

Analyzing Governance Failures in Iran's Petrochemical Programs: A Grounded Theory Study with Sustainable Development Approach

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Abstract

Field surveys and reports from research institutions indicate that petrochemical industry programs have faced numerous challenges, including severe time and cost overruns and low investment returns, revealing fundamental governance deficiencies. Sustainable development requires proper planning and organizational frameworks to achieve its objectives, making effective governance indispensable. Given the substantial investments in infrastructure programs and the importance of related research, there is a demonstrated need for studies that analyze inefficient governance phenomena in the petrochemical industry using empirical field data and identify their specific components. This research employs a qualitative grounded theory methodology through semi-structured interviews with key industry stakeholders. The research strategy is Theory Building from Multi Case Study, and data analysis was carried out with a grounded theory approach in the form of coding, during which main and sub-categories were identified. The achievement of this research can be used as a model in line with sustainable development policies in the three dimensions of social, economic and environmental in petrochemical program.

Keywords: Sustainable Development, Programs Governance, Grounded Theory, Laws and Regulations.

1. INTRODUCTION

The petrochemical industry is one of the largest sub-sectors of the oil industry, which has a very important position in profitability and value-added creation. The development and implementation of petrochemical programs in different regions of the country boosts the country's industrial development process. In the petrochemical industry, there are many challenges and complexities, the resolution of which is very necessary for the sustainable development of the country. Product diversity, separation of feed and product markets, feed diversity, etc. are some of the features that make it difficult to design a regulatory body for the petrochemical sector. Moreover, the ambiguity in the role of the National Petrochemical Industries Company and the limits of its authority can be considered as another problem. Simply put, in the petrochemical sector, like other sectors, there is a need for a major policymaker who is responsible for explaining policies. Alongside this major policymaker, regulatory bodies can also be active. Currently, such a policymaking body is ambiguous in its roles. The presence of the Ministry of Industry, Mines and Trade alongside the Ministry of Oil through relevant state-owned companies and the multitude of major decision-makers has created problems for the petrochemical sector. For example, a petrochemical industrial unit must refer to the Ministry of Industry, Mines and Trade to obtain a license, while the issue of supplying feedstock is in the hands of national oil companies. The National Gas Company is also responsible for the transfer, refining and distribution of petroleum products. Recently, private

refineries have also encountered numerous problems in supplying feedstock to petrochemical units and increasing feedstock prices. Meanwhile, the National Petrochemical Company also introduces itself as a regulator. On the other hand, the role of the Environmental Protection Organization in granting licenses should not be ignored. The presence of these influential players in the petrochemical industry and their lack of coordination in managing and planning this industry has caused problems in this industry.

Lack of attention to feasibility studies and appropriate location for the construction of petrochemical programs¹, disregard for regional environmental issues and sustainable development, and the manner in which environmental permits are obtained based on political and demagogic trade-offs rather than on professional and principled expert reports are among the very important issues that should be given great attention. The programs defined in the petrochemical industry do not have the necessary productivity, and the lack of proper governance in the programs prevents the achievement of sustainable development and imposes huge costs on the national economy annually. Ultimately, it has obscured the realization of benefits, which is the mission of defining a program, and within the framework of the objectives of the laws, it undermines sustainable development. Therefore, there is a need to conduct research on the factors affecting the consequences of undesirable governance of petrochemical programs with a focus on sustainable development in a legal context.

According to the executive regulations of Article 215 of the Five-Year Development Plan Law, the implementation of programs must have technical, economic, social, environmental, financial, cultural, and passive defense justification [1]. According to the Majlis Research Center, the lengthening of the program construction period is such that about sixty percent of the programs have not been completed on time, which indicates inefficiency in defining the programs and their disproportionate size to the resources allocated to this area [2]. According to the results of the research of the Majlis Research Center, issues such as lack of good governance, lack of attention to sustainable development, conflict in laws and regulations, conscious continuation of the process of incorrect development of programs, dominance of individual, group or organizational tendencies over social interests, existence of systemic and administrative corruption, lack of belief in expert work, lack of commitment and belief in the planning process, lack of teamwork culture are examples of factors that have led to the formation of behaviors and decisions that affect the performance of programs. Governance and sustainable development are among the new topics that are less than a quarter of a century old, and many studies in this field have not been conducted in a way that considers the effect of governance dimensions on the components of sustainable development. Given that increasing economic growth, social growth and environmental protection are components and components of sustainable development, governance will affect each of these components and ultimately on sustainable development. There is a direct and proportional relationship between sustainable development and governance.

¹ A program is a temporary structure designed to guide multiple related projects and other work to progressively achieve benefits for one or more organizations (Managing Successful Programs, 2020). According to the definition provided by the Project Management Institute (PMI), a program is a set of interrelated activities that are managed in a coordinated manner to achieve benefits that would not be achieved by managing the components individually. Governing the component programs as a program increases the chances of achieving benefits. Programs are executed to deliver benefits to their sponsoring organizations [3]. The primary focus of program governance is on achieving benefits. In contrast, in a project, the focus of project management is on delivering the intended project outputs.

The aim of the research is to clarify the concept of factors affecting the ineffective governance of the programs under study (program A, B and C²) and its consequences in the context of sustainable development. So far, various models and patterns have been prescribed by researchers and international organizations for a wide range of countries, which are often doomed to failure due to incompatibility with local, cultural, etc. conditions and have led to unsustainable development. Accordingly, it is necessary for each industry and program to formulate an efficient governance model and pattern in line with its own conditions.

2. MATERIALS AND METHODS

2.1 Key principles and capabilities of program governance

The success of governance in achieving the Sustainable Development Goals is tied to various reasons, and the World Bank emphasizes its implementation. Governance principles are often classified into two categories, as follows [4]:

1. Fundamental principles include: accountability, transparency, efficiency, effectiveness and ethical behavior [5].
2. Supporting principles include: legitimacy, legal security, equality before the law, integrity, oversight and leadership.

The topics of structure, process and mechanism, organizational culture and human resources can be defined as key capabilities of the governance of the program as follows:

1. Structure: Structure includes accountability functions such as executive boards and committees and refers to oversight and strategic decisions and includes: roles and responsibilities, organizational structure, board of directors and CEO, strategy committee [6, 7].
2. Process and mechanism: Processes are components of organizational capability but are not considered equivalent to capability alone [8]. Organizations that design structure and processes in line with key capabilities perform 40% better and include: strategic information systems planning, governance maturity models, active participation and collaboration among key stakeholders, incentives and rewards for participation, interdisciplinary training [9].
3. Organizational culture: It has been introduced as an organizational capability and becomes an organizational capability when the following elements are in place: core values (safety, honesty, customer orientation, innovation) [10], learning culture [11], accountability culture, communication patterns, behavioral norms.
4. Human resources: It has been introduced as organizational capabilities and becomes an organizational capability when the following elements are in place: Skills: expertise and capabilities of individuals, such as knowledge, skills and technical capabilities (example: training expert engineers in projects). Motivation: effective reward systems, ability to attract and retain talents (example: employee stock program). Opportunity creation: empowering structures (example: idea generation culture in companies) [12].

