



The Role of Human Factors and Culture in the Upcoming Challenges in Safety with the Approach of Increasing Financial Productivity

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Submit: 2024/02/20 Accept: 2024/04/12

Abstract

Objectives: The purpose of this study is to explore the role of human factors and culture in the upcoming safety challenges associated with increasing financial productivity.

Design/methodology/approach: In the face of environmental crises, human factors and safety culture play a crucial role in navigating challenges and seizing opportunities. Issues such as population participation and the promotion of environmental values are met with obstacles like violations of environmental protection laws. However, by leveraging opportunities to advance clean technologies and smart management practices, we can progress towards maintaining and enhancing the environmental situation. This study utilized a descriptive research method to investigate human factors, safety culture, environmental challenges, and opportunities in Isfahan. Data was collected from library resources in 2024, and practical results were presented.

Results: The findings indicate that fostering coordination between human factors and the development of an environmental safety culture is essential for striking a balance between environmental protection and sustainable development.

Innovation: By capitalizing on opportunities to enhance clean technologies and smart management practices, it is feasible to improve the environmental condition of Isfahan. The city faces challenges such as environmental protection law violations, unsustainable activities, and rapid urban and industrial growth that strain the environment. These challenges underscore the urgency of implementing robust environmental protection measures. However, Isfahan also benefits from opportunities like transparent environmental management and a deeper understanding of the economic and social impacts of environmental initiatives. Increasing public awareness and transparency in decision-making processes can enhance environmental management and natural resource conservation. Additionally, the potential for upgrading clean technologies and utilizing renewable energy presents a key opportunity to mitigate environmental harm. These actions can contribute to creating a more sustainable environment and reducing greenhouse gas emissions. Overall, Isfahan has leveraged its resources to preserve and enhance the environment by effectively balancing challenges and opportunities.

Keywords: Environment, Safety Culture, Challenges and Opportunities.

1. Introduction

To protect the environment, first of all, human groups should be educated, this education should be aimed at understanding the environment and nature and making friends with it (Hosseini et al., 2013). Today, the environment is exposed to various threats. Since many of these changes and occurrence of environmental problems are the result of human activities and due to the lack of awareness and understanding of the environment, promotion of public culture and environmental education can be considered as one of the basic measures in solving these problems. The crystallization of the environmental culture in the society is that all the people of the society consider the environment as a vital and valuable phenomenon and do not harm it. The main purpose of this research is to investigate the role and relationship of culture and education in preserving the environment. Since the expansion of awareness requires education, today, in parallel with the increase of human activities and their effects, the need for extensive and comprehensive education of people in exchange for their responsibility towards the environment has also become more noticeable. This research was conducted by a review method and the required information was collected from library and internet sources. From the conducted investigations, it can be concluded that practical, basic and long-term education can cause environmental culture and lay the groundwork for improving and reforming environmental behaviors in society (Azizi, 2014).

Isfahan, with its long history and culture, as one of the big cities of Iran, faces unique issues and challenges in the field of environment. The influence of people and safety culture is of particular importance in this context; Because cultural behaviors, beliefs, and habits can have profound effects on environmental protection.

In this article, we will first examine how humans interact with the environment of Isfahan and examine the role of human factors in the formation of challenges and opportunities. Then, we will present the existing attitudes and policies in the field of safety

culture and environmental protection and analyze the obstacles and possibilities in this field.

Finally, according to the achievements, we will make suggestions to improve the environmental condition of Isfahan. This analysis is the first step towards a deeper understanding of the challenges and taking advantage of the opportunities to protect the environment of this region. In this article, we will investigate the human factors and safety culture in relation to the environment of Isfahan. This review includes the challenges and opportunities that these factors create for the protection and sustainable development of the environment in this region. In order to improve the future of Isfahan's environment, it is necessary for these factors to face the challenges and benefit from the available opportunities.

