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Research Article

REGIONAL PRIORITIZATION OF BUSINESS STRATEGIC CLUSTERS: CASE STUDY OF ZANJAN PROVINCE

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ABSTRACT
Industrial clusters"is a broad concept and many discussions have been addressed regarding their role and effectiveness on regional and urban development. The term 'Business clusters' is used to refer to linked concentration of medium and small industries with common historical backgrounds within a certain geographical space where they collaborate and compete eachother through improving learning capabilities in order to optimize the utilization of resources and achieve various advantages.In this study by focus on Zanjan province of Iran, firstly potential and available business clusters are identified and rated based on strategic indices and importance of development. This may be used to allocate development resources to other regions of the country as a general pattern.

Keywords: *Business Clusters, Strategy, Regional Development*

INTRODUCTION
The term 'Business clusters' is used to refer to linked concentration of medium and small industries with common historical backgrounds within a certain geographical space where they collaborate and compete eachother through improving learning capabilities in order to optimize the utilization of resources and achieve various advantages. The emergence of clustered development pattern returns to Alfred Marshall (26 July 1842 – 13 July 1924) in England in 1890. He discussed three main subjects regarding external consequences of commercial place arising from similar corporations concentrated in the same geographical location (Simpson, 2007).
Kentucky Science and Technology Corporation (KSTC) considers clusters as a collection of corporations which have communications and needs such as industrial cooperation, required trainings provider, educational foundations as well as industrial and development collaboration institutes. By this definition, the position of each corporation within the competation sphere is related to corporation itself, its performance, and its other partners.Generally, fundamental characteristic of business clusters is their interdependence and share to interests and commercial success is indebted to common endeavor to resolve collective problems along with competition.
Scotland entrepreneurship center consideres industrial clusters a collection of customers, suppliers, rivals and supporting agencies such asuniversities, training, research, institutional,and financial centers as well as infrastructural facilities.
According to South Bay Burea of cooperation for economical development in California industrial clusters are a group of interrelated industries which cause wealth formation in a region through service and goods export.
United Nations Industrial Development Organization affiliated to UN defines cluster as geographical concentration of small and medium corporations in a certain and specified industry where they are faced to similar challenges and opportunities. This concentration causes economical savings (such as spontaneous emergence of necessary materials, equipments suppliers, availability of expert workforce), formation of establishment of financial, consultancy and industrial service providers and also dynamic environmental development in order to improve and widen intercorporate cooperations, government agencies and private sector to increase local production level as well as innovative and communal learning (UNIDO, 2006).

Consistent development department of Inter-American Development Bank (IADB) has preparesd a report in which, Carlo pietrobelli from RomeUniversity and Roberta Rabelotti from Piedmont university believe that analysis of industrial clusters focuses on local communications role in formation of competitive advantages of export industries. Based on this, they believe that industrial cluster is in fact spatial concentration of specialized corporations where corporation members of cluster are favoured by initiating economical benefits resultingfrom unites aggregation and interrelated activities.

International Bank for Reconstruction and Development which is under supervision of The World Bank, in an alalysis regarding position of industrial cluster in Japan, has its particular idea about definition of industrial cluster. In this report that is provided by Heidi Havumaki, he points to the definition that produced by Porter, but the author noted that each cluster is different from other clusters in terms of key elements such as geographical location, products, functions and intra-corporation communications pattern. The main cause is the difference in cluster historical conditions, demand provisions, supporting industries and competitive conditions (Lead to progressive evolution of cluster). Some clusters are formed under specified historical conditions while others may be formed during different economical interactions. Primary economical conditions that form cluster are not necessarily fixed during different times. Economical conditions of clusters may vary due to emerging changes in national and international competitive situations.

In English Institute of Development Studies, University of Sussex, according to the order of UNIDO small and medium size businesses group a report was prepared by John Humphrey and Hubert Schmitz where they belive that: Marshall emphasized on concentration of small corporations with similar characteristics where they are supported in particular locations and interpreted the results of this support as economical benefits and addressed above mentioned concept to answer ~~to~~ these questions: Why and how location of an industry must be determined and why and how small corporations can be efficient and compete ? As a matter of fact; Marshall called local corporations as “Local Industries” or “industrial districts” and although he did not define cluster but now we understand that his purpose was a cluster with deep work divisions among corporations.