Therefore, having a specific combination of structure, process and mechanism, organizational culture and human resources can be necessary in implementing an efficient governance framework in the organization, which in each organization depends on various potential reserves, different and optimal combinations of these three elements are available. The international standard ISO 26000 in 2010 considers the organizational governance system to consist of two elements, formal governance mechanisms (based on the definition of structure and processes) and informal

² Due to legal issues and confidentiality of information extracted from documents and interviews of the three major petrochemical programs, their real names have been omitted and the letters A, B, and C have been used.

governance mechanisms (related to organizational culture and values, which are often influenced by the people leading the organization) [4].

2.2 Laws and regulations related to the country's interior

Laws and regulations on sustainable development exist in various documents, including the Constitution, general environmental policies, development program laws, and specific environmental laws. The progressive principle of the fifty-year Constitution of the Islamic Republic of Iran, as a solid and supporting document, has a special role and position in environmental protection. Because following this law, specific and detailed laws and regulations were approved in various areas related to the environment. Accordingly, there is a set of environmental law sources, including general and mother laws and specific laws and regulations, which have stipulated, on a temporary (in the form of development program laws) and permanent basis, how to deal with the human and natural environment. In addition to these cases, there is a wide set of twenty international treaties that have also established the international management of some environmental matters, and the Islamic Republic of Iran has ratified almost all of these treaties, and the Environmental Protection Organization is also responsible for following up, implementing, and supervising their implementation as a national authority.

But the most important executive law in this regard is the Development Law, which marked the beginning of structured development planning in Iran and dates back to before the revolution. The Pahlavi government implemented 5 development programs in the country between 1948 and 1977, and after the revolution, 7 programs have been planned and implemented, the focus of which is the economic, social, and cultural development of the Islamic Republic of Iran.

Of course, the general environmental policies announced by the Supreme Leader in 2015 also emphasized this issue. These policies include 15 clauses that emphasize sustainable management of natural resources, pollution reduction, combating climate change, and developing a green economy, and indicate the importance of the issue at the highest level of government.

In particular, the Environmental Protection Organization in 2018 developed a National Sustainable Development Document with the aim of integrating economic and environmental goals. Based on the vision of this document, by 2024, the state of Iran's environment will be improved, so that the natural state of landscapes, ecosystems, living organisms and genetic reserves, vital resources and elements of air, water, soil, and land will be preserved, and humans will enjoy physical and mental health and well-being, sustainable social and economic peace and security, and environmental justice in such an environment.

Other laws and regulations related to the issue are as follows:

2.2.1 Petrochemical Industries Development Law, approved on 10/10/1965

The above law consists of 5 articles, the summary of which is as follows: The National Petrochemical Industries Company, which was established pursuant to Note 64 of the 1343 National Budget Amendment Law, is permitted to participate with Iranian or foreign institutions and companies that have technical and financial qualifications to produce petrochemical products derived from natural gases and other hydrocarbons, and to distribute, sell, transport, and export the aforementioned products. Agreements and contracts concluded for this purpose will be implemented after approval by the Supreme Council of Petrochemical Industries, the General Assembly of the National Oil Company, the Council of Ministers, and the approval of the Joint Committees on Economy and Finance of the two Houses of Parliament. The foreign partner does not have the right to transfer all or part of the shares it holds in the partnership to another party without the prior written consent of the Iranian party. In case of violation of this condition, the

National Petrochemical Industries Company may terminate the contract. The share of the National Petrochemical Industries Company will not be less than fifty percent. Any disputes that arise between the National Petrochemical Industries Company and other parties, if not resolved through friendly negotiations as foreseen in each contract, will be resolved through conciliation and arbitration.

2.2.2 Clean Air Law, approved on 15/07/2017

Articles 11 to 18 of this law deal with the control and management of pollution in industrial units, especially petrochemical programs.

2.2.3 Laws and regulations related to environmental protection abroad

After its emergence in the final decades of the twentieth century, environmental law as a "coherent legal system" quickly underwent remarkable developments that can be seen as the result of a profound transformation in the concepts and the way humans view and deal with nature and the environment. The realities based on this concept gradually made it necessary to approve documents to provide greater and more favorable protection for the environment. Accordingly, the legislative process in this area gained increasing momentum over time and at the same time as the rate of environmental destruction grew. Among them, the following are briefly mentioned:

Regional Protocol for Combating Pollution by Oil and Other Harmful Substances in Emergencies, adopted in 1978:

In order to cooperate in the field of protecting the marine environment against pollution, a protocol with 13 articles and entitled Regional Cooperation for Combating Pollution by Oil, Gas and Other Harmful Substances in Emergencies was concluded in Kuwait in 1357 AH, corresponding to 1978. In short, this protocol is generally about the need for cooperation and assistance of the contracting states in carrying out the necessary operations in emergencies at sea and on the other hand protecting the interests of the contracting states. This text refers to the need to combat, i.e., reduce and prevent pollution and eliminate pollution. The establishment of a mutual assistance center to combat oil pollution and the development of facilities to combat pollution and the distribution of information and the preparation of laws and regulations are among the items foreseen in this protocol.

2.2.4 Islamic Penal Code and Environmental Issues

In the field of environmental issues, there are laws but the enforcement guarantee is low and despite the fines set, the measures taken are not enough. There is no lack of law but unfortunately the enforcement guarantee has not been realized. Today, land planning and strategic assessment, strengthening HSE management, etc. can give the power to control the industry to identify weaknesses. Environmental protection laws guide us towards sustainability and in this regard, traditional solutions and fines must be changed and amended.

2.3 The concept and dimensions of sustainable development

The petrochemical industry can play a significant role in the transition to a carbon-free society [13], as it provides products and technologies used for energy conservation and the utilization of renewable energy. Nearly all renewable energy sources and technologies rely on innovations in chemistry to become more efficient, cost-effective, and practical [14].

In 2015, the United Nations designed a set of goals for all countries to reduce poverty, preserve land, and prosper, which must be met by 2030. Achieving the Sustainable Development Goals requires the combined efforts of governments, the private sector, civil society, institutions, and individuals [15, 16].

