Nexus between entrepreneurial orientation and intellectual capital. *Journal of Intellectual Capital* 24: 70–114. [CrossRef]
- Contreras Cruz, Marcela, Karim Messeghem, and Alexis Catanzaro. 2024. Environmental entrepreneurship: A bibliometric perspective of the field. *International Entrepreneurship and Management Journal* 20: 451–77. [CrossRef]
- Dean, Thomas J., and Jeffery S. McMullen. 2007. Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action. *Journal of Business Venturing* 22: 50–76. [CrossRef]
- Dijkstra, Hanna, and Julia Planko. 2023. The roles of sustainable entrepreneurs in tackling societal challenges: Quantifying how sustainable plastic companies act to create system change. *Sustainable Production and Consumption* 39: 534–45. [CrossRef]
- Elyta, E., and Fuzy Firda Zhan. 2021. The Role of Non-Government Actors in Realizing Ecopreneurship Based on Environmental Security. *International Journal of Humanities and Social Science Research* 4: 2595–99. [CrossRef]
- Emami, Amir, Shayegheh Ashourizadeh, and Mark D. Packard. 2023. The impact of social network support on opportunity intention among prospective male and female entrepreneurs during Cov 19 pandemic. *International Journal of Entrepreneurial Behavior & Research* 29: 132–69.
- Fernández, Sara, Celia Torrecillas, and Romilio Ernesto Labra. 2021. Drivers of eco-innovation in developing countries: The case of Chilean firms. *Technological Forecasting and Social Change* 170: 120902. [CrossRef]
- Gia Hoang, Think, Cuong Van Hoang, Nam Hai Vu, Giang Tinh Ngo Nguyen, and Thanh Thi Huong Nguyen. 2020. How can scientists and engineers contribute to organizational sustainability reform? *Social Responsibility Journal* 16: 827–41. [CrossRef]
- Guan, Ting, and Qian Zhang. 2023. Value orientations, personal norms, and public attitude toward SDGs. *International Journal of Environmental Research and Public Health* 20: 4031. [CrossRef] [PubMed]
- Gunawan, Arien Arianti, Allard ACR van Riel, and Caroline Essers. 2021. What drives ecopreneurship in women and men?—A structured literature review. *Journal of Cleaner Production* 280: 124336. [CrossRef]
- Guo, Ying, and Lifang Wang. 2022. Environmental entrepreneurial orientation and firm performance: The role of environmental innovation and stakeholder pressure. *Sage Open* 12: 21582440211. [CrossRef]
- Guodong, Yan, and Kang Jiancheng. 2009. Investigation on public environmental awareness in Shanghai. Paper presented at International Conference on Environmental Science and Information Application Technology, Wuhan, China, July 4–5.
- Hagebakken, Grete, Christian Reimers, and Elsa Solstad. 2021. Entrepreneurship education as a strategy to build regional sustainability. *Sustainability* 13: 2529. [CrossRef]
- Hägg, Gustav, Diamanto Politis, and Gry Agnete Alsos. 2023. Does gender balance in entrepreneurship education make a difference to prospective start-up behaviour? *Education Training* 65: 630–53. [CrossRef]
- Hanage, Richard, Mark Alexander Phillip Davies, Pekka Stenholm, and Jonathan Matthew Scott. 2024. Extending the theory of planned behavior—A longitudinal study of entrepreneurial intentions. *Entrepreneurship Research Journal* 14: 1223–58. [CrossRef]
- Hariram, N. P., K. B. Mekha, Vipinraj Suganthan, and K. Sudhakar. 2023. Sustainalism: An integrated socio-economic-environmental model to address sustainable development and sustainability. *Sustainability* 15: 10682. [CrossRef]
- Hassan, Shahid, Wai Chuen Poon, and Ibiwani Alisa Hussain. 2024. Heterogeneous social capital influencing entrepreneurial intention among female business students in the Maldives. *Journal of Entrepreneurship in Emerging Economies* 16: 209–30. [CrossRef]

- Hesselbarth, Charlotte, and Stefan Schaltegger. 2014. Educating change agents for sustainability—Learnings from the first sustainability management master of business administration. *Journal of Cleaner Production* 62: 24–36. [CrossRef]