Some of the previous studies on the subject are as follows:

Mashari (2016) reviewed environmental management challenges and methods of working, highlighting that if the current rate of deforestation in the country continues, Iran will lose its forests within the next 30 to 40 years. In the last forty years alone, one third of Iran's forests have been destroyed. This is an unforgivable sin that will punish both the perpetrators and the bystanders. The remnants of nature in the future will serve as a reminder to future generations that Iran's natural resources were exploited by those who made mistakes and crossed boundaries until there was nothing left. Each year in Iran, approximately 15 tons of soil per hectare are lost due to water erosion. Additionally, major floods in the 1360s have doubled to 400 compared to the 1330s. Preserving biodiversity at the levels of genes, species, and ecosystems is a key indicator of environmental protection. According to the "Red Book of Basic Information of Iran," out of 1727 native plant species in the country, 453 are threatened with extinction, 21 are at risk of near-term extinction, and 432 are at risk of medium-term extinction. The awareness and acknowledgment of such issues in other countries began in the 60s, leading to conferences like Brantland (1987) and Rio de Janeiro (1992), the development of



ISO 14000 series standards, and the "Sustainable Development" world summit in 2002 as examples of global actions. Third world countries are less proactive in environmental management compared to industrialized nations. In Iran, there has been significant growth in environmental goal-setting, policy-making, and planning over the past decade, but these efforts have mostly resulted in symbolic laws and statements due to social and cultural constraints, failing to achieve desired outcomes. This article aims to trace the evolution of environmental attitudes and identify commonalities with public administration to address the ineffectiveness of policies, goals, and programs.

Zarei et al. (2014) investigated the role of education in promoting environmental culture in society, emphasizing the importance of increasing environmental awareness in the modern era. Humans and other creatures impact their surroundings differently, with early humans having a lesser impact due to less pollution. However, technological advancements and changing civilizations have led to more complex environmental issues, necessitating a correct balance between human needs and the environment. Promoting public culture through environmental education is crucial to addressing environmental problems and making environmental awareness a part of public culture.

Karmi et al. (2012) examined the environmental challenges of inter-basin water transfer projects in Iran and globally, emphasizing the need to evaluate the environmental impacts alongside economic and social effects when deciding on project implementation. Changes in water resources affect vegetation and soil quality, leading to ecosystem and environmental effects. The article discusses the economic, social, and environmental impacts of various projects and outlines criteria and considerations for inter-basin water transfers.

Amiri et al. (2012) explored Iran's challenges, opportunities, and position in attracting carbon storage to protect the environment. Fossil fuel plants and refineries emit large amounts of CO₂, contributing to

climate change. The development of carbon capture and storage (CCS) technology can help address this issue, reducing the threat of climate change. The study evaluates the challenges and opportunities of CCS technology, including cost, safety, storage capacity, injection conditions, and Iran's CO₂ storage potential. Identifying suitable storage locations is crucial, with considerations for reservoir engineering, geology, hydrodynamics, economics, and monitoring requirements. Saline reservoirs have the largest capacity for CO₂ storage, but injecting CO₂ into oil reservoirs may be more economically viable in Iran.

Shokri (2021) investigated the environmental governance system in Iran and its challenges and pointed out that currently the Islamic Republic of Iran is facing many problems in the field of environment. Air and water pollution, desertification, deforestation, loss of biodiversity and water scarcity crisis have brought the country's environmental situation to a critical level. The crisis of water scarcity and drought forces people to migrate, air pollution has made life challenging, soil erosion and increasing desertification have made agricultural land useless. Biodiversity is under threat. The main idea of this article is: while external factors such as global climate change and international economic sanctions are generally recognized as external drivers in creating environmental problems, a major part of Iran's environmental problems is caused by the weak governance of the country in this is the field. Improper management in policies related to energy consumption, especially water, weak public awareness of the state of the environment, lack of proper understanding of development, weak fertilizers and population policies are among the human factors affecting the destruction of the environment in Iran.

Corrigan (2020) reviewed Human Factors and Safety Culture: Challenges and Opportunities for the Port Environment and noted that the critical role of understanding human factors and the importance of safety culture in the maritime sector is becoming a prominent topic. While much research has focused on ships at sea, it is crucial to recognize that ports and



docks can also be dangerous and hazardous environments. The purpose of this paper is to report an exploratory research study assessing safety culture and human factors awareness in a large European port environment. The study utilized a multi-method awareness of human factors and a positive shift towards approach, including a safety culture assessment survey in a port environment (161 responses) and research interviews (11 in total) with a reference port company. The research concludes that there is a growing a safety culture that promotes openness and flexibility in safety measures. However, more focused research on the complexities, constraints, and shared processes of port environments is necessary.