In any political system, in addition to economic growth, social and environmental components such as the level of education, the well-being of society and workers, and the increase in the quantitative and qualitative level of life and health must also be measured, and economic development cannot be considered separate from social and environmental dimensions. Because high economic growth or gross domestic product does not in itself guarantee progress and development in a country, because countries that have grown poorer day by day with high economic growth, and even their environment and human rights are declining day by day. The general dimensions of sustainable development are [17]:

1. The social dimension, which includes poverty reduction, changing consumption patterns, demographic changes, providing health and adequate housing, everyone's participation in the development process, paying attention to children, youth and women, the participation of indigenous people in the region, non-governmental organizations, the role of local officials, workers and employees in various fields [18].
2. The environmental dimension also includes preserving the atmosphere, proper use of land, protecting forests, environmental diversity, preserving and managing water resources and toxic chemicals, hazardous waste and wastewater [19].
3. The economic dimension includes a sustainable reduction in energy and natural resource consumption through increased efficiency and economic growth and changing lifestyles [20].

3. RESEARCH BACKGROUND

By showing the effectiveness of governance in creating a balance between the economic, social, and environmental components of sustainable development in 20 selected economies for the period 1996-2014, Omari and Mabrouk (2020) concluded that political and institutional governance positively contributes to the components of sustainable development, and that improving political and institutional governance allows governments in these countries to moderate the negative effects of environmental pollution on economic growth and human development on the one hand, and the positive effect of economic growth on increasing environmental pollution and, consequently, sustainable development on the other [21].

Ramzy et al. (2019) reviewed the two concepts of governance and sustainable development by providing empirical evidence of the success of institutionalizing sustainable development through governance, and showed that achieving sustainable development requires governance, and achieving good governance requires sustainable development. The results of their research indicate that there is a strong relationship between various governance variables and sustainable development variables [22].

Afolabi et al. (2018) in their study have acknowledged that strong adherence and commitment to the rule of law and governance is essential for sustainable development, and the process leading to unsustainable development and underdevelopment is accompanied by the overthrow of due process and the manipulation of existing laws and regulations. The result of this study indicates that in order to reflect sustainable development, there is a need to reorient political leaders towards adherence to the principle of the rule of law and good governance as a foundation for sustainable development in Nigeria [23].

Güney (2017) concludes that governance has a significant and positive impact on sustainable development. This powerful effect exists for all developed and developing countries, and argues that to prevent resource scarcity, they must increase their level of governance to protect welfare. The results show that in both developing and developed countries, the level of sustainable development increases with increasing governance [24].

Dhaoui (2019) concludes in his study titled “Good Governance for Sustainable Development” that governance plays a very important role in the development process and that the institutional dimension is very important for governance and, by creating a suitable environment for the functioning of sustainable development mechanisms, it helps the government to participate in development programs in a specific, efficient and responsible manner [25].

Briguglio (2016) believes that a holistic approach to development is needed to establish a balance between different dimensions of development, which includes social, economic and environmental dimensions, and that sustainable development should aim to achieve social, economic and environmental sustainability goals in addition to economic growth [26].

4. RESEARCH METHODOLOGY

The research type is qualitative and the data analysis method is based on grounded theory, and interviews and questionnaires were used to collect data [27]. The orientation of this research is an applied-developmental orientation that attempts to develop existing theories in the field of governance and sustainable development theories around three programs in the petrochemical industry (programs A, B, and C), and to provide a model for the agents and operators of the petrochemical industry to effectively realize benefits and achieve sustainable development in the programs. Grounded theory is an approach to systematically examine (mostly) qualitative data with the aim of generating a theory [28]. The grounded theory model is shown in Figure 1.

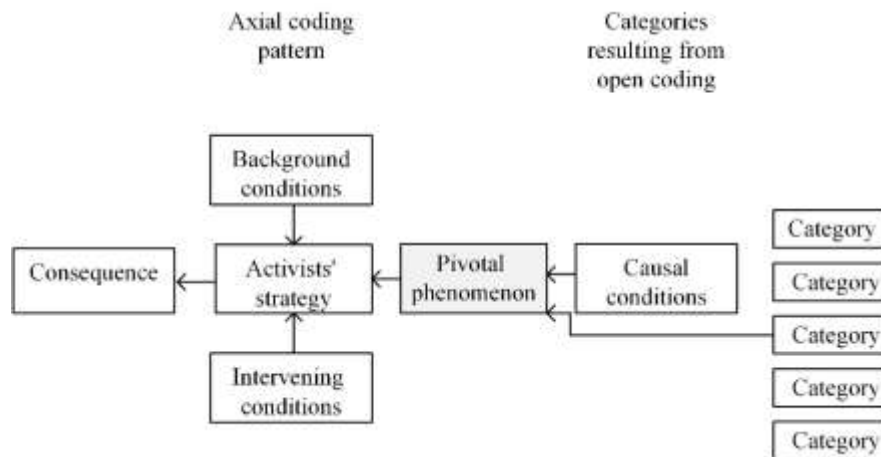


Figure 1: Coding of grounded theory [29]

The stages and activities of conducting the research are also outlined in Figure 2.

