

# Prioritize Strategies Appropriate to the Present Conditions of Sericulture Industry in Iran

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## ABSTRACT

Sericulture has a long background in Iran and this industry has played an important role in Iranian economy and culture. Challenges ahead of this industry and attention to its role in economic development, increasing income, increasing occupation, helping with rural economy and Make strategy development essential. The present research is an applied one because of its goal, which is determining appropriate strategies for Iranian sericulture industry in order to revive and develop this industry. In the present research, documents and evidence were gathered and internal/external environmental parameters influencing on sericulture industry were identified in the form of weak points/strengths and threats/opportunities. Questionnaire and interview were used to ask 62 experts and validity and reliability were tested. The gathered data were analyzed by PASW statistics 18 software. Results of SWOT matrix showed that Iranian silk and sericulture industry are at defensive position. results of evaluating appropriate strategies corresponding to the present position of sericulture industry using QSPM showed that diversification strategy and development of silk products strategy, maintaining sericulture industry by developing carpet industry and maintaining the present position by developing agriculture sector are the most appropriate strategies for releasing this industry from the present position.

**KEYWORDS:** strategy, mission, weak points and strengths, opportunity and threat, sericulture

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## INTRODUCTION

Agriculture is an important sector of economy due to its vital role in human life and it is very important to pay attention to this sector in developing countries where most people work in this sector and their lives are dependent on agriculture [9]. In developing countries, economic activities are generally based upon agriculture. Therefore, such countries have relative advantage in agricultural production [17]. However, agricultural production and its sub-category products are among the most risky economic activities. There are many risks before and after supplying agricultural products to markets that threaten this sector. These risks include: variations of agricultural material prices, unsteadiness of agricultural products price in internal and international market, unsteady state policies in relation to some products, banking system obstacles ahead of making loans to producers, natural risks like weather unfavorable conditions, pests, diseases and so on [11]. It is therefore necessary to try to reduce agriculture sector risks through determining and adopting appropriate strategies. It is obvious that such strategies are adopted by governments in order to achieve special goals in internal and external markets of agricultural products [18]. Incidentally, adopting appropriate strategies and determining agricultural sector policies involves awareness of production conditions in agricultural units and marketing methods and it also depends on decision-makers understanding of farmers' decision process and their responds to various agricultural policies [7].

### Statement of the problem

Sericulture is among very old crafts which has undergone numerous variations over the years. Silk has been present during the several-thousand-years-old life of this land and even in some periods, it has been the economical pivot of this country. This profession has also existed in many other countries and mainly Asian countries and it has been an important income route. Although sericulture has been considered as a peripheral activity, it is possible to increase its production with technology development in an ordinary climatic condition. However, it is possible to turn it into a main income-gaining activity in villages with favorable climatic conditions due to Mulberry growth rate and ease of raising silkworm. Therefore, its right development proportional to climatic conditions of different regions can be a convenient program in removing some parts of economic and social problems especially providing silk-rich countries with currency needs [13].

In the recent years, sericulture has faced a recession in Iran. This is not due to lack of capabilities of this country but it can be attributed to some problems that has challenged Iranian silk and sericulture industry like some other agricultural subcategories. Furthermore, independence of decision-making elements in supply, production and distribution chains and lack of consideration with respect to its harms to sericulture industry and lack of systematic viewpoint has put this activity ahead of risky ups and downs [14].

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Hence, adopting favorable strategies in order to optimize and reduce independent policies seems inevitable. Adopting appropriate policies especially state support policies in different forms and application of suitable tactics can both maintain the present circumstances and develop this old activity. On the other hand, defining outputs other than carpet, like producing silk cloths, entering hygienic, pharmaceutical and food industries through producing silk powder and things like that can revive this industry.

The present research tries to determine and select appropriate strategy for Iranian silk and sericulture industry from among the existing strategies that lead to this industry's revivification and studies parameters influencing on this industry and introduces the most important strategies that best suit the current conditions of this industry.

## **LITERATURE REVIEW**

In the recent years, attention to strategy concept and comprehensive or strategic programming has increased and this kind of planning has been introduced as the only route to efficiency and effectivity for managers [2]. Many definitions have been proposed for strategy which looks at this concept from different angles. Strategy can be defined from its different aspects or its forming process can be explained or its role in organizations success can be clarified. Although these definitions seem different, all of them refer to one concept [15].

One definition for strategy is that strategy is a comprehensive and unit plan or template that helps an organization with achieving its goals through utilizing efficient human force, clear and precise methods, effective styles, appropriate tools and other resources [20].

From organizational point of view, strategy is a variable business template and necessary goal and executive direction for achieving organization's goals [19]. In other words, strategy discusses the way of achieving long-term goals in a competitive environment [1].

From functional point of view, strategy is the application of material and non-material resources to achieving steady competitive advantages. From fundamental philosophy viewpoint, strategy means on-time (before competitor) identification of customers needs and its satisfaction (better than competitor). From process point of view, strategy is the creation of distinctive competencies in an organization for creating value (more than competitor). Strategic management approach is determination, implementation and evaluation of strategy within organization [15].