- Karabetyan, Lina, and Gamze Sart. 2024. The Impact of Entrepreneurship and Education on the Ecological Footprint: Insights from the G-20 States. *Sustainability* 16: 97. [CrossRef]
- Klapper, Ritta G., and Alain Fayolle. 2023. A transformational learning framework for sustainable entrepreneurship education: The power of Paulo Freire's educational model. *The International Journal of Management Education* 21: 100729. [CrossRef]
- Koubaa, Salah. 2017. Renewable energy through the lens of entrepreneurship theory: The case of Morocco. *Projectics/Proy ctica/Projectique* 18: 69–88. [CrossRef]
- Kwapisz, Agnieszka, William J. Schell, Gregg Aytes, and Scott Bryant. 2022. Entrepreneurial action and intention: The role of entrepreneurial mindset, emotional intelligence, and grit. *Entrepreneurship Education and Pedagogy* 5: 375–405. [CrossRef]
- Latif, Badar, James Gaskin, Nuwan Gunarathne, Robert Sroufe, Arshian Sharif, and Abdul Hanan. 2024. Climate change risk perception and pro-environmental behavior: The moderating role of environmental values and psychological contract breach. *Social Responsibility Journal* 20: 538–67. [CrossRef]
- Lepoutre, Jan, Rachida Justo, Siri Terjesen, and Niels Bosma. 2013. Designing a global standardized methodology for measuring social entrepreneurship activity: The Global Entrepreneurship Monitor social entrepreneurship study. *Small Business Economics* 40: 693–714. [CrossRef]
- Li, Zheng, and AYM Atiquil Islam. 2021. Entrepreneurial intention in higher vocational education: An empirically-based model with implications for the entrepreneurial community. *Sage Open* 11: 1–14. [CrossRef]
- Liu, Jianjiao, and Raymond James Green. 2024. Children's pro-environmental behaviour: A systematic review of the literature. *Resources, Conservation and Recycling* 205: 107524. [CrossRef]
- Maheshwari, Greeni. 2021. Factors influencing entrepreneurial intentions the most for university students in Vietnam: Educational support, personality traits or TPB components. *Education Training* 63: 1138–53. [CrossRef]
- Makhloufi, Lahcene, Abderrazak Ahmed Laghouag, Tang Meirun, and Fateh Belaid. 2022. Impact of green entrepreneurship orientation on environmental performance: The natural resource-based view and environmental policy perspective. *Business Strategy and the Environment* 31: 425–44. [CrossRef]
- Makhloufi, Lahcene, Jing Zhou, and Abu Bakkar Siddik. 2023. Why green absorptive capacity and managerial environmental concerns matter for corporate environmental entrepreneurship? *Environmental Science and Pollution Research* 30: 102295–312. [CrossRef] [PubMed]
- Mart nez-Ca nas, Ricardo, Pablo Ruiz-Palomino, Juan Jos  Jim nez-Moreno, and Jorge Linuesa-Langreo. 2023. Push versus pull motivations in entrepreneurial intention: The mediating effect of perceived risk and opportunity recognition. *European Research on Management and Business Economics* 29: 100214. [CrossRef]
- Martins, Jos  Moleiro, Muhammad Farrukh Shahzad, and Shuo Xu. 2023. Factors influencing entrepreneurial intention to initiate new ventures: Evidence from university students. *Journal of Innovation and Entrepreneurship* 12: 63. [CrossRef]
- McAdam, Maura, Caren Crowley, and Richard T. Harrison. 2018. The Emancipatory Potential of Female Digital Entrepreneurship: Institutional Voids in Saudi Arabia. *Academy of Management Proceedings* 1: 10255. [CrossRef]
- Misztal, Anna, and Magdalena Kowalska. 2023. Factors of green entrepreneurship in selected emerging markets in the European Union. *Environment, Development and Sustainability*, 1–24. [CrossRef]
- Nalband, Nisar Ahamad, Saad Alkelabi, and Dafeeah Awad Jaber. 2016. Innovation Practices in Saudi Arabian Businesses. *International Journal of Business Management* 11: 136–60. [CrossRef]
- Nguyen, Luan Trong, Loc Ba Tran, Ngan Thi Thanh Nguyen, Linh Duy Le, and Tri Huu Nguyen. 2024. The Impact of Perceived Happiness on the Green Entrepreneurship Intention Among University Students in Vietnam. *Kurdish Studies* 12: 362–81.