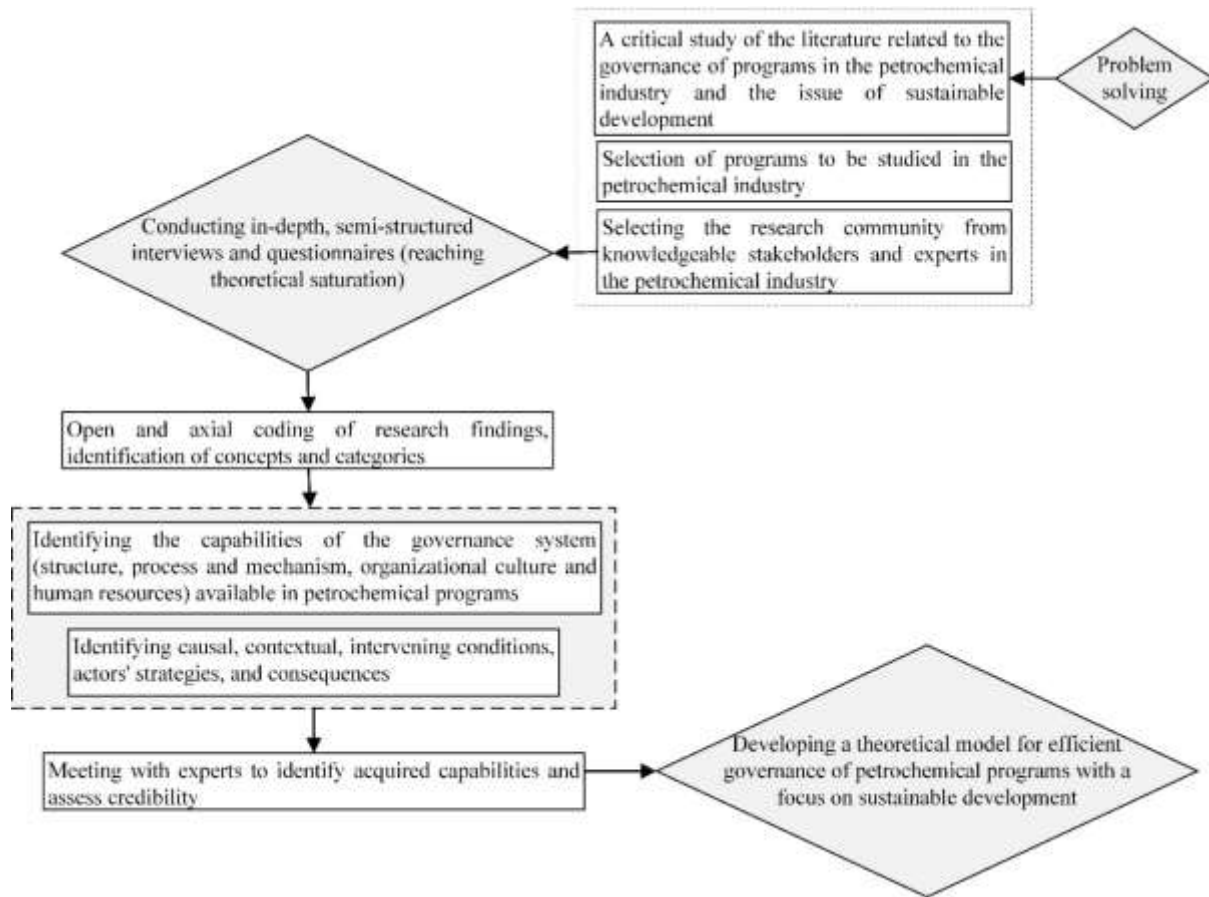


Figure 2: Research steps and activities

Data analysis was conducted using coding. The purpose of coding is to increase the level of abstraction and create concepts that explain more data. In the Strauss and Corbin approach, three stages of open, axial and selective coding are used for data analysis. Open and axial coding are not sequential tasks and dimensions, relationships, density and explanatory power as a theory grow together during the analysis. Therefore, the researcher does not stop coding for the characteristics and dimensions of the discovered categories while forming the connections between concepts [30]. Therefore, the interviewees are from the upper levels of the organization involved in the governance of petrochemical programs, who have the necessary expertise and experience and were selected by the snowball method. The selection criteria for individuals were those who had discipline in the field of program management, program executor, planning manager, program steering committee manager, work experience of more than 10 years, theoretical mastery, practical experience, willingness and ability to participate in the research, and access to them was possible. The interviews continued in one round until no new information was added to the interview (theoretical saturation³); in such a way that repetitions were clearly observed in the interviews from the twenty-sixth interview onwards, and from the thirtieth interview onwards, the information received completely overlapped with the previous information. However, to ensure the theoretical saturation point, the interview stages continued until the thirty-third sample. The demographic characteristics of the research sample are presented in Table 1.

³ "Theoretical saturation is achieved when further data collection and analysis no longer generate new theoretical insights about the categories and their interrelationships" [30].

Table 1: Demographic characteristics of interviewees

Work Experience (Years)			Educational Qualification			Organizational Affiliation (From the body of the company)			Petrochemical Programs
X>20	20>X>15	X<15	PhD	Master's	Bachelor's	contractor company	consulting company	employer company	
3	4	4	3	3	5	2	3	6	Petrochemical (A)
%27	%36	%36	%27	%27	%46	%18	%27	%55	Relative Share
1	5	5	2	3	6	3	3	5	Petrochemical (B)
%8	%46	%46	%18	%27	%55	%27	%27	%46	Relative Share
3	6	3	2	2	7	3	4	4	Petrochemical (C)
%18	%55	%27	%18	%18	%64	%27	%36	%36	Relative Share
33									Total interview

Due to the implementation of a sound and transparent governance structure and the existence of some main disciplines in the programs governance Bord of Director⁴ (BOD) such as: Senior Responsible Owner (SRO), Business Change Manager (BCM), Program Manager (PM) and sub-committees including: Risk Committee, Benefit Realization Committee and Commercial Committee in the programs governance structure, very important and fundamental decisions will be made realistically and with the necessary quality and accuracy, and the outcome of this Program is an efficient governance structure within the framework of achieving social development, economic growth and environmental protection. The capabilities of the governance system in the three petrochemical Programs studied (Programs A, B and C) include structure, process and mechanism, organizational culture and human resources.

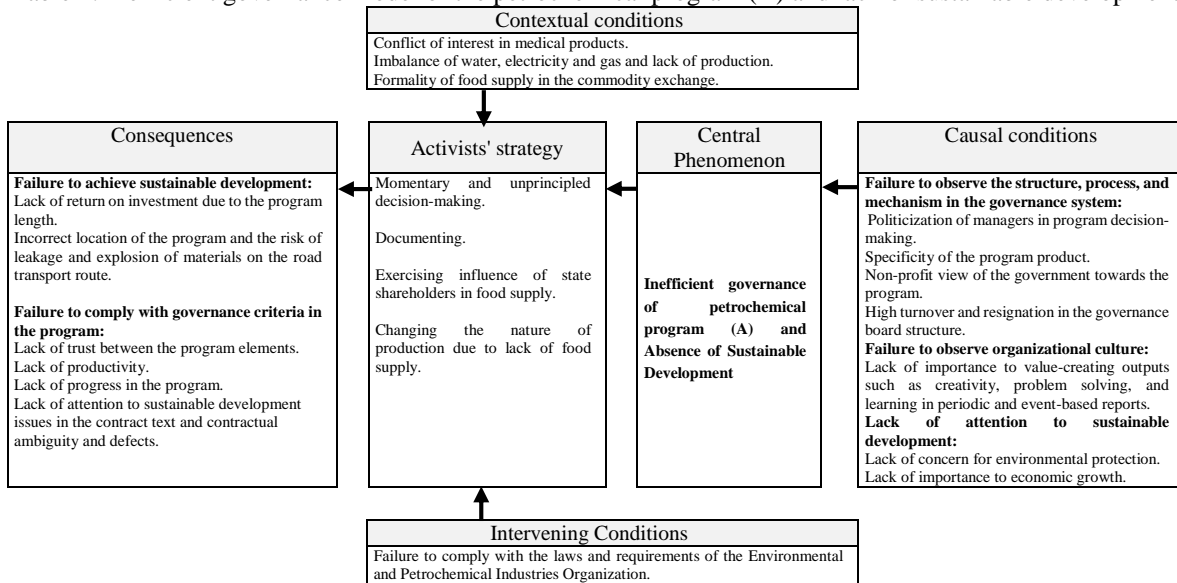
1. RESULTS AND DISCUSSION

Inefficient governance model of petrochemical program (A) with a focus on non-sustainable development

