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Model of Entrepreneurship Development with an Approach to Preventing Environmental Harm

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ABSTRACT

The purpose of this study is to propose a model for entrepreneurship development within the National Iranian Oil Refining and Distribution Company, focusing on preventing environmental harm. From a purpose-oriented perspective, this research is applied-developmental, and from a paradigmatic standpoint, it adopts pragmatism. By employing the thematic analysis technique, this study aims to develop and validate a model for "entrepreneurship development in the National Iranian Oil Refining and Distribution Company with an approach to preventing environmental harm." The research population consists of senior managers from the Environmental Protection Agency, consultants of the National Iranian Oil Refining and Distribution Company, and academic experts in the field of entrepreneurship, with an initial estimate of approximately 12 individuals identified. Given the qualitative nature of the study, the "snowball sampling" method was utilized. Data were collected through interviews. In the first (qualitative) phase, the identification of main and sub-themes for designing the entrepreneurship development model in the National Iranian Oil Refining and Distribution Company, with a focus on preventing environmental harm, was conducted using the thematic analysis technique via the Maxqda 2020 software. The results indicate that the main themes include Green Entrepreneurial Culture and Climate, Development of Green Entrepreneurial Structures and Processes, Managerial Factors, Environmental Factors, Development of Green Entrepreneurial Opportunities, Entrepreneurial Human Resources, and Green Entrepreneurship Development.

KEYWORDS: Entrepreneurship Development, Prevention of Environmental Harm, National Iranian Oil Refining and Distribution Company, Green Entrepreneurial Opportunities

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1. Introduction

The development of organizational entrepreneurship is a strategy that, despite the presence of hierarchical and traditional management structures, can lead to transformations in organizational functions, thereby enhancing their efficiency and effectiveness. It can open new horizons for organizations without necessitating fundamental changes (Hooi, 2024). Individuals who demonstrate entrepreneurial development within an existing organization act as a breath of fresh air for that entity. They can leverage their accumulated knowledge for innovation and transform that innovation into success; such individuals are referred to as organizational entrepreneurs (Dihim et al., 2023).

Generally, the findings of prior research indicate that the components of organizational entrepreneurship vary depending on multiple factors, such as organizational culture, the type and nature of organizational activities, management style (private or public), and the status of employees. Extensive studies on identifying entrepreneurship components have predominantly focused on public organizations and universities, while overlooking organizations responsible for the refining and distribution of petroleum products, which differ in the nature of their activities (Abugabel, 2023; Costa et al., 2023; Divanti, 2023; Hooi, 2024; Funko et al., 2023; Dihim et al., 2023).

Research in the petroleum refining industry, particularly regarding environmental entrepreneurship, contributes to understanding how communities dependent on natural resources—often confronted with persistent poverty—can harness entrepreneurial initiatives to create sustainable and profitable businesses. However, the organizations overseeing this industry differ in their functional nature and operational missions from certain educational institutions, such as universities. Consequently, the components and dimensions of entrepreneurship development in these organizations also differ.

Theoretical reviews suggest that the development of environmental entrepreneurship requires specific conceptual and practical frameworks, encompassing innovation in clean technologies, sustainable policymaking, stakeholder engagement, and the development of green business models. Nevertheless, previous studies have largely focused on general concepts of green entrepreneurship, with fewer investigations specifically addressing the modeling of environmental entrepreneurship development in the oil refining industry (Zeidan et al., 2022).

From a practical perspective, statistics reveal that Iran's oil and gas sector is one of the country's most polluting industrial sectors. According to the Iran Environmental Protection Agency's report (2022), refining industries account for over 30% of pollutant gas emissions and 25% of the nation's industrial waste. Meanwhile, data from the Iranian Ministry of Petroleum (2021) indicate that fewer than 10% of the country's refineries have comprehensive environmental management and green entrepreneurship development programs.