In its simple meaning, a Strategic plan is an exercise for clarifying the fact that what the organization tries to achieve and what are the suggestions for improving that [5]. In other words, strategic planning is the process of continuous and complex organizational change [24]. Another definition for strategic planning is that it is a systematic method which supports strategic management. This method involves all measures that result in definition of goals and determination of suitable strategies for achieving organizational goals [3]. In a general conception, strategic planning is a process in which organizations analyze their internal and external environments and form strategies based on that analysis which helps organizations achieve their goals. This kind of planning emphasizes on organization and environment's mutual trading and tries to create an appropriate and logical relationship between these two factors. Therefore, in such a kind of planning, various factors that affect environment and also the relationships between them and their potential impacts on the organization are considered. Strategic planning utilizes a especial framework for determining organizational competencies [21]. Framework of strategic planning involves analysis of the present situation, formulating strategies and executive planning. Starting point in strategic planning is evaluating the present condition. This starting point is important because it indicates the starting point for system design operations and presents an organizational self-awareness from previous investments. Evaluation of the present condition is conducted from different aspects. First, an organization's environmental situation is evaluated and competitive situation along with benefits and competencies (strengths/weaknesses analyses) are gathered. On the other hand, organization's missions and goals are defined. Then, strategic options are suggested, possible happenings are evaluated, and market assessment and measurements are prepared. At the fourth step, strategies and goals are determined and substitutes are provided [21].

There are many models or different templates for strategic planning. One of the most important models is David's model for strategic planning. This model was introduced by David in 1994 which is more comprehensive than other models. In fact, this model has 3 basic steps for strategic planning: Formulation, implementation and evaluation or control. By the way, each of these steps involves taking some steps. Figure 1 illustrates the three mentioned steps of David's strategic planning template.

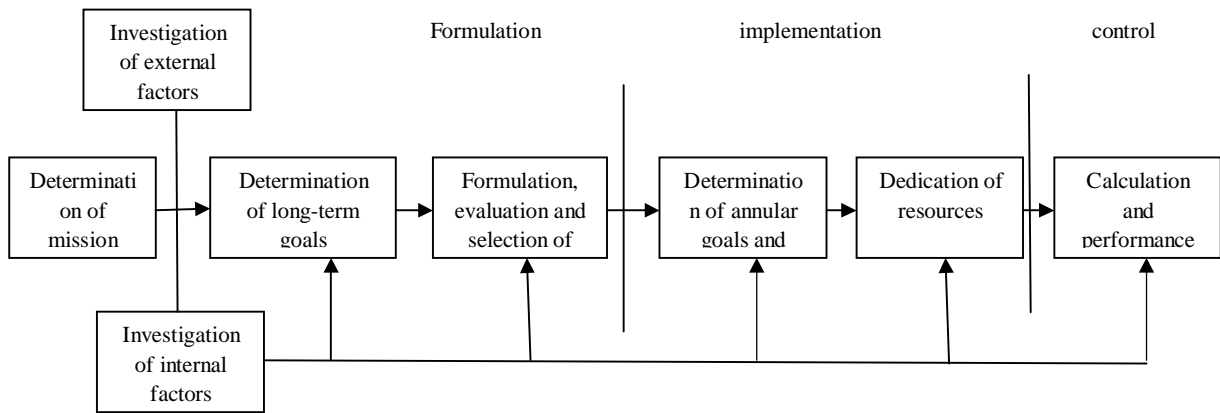


Figure 1. Comprehensive template for strategic management [16]

In formulation stage, the following steps are taken:

- 1) The present goals, missions and strategies of the organization are studied in detail.
- 2) Important external factors including opportunities (O) and threats (T) in economic, social, technological, political, legal, international, customers, competitors and suppliers aspects are determined (EFE matrix).
- 3) Important and effective internal environment including strengths (S) and weak points (W) in different aspects like organization and management, marketing, finance, accounting, production and operation, R&D, information systems and human resources are determined (Matrix IFE).

**Research background**

Most scientific studies in the field of sericulture and silk industry in Iran and other spots of the world have paid little attention to the investigation of policies affectivity, except for studies that have referred to governments policies in silk-rich countries generally, or those studies that have addressed silkworm Eugenic, mulberry and so on. No research has been conducted to specifically address strategy selection in sericulture industry but some studies have been conducted to deal with sericulture activities planning in order to develop and enhance this industry. However, some relatively similar studies were found after searching internet and documents that follow.

Seidavi (2000) investigated Iranian sericulture industry and showed that development of this industry is dependent on creating infrastructure with state sector support and especially creation and strengthening of sericulture cooperative companies in the regions that are suitable for developing this industry [12].

Pourhosein et al (2003) investigated silkworm raising in different regions in Iran and found that silkworm raisers face a great many of problems and in most cases, they lack enough basic information and knowledge to utilize all potentials and capacities in this sector and that state sector should remove these challenges by adopting supporting policies especially developing technical knowledge [4].

Results of the research conducted by Guilan Province Inspection Organization (2003) showed that the government can adopt appropriate policies and therefore play an important role in strengthening sericulture industry and removing cocoon producers' challenges [10].