The current governance of petrochemical program (A) has been carried out inefficiently in this program, which is in the life cycle of completion and operation, and is shown in Table 2. Finally, after presenting three models of inefficient governance of all three petrochemical programs (A, B, and C), the final model of inefficient governance of the programs is presented based on a comparative comparison of the three programs, and then the prescriptive pattern is presented as an efficient model of governance with a focus on sustainable development.

⁴ The Program Governance Board is the governing body or BOD with delegated authority to deliver the benefits of the achievement within defined constraints. This group is comprised of senior managers who are accountable to the sponsoring group (through the Senior Accountable Owner as the sponsoring group representative). They are responsible for developing, implementing and maintaining the program strategy and responding to questions from the approach sections of each topic.

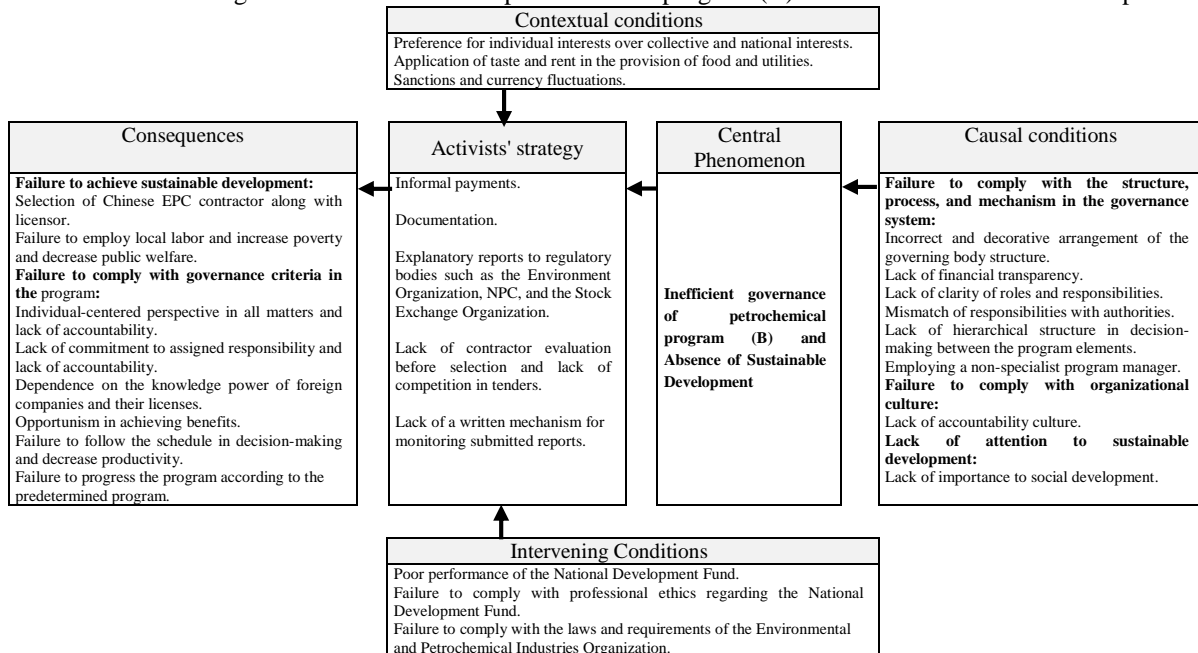
Table 2: Inefficient governance model of the petrochemical program (A) and lack of sustainable development



Inefficient governance model of petrochemical program (B) with a focus on non-sustainable development

The current governance of the Petrochemical program (B) has been implemented inefficiently in this program, which is in the implementation life cycle, and is shown in Table 3.

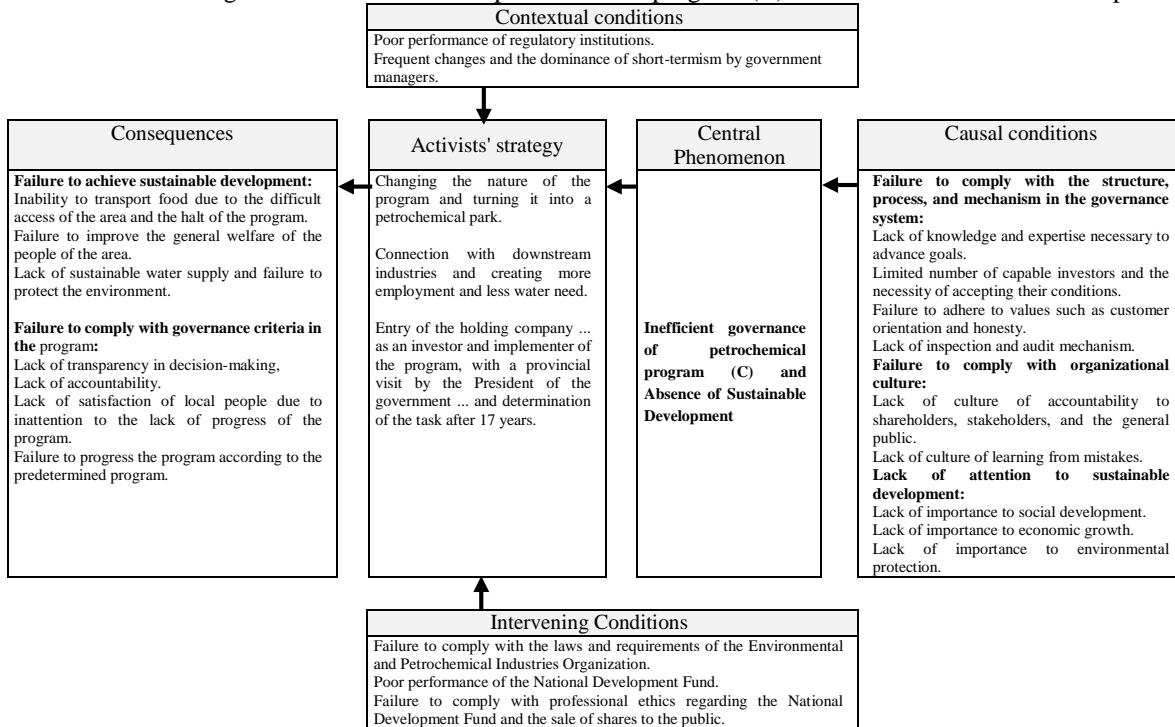
Table 3: Inefficient governance model of the petrochemical program (B) and lack of sustainable development



Inefficient governance model of petrochemical program (C) with a focus on non-sustainable development

The current governance of the petrochemical program (C) is carried out in an inefficient manner in this program, which is defined in the life cycle, and is shown in Table 4.