Thus, the present study seeks to propose a comprehensive model for entrepreneurship development in the oil refining industry, offering practical solutions to mitigate environmental harm. This model can assist policymakers, oil industry managers, and entrepreneurs in capitalizing on emerging environmental opportunities, reducing negative environmental impacts, and achieving economic and social sustainability.

The oil and gas industry, as one of the most critical strategic sectors globally, plays a pivotal role in energy supply and economic growth. However, it has consistently faced significant

environmental challenges, including air pollution, greenhouse gas emissions, natural resource degradation, and improper industrial waste disposal (Funko et al., 2023).

In this context, the development of environmental entrepreneurship in the oil and refining industry can serve as a strategic approach to reducing environmental damage and promoting sustainability. Environmental entrepreneurship refers to the creation and development of businesses that, in addition to achieving economic profitability, focus on reducing environmental impacts and enhancing resource efficiency. The National Iranian Oil Refining and Distribution Company, a key pillar of Iran's oil industry, requires a comprehensive model for entrepreneurship development aimed at mitigating environmental harm. However, comprehensive studies in this area remain scarce, highlighting a gap in the availability of a practical and implementable model for environmental entrepreneurship development in Iran's oil refining industry.

Given the significance of entrepreneurship development as one of the key concepts within the discourse of environmental sustainability, this study aims to propose a model for entrepreneurship development under environmental conditions. Specifically, this research seeks to address the following question: By identifying entrepreneurship development in the National Iranian Oil Refining and Distribution Company with a focus on preventing environmental harm, what model can be proposed?

2. Theoretical Foundations and Research Background

Entrepreneurship development is a process through which an entrepreneur, by introducing a novel idea or concept, establishes a business while accepting risks and uncertainties, ultimately delivering a new product or service. In other words, entrepreneurship development encompasses any organized action or effort aimed at advancing, maturing, and enhancing the utility of entrepreneurship, characterized as an observable and programmable behavior (Divanti, 2023; Dihim et al., 2023). Preventing environmental harm involves mechanisms and methods designed to avert the destruction and pollution of environmental resources (e.g., aquatic ecosystems), encompassing any efforts or investments in this domain. Such initiatives align with the primary objective of fostering a healthy, vibrant, and thriving living environment for all humans and creatures on Earth (Funko et al., 2023). Conversely, activities that degrade the environment—such as habitat destruction, overexploitation, various forms of pollution, and the introduction of non-native species into habitats and ecosystems—have led to the widespread deterioration of the environment and biodiversity across the planet. The development of entrepreneurship hinges on addressing diverse issues from multiple perspectives, underscoring the necessity of adopting an ecosystem-based approach(Abugabel, 2023). Entrepreneurship development is a pressing need for Iran's economy. Amid declining investment in the national economy, coupled with low productivity and a tendency toward workforce reduction in organizations, unemployment has emerged as a significant economic and social challenge of the present era. Entrepreneurship is widely regarded as a remedy for unemployment, with self-employment being its most prominent outcome. Consequently, fostering entrepreneurship and promoting its culture in the country constitute an economic, social, and political imperative. Drawing on the research background (Abugabel, 2023; Costa et al., 2023; Divanti, 2023; Hooi, 2024; Funko et al., 2023; Dihim et al., 2023), it can be inferred that the majority of entrepreneurship studies pertain to economic, technological, and informational dimensions. Although research has also been conducted on entrepreneurship development within the education sector, these studies exhibit gaps, including

deficiencies in the quantity and quality of the dimensions and components under investigation. Similarly, gaps exist concerning the dimensions and components of environmental harm, as these variables have not been comprehensively and simultaneously examined from economic, social, infrastructural, cultural, environmental, and human perspectives. In this regard, the present study seeks to address these shortcomings. Moreover, the aforementioned studies indicate that, to date, no research has been conducted on entrepreneurship development with a focus on preventing environmental harm within the National Iranian Oil Refining and Distribution Company. This highlights a critical research gap that this study aims to fill by integrating and exploring the interplay of these dimensions in a holistic manner.