- Pidduck, Robert, Daniel Clark, and G. T. Lumpkin. 2023. Entrepreneurial mindset: Dispositional beliefs, opportunity beliefs, and entrepreneurial behavior. *Journal of Small Business Management* 61: 45–79. [CrossRef]
- Piwowar-Sulej, Katarzyna, Ma gorzata Krzywonos, and Izabela Kwil. 2021. Environmental entrepreneurship—Bibliometric and content analysis of the subject literature based on H-Core. *Journal of Cleaner Production* 295: 126277.
- Ragmoun, Wided. 2019. WR A descriptive analysis of entrepreneurial female career success determinants on Saudi Arabia along entrepreneurial process. *Archives of Business Research* 7: 119–29. [CrossRef]
- Ragmoun, Wided. 2022. Determinants of entrepreneurial intention: A comparative analysis. *Polish Journal of Management Studies* 25: 361–76. [CrossRef]
- Sarkar, Manas. 2023. Environmental Sustainability under E-Commerce: A Holistic Perspective. *European Journal of Development Studies* 3: 1–6. [CrossRef]
- Shabsough, Tina, Anil Boz Semerci, and Azize Ergeneli. 2021. Women's entrepreneurial intention: The role of sticky floor perception and social networking. *The International Journal of Entrepreneurship and Innovation* 22: 45–55. [CrossRef]
- Shahzad, Muhammad Farrukh, Kanwal Iqbal Khan, Saima Saleem, and Tayyiba Rashid. 2021. What factors affect the entrepreneurial intention to start-ups? The role of entrepreneurial skills, propensity to take risks, and innovativeness in open business models. *Journal of Open Innovation: Technology, Market, and Complexity* 7: 173. [CrossRef]
- Si, Ming-Yu, Xiao-You Su, Yu Jiang, Wen-Jun Wang, Xiao-Fen Gu, Li Ma, and Jing Li. 2020. Psychological impact of COVID-19 on medical care workers in China. *Infectious Diseases of Poverty* 9: 1–13. [CrossRef] [PubMed]

- Soomro, Bahadur Ali, Nisren Farouk Moawad, Umami Naiemah Saraih, Nadia A. Abdelmageed Abdelwahed, and Naimatullah Shah. 2024. Going green with the green market and green innovation: Building the connection between green entrepreneurship and sustainable development. *Kybernetes* 53: 1484–504. [CrossRef]
- Soomro, Bahadur Ali, Ikhtiar Ali Ghumro, and Naimatullah Shah. 2019. Green entrepreneurship inclination among the younger generation: An avenue towards a green economy. *Sustainable Development* 10: 1002. [CrossRef]
- Stephan, Ute, Andreas Rauch, and Isabella Hatak. 2023. Happy entrepreneurs? Everywhere? A meta-analysis of entrepreneurship and wellbeing. *Entrepreneurship Theory and Practice* 47: 553–93. [CrossRef]
- Tarka, Piotr. 2018. An overview of structural equation modeling: Its beginnings, historical development, usefulness and controversies in the social sciences. *Quality & Quantity* 52: 313–54.
- Terjesen, Siri, Niels Bosma, and Erik Stam. 2016. Advancing public policy for high-growth, female, and social entrepreneurs. *Public Administration Review* 76: 230–39. [CrossRef]
- Thompson, Mark. 2017. 'Vision 2030': A viable response to youth aspirations and concerns? *Asian Affairs* 48: 205–221. [CrossRef]
- Tu, Yu, Yiqiong Li, and Wenchao Zuo. 2023. Arousing employee pro-environmental behavior: A synergy effect of environmentally specific transformational leadership and green human resource management. *Human Resource Management* 62: 159–79. [CrossRef]
- Vaishnavi, V., M. Suresh, and Pankaj Dutta. 2019. Modelling the readiness factors for agility in healthcare organization: A TISM approach. *Benchmarking: An International Journal* 26: 2372–400.
