Environmental Assessment of Iran’s Industrial Development Strategic Policies by Strategic Factors Analysis Method (SWOT)

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Abstract: The present investigation deals with the quality of capacity building and institutional strengthening of strategic environmental assessment (SEA) in the industrial sector as well as determining the environmental strategies for industrial sustainable development in Iran. The leading aim of this paper has been to systematize the environmental considerations in industrial development strategies, policies, plans and programs in the highest strategic decision making processes and to ensure environmental considerations and alternatives together with other economic and social considerations in the procedures, before the research processes. In order to analysis of Iran’s industrial development strategies, a matrix method was used as one of the most practical techniques of strategic programing as; SWOT (strengths, weaknesses, opportunities and threats). Eventually the result of SWOT matrix analysis, has been an indicative of the degree of need toward performing SEA in connection with the kinds of the country’s industrial strategies in a categorizing priorities system. As among all the industrial strategic policies, have been screened and evaluated 2 strategies in the first priority and 4 strategies in the second priority. The industrial strategies with the first priority require; suitable capacity building for the formation of developing specialized mother companies in the sake of non-governmental sector development in industrial sector and reaction with foreign companies with the intention of proceeding to international markets and attracting the foreign direct investment. Industrial strategies also require SEA in the second priority including supporting and encouraging strategies for the industrial exports, supporting and improving the supporting constitution of small and medium industries, creating foundations for joining to WTO and decreasing the governmental supervision and restriction in industrial sector. The basis of the results of this study is achieving and realizing the conditions of environmental quality sustainability and industrial development sustainability in Iran calls for policy making and tremendous and strategic decision making on the basis of these strategies in the framework of SEA methodology and in the pre-research phase (policies, plans and programs) as well as performing EIA projects.

Key words: Strategic environmental assessment (SEA) %screening %plan %policy %program, %SWOT matrix

INTRODUCTION

Over the past three decades, there has been a vast application of EIA methodology, considering the effectiveness of this methodology [1]. However, there is still uncertainty about the effectiveness of the results gained by EIA studies, due to the negative environmental consequences caused by applying the policies not based on environmental considerations [2]. This issue has been suggested at the international societies and to solve this problem over the recent years, a strategic environmental assessment methodology has been established as strongly decision support system in the highest levels of policy making in the framework of policies, plans and programs [3]. One of the procedures of the strategic programing process is to identify the
analysis skills in the preparation and setting the programs as well as applying them in the last phase of the mentioned process [4]. Strategic planning has a dynamic process. This kind of planning is going to try for achieving into coming future with providence about existing realities and situations and effective strategies and methods. Strategic planning isn’t a linear process for executing as step by step in an inflexible framework. Strategic planning basis is participating all involved people in defining aims and preparation of action patterns for achieving to the purpose. The strategic environmental assessment process always remains in balance with the sectoral or regional strategic programing process. Eventually, composing common programing or strategic policy making process in Iran and necessities of a strategic environmental assessment is the results of the paper. This study tends to make use of this mentioned approach and method in relation with the Iran’s industrial sector to determine a environmental comprehensive strategy for industrial development. Thus, at the first different types of industrial development strategies in Iran are briefly discussed and analyzed on the basis of SWOT method. This research is carried out in 2002-2004 in Iran.

MATERIALS AND METHODS

The various methods are developed with different applications in strategic management and programing plans, the most important of which include [5]:

C System approach
C Ideal programming
C Delphi method
C Analytical hierarchy process (AHP)
C Multiple criteria decision making (MCDM)
C Strategic factors analysis strategies and matrix method (SWOT)

One of the most appropriate and strategic analysis and programig skills is SWOT matrix (the analysis of the strength and weakness points, opportunities and threats). Nowadays it is used as a new instrument for the analysis of gap condition by the planners and strategic assessors [6, 7]. Due to this reason, it is used in the paper. SWOT matrix is so expanded and is considered as a conceptual framework for the systemic analysis that leads to the inspection of factors and comparison of constraints, threats, damagable aspects, opportunities, demands and external environmental situations as well as the strategic strength and weakness views.