3. Research Methodology

The present study is exploratory in nature and utilizes qualitative data. Its primary objective is to propose a model for entrepreneurship development within the National Iranian Oil Refining and Distribution Company, with an emphasis on preventing environmental harm. The qualitative research population consists of experts and experienced university faculty members. The researcher employed the snowball sampling method, achieving theoretical saturation after conducting interviews with 12 elites and experts. The criteria for selecting participants and panel members from the expert population included having significant practical experience or authored scientific publications and articles related to the research topic, possessing academic qualifications relevant to the study, a minimum of 10 years of professional experience, and holding at least a doctoral degree. Given the qualitative approach adopted in this section, the "snowball sampling" method, a qualitative sampling technique, was utilized. This entailed each participant recommending one or more additional specialists, experts, or researchers knowledgeable about the study's focus to the researcher. Theoretical saturation was reached after conducting semi-structured interviews with 12 elites and experts. Prior to the interviews, ethical considerations were addressed by obtaining permission to record the sessions. Participants were assured that their identities would remain confidential and undisclosed. On average, each interview lasted approximately two hours. This study employed thematic analysis techniques to develop and validate a model, specifically aimed at "proposing a model for entrepreneurship development in the National Iranian Oil Refining and Distribution Company with a focus on preventing environmental harm." To ensure construct validity in this qualitative research, the method of participant checking was applied. Additionally, searches for negative cases and alternative explanations were conducted. Efforts were made to select interviewees with diverse experiences and inclinations to prevent personal biases or preferences from skewing the research perspective. To achieve internal validity, after coding, categorizing, and analyzing the qualitative data, an experiential model was derived and compared with the theoretically predicted model based on the literature. In qualitative research, since participants are not representative of the broader population, generalizing findings to a larger population is not feasible; thus, external validity cannot be claimed in this study. To ensure the reliability of the qualitative section and confirm theoretical saturation, the study utilized a correlation matrix test of inter-rater agreement among interviewees and a dual-coder chart, which will be elaborated upon later. Furthermore, the analysis of results was conducted using the Maxqda 2020 qualitative analysis software.

4. Findings

This section addresses the analysis of the collected data and the research findings. The data collection tool consisted of semi-structured interview files, and the results were analyzed using the

Maxqda 2020 qualitative analysis software. Data analysis was conducted based on 15 interview files. Subsequently, through a three-stage process—open coding, sub-theme coding, and main theme coding—the main and sub-themes were extracted. These three stages are illustrated and explained in detail in Figure 1. Ultimately, for the present study, a model is proposed under the framework of "Entrepreneurship Development in the National Iranian Oil Refining and Distribution Company with a Focus on Preventing Environmental Harm." The coding stages are outlined as follows: 1) Open Coding: At this stage, the interview files were collected and categorized by the researcher. It is worth noting that in this study, 12 interview files were gathered and coded. 2) Sub-Themes: Sub-theme coding occurs when the researcher assigns a code to each paragraph or section of the text upon review. At this stage, more than one code may be assigned to a specific section or paragraph of the text. 3) Main Themes: During this stage, the extracted codes are displayed in the "Code System" section, allowing for the categorization and merging of codes. This window represents selective coding (main themes), where codes are used to classify, categorize, and organize them for diagramming and structuring purposes. The qualitative findings indicate the identification of seven main themes. The extracted main themes include: 1) Green Entrepreneurial Culture and Climate, 2) Development of Green Entrepreneurial Structures and Processes, 3) Managerial Factors, 4) Environmental Factors, 5) Development of Green Entrepreneurial Opportunities, 6) Entrepreneurial Human Resources, and 7) Green Entrepreneurship Development. Consequently, the thematic network for entrepreneurship development with an approach to preventing environmental harm is presented in Figure 1.