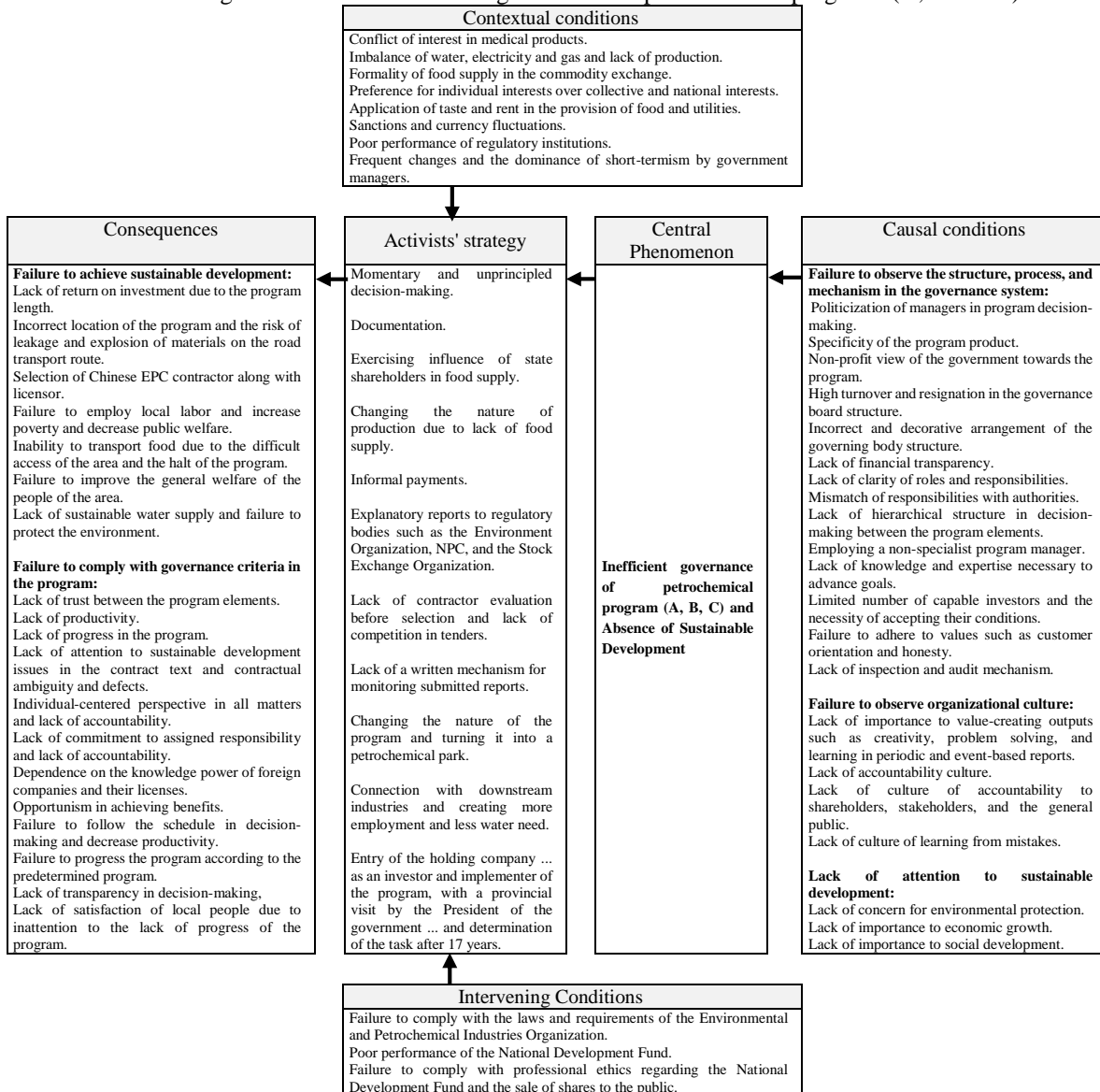
Table 4: Inefficient governance model of the petrochemical program (C) and lack of sustainable development



Integrated model of ineffective governance of petrochemical programs (A, B and C) with a focus on non-sustainable development

The current governance of petrochemical programs (A, B and C) has been carried out inefficiently. Finally, after presenting three models of ineffective governance of all three programs, the final model of ineffective governance of the programs is presented based on a comparative comparison of the three programs in Table 5., and then the prescriptive model is presented as the desired pattern of governance with a focus on sustainable development.

Table 5: Integrated model of ineffective governance of petrochemical programs (A, B and C)



Research findings

Explanation of an integrated model of efficient governance of petrochemical programs (A, B and C) with a focus on sustainable development

After ensuring theoretical saturation and conducting open coding, axial coding and selective coding, first, the components of the model are explained and then the model is explained based on grounded theory.

Causal conditions

These conditions cause the formation of the central phenomenon. These conditions are formed by a set of categories along with their characteristics [31]. The concepts and categories identified related to causal conditions are presented in Table 6.

