

# **The Study of Industrial Clusters Performance in Islamic Republic of Iran (The Case Study of Yazd Textile Industrial Cluster)**

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## **Abstract**

Today, since industrial clusters affect the organizational competitiveness both national and international levels and introduces a new perspective towards the location of business establishment, most countries use industrial cluster development strategy.

Industrial clusters have been also considered in Iran and the industries adapted to and coordinated with the mentioned approach have tried to locate their business at the better conditions of competition and market gain within the country, region and throughout the world. In this article, at first industrial cluster, its advantages and disadvantages have been defined, and then, the history of industry and industrial cluster of Yazd province and Yazd Textile Cluster performance examination tools and at the end, the strengths, weaknesses, opportunities and threats Yazd Textile Cluster have been investigated.

**Keywords:** Textile industrial cluster, strength, weaknesses, opportunities & threats (SWOT), YAZD

## **Introduction**

All countries hope to achieve increasingly developments which grow fast. Nowadays many developed countries are using strategy of industrial clusters development because they influence the competitiveness of industrial clusters in the country as well as beyond national borders and show new ways of thinking about the place of dealing and earning. Industrial clusters influence competition through increasing of productivity based on settlement of companies and providing quick guidelines for development and innovation and encouraging of new business. Recently this method in Iran attracted many attentions based on industries compatible with mentioned method which attempts to provide a better and competitive market place for the country, region and the world.

A new approach proposed nowadays in the discussions of regional and industrial development is that different regions depending on, natural, human and organizational advantages or available industrial should pay serious attention to the development of a limited number of

industrial clusters and facilitate different dimensions for organization of clusters. In these situations they can be successful in international markets and hold more valuable sectors of related goods from their value chain and they can reform or reconstruct existing structures against world problems.

## **Industrial Cluster Definition**

Using various definitions provided by the thinkers, industrial clusters can be defined a set of correlated firms, professional suppliers, service providers, the firms consisting of dependent industries, and interconnected institutions each one of which is linked to another one to save the added value supply. This set works in a common field, is concentrated in a certain geographic area, is able to synergy, and has created the possibility to use external savings and has common challenges and opportunities.

Forming industrial clusters has many advantages, a number of which are mentioned below:

- Regional economic growth and encouragement of more investment in the region
- More effective cooperation between public and private sector
- Improvement of efficiency and increase of productivity in small and medium enterprises
- Development of adaptability and flexibility in small and medium enterprises in the fields of product, market, technology, management and organization considering trade liberalization across the world and economic globalization
- Possibility to achieve criterion-driven interests, market knowledge, local interaction-dependent innovation and technological progress
- Make the education endogenous, development of new skills, professional and efficient division of labor, use of external savings, reduction of transaction costs, elimination or reduction of market entry restriction
- Easier and faster access to suppliers of raw materials, services, specialist human resources
- Economic justification of establishing and strengthening service and support centers in various areas such as marketing, reference laboratories, technical and financial and consultations ...
- Proportion to indigenous social structures
- The most appropriate development path
- Facilitation of the developmental process

## **Shortcomings of Industrial Clusters**

- They fail to act properly if there is inappropriate copying of models without considering specific conditions  
Of performed model in other countries.
- Adjustment of products according to customer demands may cause problems in the cluster interests

## **History of industry and industrial clusters in Yazd province**

Yazd's name has been long associated with industry, productivity, and industrial activities and artisans of the province have had a distinguished and considerable role in providing the goods required throughout the country since many years ago. Hard work, compassion, contentment and saving have been associated with the essence of the people of this desert province and underlies their elevated culture in terms of work and production and this has provided the good cultural groundwork along with other relative advantages such as competent and experienced managers and employers, optimal growth of higher education, richness of the mines, being located in the center of the country and infrastructural facilities and appropriate services regarding ways, railways, airports, energy, telecommunications, etc. have provided suitable setting to develop industry in the province. Yazd province has an exclusive place in Iran's industry and a significant part of the country's industrial products; especially in the textile and non-metallic minerals sector, is produced in Yazd Province. In general, dominant industry in the Yazd province has long been the textile industry.

### **Textile industry status in Yazd province**

Long before Islam, Yazd has had a very effective role in production of gold cloth so that the pieces of silk fabric left from the Sassanid age woven through the two-woof technique, is attributed to Yazd. At the time of the Mughal and the Safavid Yazd province and Yazd people had been one of the main weavers and producers of fabric in our country and these products can be seen in the great museums of the world. Yazd textile industry includes about 25 percent of the total number of institutions, 45 percent of total employment and 16 percent of total industrial investment in the province of Yazd. This industry includes about ten percent of total employment in Iran textile industry.