- Vasilescu, Maria Denisa, Gina Cristina Dimian, and Giani Ionel Gradinaru. 2023. Green entrepreneurship in challenging times: A quantitative approach for European countries. *Economic Research-Ekonomska Istraživanja* 36: 1828–47. [CrossRef]
- Vecchione, Michele, Shalom H. Schwartz, Gian Vittorio Caprara, Harald Schoen, Jan Cieciuch, Jo Silvester, and Paul Bain. 2015. Personal values and political activism: A cross-national study. *British Journal of Psychology* 106: 84–106. [CrossRef] [PubMed]
- Velez-Grajales, Viviana, and Roberto Velez-Grajales. 2014. Is entrepreneurship inherited? A study of intergenerational social mobility in Mexico. *Latin American Journal of Economics* 51: 247–78. [CrossRef]
- Vuong, Quan Hoang. 2021. The semiconducting principle of monetary and environmental values exchange. *Economics and Business Letters* 10: 284–90. [CrossRef]
- Vuorio, Anna Maija, Kaisu Puumalainen, and Katharina Fellnhofer. 2018. Drivers of entrepreneurial intentions in sustainable entrepreneurship. *International Journal of Entrepreneurial Behavior & Research* 24: 359–81.
- Wang, Gang, Taiwen Feng, Zhanguo Zhu, and Yisa Jiang. 2023. Enabling green supply chain integration via green entrepreneurial orientation: Does environmental leadership matter? *Corporate Social Responsibility and Environmental Management* 30: 518–30. [CrossRef]
- Wang, Yan, Yun Yu, Tingting Xu, Zheyun Wang, and Yating Fang. 2024. Interpretative Structural Modeling Method: An Analysis of Influencing Factors Analysis on the Adverse Experiences of Cardiac Surgery Patients in the Intensive Care Unit. *Heliyon* 10: e36511. [CrossRef]
- Wei, Xushi, Haiping Ren, Sana Ullah, and Cuma Bozkurt. 2023. Does environmental entrepreneurship play a role in sustainable green development? *Evidence from emerging Asian economies, Economic Research-Ekonomska Istraživanja* 36: 73–85.
- Wu, Wenqing, Hongxin Wang, and Yenchun Jim Wu. 2021. Internal and external networks, and incubatees' performance in dynamic environments: Entrepreneurial learning's mediating effect. *The Journal of Technology Transfer* 46: 1707–33. [CrossRef]
- Yang, Dan, Kenneth S. Law, and Guiyao Tang. 2023. Not all pro-environmental initiatives can increase pro-environmental behavior: An empirical examination of employees' pro-environmental attributions. *Journal of Environmental Psychology* 92: 102177. [CrossRef]
- Yasir, Nosheena, Muhammad Babar, Hafiz Shakir Mehmood, Ruyi Xie, and Guanke Guo. 2023. The environmental values play a role in the development of green entrepreneurship to achieve sustainable entrepreneurial intention. *Sustainability* 15: 6451. [CrossRef]
- Yi, Gaofeng. 2021. From green entrepreneurial intentions to green entrepreneurial behaviors: The role of university entrepreneurial support and external institutional support. *International Entrepreneurship and Management Journal* 17: 963–79. [CrossRef]
- Yin, Liping, and Yenchun Jim Wu. 2023. Opportunities or threats? The role of entrepreneurial risk perception in shaping the entrepreneurial motivation. *Journal of Risk and Financial Management* 16: 48. [CrossRef]
- Zaydane, Amro Alaa'. 2011. Entrepreneurship: The driving force of national economies. *Gulf Arab Academy for Studies. Manama Branch Bahrain* 3: 9.

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