In fact, composing these factors will be on the basis for compiling four kinds of strategies as follows:

1. SO = Composing strengths-opportunities
2. ST = Composing strengths-threats
3. WO = Composing weaknesses-opportunities
4. WT = Composing weaknesses-threats

These strategies can make the strategic choices framework possible for the strategic auditing [8]. The mentioned strategies are designed and performed will be based on the external environment analysis (threats, constraints, damagable factors, demands and opportunities) and internal environment (weaknesses and strengths). The application of the mentioned skills in different countries has proved the potentialities and capabilities of the innovative and effective SEA approach as one of the most qualified of strategic auditing skills [9-11].

RESULTS

The study research aims is to enjoy the SEA approach in connection with future industrial development strategies in Iran. Therefore in accordance with this objective, four strategic policies have been applied:


According to accomplished investigations, the aims of Iran’s industrial development based on strategic policies of the country are summarized in the following 10 objects:

1. Suitable capacity building for the rapid economic growth, developing general welfare and developing per capita income
2. Increasing added worth in industrial sector
3. Economic and industrial self sufficient
4. Achieving to knowledge of optimized management system in industrial institutions and nationalizing it’s process
5. Developing industrial export and effective presence in regional and global markets
6. Fundamental strengthening sustainable competitive space (economic competition) in industrial sector.
7. Promoting the usage, quality and profitability in industrial institution
8. Optimizing, innovating and developing industrial technologies
9. Sustaining environmental quality and regional equilibrium in industrial sector
10. Increasing the country share in global industrial and economic reactions system

The types of Iran's industrial development strategies and scenarios based on the country's strategic policies also are consisting of the following 15 strategies:

1. Creating and spread use of new industries and industrial modern technologies containing electronic and it's subsectors, biotechnology, high technology (HT), nanotechnology and etc.
2. Assembling specialization rapid formation conditions in industries' upper and lower industries having relative advantage such as oil, gas and petrochemistry and creating the competitive advantage among machinery industries, process control systems, digging and mining equipments on the one hand and on the other hand, chemical industries
3. Renewing, stabilizing and methodical integration and minimizing regional-economic difficulties resulting natural or compulsory reducing full grown industries missing sustainable competitive power such as leather, textile and some nourishment majors
4. Decreasing governmental supervision and restriction in industrial sector (developing industrial privatization)
5. Physical, legal and institutional capacity building for joining to WTO and fundamental globalization of the country's industrial economic
6. Redistribution and ranking industrial areas in Iran and following industrial development of the country's spatial development system (Land use)
7. Reaction with foreign companies with the intention of proceeding to international markets and attracting the foreign direct investment in industrial sector
8. Supporting, improving and strengthening the supporting institutions of small and medium industries with the priority of private and cooperative sectors
9. Designing, creating and developing the supporting and encouraging actions for industrial export in the framework of Iran's commerce policies
10. Designing, improving and optimizing the institutional abilities and improving legal structure of industrial sector for realizing development activities, organizing and economic competitive
11. Suitable capacity building for formation of developing specialized mother companies in the sake of non-governmental sector development in industrial sector
12. Improving, developing and strengthening ICT and it's outputs in industrial sector for the sake of stakeholders and job creators access to required information
13. Increasing use, improving industrial institutions management and converging the supporting activities of production chain such as research and development, designing and engineering, marketing and sale
14. Using and developing financial-nominal modern processes and strengthening the developed and specialized banks for industrial development
15. Renewing and modernizing the country's industries

According to the methodology of strategic factors analysis method (SWOT) and recognizing opportunities, threats, strengths and weaknesses resulting external and internal effective factors on development aims of industrial sector in Iran, at the first, each of effective factors have been identified as follows:

External effective factors on industrial sector, consisting:

C Political factors, containing:
   C Views of political parties
   C Foreign policy (International relations)
   C Aggravating international terrorism
   C Regional political status
   C America's political declaring against Iran

C Economic factors, containing:
   C Tariff constraints
   C Vacillations of foreign exchange rate
   C Limitation of financial sources (budget)
   C Increasing economic inflation rate
   C Joining Iran to world trade organization (WTO)
   C International economic reaction in Iran

C Social factors, containing:
   C Increasing employment demand
   C Increasing the migration rate
   C Improving the living system and house income sources
Quality of governmental and private sector reaction
Existing motivating in work environment
Implementing and improving the businesses classification plan
Developing the worker formations