Chuprayoon (2005) investigated sericulture industry in Thailand revealed that government policies in relation to silk has three main axes: a) development of sericulture for farmers' occupation b) maintenance of Thailand silk as a national capital c) development of silk production to satisfy internal need without being dependent on import [22].

Charmchian Langroudi et al (2000) investigated silkworm raising as a strategy for reviving Iranian silkworm production in a research titled: "the role of developing sericulture in order to revive cocoon production in Iran". They concluded that skilled human resource is necessary for increasing demand and production. Increasing human resource education in people level will increase scientific production of silk. This research tried to increase women and men information, education, marketing, technology transfer, groups' formation, long-distance education and scientific methods and showed that sericulture development can be concentrated in a wide range of areas in Iran [6].

Rahi (1390) in a research titled "investigation of influence of government support policies on Guilan Province sericulture activity", studied 5 state support policies in Guilan as the centre of sericulture in Iran: a) assigning subsidy to eugenic mulberry sapling and price of silkworm distributive hybrid seed F1 b) purchase of wet cocoon from silkworm raisers with guaranteed price c) insurance of silkworm raising d) granting credit to construction and renewal of cocoon barn or place of silkworm raising e) education and development of sericulture. Results showed that individuals with different ages, experiences and education levels raise silkworm and receive different level of support. Furthermore, the average income of silkworm raisers who received support policies was more than average income of those who did not receive support policies. However, there

was no significant difference between the two groups' average point in two variables bank credit granting and education of sericulture. Investigation of correlation between dependent and independent variables showed that there was significant relationship between some of the individual characteristics of silkworm raisers and receiving support policies [8].

Nguyen.L& Eiligman. A (2010) in a research titled " study of sericulture chain in Vietnam", investigated this chain within the framework of a common program titled "green production and commerce in order to increase income and occupational opportunities for villagers", which was led by International Trade Center, on 4800 poor farmers in 4 north-Vietnamese provinces and listed the strengths/weak points, opportunities/threats in sericulture industry using SWOT for each of the provinces. Results of the research showed that Training Need Analysis is necessary for facilitating and improving activities related to farmers, spinners and weavers education. By the way, creation of an information system for farmers with updated prices of market (absence of asymmetric prices), production of new mulberry tree varieties with higher efficiency (which can be done through research centers support) and facilitation of e-commerce through establishing center for development and spread of handicrafts in Vietnam for developing production of Brocade fabric and Featured silk flowers... can be helpful [23].

## RESEARCH TOOL AND METHODOLOGY

The present research is an applied study from research type viewpoint and it is a survey research from data gathering point of view (using questionnaire). Statistical population of this research included 62 experts, specialists and commentators of sericulture industry in Iran whose opinions were used in this research. Data was gathered both through documents review and field study. Documents review was used to gather information in order to determine goals, population determination, research methodology and generalities and background which were conducted through studying books, theses, research plans, papers, statistics letters, and formal reports and so on. Field method was utilized to gather information using survey method along with direct interview. In order to assure the questionnaire validity, several questionnaires were given to 10 experts, statistics specialists and Iranian silkworm raising stock company employees and some amendments were implemented. In order to investigate reliability, the designed questionnaire was distributed among 15 experts accidentally and Chronbach's alpha was calculated 0.824 by means of Statistics 18 PASW which is an acceptable value for reliability coefficient. Strengths/weak points and opportunities/threats in sericulture industry were evaluated by means of SWOT matrix and selection of the most important strategies corresponding to the existing situation of this industry was conducted by means of quantitative strategic planning matrix (QSPM).

## RESULTS ANALYSIS AND CONCLUSION

Results of evaluating internal and external factors listed in tables 1, 2 and 3 and figure 1 show that Iranian sericulture industry is in "defensive" condition at the moment. In other words, weak points and threats of this industry are more effective than the strengths and opportunities at the present time. WT Strategies are appropriate for this situation and Iranian silkworm Stock company which is the governing institute in sericulture industry should try to reduce weak points and avoid threats in order to get out of the present conditions.

Table 1: external factors evaluation matrix (EFE)