Employment Development Department - State of California in first volume of its report of California industrial clusters expression, defined industrial cluster as the concentration of complementary and rival activities where they cause wealth generation in a geographical region. Geographical concentration leads to the expansion of professional skills, foundations and associations. Important terms to be noted are: Export focus (sales of goods and services by clusters to outer region customers), speciality in career (Occupation within focused cluster has more concentration relative to occupational concentration of same activity in national level) and size and growth (Either cluster must have an acceptable size if it is new or its growth to be greater than average growth of same activity at national level). Some experts traditionally define cluster respective to collective economical benefits. Some define it individually along with emphasize on supply-demand key relationships and others define cluster respective to cooperation and aggregation of industrial units in a particular location. Generally, depending on different applications, there are diversified and numerious introduced definitions for cluster where may they have not rather suitable conformity to each others.

Research library of Clemson University regional economical development located at state of South Carolina defined cluster in a report about regional development as following: A set of similar and related corporations located in same geographical location and cause initiation of competitive advantage for cluster members and local economy through their relationships. Overall, industrial clusters include those corporations that have significant horizontal and vertical relationships with each other or use same resources and workforce. Members of industrial cluster may become partner regarding sale-buy relationships, intercorporation cooperation to develop product, marketing and researches or share specialized services and labour market.

Yorkshire institute of Life Sciences knows industrial cluster as a group of organizations in related industries where they have relationships through trade-offs or because of utilizing infrastructures, customers and same skills. An industrial cluster is something more than an industrial sector because

industrial cluster usually connect a group of industrial sectors to their required infrastructures such as financial foundations, supportive services and etc. Furthermore, industrial clusters connect universities and research institutes which provide useful research findings to industrial sectors. Success of industrial cluster depends on existence of the mentioned establishments in region and their relationship attitude. Common point in all above mentioned definitions are as follows:

Cooperation, partnership and competition of corporations, geographical space of corporations, historical correlation and common strategies, marketing and sales, also common challenges.

Reason of intention of developed and developing countries to grow and expansion of small and medium industries are (Yeganegi, 2000):

A. Extremely important role of small and medium industries in producing necessary goods and parts for large industrial corporations.
B. Low price and economical beneficial production through small and medium industries.
C. Extremely important role of small and medium industries in job generating with low investment.
D. Flexibility of small and medium industries against economical irregularities (inflation, decrease of national currency value and …)
E. Flexibility of small and medium industries against fluctuations in consuming market and diversifications of customers tastes.
F. Enjoyment of entrepreneur managers and solidarity to innovations and entrepreneurship
G. A factor in development of less developed regions and establishing regional-economical balance.
H. Appropriate and confident ground for foreign investment.
I. Main factor in transforming large public companies to small and medium ones.
J. Prevention of large industrial corporations monopolism.
K. Prevention of allowing foreign small and large corporations performances to be unrivaled.

In Table-1, several developed and developing nations are compared respected to small industries percent and value of these industries.

Table 1: Small industriesin industrial development of some industrial and developing nations

Small and medium industries characteristics	Country	S/R
89% of country industries, 67% of workforce of industrial sector, 33% of value added in industrial sector, 80% of products value and 60% of total exports belong to small and medium industries.	Japan	1
97% of country industries, 67% of industrial employment, 50% of value added in industrial sector, 50% of products total value and 67% of total exports belong to small and medium industries.	Taiwan	2
79% of industrial units, 82% of industrial employment, 40% of value added in industrial sector, 55% of total exports and 90% of industrial innovations belong to small and medium industries.	India	3
94% of industrial units, 87% of industrial employment, 45% of industrial value added, 40% of industrial products belong to small and medium industries.	Indonesia	4
94% of industrial units, 76% of industrial employment, 29% of industrial value added and 90% of total exports belong to small and medium industries.	Singapore	5
93% of industrial units, 38% of industrial value added, 53% of industrial products value belong to small and medium industries.	Malaysia	6
73% of industrial units, 57% of industrial employment, 43% of value added in industrial sector, 47% of industrial products value and 39% of exports belong to small and medium industries.	South Korea	7
98% of industrial units, 55% of industrial employment, 17% of value added in industrial sector and 17% of industrial products value belong to small and medium industries.	Iran	8