Ciavarelli (2016) reviewed the integration of human factors into safety and environmental management systems and addressed human performance risk reduction strategies for integration into a safety and environmental management system (SEMS). A framework is presented that identifies the human factors considerations and evaluation criteria needed for successful integration into a company's SEMS. A methodology for evaluating the safety culture and effectiveness of SEMS implementation is also presented. Survey results from employees in various high-risk industries will be discussed, emphasizing common problems in creating and maintaining a strong safety culture and the challenges of achieving an effective SEMS.

Successfully integrating human factors into SEMS for the oil and gas industry can reduce the risks of human-caused accidents and disasters like the Macondo well blowout. Integrating human factors into a SEMS can also enhance operational efficiency and effectiveness by considering all levels of performance improvement, from individual workers to management. Optimal performance by all employees is essential for achieving a high level of organizational reliability.

Certain human factors components can improve safety performance and help prevent human error incidents and organizational failures, such as

specifying personnel qualification standards, utilizing advanced simulation training, analyzing and displaying critical safety data, identifying human factors hazards, providing safety training for line supervisors, and assessing safety climate and culture regularly based on High Reliability Organization principles.

These factors are crucial components of an effective SEMS that, when absent or poorly implemented, can lead to man-made accidents and disasters. They are essential areas of assessment for evaluating the strength of safety culture and the successful integration of human factors into a company's SEMS. These methods and lessons learned should be considered for implementation in the oil and gas industry. Environmental research is vital in Isfahan, confirming the necessity from multiple perspectives.

- **Protection of natural resources:**

Research in the field of environment helps to preserve Isfahan's natural resources, including water, air, soil and biodiversity, in a sustainable manner. These measures prevent the destruction of the environment and the reduction of the quantity and quality of natural resources.

- **Sustainable urban management:**

Environmental research allows the municipality and city officials to implement sustainable urban management programs and projects based on accurate and scientific information. These measures improve the quality of life of citizens and reduce damage to the environment.

- **Coping with climate change:**

Research in the field of environment can help to better understand the patterns and climate changes in Isfahan. This knowledge is essential to adopt appropriate policies and measures to deal with climate change and reduce its effects.

- **Maintaining public health:**

Environmental research helps to better understand the polluting agents and the correct risks associated with them. This information helps public health organizations to implement appropriate health programs and policies and prevent disease outbreaks.



In general, environmental research in Isfahan is necessary to take serious measures to preserve the environment, improve the quality of life of citizens, and deal with climate challenges and air and water pollution.

2. Research method

In this study, human factors and safety culture, challenges and opportunities for the environment of Isfahan were investigated by using descriptive research method and by collecting library sources, and the results were collected in the findings section of the article.

3. Findings

Human factors and safety culture in Isfahan can be related to environmental protection or threat. The strengths of safety culture and social cooperation can help reduce pollution and preserve natural resources. On the other hand, challenges such as violation of environmental protection laws may lead to environmental degradation. Considering the harmony between the pros and cons, creating awareness and promoting a responsible environmental culture can help improve the environmental condition of Isfahan:

- **Human factors**
 - Increasing the population's awareness about the importance of environmental protection through educational programs.
 - Promoting the active participation of people in protective measures, such as cleaning contaminated areas.
- **The role of local groups:**
 - Encouraging and supporting local groups and associations in the implementation of environmental protection plans and projects.
 - Promoting positive interactions between individuals and local groups in order to preserve and benefit from natural resources.

Emphasizing the active participation of the population as well as the cooperation of local groups in this field

can help to develop a culture of environmental protection and reduce its harmful effects.

- **Safety culture:**

Surveys show that weak safety culture is the determining factor of accidents. On the other hand, the change in people's behaviors and attitudes and their greater focus on safety can only be realized through the formation of a safety culture, which also requires understanding and identifying the current culture. Safety culture includes the application of all necessary values in the field of occupational health and safety, effective and useful attitudes in this field, application of laws, systems and methods of management and participation in order to create a healthy and safe work environment. In fact, it is possible to create a culture in the field of safety through

- 1) creating physical and psychological safety grounds,
- 2) legal support and supervision,
- 3) promotion and persuasion of people in the organization.