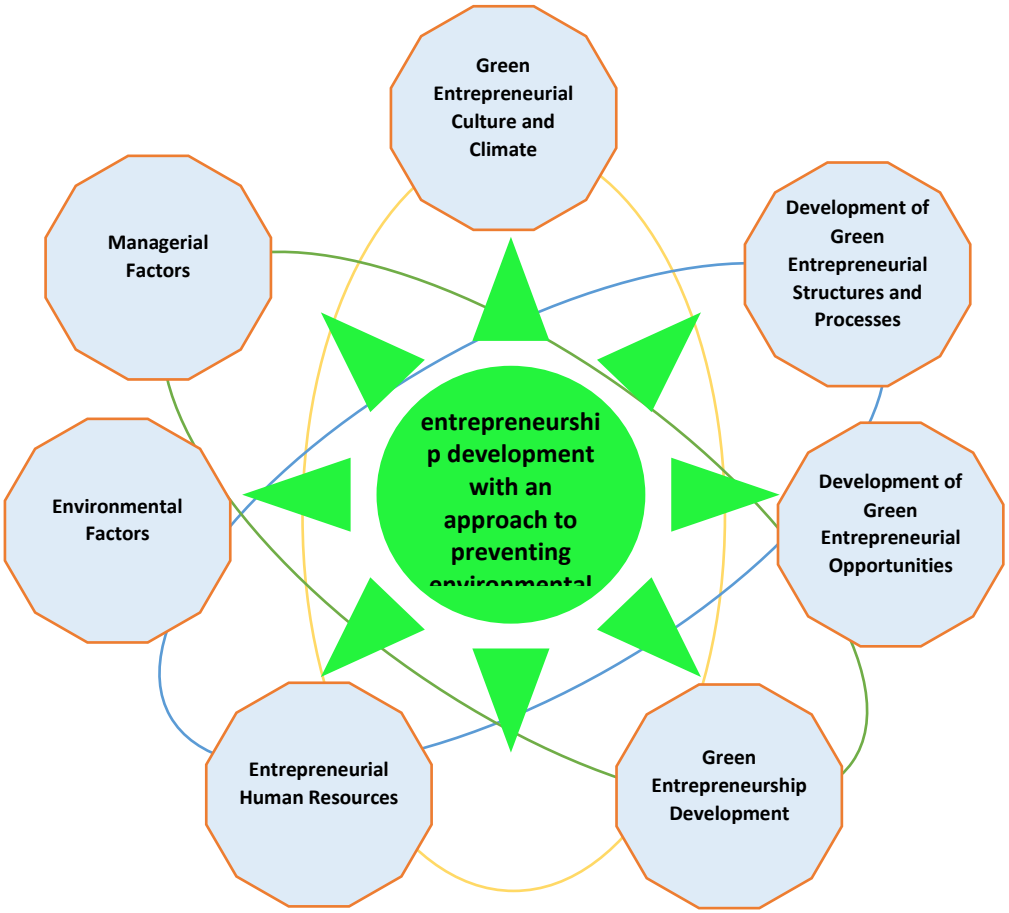

Figure 1 - Thematic Network of Entrepreneurship Development

One of the indicators of reliability in qualitative research is the evaluation of two or more documents in terms of their reference to a specific indicator. The Maxqda software possesses this capability. The reliability coefficient can be calculated using a single test or multiple tests, and these tests can be applied at one point in time or across multiple instances.

Accordingly, for each of the selected themes in this study, the level of agreement among interviewees is specified in Table 2, with an acceptable threshold of over 60%. Specifically, the intersection of the row and column for each interviewee with themselves naturally yields a value of 1. However, the column of a given interviewee must be examined in relation to other interviewees. For instance, Interviewee 1 and Interviewee 2 share a value of 0.77 (77%) for the selected theme. This can be interpreted as follows: Interviewee 1 and Interviewee 2 have a 77% overlap in their views regarding the selected theme. Given that the agreement among interviewees exceeds 60%, it can be concluded that theoretical saturation was achieved after the twelfth interview.