Table 6: Concepts and categories identified related to causal conditions

Main category	Theme	Final codes		
Causal conditions	Governance Board Structure, Process, and Mechanism	Role Responsibilities and Structure	Frequent changes and resignations in the board structure Political involvement of managers in program decisions Lack of communication with capable investors and the need to accept their conditions Government profiteers' view of the program Lack of financial transparency of shareholders Incorrect and principled arrangement of the board structure Lack of transparency of roles and responsibilities	
		Authority and Accountability Structure	Lack of alignment of responsibilities with authorities	
		Hierarchical structure	Lack of employing expert elements Lack of attention to the knowledge and expertise necessary to advance goals Lack of hierarchical structure in decision-making between program elements	
			Inspection and audit	Lack of inspection and auditing mechanism
			Learning Culture	Emphasis on value-creating outputs such as creativity, problem solving, and learning in periodic and event-based reports
		Organizational culture	Culture of Accountability of	Lack of culture of accountability to stakeholders, beneficiaries, and the general public
	Culture of Learning		Lack of culture of learning from mistakes	
	Sustainable development issues	Economic growth	Lack of ability of the private sector to finance the program on time	
		Social development	Lack of attention to the development of social issues in the program	
		Environmental protection	Lack of attention to environmental protection in the program	

Contextual conditions

Contextual conditions are concepts in which causal factors affect the main phenomenon. These conditions affect the development or limitation of the phenomenon. Contextual conditions in this study, along with the concepts and categories, include those presented in Table 7.

Table 7: Identified concepts and categories related to contextual conditions

Main category	Theme	Final codes
Contextual conditions	Performance of Supervisory Bodies	Poor performance of regulatory institutions Short-term view of government managers on programs
	Managers' Perspective on the Program	Lack of supply of food on the commodity exchange Lack of planning to reduce the impact of sanctions and currency fluctuations
	How the Program is Assigned	Creating situations of conflict of interest Imbalance of water, electricity and gas in the production sector
	The Nature of the Program	Lack of guarantee of food, water and electricity supply

Central Phenomenon

The central phenomenon is the central phenomenon that we explore in the context of this study [32]. Given the purpose of the research, which is to investigate the factors affecting the efficient governance of petrochemical programs, the main phenomenon under study is the efficient governance of petrochemical programs within the framework of laws and sustainable development. Table 8 shows the concepts and categories related to it.

Table 8: Concepts and categories identified related to the central phenomenon

Main category	Theme	Final codes
Central Phenomenon	Failure to Governance petrochemical programs within the framework of laws and sustainable development	Lack of sustainable growth and development within the framework of laws and in the three economic, social, and environmental aspects

Activists' strategy

Strategies indicate what measures, tricks and techniques actors adopt in response to the contexts and conditions they find themselves in. Strategies result from a central phenomenon. Related concepts and categories are listed in Table 9.

Table 9: Identified concepts and categories related to strategies

Main category	Theme	Final codes	
Activists' strategy	Processes in the governance system	Knowledge Management and Learning Process	Providing embellished and unrealistic reports to regulatory bodies such as the Environment Organization, the National Petrochemical Company, and the Stock Exchange Organization
		Decision Making Process	Momentary and unprincipled decision-making
		Conflict management process	Avoiding documentation and creating official reports
	Mechanism in the governance system	Procurement Management Process	Non-transparent and unofficial financial payments
		Communication Management Process	Providing food with an optimistic view
		Stakeholder Management Process	Lack of communication with downstream industries and job creation
		Monitoring and control mechanism	Failure to evaluate contractors before selecting and making tenders competitive
		Lack of a written mechanism to monitor financial statements and reports submitted	

Intervening conditions

The occurrence of intervening factors strengthens or neutralizes the central phenomenon, namely; governance of petrochemical programs within the framework of laws and sustainable development. The final codes, concepts and categories related to intervening conditions were obtained according to Table 10.

Table 10: Identified concepts and categories related to intervening conditions

Main category	Theme	Final codes
Intervening conditions	Professional Ethics	Failure to comply with the principles and foundations of professional ethics and the definition of behavioral guidelines
	Performance	Poor performance of the National Development Fund
	Laws and Requirements	Failure to comply with the laws and requirements of the Environmental and Petrochemical Industries Organization

Consequences

Consequences refer to what effects and outcomes the sum of causal conditions and chosen strategies will lead to? In other words, consequences are the main output of the application of strategies. The concepts and categories related to the consequences resulting from the application of the identified strategies are given in Table 11.

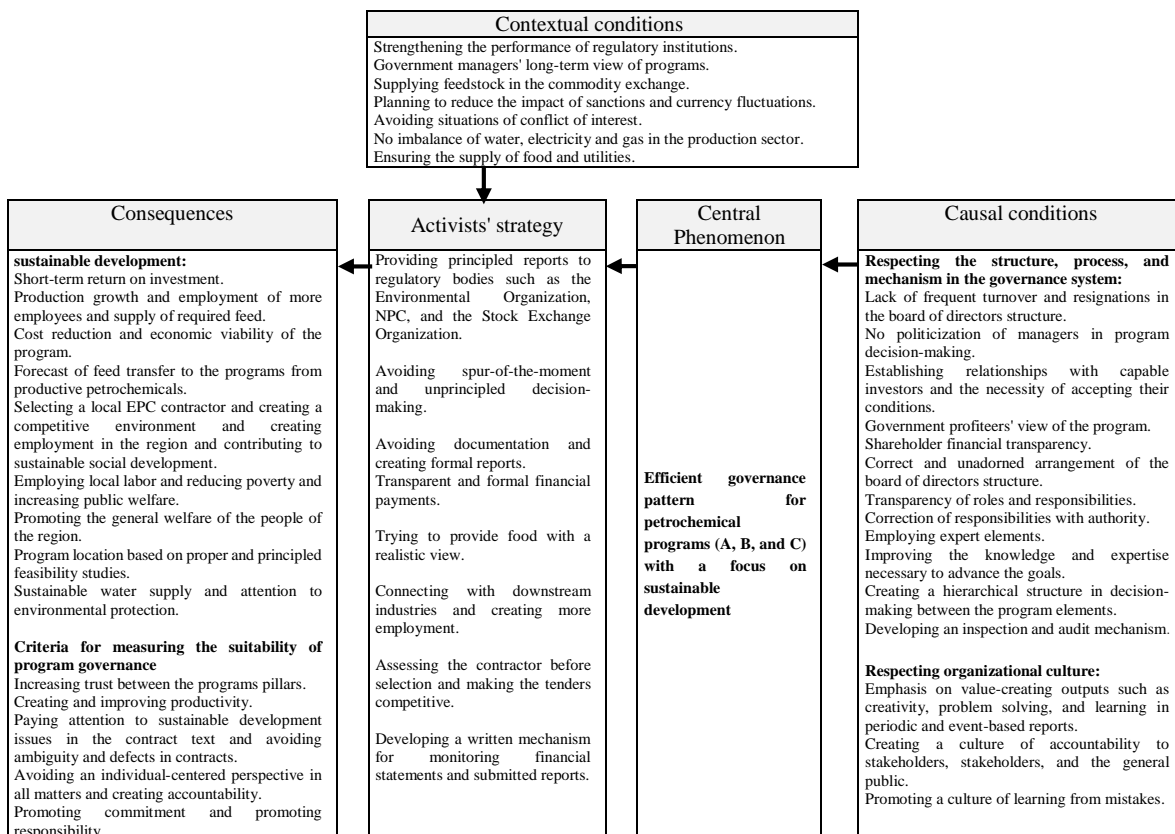
Table 11: Identified concepts and categories related to consequences