Textile industry in this province includes about ten percent of the total spinning capacity and a quarter of total weaving capacity in the country. Finally, in terms of textile, at present, Yazd is most quietly diverse in various fields throughout Iran and in the words, Yazd can be called Iran textile industry hub.

### **Statistical population and sample**

Statistical population of the study is all small, medium and large active textile industrial units in the city of Yazd based on 3ISIC code.

### **Sampling method**

For this research, after conducting the required studies, two classification-sampling methods are selected with appropriate and systematic allocation.

### Determination of the Classification Sample size (n) with proportional allocation

Since in the main definition of cluster, units are divided into small, large and medium categories, the following formula applies and in other words, each class has been relatively shown with  $Q_h$  and  $P_h$  and  $P_h = \frac{A_h}{N_h}$  where  $A_h$  is volume of large units of each class and  $N_h$  is

the total volume of each class.  $V$  is the estimating variance which has been assumed to be a constant value and when the estimating variance of value sum of the units is already determined, sample size will be estimated from the following method:

$$s_h^2 = \frac{N_h}{N_h - 1} P_h Q_h$$

$$n_0 = \frac{N}{V} \sum_{h=1}^L N_h s_h^2 = \frac{374 * 77.197}{41} = 702$$

$$\hat{n} = \frac{n_0}{1 + \frac{n_0}{N}} = 244$$

Also Sample size estimated through Kakran method with error volume of ( $E = 0.037$  and  $0.05 = \alpha$  and  $p = 0.5$ ) is as follows:

is obtained from the following formula: Size of the classes of ( $n_h$ )

$$n_0 = \frac{Z_{\alpha/2} * p(1 - p)}{E^2} = 702$$

$$\hat{n} = \frac{n_0}{1 + \frac{n_0}{N}} = 244$$

$$n_h = n * \frac{N_h S_h}{\sum_{h=1}^L N_h S_h}$$

### Research tools:

To investigate the function of Yazd textile cluster, we used a questionnaire tool including human resource pivots, raw material supply network, technology, network access to markets, financing and capital provisions and coordination agency; the collected data indicates that:

## **The human resources employed in the textile cluster**

Data from the questionnaires on human resources shows that:

- Regarding use of technical power and skill of human resources of other similar units by textile units, 56.7% of textile production units have used technical power and skill of human resources of other similar units.
- Regarding the time of using technical power and skill of human resources of other similar units by textile units, 9.8% textile manufacturers stated that they have continuously used technical power and skill of human resources of other similar units.
- Regarding the question of how do you evaluate the result of using the human resources skill of the similar units? 18% of textile units have evaluated it to be very desirable and 45% of textile units have suggested that the use of the human resources skill of the similar units is undesirable.
- Regarding the question of whether the textile units are content with other similar units using their human resources skill or not? 50.7% of textile units have expressed their interest in lending their human resources skill to their counterparts.
- Regarding the question of whether the textile units need to use human resources skill of the similar units or not? 43.1% of textile units have announced that they need to use human resources skill of the similar units.

## **Raw material supply network in textile cluster**

Information provided by the textile units on raw material supply network indicates that:

- 39% of textile units purchase their required raw materials directly from the raw material manufacturers.
- 37% of textile units purchase their required raw materials from trading companies.

In response to the question of “if raw materials are provided directly from the manufacturers, where these units belong to”?

- 28% of textile units have stated that they are within the city of Yazd.
- 72% of the textile units have stated that their raw materials suppliers are outside the city of Yazd.

In response to the question of “if there is cooperation with other similar units, in what areas is this cooperation? “

- 2% of textile units have stated that they will cooperate in the joint purchase of raw materials in a large scale to reduce the purchase price.
- 65% of textile units have announced their cooperation on identification of raw material manufacturers.

Regarding the question of whether textile units desire to cooperate with other similar units regarding raw material supply or not?

- 84.9% of textile units have expressed their willingness to cooperate with other similar units on raw material supply.

## **Technology in textile cluster**

In response to the question of “if the textile units use machinery made in the country, where the manufacturers of those machinery work? The following answers are provided by the textile units:

- 33% of textile unites have announced that the manufacturers of the machinery made in the country, work within the city of Yazd.
- 3% of the textile unites have stated that the manufacturers of the machinery made in the country, work within the other towns of Yazd
- 63% of textile unites have stated that the manufacturers of the machinery made in the country, work outside Yazd province.