In addition, the HSE category in Iran is a new discussion. For this reason, the structure of giving it an identity as well as the implementation of HSE laws, like the implementation of other laws, requires the provision of appropriate tools, resources and infrastructure. Providing facilities requires the use of financial, scientific and human resources. Therefore, it is necessary to manage the use of these resources and facilities in order to reduce costs (Razavi, 2013).

- **Promoting environmental values in society:**

In Isfahan, environmental values are promoted through various measures. This includes education and information in schools and the community, holding workshops and educational meetings about biodiversity conservation, waste management, and effective use of energy. Also, Isfahan Environmental Organization promotes environmental values in this region by implementing environmental projects and supporting people's activities.



It is inevitable to use cultural tools to provide change in knowledge, values, behavior and in general way of life. The environment is defined as a system in which humans, nature and culture are its constituent elements. Therefore, changing the attitude and behavior of society regarding the value and importance of the environment is essential for the continuation of human life. In order to achieve the development of environmental culture, we have the following solutions in the forefront: public education at all age levels, specialized environmental education, encouraging agents active in the matter of environmental protection, appropriate policy making and foundation, expansion of environmental research, Supporting environmental non-governmental organizations, establishing strong laws and regulations to protect the environment, monitoring and punishing polluting industries and people, using mass communication tools such as television, radio and the press to inform the public, revive beliefs and customs. and environmental customs of the past and finally creating new customs related to preserving the environment in accordance with social and cultural conditions. The noteworthy point is that for a teaching to become cultural, it must be institutionalized in a continuous and stable process. The beginning of any change in the society is mainly the people in charge of that society. The officials of the society must first be justified and get the necessary training in the field of the environment, and then their performance can lead to the injection of the spirit of environmental protection in the whole society and create a sensational movement in this field (Hosseini et al., 2012).

- **Creating a culture of safety against air and water pollution.**

The damage caused by the lack of water is more than the damage caused by other environmental hazards such as floods, earthquakes, storms, etc., and the effects of the water crisis in various sectors of agriculture, social, economic, health, international relations and also environmental. It appears gradually and leaves negative effects, that is why water

shortage has become a challenge or crisis. If the necessary measures are not taken to deal with and reduce the adverse effects of water crisis, this crisis will turn into war and tension. between countries, which will have irreparable effects. What is necessary is to create a global action to ensure safe access to safe water for everyone. Also, considering everyone's enjoyment of water as one of the basic factors of human rights, developing National and regional and increasing international aid to developing and underdeveloped countries along with the global action plan to solve the water crisis is very effective. The importance and influence of water in the economic and social life of nations is not a new issue. The way of human life and technology have played a very important role. The limitation of water resources will be the first obstacle to the expansion and development of agricultural production in the next decade. The incorrect pattern of consumption in industrialized and advanced countries will aggravate the water crisis and reduce food in other parts of the world. The lack of food in countries with a high population growth rate is quite noticeable, on the other hand, the occurrence of droughts, social problems, inflation and economic recession make the situation of these countries more vulnerable. The situation of these countries is such that with millions of refugees, they are actually environmental refugees. They are faced with having to leave their lands. They potentially endanger the environmental balance in the host country (Shariatmadari and Ansari, 2014).

In Isfahan, creating a culture of safety against air and water pollution is done through community awareness and implementation of awareness campaigns by related organizations and departments. Educational programs in schools and universities, promoting sustainable behaviors and reducing the



consumption of water and energy resources, among other measures, have been carried out.

4. Challenges

Issues caused by violations of environmental protection laws and unsustainable financial resources and activities. In Isfahan, violating environmental protection laws and performing unsustainable activities, including misuse of natural resources and unpleasant wastes, lead to challenges. Failure to effectively implement environmental laws and violation of environmental protection standards can increase the factors of pollution and damage to the environment. The process of urban and industrial growth increases the pressure on the environment.

Rapid urban and industrial growth in Isfahan increases the need for natural resources, decreases air and water quality, and reduces urban green spaces. The increase in traffic, the decrease in air quality and the destruction of green spaces are known as the main challenges caused by urban and industrial growth in Isfahan.