Technologic factors, containing:
Technologic positioning
Developing the research and development system
Access level to modern technologies
Existing usage level in production process
Level of existing technical and professional skills and trainings
Amortization of technology in the country
ICT development level in the country
Existing status of transportation system in the country

Environmental factors, containing:
Effectiveness level of existing environmental laws, regulations and legislations
Environmental constraints and limitations in the country's areas
Environmental capabilities in the country's areas
Level of clean and compatible technologies with the environment
Usage level of environmental activities, approaches and procedures

Internal effective factors on industrial sector, consisting:
Existing industrial investment rate
Industrial products pricing system
Industrial products market
Existing tariff constraints for industrial products

Technologic factors, containing:
Access level to industrial modern technologies
Developing the research and development system in industrial sector
Existing use level in industrial production process
Industrial production rate in existing status
Industrial wastes production and wasting rate in existing status

Amortization of industrial technologies in the country
Social factors, containing:
Increasing the occupying human power in industrial sector
Current use rate of expert and specialist human power
Existing provocations in industrial privatization system
Creating employment opportunities status in industrial sector

Environmental factors, containing:
Aggravating environmental effects and impacts in industrial sector
Increasing consumption amount of environmental resources
Level of existing industrial technologies compatible with the environment
Usage level of environmental activities, approaches and procedures

According to factors obtained, opportunities and threats matrix resulting external effective factors and strengths and weaknesses matrix resulting internal effective factorson industrial sector development aims in Iran, have been arranged in the Tables 1 and 2.

DISCUSSION

In the sake of SWOT matrix foundations establishment for analysing all strategic factors (opportunities, Threats, Strengths and weaknesses) in developing the industrial sector in Iran, four levels of strategies are considered as follows:

Industrial development strategies based on SO strategy:
This strategy is narrative of the most desired condition in each position in SWOT matrix toward this ideal state, relying on which all the strengths, advantages and qualifications can be used to maximize the opportunities and demands. Among 15 industrial development strategies in Iran, the following 3 strategies are conformed with this strategies as:

Increasing use, improving industrial institution management and converging the supporting activities of production chain work such as research and development, designing and engineering, marketing and sale
Table 1: Opportunities and threats matrix resulting external effective factors on industrial sector development aims in Iran

<table>
<thead>
<tr>
<th>Industrial development aims in Iran</th>
<th>External effective factors of industrial sector</th>
<th>Political factors</th>
<th>Economic factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Political factors</td>
<td>Economic factors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Views of political parties</td>
<td>Foreign policy (International relations)</td>
<td>Aggravating international terrorism</td>
</tr>
<tr>
<td>Capacity building for the rapid economic growth, developing general welfare and developing per capita income</td>
<td>O O T T T T</td>
<td>T T T T O O</td>
<td></td>
</tr>
<tr>
<td>Increasing added worth in industrial sector</td>
<td>O O T T T T</td>
<td>O T T T O O O</td>
<td></td>
</tr>
<tr>
<td>Economic and industrial self sufficient</td>
<td>O O T O O O O</td>
<td>O T T T O O O</td>
<td></td>
</tr>
<tr>
<td>Achieving knowledge of optimized management system in industrial institutions and nationalizing its process</td>
<td>O O T T T T T T O O O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing industrial export and effective presence in regional and global markets</td>
<td>O O T O T T T T T O O O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundamental strengthening sustainable competitive space (economic competition) in industrial sector</td>
<td>O O T T T T T T O O O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promoting the usage, quality and profitability in industrial institution</td>
<td>O O T T T T T T O O O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimizing, innovating and developing industrial technologies</td>
<td>O O T T T T T T O O O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustaining environmental quality and regional equilibrium in industrial sector</td>
<td>T T T T T T T T O T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increasing the country share in global industrial and economic reactions system</td>
<td>O O T T T T T T O O O</td>
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</tbody>
</table>

Table 1: Opportunities and threats matrix resulting external effective factors on industrial sector development aims in Iran (Continued)