| External factors   |  | coefficient | point | Final point |
|--|--|-------------|-------|-------------|
| opportunities  | Appropriate climatic conditions for planting mulberry tree all over the country  | 0.04        | 3     | 0.12        |
|  | Appropriate climatic conditions for raising silkworm all over the country  | 0.04        | 4     | 0.16        |
|  | Favorable temporal situation for raising silkworm in view of other agricultural products cultivation time  | 0.07        | 3     | 0.21        |
|  | Favorable conditions for families work force occupation  | 0.03        | 4     | 0.12        |
|  | No need for large investments in comparison with some activities in agriculture sector   | 0.05        | 3     | 0.15        |
|  | Directing low-interest state loans and credits towards sericulture development through development of planting eugenic mulberry trees and constructing new units and renewal of existing units | 0.02        | 3     | 0.06        |
|  | Possibility of increasing silk seed in Iran in case of developing silkworm raising   | 0.07        | 4     | 0.28        |
|  | Carpet and Textile Weaving industries need to produced silk thread in Iran   | 0.05        | 4     | 0.2         |
|  | Presence of numerous carpet weaving and other silk material workshops  | 0.05        | 3     | 0.15        |
|  | Possibility of increasing variety in silk products   | 0.05        | 3     | 0.06        |
| threats  | Possibility of exploiting novel products like pharmaceutical, hygienic, food and ... industries.   | 0.02        | 3     | 0.1         |
|  | Increase in plot price and shortage of water and soil supply   | 0.05        | 2     | 0.1         |
|  | Cost-effectiveness of competitor activities like Poplar cultivation  | 0.05        | 2     | 0.1         |
|  | Increase in worker cost  | 0.05        | 1     | 0.05        |
|  | Increase in silkworm raisers age and youths reluctance to do sericulture   | 0.04        | 1     | 0.04        |
|  | Low income of cocoon selling price in Iran in comparison to life current costs   | 0.04        | 2     | 0.08        |
|  | Low global price of cocoon and silk thread and its impact on internal markets  | 0.04        | 2     | 0.08        |
|  | Import of silk cocoon and thread with unfair tariffs and its impact on internal products   | 0.05        | 1     | 0.05        |
|  | Decrease in the share of Iranian silk carpet export in global market due to the presence of new competitors  | 0.05        | 1     | 0.05        |
|  | Lack of processing industries and production of silk products  | 0.03        | 1     | 0.03        |
| Low consumption of silk products inside the country  | 0.06   | 2           | 0.12  |             |
| Lack of coordination between industry and trade sector and agriculture sector related to sericulture | 0.01   | 1           | 0.01  |             |
| Weak presence of scientific centers at solving Iranian sericulture industry problems                 | 0.02   | 1           | 0.02  |             |
| Lack of attention to bio-technologic knowledge and production of new products                        | 0.02   | 1           | 0.02  |             |
| <b>sum</b>   |  | <b>1</b>    |       | <b>2.41</b> |

Table 2. internal factors evaluation matrix (IFE)

|   | Internal factors  | coefficient                                     | point | Final points |
|---|---|---|-------|--------------|
| strengths   | Background and Antiquity of sericulture industry  | 0.04  | 4     | 0.16         |
|   | Experience and familiarity of silkworm raisers with sericulture   | 0.05  | 3     | 0.15         |
|   | Possibility of utilization of cocoon barns for other purposes in seasons that silkworm is not raised  | 0.01  | 3     | 0.03         |
|   | Possibility of producing eugenic mulberry saplings proportional to different climatic conditions in Iran and their raising at the side of farms in order to develop mulberry orchards | 0.06  | 3     | 0.18         |
|   | Appropriate background education to farmers to introduce new methods  | 0.03  | 3     | 0.09         |
|   | Possibility of designing equipment considering various climatic conditions  | 0.02  | 3     | 0.06         |
|   | Granting low-interest loans in order to renew equipment and installations   | 0.02  | 3     | 0.06         |
|   | Having technical knowledge for producing silk seed  | 0.02  | 4     | 0.08         |
|   | Self-sufficiency in producing silk seed and mulberry sapling  | 0.06  | 4     | 0.24         |
|   | Possibility of transferring technical knowledge of producing silk seed to private sector  | 0.02  | 3     | 0.06         |
|   | Ability to export silk seed and mulberry sapling  | 0.06  | 3     | 0.18         |
|   | Presence of research centre for silkworm eugenics and mulberry sapling inside the country   | 0.02  | 4     | 0.08         |
|   | Possibility of adjusting cocoon market through eliminating brokers  | 0.06  | 3     | 0.06         |
|   | Need of some export products like carpet to silk thread produced in Iran  | 0.06  | 4     | 0.24         |
|   | weaknesses  | Traditional system of cocoon production in Iran | 0.06  | 1            |
| nativeness and oldness of most present mulberry orchards and their low productivity from qualitative and quantitative point of view   |   | 0.06  | 1     | 0.06         |
| Inappropriate places for silkworm raising and lack of environmental control conditions and provisions of raising standards            |   | 0.04  | 2     | 0.12         |
| Low production of qualitative and quantitative production of wet cocoon   |   | 0.04  | 1     | 0.04         |
| Lack of cost-effectiveness of cocoon production due to low capacities of production   |   | 0.02  | 1     | 0.02         |
| Failure of development part in encouraging farmers to observe technical points  |   | 0.04  | 1     | 0.04         |
| Obligation to sell wet cocoon within a short period due to its rotting possibility and lack of access to cocoon drying equipment      |   | 0.05  | 2     | 0.1          |
| Dependence of some of sericulture industry activities on state system and its failure in economic competition                         |   | 0.02  | 1     | 0.02         |
| dispersion of state institutes that are connected with sericulture industry and lack of coordination between the mentioned institutes |   | 0.06  | 2     | 0.12         |
| Absence of cooperatives and powerful institutes for supporting sericulture producers  |   | 0.03  | 2     | 0.06         |
| Lack of enough credit in order to produce eugenic mulberry sapling and development of new mulberry orchard                            |   | 0.02  | 1     | 0.02         |
| Shortage of bank credits and loans for installing appropriate technical places  |   | 0.03  | 1     | 0.03         |
| Inappropriate equipment and poor installations concerning drying wet cocoon   |   | 0.02  | 2     | 0.04         |
|   |   | <b>sum</b>                                      | 1     | 2.4          |