Textile unites were asked whether all the operational levels of their production are performed in their own units or not? The responses provided by the textile units were as follows:

- 71.2% of textile unites department announced that all the operational levels of their production are performed in their own units

Textile units expressed their reasons for assigning a part of their manufacturing operations to other units as follows:

- 61% of textile units referred to their lack of required machinery to perform certain desired operations as their reason for assigning a part of their manufacturing operations to other units.

Regarding the exchange capability of technology, textile units were asked whether they have ever used their own machinery to complete the production of other units or not? The responses provided by the textile units were as follows:

- 55.2% of textile unites have responded that they have used their own machinery to complete the production of other units.

Their response regarding the cooperation of units on technology exchange indicates that:

- 83.3% of textile units have periodically used their own machinery to complete the production of other units.

Regarding the question of whether textile units are willing to provide their counterparts with machinery services or not, the answer is:

- 47.6% of textile units have expressed their willingness to provide their counterparts with machinery services.

Regarding the cooperation of units on the exchange of technical methods and knowledge of production, the units' comments are as follows:

- 50% of textile units have announced that they have cooperated with other similar units on the exchange of technical methods and production know how.

## **Market access network center in textile cluster**

Regarding the market access network, textile units were asked about their marketing methods. Their responses indicated that:

- 54% of textile units have declared that their products were marketed directly by themselves.

In response to the question of “if the goods are sold by textile units, where will these products be presented?” Textile unit responses are as follows:

- 42.9% of textile units have stated that they market main part of their goods outside the city of Yazd and a part of it in the city of Yazd.

Textile units were asked whether they have ever enjoyed the cooperation of the other similar units to identify new markets for their products or not? Their responses have been as follows:

- 82.4% of the textile units have stated they have enjoyed the cooperation of the other similar units to identify new markets for their products.

In response to the question of “if there is any cooperation in identifying new markets, where has the mentioned cooperation with the units been based in? Answers of the units are as follows:

- 50% of textile units have announced that their cooperation with textile units in identifying new markets has been within the city.

Regarding the time the textile units spent to cooperate in identifying new markets, their answers have been as follows:

- 50% of textile units have had short-time cooperation

## **The financial issues in textile cluster**

Textile units were asked some questions regarding the financial issues which are as follows:

Textile units were asked whether they have faced serious financial issues to continue the activities of their own units or not? The answers of textile units have been as follows:

- 89% of textile units have been facing serious financial issues.

Regarding the question of whether textile units have ever helped on financial issues of their counterparts and partner units or not? The answers of textile units have been as follows:

- 24% of textile units have helped to solve financial issues of their similar units and partner units.

Regarding the desirability or undesirability of the result of financial assistance of textile units to similar units, the answers of textile units have been as follows:

- 68% of textile units have evaluated the result of financial assistance of textile units to similar units and helping them to be desirable.

Regarding getting facilities from the banking system, textile units were asked whether they have used banking facilities to establish industrial units or not? The answers given are as follows:

- 95.4% of the textile units have used banking facilities to establish their own industrial unit.

Textile units were asked whether they agree with establishment of finance fund which is formed through membership and investment of units and aims to help to meet the financial needs of the partner units or not? The answers of textile units have been as follows:

- 84.1% of textile units have agreed with the establishment of finance fund which is formed through membership and investment of units and aims to help to meet the financial needs of the partner units.

Regarding the establishment of finance fund, the textile units have been asked whether they agreed to join the fund or not? The answers provided by textile units are as follows:

- 86.7% of textile units declared their intention to become a member and invest in the fund.

### **Coordination in textile unites**

Regarding the topic of harmony and establishment of a non-governmental organization for this purpose, textile units were asked whether there is any trade or professional association in their industry or not? Their answers have been as follows:

- 58% of textile units have stated that there are trade or professional associations in their industry.

Textile units have been asked that at which level do the trade or professional associations work in their industry (city, province, and country) and the answers provided by textile units are as follows:

- 9% of textile units have announced that their trade association works within the city.
- 40% of textile units have announced that their trade association works at the provincial level.
- 51% of textile units have announced that their trade association works at country level.

Textile units were asked whether they are a member of their own trade association or not? The answers provided by them have been as follows:

- 61.4% of textile units are a member of their own trade association.

Regarding the coordination, textile units have been asked "if the issues related to the manufacturing units are supposed to be organized through the formation of a non-governmental organization in order to increase their share of national and international markets and solve existing problems, what combination is appropriate for it?" the answers of the units have been as follows:

- 59.4% of the textile units believe that the mentioned organization should be established through the presence of the similar industrial units.