Table 1 - Correlation Matrix of Interviewees for Themes

Document name	Respon01	Respon02	Respon03	Respon04	Respon05	Respon06	Respon07	Respon08	Respon09	Respon10	Respon11	Respon12
Respon01	1.00	0.77	0.71	0.77	0.80	0.78	0.84	0.72	0.77	0.78	0.75	0.76
Respon02	0.77	1.00	0.75	0.70	0.70	0.72	0.68	0.74	0.73	0.72	0.73	0.75
Respon03	0.71	0.75	1.00	0.70	0.71	0.74	0.66	0.67	0.57	0.66	0.70	0.70
Respon04	0.77	0.70	0.70	1.00	0.70	0.68	0.72	0.68	0.73	0.75	0.73	0.81
Respon05	0.80	0.70	0.71	0.70	1.00	0.71	0.65	0.70	0.72	0.75	0.75	0.73
Respon06	0.78	0.72	0.74	0.68	0.71	1.00	0.65	0.71	0.72	0.73	0.74	0.71
Respon07	0.84	0.68	0.66	0.72	0.65	0.65	1.00	0.68	0.72	0.71	0.69	0.74
Respon08	0.72	0.74	0.67	0.68	0.70	0.71	0.68	1.00	0.68	0.73	0.66	0.71
Respon09	0.77	0.73	0.57	0.73	0.72	0.72	0.72	0.68	1.00	0.71	0.67	0.72
Respon10	0.78	0.72	0.66	0.75	0.75	0.73	0.71	0.73	0.71	1.00	0.66	0.65
Respon11	0.75	0.73	0.70	0.73	0.75	0.74	0.69	0.66	0.67	0.66	1.00	0.74
Respon12	0.76	0.75	0.70	0.81	0.73	0.71	0.74	0.71	0.72	0.65	0.74	1.00

Based on the findings, a "Two Cases Model" diagram was constructed for Interviewee 1 and Interviewee 15. According to this diagram, the codes positioned in the center, indicated by double-headed arrows, represent those codes that are common between the two aforementioned interviewees, with each having referred to them. The codes located on the right side are those mentioned solely by Interviewee 15 and not referenced by Interviewee 1. Conversely, the same applies to Interviewee 1, with codes on the left side being unique to them. Additionally, each arrow is accompanied by a value reported by the software, which indicates the frequency of that code's occurrence among the coded segments. Given that the agreement between the codes of the two interviewees exceeds the number of non-overlapping codes, the reliability and theoretical saturation are confirmed.

Furthermore, the report of the extracted codes for the two files, Respon02 and Respon04, is presented below.