Graph 1. 4-square internal and external factors matrix

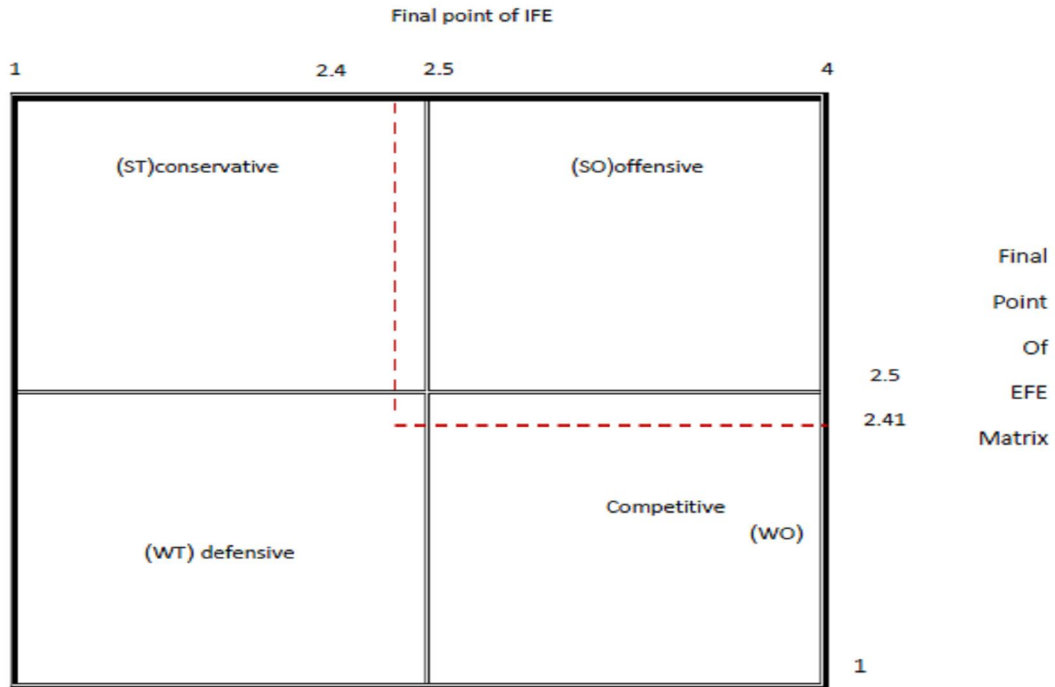


Table 3. SWOT matrix

|  |   |  |
|--|---|--|
| <b>Weak points</b><br>1) traditional cocoon production system in Iran<br>2) ...<br>.<br>.<br>13) inappropriate installations and equipment related to Drying cocoon  | <b>Strengths(S)</b><br>1) antiquity and background of sericulture<br>2) experience and familiarity of farmers with sericulture<br>.<br>.<br>14) need of some export products especially carpet to silk thread produced in Iran  | <b>IFE</b>   |
| <b>Conservative strategy(WO)</b><br>1) support for institutes in order to coordinate them in silk and cocoon production<br>2) identification of regions suitable for silkworm raising an supporting them<br>3) development of sericulture and related industries through assigning credit and loan | <b>Offensive strategy(SO)</b><br>1) support for construction and development of mulberry orchards and planting mulberry trees in marginal farmlands<br>2) development of sericulture in villages as an economic activity (S1, S2, S5, O1, O2, O6)<br>3) substitution of import need of carpet and textile weaving industry to silk and thread through internal production | <b>EFE</b><br><b>Opportunities (O)</b><br>1) favorable climatic conditions for planting mulberry tree in different spots of Iran<br>2) favorable climatic conditions for raising silkworm in different regions of the country<br>.<br>.<br>11) possibility of production of novel products |
| <b>Defensive strategy (WT)</b><br>1) maintaining the current condition through agriculture sector<br>2) maintaining sericulture industry with the aid of carpet industry<br>3) diversification and increase in silk products production  | <b>Competitive strategy(ST)</b><br>1) development of mulberry orchards through increasing productivity and reducing costs<br>2) making cocoon production economical through reducing costs and increasing production factors productivity<br>3) adjusting internal market of cocoon and silk  | <b>Threats(T)</b><br>1) increase in land price and restrictions for water and soil supply<br>2) cost-effectiveness of competitor activities like planting spruce and ...<br>.<br>.<br>13) lack of attention to bio-technologic knowledge and production of new products                    |

Furthermore, the results of evaluating appropriate strategies corresponding to the present conditions of sericulture industry in Iran using QSPM (Tables 4 and 5) show that priority of the 3 select strategies are diversification and development of silk products production, maintaining sericulture industry based on carpet industry carpet industry and maintaining the present conditions with the help of agriculture sector, respectively. Incidentally, the first and third strategies seem to be affected mostly by external factors than internal factors and the second strategy seem to be affected by internal factors with respect to other factors, therefore, these strategies should be put into action based on their priority in order to get released from the present condition of sericulture industry and attention must be paid to internal and external factors influence on the mentioned strategies.