<table>
<thead>
<tr>
<th>Industrial development aims</th>
<th>External effective factors of industrial sector</th>
<th>Social factors</th>
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<tbody>
<tr>
<td></td>
<td>Increasing employment demand</td>
<td>Increasing the migration rate</td>
</tr>
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<td></td>
<td>Improving the living system and house income source</td>
<td>Quality of governmental and private sector reaction</td>
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<td>Existing motivating in work environment</td>
<td>Implementing and improving the businesses classification plan</td>
</tr>
<tr>
<td></td>
<td>Developing the worker formations</td>
<td></td>
</tr>
<tr>
<td>Capacity building for the rapid economic growth, developing general welfare and developing per capita income</td>
<td>T T</td>
<td>O O T T</td>
</tr>
<tr>
<td>Increasing added worth in industrial sector</td>
<td>T T</td>
<td>O O T O T</td>
</tr>
<tr>
<td>Economic and industrial self sufficient</td>
<td>T T</td>
<td>O O T O T</td>
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<td>O O T O T</td>
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<td>T T</td>
<td>O O T O T</td>
</tr>
<tr>
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<td>T T</td>
<td>O O T O T</td>
</tr>
<tr>
<td>Increasing the country share in global industrial and economic reactions system</td>
<td>T T</td>
<td>O O T O T</td>
</tr>
</tbody>
</table>

O = Opportunity    T = Threat
<table>
<thead>
<tr>
<th>Industrial development aims</th>
<th>Technologic factors</th>
<th>Environmental factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity building for the rapid economic growth, developing general welfare and developing per capita income</td>
<td>T O T T T T T T</td>
<td>T T O T T T T T T</td>
</tr>
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</tr>
<tr>
<td>Optimizing, innovating and developing industrial technologies</td>
<td>T O T T T T T T</td>
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<td>Sustaining environmental quality and regional equilibrium in industrial sector</td>
<td>O O T T T T T T</td>
<td>T T O T T T T T T</td>
</tr>
<tr>
<td>Increasing the country share in global industrial and economic reactions system</td>
<td>T O T T T T T T</td>
<td>T T O T T T T T T</td>
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</tbody>
</table>

O = Opportunity T = Threat
### Table 2: Strengths and weaknesses matrix resulting internal effective factors on industrial sector development aims in Iran

<table>
<thead>
<tr>
<th>Internal effective factors of industrial sector</th>
<th>Economic factors</th>
<th>Technologic factors</th>
<th>Social factors</th>
<th>Environmental factors</th>
<th>Level of existing industrial technologies compatible with the environment</th>
<th>Usage level of environmental activities, approaches and procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity building for the rapid economic growth, developing general welfare and developing per capita income</td>
<td>W3</td>
<td>W2</td>
<td>W3</td>
<td>S1</td>
<td>W3</td>
<td>W2</td>
</tr>
<tr>
<td>Increasing added worth in industrial sector</td>
<td>W2</td>
<td>W3</td>
<td>W2</td>
<td>W2</td>
<td>W2</td>
<td>S1</td>
</tr>
<tr>
<td>Economic and industrial self sufficient</td>
<td>W4</td>
<td>W3</td>
<td>W4</td>
<td>S2</td>
<td>W4</td>
<td>S3</td>
</tr>
<tr>
<td>Achieving knowledge of optimized management system in industrial institutions and nationalizing its process</td>
<td>W2</td>
<td>W2</td>
<td>W5</td>
<td>W3</td>
<td>W5</td>
<td>S1</td>
</tr>
<tr>
<td>Developing industrial export and effective presence in regional and global markets</td>
<td>W3</td>
<td>W2</td>
<td>W3</td>
<td>W2</td>
<td>W5</td>
<td>S1</td>
</tr>
<tr>
<td>Fundamental strengthening sustainable competitive space (economic competition) in industrial sector</td>
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<td>W3</td>
<td>W3</td>
<td>S2</td>
<td>W2</td>
<td>S2</td>
</tr>
<tr>
<td>Promoting the usage, quality and profitability in industrial institution.</td>
<td>W2</td>
<td>W4</td>
<td>W4</td>
<td>S3</td>
<td>W4</td>
<td>S1</td>
</tr>
<tr>
<td>Optimizing, innovating and developing industrial technologies</td>
<td>W2</td>
<td>W3</td>
<td>W4</td>
<td>S2</td>
<td>W3</td>
<td>S1</td>
</tr>
<tr>
<td>Sustaining environmental quality and regional equilibrium in industrial sector</td>
<td>W1</td>
<td>W2</td>
<td>W2</td>
<td>S1</td>
<td>W3</td>
<td>S2</td>
</tr>
<tr>
<td>Increasing the country share in global industrial and economic reactions system</td>
<td>W3</td>
<td>W2</td>
<td>W4</td>
<td>W3</td>
<td>W5</td>
<td>S1</td>
</tr>
</tbody>
</table>