### **Evaluation of the points of strength & weaknesses and opportunities & threats of textile cluster**

SWOT analysis can be performed in various fields such as marketing, supply chain of information systems, and etc. Essentially, this analysis proves to be valuable when used for the



current situation, but this analysis can also be used to formulate the strategies. Using SWOT analysis (strengths, weaknesses, opportunities and threats), it will be possible firstly to analyze the internal and external environments and also to be able to make strategic decisions which balance the organization competitions through appropriate job opportunities.

#### **Textile cluster points of strength**

- Being located at the center of the country and at a proper distance from southern and northern boundaries and domestic markets, South, access to the eastern transnational railways and airports
- Access to the market of neighboring countries particularly Iraq and Afghanistan.
- Leading units which have proceeded to purchase and utilize advanced machinery
- Culture and feeling the need to replace machinery and use new appropriate machinery
- Work commitment among the majority of artisans
- Despite the large number of university graduates
- Availability of lots of university graduates
- Availability of several universities, technical centers and conservatories which are able to train the academic force in the field of textile
- Good technical skills and expertise of the artisans and their potential capability in presenting high quality products
- Investment and entrepreneurship of the investors on textile industry

#### **Textile cluster weaknesses:**

- Non-organized sporadic sales mechanism by manufacturer of small units led to cut rate
- Lack of trade associations in the field of marketing
- Lack of efficient educational centers on marketing and consultation
- Weakness in marketing, customer identification and understanding of the customers' culture and tastes and establishment of strong appropriate relationship with the customer
- Lack of standards or absence of precise clear regulations for standards
- Unhealthy breakable competition on price between some units
- Fluctuations in raw material price
- Lack of technical knowledge and scientific mechanisms to determine quality level of raw materials and print them
- The problem of liquidity and poor financial condition
- High energy consumption
- High banking interest rates
- Depreciation of machinery
- Weakness in technology and machinery to the manufacturers abroad
- Poor knowledge of preservation and maintenance for newly purchased modern machinery
- Cultural problems as radical problems, such as copying other people's projects
- Lack of appropriate and effective relationship between industry and universities

- Artisans and manufacturers not being risk-takers
- Poor work commitment and work ethic compared to the past
- Falling behind in the field of quality and innovation of designs compared to the advanced countries
- Lack of quality control laboratories and absence of the effective use of existing laboratories
- Poor packaging
- Severe restrictions in valid and known brands
- Imports of second-hand machinery
- Low efficiency in the textile industry
- Water Shortage
- Lack of application of modern knowledge and technologies
- Lack of explanation of the industrial textile cluster position
- Shortage of skilled force and capable agent in the field of cluster and lack of stability and job security of the cluster agent

### **Textile cluster opportunities**

- Vast new markets within and outside the country.
- The main volume of yarn consumed in Yazd textile cluster is provided from outside Yazd Province and due to its high volume of consumption, there is a remarkable potential for construction of the unit manufacturing this type of yarns in the area.
- Capability to respond to small orders
- Increasing consumption and use of furniture in Iranian families
- Presence of people experienced and skilled in recognition and understanding the generalities of the textile industry over time
- Increase in national and international income levels and consequently, increase of per capita income level

### **Textile clusters threats**

- Unhealthy competitions which destroy the quality of products
- The high rate of growth and mutation of world textile industry
- The presence of Asian manufacturers with high production power and low price
- Investments of leading textile producing countries such as China, Turkey and ... in understanding of Iranian consumption culture and planning to seize a greater share of our domestic market
- Investment of the textile leading countries on planting cotton and similar plants to improve their quality and quantity and consequently, possess raw materials with better quality and lower price
- Extreme changes in technology of the world textile machinery
- failure to train experts in electronic maintenance of machinery

- Slow movement of industries and manufacturing units in opposite to the drastic changes in the world technology
- high cost of new dyeing and finishing machinery and the capital required to build Dyeing factories which has caused units to use second hand machinery as a result of which the quality of dyeing and finishing process has reduced
- culture of consuming imported clothing
- Manufacturers' lack of trust in the possibility of making amendments due to cynicism about organizations and institutions
- Increase of national and global income levels and consequently, demand for high quality goods from customers
- Other manufacturers' movement towards replacing worn out equipment by new machinery
- The possibility of reduction of using synthetic fiber tissue developed countries' market and changes in demand context
- Excessive trafficking and imports

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