Table 4. Qualitative strategic planning matrix (QSPM)

| parameters       | coefficient   | First strategy             |       | Second strategy            |       | Third strategy             |       |      |
|------------------|---|----------------------------|-------|----------------------------|-------|----------------------------|-------|------|
|                  |   | Attractiveness coefficient | point | Attractiveness coefficient | point | Attractiveness coefficient | point |      |
| <b>strengths</b> |   |                            |       |                            |       |                            |       |      |
| <b>S1</b>        | Background and antiquity of sericulture industry  | 0.04                       | 4     | 0.016                      | 4     | 0.16                       | 4     | 0.16 |
| <b>S2</b>        | Experience and familiarity of silkworm raisers with sericulture   | 0.05                       | 4     | 0.2                        | 2     | 0.1                        | 4     | 0.2  |
| <b>S3</b>        | Possibility of utilization of cocoon barns for other purposes in seasons that silkworm is not raised  | 0.01                       | 3     | 0.03                       | 2     | 0.02                       | 3     | 0.03 |
| <b>S4</b>        | Possibility of producing eugenic mulberry saplings proportional to different climatic conditions in Iran and their raising at the side of farms in order to develop mulberry orchards | 0.06                       | 4     | 0.24                       | 3     | 0.18                       | 4     | .024 |
| <b>S5</b>        | Appropriate background education to farmers to introduce new methods  | 0.03                       | 4     | 0.12                       | 2     | 0.06                       | 4     | 0.12 |
| <b>S6</b>        | Possibility of designing equipment considering various climatic conditions  | 0.02                       | 3     | 0.06                       | 4     | 0.08                       | 4     | 0.08 |
| <b>S7</b>        | Granting low-interest loans in order to renew equipment and installations   | 0.02                       | 4     | 0.08                       | 4     | 0.08                       | 4     | 0.08 |
| <b>S8</b>        | Having technical knowledge for producing silk seed  | 0.02                       | 4     | 0.08                       | 3     | 0.06                       | 3     | 0.06 |
| <b>S9</b>        | Self-sufficiency in   | 0.06                       | 4     | 0.24                       | 3     | 0.18                       | 4     | 0.24 |

|                      |   |      |   |       |   |      |   |      |
|----------------------|---|------|---|-------|---|------|---|------|
|                      | producing silk seed and mulberry sapling  |      |   |       |   |      |   |      |
| <b>S10</b>           | Possibility of transferring technical knowledge of producing silk seed to private sector  | 0.02 | 3 | 0.06  | 4 | 0.08 | 4 | 0.08 |
| <b>S11</b>           | Ability to export silk seed and mulberry sapling  | 0.06 | 3 | 0.18  | 4 | 0.24 | 4 | 0.24 |
| <b>S12</b>           | Presence of research centre for silkworm eugenics and mulberry sapling inside the country   | 0.02 | 4 | 0.08  | 4 | 0.08 | 4 | 0.08 |
| <b>S13</b>           | Possibility of cocoon market adjustment through eliminating brokers   | 0.02 | 3 | 0.06  | 4 | 0.08 | 4 | 0.24 |
| <b>S14</b>           | Need of some export products like carpet to silk thread produced in Iran  | 0.06 | 3 | 0.18  | 4 | 0.24 | 4 | 0.08 |
| <b>weaknesses</b>    |   |      |   |       |   |      |   |      |
| <b>W1</b>            | Traditional system of cocoon production in Iran   | 0.06 | 1 | 0.06  | 1 | 0.06 | 1 | 0.06 |
| <b>W2</b>            | nativeness and oldness of most present mulberry orchards and their low productivity from qualitative and quantitative point of view | 0.06 | 1 | 0.06  | 1 | 0.06 | 1 | 0.06 |
| <b>W3</b>            | Inappropriate places for silkworm raising and lack of environmental control conditions and provisions of raising standards          | 0.06 | 1 | 0.06  | 2 | 0.12 | 1 | 0.06 |
| <b>W4</b>            | Low production of qualitative and quantitative production of wet cocoon   | 0.04 | 2 | 0.08  | 2 | 0.08 | 1 | 0.04 |
| <b>W5</b>            | Lack of cost-effectiveness of cocoon production due to low capacities of production   | 0.02 | 1 | 0.02  | 2 | 0.04 | 1 | 0.02 |
| <b>W6</b>            | Failure of development part in encouraging farmers to observe technical points  | 0.04 | 2 | 0.08  | 2 | 0.08 | 1 | 0.04 |
| <b>W7</b>            | Traditional system of cocoon production in Iran   | 0.05 | 1 | 0.05  | 2 | 0.1  | 2 | 0.1  |
| <b>W8</b>            | nativeness and oldness of most present mulberry orchards and their low productivity from qualitative and quantitative point of view | 0.02 | 2 | 0.04  | 2 | 0.04 | 1 | 0.02 |
| <b>W9</b>            | Inappropriate places for silkworm raising and lack of environmental control conditions and provisions of raising standards          | 0.06 | 1 | 0.06  | 2 | 0.12 | 1 | 0.06 |
| <b>W10</b>           | Low production of qualitative and quantitative production of wet cocoon   | 0.03 | 1 | 0.03  | 2 | 0.06 | 1 | 0.03 |
| <b>W11</b>           | Lack of cost-effectiveness of cocoon production due to low capacities of production   | 0.02 | 1 | 0.02  | 2 | 0.04 | 2 | 0.04 |
| <b>W12</b>           | Failure of development part in encouraging farmers to observe technical points  | 0.03 | 2 | 0.06  | 3 | 0.09 | 1 | 0.03 |
| <b>W13</b>           | Inappropriate equipment and poor installations concerning drying wet cocoon   | 0.02 | 2 | 0.04  | 2 | 0.04 | 3 | 0.06 |
| <b>sum</b>           |   | 1    |   |       |   |      |   |      |
| <b>opportunities</b> |   |      |   |       |   |      |   |      |
| <b>O1</b>            | Appropriate climatic conditions for planting mulberry tree all over the country   | 0.04 | 4 | 0.016 | 3 | 0.12 | 4 | 0.16 |
| <b>O2</b>            | Appropriate climatic conditions for raising   | 0.04 | 4 | 0.16  | 3 | 0.12 | 4 | 0.16 |