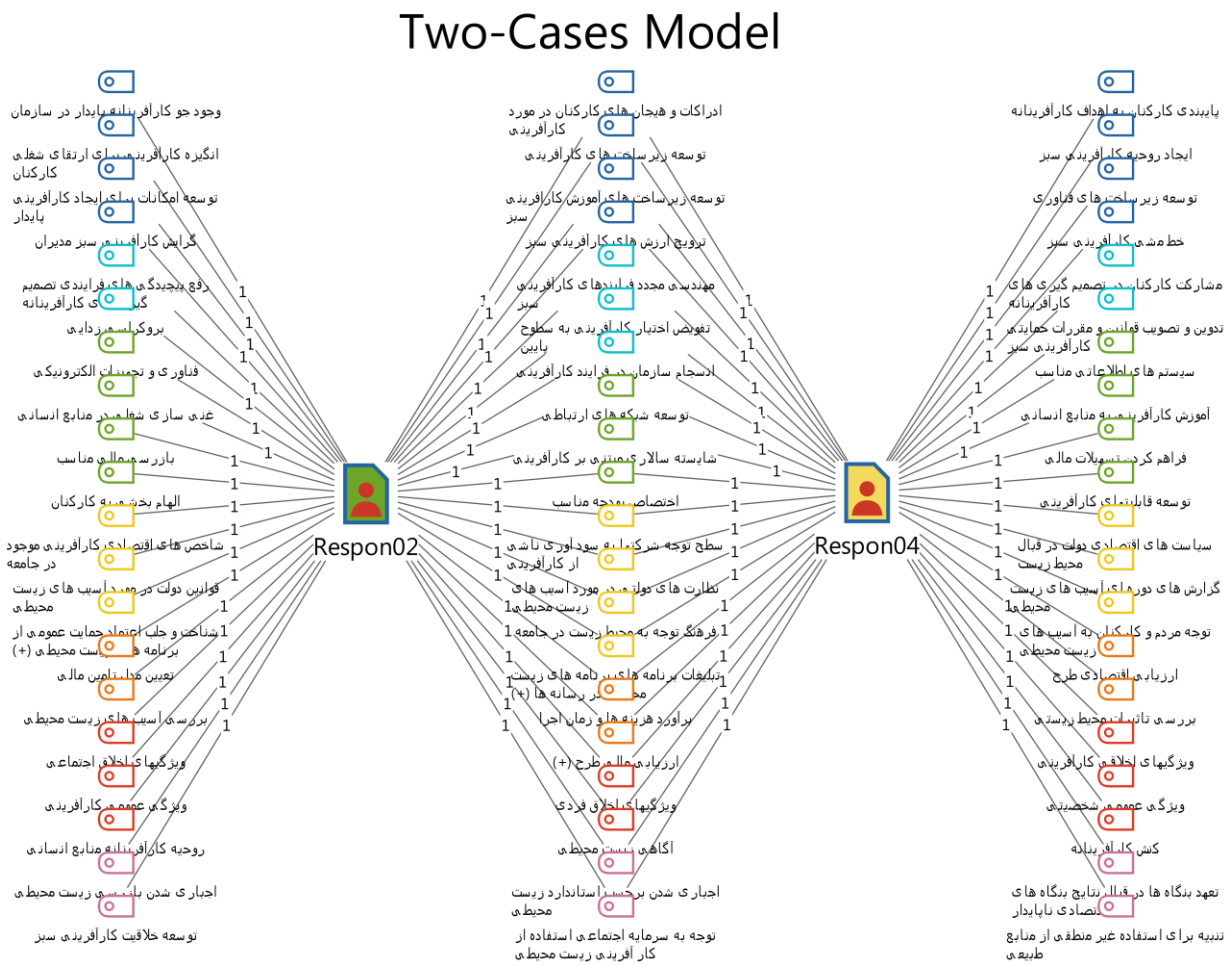

Figure2. Two Cases Model Diagram in Maxqda Software for Interview Files 2 and 4

Based on the findings of the above diagram, the "Two Cases Model" was constructed for Interviewee 2 and Interviewee 4. According to this diagram, the codes positioned in the center, indicated by red double-headed arrows, represent those codes that are common between the two aforementioned interviewees, with each having referred to them. The codes located on the right side are those mentioned solely by Interviewee 4 and not referenced by Interviewee 2. Conversely, the same applies to Interviewee 2, with codes on the left side being unique to them. Additionally, each arrow is accompanied by a value reported by the software, which indicates the frequency of that code's occurrence among the coded segments.

In the following section, the design of the entrepreneurship development model with an approach to preventing environmental harm will be addressed. In fact, by designing this model, the main research question is answered.

5. Discussion, Conclusion, and Recommendations

Based on the results, the main themes identified include: Green Entrepreneurial Culture and Climate, Development of Green Entrepreneurial Structures and Processes, Managerial Factors, Environmental Factors, Development of Green Entrepreneurial Opportunities, Entrepreneurial Human Resources, and Green Entrepreneurship Development. Among these, the main theme of

"Development of Green Entrepreneurial Structures and Processes" ranks first in priority and importance, followed by "Development of Green Entrepreneurial Opportunities" in second place, "Environmental Factors" in third, "Green Entrepreneurial Culture and Climate" in fourth, "Managerial Factors" in fifth, "Entrepreneurial Human Resources" in sixth, and finally "Green Entrepreneurship Development" in seventh.