5. Opportunities

Creating transparency in environmental management and understanding how financial resources are spent in the environment is crucial for better understanding the economic, social, and financial effects of environmental actions.

The lives of all creatures, including humans, depend on a healthy and pollution-free environment. The rapid increase in population and their contribution to pollution and environmental destruction is a significant issue today. The conversion of large farmland into cities, the destruction of forests and pastures due to unprincipled exploitation, and the construction of factories without regard for environmental protection principles have all contributed to the serious threat to the environment we face today.

Many countries have recognized the right to a healthy environment by incorporating it into their constitutions. Preserving the environment is essential for meeting the needs of society, respecting public

rights, and preventing social inequalities and misuse of nature that violate human rights. Iran is also facing environmental challenges, but with efficient management and increased public participation in environmental issues, threats can be transformed into opportunities (Mirzadeh Kohshahi and Yousefi, 2022).

In Isfahan, there is an opportunity to increase transparency in environmental management, improve understanding of economic effects, and optimize the allocation of financial resources for environmental measures. By increasing public awareness of the environmental impact of actions taken and enhancing transparency in financial decision-making processes, environmental management can be improved, and natural resources can be better protected. Promoting clean technologies and renewable energies is also essential to reduce harmful effects on the environment.

Transitioning to clean energy systems, utilizing renewable resources effectively, and developing environmental technologies can enhance environmental sustainability and reduce greenhouse gas emissions in Isfahan. By responsibly utilizing these opportunities and coordinating these efforts, it is possible to help preserve and improve the environmental condition of Isfahan.

6. Discussion and Conclusion

Interference between human factors, safety culture, challenges, and opportunities in the Isfahan environment is a serious challenge. Human factors have the ability to contribute to or violate environmental protection, along with the culture of safety and transparency in financial spending in the environmental field. These factors may either help promote the values of environmental protection or be powerless in the face of challenges, creating a complex scenario.

To improve the environmental condition of Isfahan, it is necessary for individuals, local communities, and officials to cooperate in creating a responsible environmental culture. Intelligent management of financial challenges and costs, such as unsustainable urban growth, and taking advantage of



financing opportunities to develop financial efficiency and environmental accounting indicators can help achieve the goals of environmental protection and sustainable development. Developing an environmental safety culture is also essential for active participation in environmental protection and continuous improvement of financial management processes, moving towards a healthy and sustainable life with balanced costs.

Environmental research in Isfahan plays a vital role in maintaining stability and intelligent financial and administrative development in the city. Challenges from unsustainable activities and urban and industrial growth highlight the need for serious measures to protect the environment. On the other hand, opportunities to create transparency in financial and environmental management, use clean technologies, and adopt renewable energies offer significant potential for improving the environment and reducing harmful effects.

Therefore, attention to environmental research and optimal management of environmental costs in Isfahan is crucial not only for preserving biodiversity and natural resources but also for creating a sustainable and healthy city. Decisions based on accurate and scientific information in the environmental field can improve the quality of life for citizens and preserve the region's natural resources.

7. Holding educational programs:

These proposals, through the coordination and cooperation of individuals, local communities, and officials, can help improve the environmental condition of Isfahan and guide towards achieving sustainable development.

a. Holding educational programs:

Raising public awareness in the field of environmental protection and promoting environmental culture through workshops and educational programs.

b. Encouraging social participation:

Creating incentive methods for population participation in environmental protection activities and projects.

c. Development of clean technologies:

Investing in research and development of clean technologies and renewable energy to reduce harmful effects on the environment.

d. Determining and implementing environmental laws:

Developing and implementing sustainable environmental laws in cooperation with local stakeholders to control harmful activities.

e. Promoting social responsibility:

Encouraging social responsibility in business and industry to promote environmentally friendly behaviors.

f. Transparency in financial management and development of financial indicators:

Providing clear information about financial management in the environment and the economic and social effects of financial measures affecting the improvement of the environment.

g. Promoting sustainable transport:

Encouraging the use of public transportation, cycling, and clean and sustainable cars.

h. Interaction with young people:

Encouraging active participation of young people in programs and decisions related to the environment to promote motivation and innovative ideas.

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