|            |  |      |   |      |   |      |   |      |
|------------|--|------|---|------|---|------|---|------|
|            | silkworm all over the country  |      |   |      |   |      |   |      |
| <b>O3</b>  | Favorable temporal situation for raising silkworm in view of other agricultural products cultivation time  | 0.07 | 4 | 0.28 | 3 | 0.21 | 4 | 0.28 |
| <b>O4</b>  | Favorable conditions for families work force occupation  | 0.03 | 4 | 0.12 | 2 | 0.06 | 4 | 0.12 |
| <b>O5</b>  | No need for large investments in comparison with some activities in agriculture sector   | 0.05 | 4 | 0.2  | 3 | 0.15 | 4 | 0.2  |
| <b>O6</b>  | Directing low-interest state loans and credits towards sericulture development through development of planting eugenic mulberry trees and constructing new units and renewal of existing units | 0.02 | 3 | 0.06 | 3 | 0.06 | 4 | 0.08 |
| <b>O7</b>  | Possibility of increasing silk seed in Iran in case of developing silkworm raising   | 0.07 | 4 | 0.28 | 3 | 0.21 | 4 | 0.28 |
| <b>O8</b>  | Carpet and textile weaving industries need to produced silk thread in Iran   | 0.05 | 3 | 0.15 | 4 | 0.2  | 4 | 0.2  |
| <b>O9</b>  | Presence of numerous carpet weaving and other silk material workshops  | 0.05 | 3 | 0.15 | 4 | 0.2  | 4 | 0.2  |
| <b>O10</b> | Possibility of increasing variety in silk products   | 0.05 | 3 | 0.15 | 4 | 0.2  | 4 | 0.2  |
| <b>O11</b> | Possibility of exploiting novel products like pharmaceutical, hygienic, food and ... industries.   | 0.02 | 2 | 0.04 | 4 | 0.08 | 3 | 0.06 |
|            | <b>threats</b>   |      |   |      |   |      |   |      |
| <b>T1</b>  | Increase in plot price and shortage of water and soil supply   | 0.05 | 1 | 0.05 | 1 | 0.05 | 2 | 0.1  |
| <b>T2</b>  | Cost-effectiveness of competitor activities like spruce cultivation and ...  | 0.05 | 2 | 0.1  | 2 | 0    | 2 | 0.1  |
| <b>T3</b>  | Increase in worker cost  | 0.05 | 1 | 0.05 | 2 | 0.1  | 2 | 0.1  |
| <b>T4</b>  | Increase in silkworm raisers age and youths reluctance to do sericulture   | 0.04 | 1 | 0.04 | 2 | 0.08 | 2 | 0.08 |
| <b>T5</b>  | Low income of cocoon selling price in Iran in comparison to life current costs   | 0.04 | 2 | 0.08 | 1 | 0.04 | 2 | 0.08 |
| <b>T6</b>  | Low global price of cocoon and silk thread and its impact on internal markets  | 0.04 | 1 | 0.04 | 2 | 0.08 | 2 | 0.08 |
| <b>T7</b>  | Import of cocoon and silk thread with unfair tariffs and its impact on internal products   | 0.05 | 1 | 0.05 | 3 | 0.15 | 3 | 0.15 |
| <b>T8</b>  | Decrease in the share of Iranian silk carpet export in global market due to the presence of new competitors  | 0.05 | 2 | 0.1  | 2 | 0.1  | 1 | 0.05 |
| <b>T9</b>  | Lack of processing industry and production of silk products  | 0.03 | 2 | 0.06 | 1 | 0.03 | 1 | 0.03 |
| <b>T10</b> | Low consumption of silk products inside the country  | 0.06 | 2 | 0.12 | 1 | 0.06 | 1 | 0.06 |
| <b>T11</b> | Lack of coordination between industry and trade sector and agriculture sector related to sericulture   | 0.01 | 2 | 0.02 | 2 | 0.02 | 1 | 0.01 |
| <b>T12</b> | Weak presence of scientific centers at solving Iranian sericulture industry  | 0.02 | 1 | 0.02 | 1 | 0.02 | 1 | 0.02 |



|            |   |      |   |      |   |      |   |      |
|------------|---|------|---|------|---|------|---|------|
|            | problems  |      |   |      |   |      |   |      |
| <b>T13</b> | Lack of attention to bio-technologic knowledge and production of new products | 0.02 | 2 | 0.04 | 2 | 0.04 | 2 | 0.04 |
|            | <b>sum</b>  | 1    |   |      |   |      |   |      |
|            | <b>Sum of attractiveness points</b>   |      |   | 4.95 |   | 5.05 |   | 5.39 |