Regarding the main theme of Green Entrepreneurial Culture and Climate, its sub-themes, in order of priority, include Organizational Infrastructure, Entrepreneurial Values, Motivational Practices, and an Excellent Organizational Climate. Fostering an entrepreneurial mindset within organizations strengthens a green entrepreneurial culture and facilitates organizational change. Organizational entrepreneurs, characterized by a blend of divergent and convergent thinking, are capable of collaborating and generating ideas across defined organizational boundaries. A culture conducive to trial and error, an innovative mindset, and opportunities for continuous experimentation and refinement defines this theme. These findings align with the research of Gregory et al. (2021), Makhloufi et al. (2022), and Vedula et al. (2022). For the main theme of Development of Green Entrepreneurial Structures and Processes, the sub-themes, in order of priority, are Decentralization, Integration of Entrepreneurial Process Structures, and Process Reform and Development. The emphasis on this factor stems from a shift toward decentralization and high formality within the organization in question. Moving toward participatory decision-making, employee engagement, and networking can enhance the pathway to creating and developing innovation. These results are consistent with the findings of Gümüsay et al. (2018), and Koe et al. (2014), which identified managerial factors as the most critical for entrepreneurship development.

Concerning the main theme of Managerial Factors, the sub-themes, in order of priority, include Entrepreneurial Leadership, Financial Resource Management, Human Resource Management, and Information Technology Management. A key focus of this study was the necessity of addressing managerial factors such as financial resource management, human resource management, and IT management. These findings align with the research of Abugabel (2023) and Costa et al. (2023), which highlighted managerial factors as the most significant for entrepreneurship development.

For the main theme of Environmental Factors, the sub-themes, in order of priority, are Political Environment, Cultural Environment, and Government and Legal Institutions. Strengthening an entrepreneurial culture aimed at preventing environmental harm can be seen as a minimal yet essential step toward entrepreneurship development. These results are consistent with the studies of Divanti (2023) and Hooi (2024).

In the main theme of Development of Green Entrepreneurial Opportunities, the sub-themes, in order of priority, include Environmental Impacts, Project Evaluation, and Feasibility Assessment of Opportunities. Identifying organizational opportunities relies on environmental analysis, recognition of organizational challenges, and access to internal information. These findings align with the research of Funko et al. (2023) and Dihim et al. (2023). Regarding the main theme of Entrepreneurial Human Resources, the sub-themes, in order of priority, are Specialized Characteristics, Ethical Characteristics, and General Characteristics. Developing employee empowerment programs and securing support from senior and mid-level managers are critical for reinforcing organizational entrepreneurship in practice. Notably, a clear commitment from management to organizational entrepreneurship serves as a precursor to entrepreneurial activities

and the subsequent creation of a suitable environment for organizational entrepreneurship. These results are consistent with the findings of Hooi (2024), Funko et al. (2023), and Dihim et al. (2023).

For the main theme of Green Entrepreneurship Development, the sub-themes, in order of priority, include Green Enterprise Development, Policy Review, and Creativity and Innovation in Green Entrepreneurship. It is recommended that governments and institutions adopt supportive behaviors toward green entrepreneurs, thereby accelerating the process of sustainable economic development in societies. These findings align with the research of Abugabel (2023), Costa et al. (2023), and Divanti (2023).

In conclusion, given the environmental challenges facing Iran's oil industry, the development of sustainable and green entrepreneurship can play a vital role in reducing environmental harm and enhancing economic productivity. The recommendations provided in this study offer a clear pathway for transforming the oil refining industry from a polluting sector into a sustainable and innovative one. Investments in green technologies, fostering entrepreneurial environments, improving supportive policies, and developing international collaborations are among the strategies that can enhance the competitiveness of Iran's oil industry while mitigating its adverse environmental impacts.

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ETHICAL CONSIDERATION

Authenticity of the texts, honesty and fidelity has been observed.

CONFLICT OF INTEREST

Author/s confirmed no conflict of interest.