S = Strengths      W = Weaknesses

Continued...
C Improving, developing and strengthening ICT and its outputs in industrial sector for the sake of stakeholders and job creators access to required information

C Redistribution and ranking industrial areas in Iran and following the industrial development of the country's spatial development system (Land use)

**Industrial development strategies based on ST strategy:**
The aim of this strategy is to have the maximum use of the strengths and intersectoral advantages to confront the constraintive conditions, threats and external (environmental) distractivs and also to minimize them. Among the 15 industrial development strategies, the most strategies (6 strategies) are related to this strategy include:

C Using and developing financial-nominal modern processes and strengthening the developed and specialized banks for industrial development

C Designing, improving and optimizing the institutional abilities and improving legal structure of industrial sector for realizing development activities, organizing and economic competitive

C Creating and spread use of new industries and industrial modern technologies containing electronic and it's subsectors, biotechnology, high technology (HT), nanotechnology and etc

C Renewing and modernizing the country's industries

C Assembling specialization rapid formation conditions in industries, s upper and lower industries having relative advantage such as oil, gas and petrochemistry and creating the competitive advantage among machinery industries, process control systems, digging and mining equipments on the one hand and on the other hand, chemical industries

C Renewing, stabilizing and methodical integration and minimizing regional-economic difficulties resulting natural or compulsory reducing full grown industries missing sustainable competitive power such as leather, textile and some nourishment majors

**Industrial development strategies based on WO strategy:**
The objective of this strategy is to diminish and minimize the weaknesses and damagable aspects and to maximize the opportunities and demands. Among industrial development strategies in Iran, the following 4 strategies are classified among these strategies:

C Suitable capacity building for formation of developing specialized mother companies in the sake of non-governmental sector development in industrial sector

C Reaction with foreign companies with the intention of proceeding to interational markes and attracthng the foreign direct investment in industrial sector

According to these data obtained, Iran's industrial development scenarios and strategies SWOT matrix from the point of view of opportunities, threats, strengths and weaknesses based on 4 mentioned strategies (SO, ST, WO, WT) are shown in Table 3. With attention to the point that the objective of this part of the study has been identifying the need level enjoying a new approach for Strategic Environmental Assessment in connection with Iran's industrial development policies, it can be claimed that having the more tendency from SO strategy toward WT strategy, the less the environmental considerations are considered in the high strategic levels and decision making.

Therefore, the stresses about environmental aspects, consequences of the presented policies, objectives and approaches increase. It is worth mentioning that the claim can be made upon the results for application of SWOT matrix method for screening and...
identifying the SO, ST, WO, WT strategic levels. Because of the present conditions in Iran, the existing problems regarding the fundamental application of policies and determining role of restrictions and strategic hindering obstacles and the real place of environment issue in Iran's policy making system, SEA qualified approach is practiced for the following industrial development strategies and in accordance with screening investigations.

The first priority required to SEA:

C Suitable capacity building for formation of developing specialized mother companies in the sake of non-governmental sector development in industrial sector

C Reaction with foreign companies with the intention of proceeding to international markets and attracting the foreign direct investment in industrial sector
The second priority of need to SEA:

C Designing, creating and developing the supporting and encouraging actions for industrial export in the framework of Iran's commerce policies

C Supporting, improving and strengthening the supporting institutions of small and medium industries with the priority of private and cooperative sectors

C Physical, legal and institutional capacity building for joining to WTO and fundamental globalization of the country's industrial economic

C Decreasing governmental supervision and restriction in industrial sector (developing industrial privatization)

The result of the carried out studies through the strategic factors analysis method, reports that the strategic environmental assessment studies are needed to be accomplished in the phase of policy making of policies, plans and programs and also there should be environmental impact assessment in the level of the projects. The probability of different environmental effects as a result of executing 8 level industrial strategies with the first priority and 4 level strategies with the second priority in Iran provide more evidence for what is concluded: No need to mention that only in these conditions, achievement of environmental quality sustainability conditions as well as industrial development sustainability can be expected in Iran.

REFERENCES