Table 5. Prioritization of the most important strategies appropriate for Iranian sericulture industry at the present conditions

| priority | strategy  | Internal factors evaluation point | external factors evaluation point | Points sum |
|----------|---|-----------------------------------|-----------------------------------|------------|
| 1        | Diversification and development of silk products production       | 2.55                              | 2.84                              | 5.39       |
| 2        | Maintaining sericulture industry with the help of carpet industry | 2.57                              | 2.48                              | 5.05       |
| 3        | Maintaining the present condition with the help of agriculture    | 2.43                              | 2.52                              | 4.95       |

In analyzing the selection, prioritization and execution of the mentioned strategies, we can refer to the continuous nature of sericulture and silk industry. This process this process consists of keeping genetic reserves and eugenics of varieties of silkworm and mulberry tree, production and distribution of silk seed hybrid, production of wet cocoon and its supply to market, drying wet cocoon, storage and its supply to market, production of various types of silk thread, and production of carpet and other silk products and this fact places this industry among high-importance chain value information systems from potential and actual capabilities. It must be mentioned that, the output of activities in this agricultural section in Iran has not received enough attention in consumption and has been always regarded as inlet part of industry and industrial workshops and on the other hand, different strategies cannot be designed for this industry because the number of families doing sericulture activities is limited and the number of industrial factories active in this section and volume of production and added value in this section are small. Therefore, the strategies mentioned above were selected and evaluated based on all discussions above.

Considering the strategy of maintaining the present conditions using agriculture sector, operational plans for fulfilling strategic goals based on investment in eugenics and maintaining silkworm reserves and mulberry trees, encouragement of private sector to entre mass production of commercial silks seed (hybrid) and farmers to produce wet cocoon with economic approach, creation of income and occupation based on investment and state supports, if required, is carried out. This viewpoint can help with fulfilling strategies of maintaining and gradual development of sericulture in short- and long-term period through quantifying the present potentials and providing necessary infrastructure. On the other hand, if the output of sericulture activities in agriculture sector is evaluated with state support policies, considering the 44<sup>th</sup> principle of Iranian Constitution and other concerning rules, there will be no guarantee for steadiness of these policies. In addition, it seems that if the costs arisen from support policies of the government are spent on industries related to output of sericulture sector, agriculture sector's ability will increase in maintaining and developing sericulture with providing more appropriate capacities. The accuracy of this viewpoint can be verified in relation to the attractiveness of each of the above-mentioned strategies based on the present documents. Therefore, it can be expected that dependence on the strategy of maintaining sericulture industry through carpet industry can keep and develop sericulture activities gradually in the short- and average term and in the long run, diversification of peripheral productions and industries can be helpful in fulfilling strategic goals in order to maintain, revive and develop sericulture and silk industries. It seems that diversification of silk products and their development in qualitative and quantitative dimensions can release sericulture output from monopoly of consumption.

**Recommendations**

1. it is better to set appropriate tariffs and regulate cocoon and silk import and prevent their import from different routes by getting necessary licenses from agricultural Jihad Ministry.
2. as determining select strategies is pivoted around decreasing weak points, it is better to assign credit to development of free of charge production and distribution of eugenic mulberry saplings and therefore substitute the old ones with new ones. It is also recommended that multi-purpose cocoon barns be designed which can be used in other activities like keeping livestock, storing agricultural crops and return on investment will happen faster using such cocoon barns. Such cocoon barns can be designed using low-interest bank loans and under the inspection of experts.
3. structural changes can be conducted in methods of raising silkworm, producing silk thread ۹ cocoon and their mechanization in order to facilitate different stages of the process, increase in production volume, reduction in costs and therefore increase in profits and income and in other words, spending lower energy and time and receiving higher efficiency and providing suitable patterns for sericulture producers in order to complete this industry's cycle, from raising silkworm and producing cocoon to silk products like carpet, scarf, handicrafts and so on in villages to increase products added value and receive a higher economical efficiency.

4. it is recommended comprehensive state supports be considered for creating and developing silk-related industries like spinning industry, textile weaving, carpet weaving, handicrafts and so on. Provision of necessary infrastructure and support policies to increase production and export silk products by means of export subsidy, tax exemptions and ... in order to increase motivation for investing in silk and sericulture industry and its development seem important.
5. it is necessary to conduct studies in the field of sericulture industry in order to execute diversification strategy and develop silk products. This will help with finding new various outputs for sericulture industry and using novel and advanced technologies in Iran like other countries that have new technologies.

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