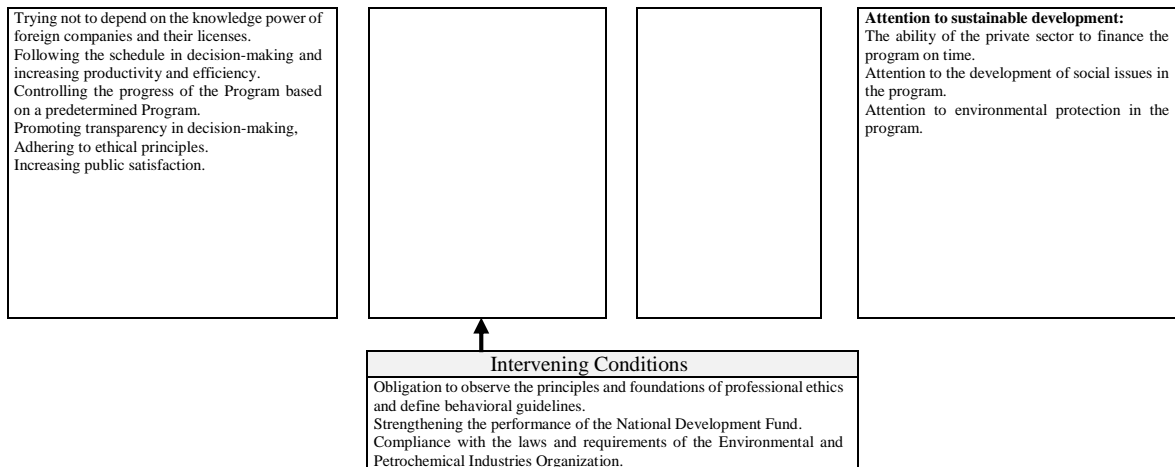
Main category	Theme	Final codes	
Consequences	Sustainable development	Economic growth	Long-term return on investment
			Reduced production growth and employee employment and lack of supply of required feed
			Increasing costs and lack of economic justification for the program
			Failure to predict feed transfer to programs from petrochemical production
			Selecting a Chinese EPC contractor with a licensor
	Social development	Failure to employ local labor and reduce poverty and increase public welfare	

Main category	Theme	Final codes
	Environmental protection	Failure to promote the public welfare of the people of the region Failure to locate the program based on proper and principled feasibility studies Lack of sustainable water supply and attention to environmental protection Lack of trust between the program elements Lack of productivity Lack of attention to sustainable development issues in the contract text and contractual ambiguity and defects. Individual-centered perspective in all matters and lack of accountability Lack of commitment to assigned responsibility and lack of accountability Dependence on the knowledge power of foreign companies and their licenses Failure to follow the schedule in decision-making and decrease productivity Failure to progress the program according to the predetermined program Lack of transparency in decision-making Lack of satisfaction of local people due to inattention to the lack of progress of the program
	Criteria for measuring the suitability of program governance	

After presenting the final model of ineffective governance of programs based on comparative comparison, the prescriptive model is presented as the desired governance model of petrochemical programs (A, B, and C), with a focus on sustainable development as the output of the research process, in Figure 12, and based on the systematic data-based theory.

Table 12: Efficient governance pattern for petrochemical programs (A, B, and C) with a focus on sustainable development





Conclusion

The role of the Environment Organization is to prevent pollutants, and the role of the National Petrochemical Company as an operating entity is to control the environmental aspects of petrochemical production units. Environmental aspects refer to the degree of interaction and programs with environmental conditions and laws, and these laws are not only for the petrochemical industry and all industries must comply with them. All petrochemical programs must obtain an environmental permit before starting work, and they cannot operate until they have a permit, and they must also obtain an operating permit for start-up and operation, and the production supervision unit also controls compliance with environmental laws during the production process. The legal process for petrochemical companies from the perspective of environmental protection is such that all petrochemical complexes have an HSE unit and must receive ISO certification annually, and in March of each year, all petrochemical units are evaluated in terms of environment by the National Petrochemical Company. There are also laws for wastewater, flaring, and waste that must be observed, and there must be a strategic assessment in the field of development, and in addition, attention should be paid to the land use program so that a petrochemical program is not built in every place to reduce the negative impact on nature. New standards must be developed to protect the environment and provide added value and competitive advantage in the global market. Decommissioning polluting units, settling industrial wastewater, disposing of waste materials, conducting environmental research, and also developing green spaces in petrochemical units are among the measures that must be given special attention. Also, the National Petrochemical Company, in order to emphasize the need to protect the environment, must make environmental requirements the focus of its activities and programs. These requirements include environmental laws related to the petrochemical industry, international treaties related to the petrochemical industry, international laws and treaties related to the sea, ports and ships, environmental management requirements in the petrochemical industry, environmental management requirements for water quality, environmental management requirements for waste, environmental requirements for air pollutants, energy management requirements in the petrochemical industry, and environmental management requirements for soil in the petrochemical industry. Only by paying close attention to the above can we say that the governance of the petrochemical industry has taken into account the rule of law and the priority of attention to the environment in its micro and macro programs. After reviewing the literature on the subject of governance, planning and sustainable development, it was determined that in the literature on the

subject, extensive research has not been conducted on the rule of law in petrochemical programs and it is limited to short experiences and there is a knowledge gap in this area.

In research conducted especially in Iran, issues such as the pathology of petrochemical program financing, legal and contractual dimensions and program risk management, and the impact of financing methods on program governance performance have been addressed. However, so far, efforts have not been effective in addressing this need in an efficient and comprehensive manner. In this research, which was conducted using a qualitative method, by interviewing activists in the field of petrochemical programs, the research problem categories were identified and the data obtained were coded and categorized based on the grounded theory method, leading to the final model. So far, less attention has been paid to the issue of governance in the petrochemical industry in relation to the rule of law and sustainable development. Also, by adopting a qualitative and exploratory perspective and using grounded theory methodology with a case study approach, three petrochemical programs in this industry were examined and an attempt was made to present a theoretical model suitable for this industry that would lead to improved performance and towards sustainable development. The achievement of this research can be used as a suitable model for good governance management in petrochemical programs from the perspective of the rule of law and sustainable development.

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