Source: http://www.un.org

History of Business Clusters in Iran

After studyingthe upstream documents of country from 1997, clustered development concept entered into Iran's development literatures and in fourth and fifth development program and also in future perspective document; it is pointed out explicitly. In eighth, nineth and tenth administrations; culture building and trial implementation have been conducted in some provinces. In addition to effectiveness of business clusters development on creating spirit of enterpruenership and regional wealth creation, it has impacts on country national security as well. Employment key and its development is embedded into proper implementation of business clusters development in the country. In 2011, almost 210 business clusters were identified in the country.

Conducted Study

Considering the identification of a wide spectrum of business clusters in the country, the main question is: how priority of cluster development planning should be to reflect appropriate effectiveness? Thus referring to a particular geographical region, this priority of strategic development was studied and tested. According to study results from reports of Zanjan Province Industrial Towns Company and completeness and assessment of identification records of clusters with relative advantage in this province and actually through extracted data from national mapping questionnaire No. 2 in final stage; prioritization process of business clusters was conducted.

Identified Business Clusters in Zanjan Province

By summarizing and adaption of conducted analyses, 15 businesses were identified to have cluster development relative advantage where are listed in Table-2. This table is summary of a field research and library study that is demonstrated in Table-2 (Bahrami, 2014; Asgari, 2014; Alimohammadi, 2014; Alizadeh, 2014; Alipour, 2011; Ghassemi and Maryam, 2005; Ghafour 2004; Izadkhah, 2005; Ahadi *et al.*, 1997; Elahi, 2006).

Table 2: Businesses with cluster development advantage

Business Title	S/N
Zink industry	1
Textile industry	2
Wood industry	3
Shoe industry	4
Filigree works	5
Knife industry	6
Copper industry	7
Wire and cable industry	8
Olive industry	9
Tourism industry	10
Dairy industry	11
Carpet industry	12
Grapes industry	13
Poultry industry	14
Apple industry	15

MATERIALS AND METHODS

Prioritization Measures and Method of Weighing Priorities

Prioritization can be implemented through different approaches. The best method is a combination of qualitative and quantitative methodologies that means to use statistical techniques and then imposing qualitative ideas and analyses on that:

In order to use any statistical technique, there is need to determine certain measures for prioritization. Process of prioritization is as followings:
A) Weighting and assigning probability to indices based on experts' comments
B) Determining levels and absolute values of measures
C) Computing weighted scores for each clusters
Determining rcognized business clusters priorities are weighted by considering geographical region's requirements and conditions.
1) Production ability
2) Ability to generate jobs
3) Export ability
4) Development capability
5) Utilizing other clusters' experiences
6) Cluster age
According to qualified experts comments; options of very low, low, medium, high and very high are selected to weight 10, 20, 30, 40 and 50 respectively and average scores of experts ideas is accounted as weight of these measures. Hence, weight of each measure is obtained at least 10 and at most 50.
Corresponding indices of each measure are shown in Table-3 (Alipour, 2011):

Table 3: Measures and indices of decision making

Evaluation indices	Measures
Ratio of cluster value added or production to province value added or production	Production ability
Ratio of cluster value added or production to country value added or production	
Ratio of cluster level of employment to province level of employment	
Average level of investment to generate a job in cluster	Ability to generate jobs
Ratio of number of units in cluster to total business units of province	
Average level of investment to generate a business in cluster	
Ratio of cluster exports to total product export of country	Export ability
Ratio of cluster products export to total sale of cluster products	
Ratio of cluster products export to total export of province	
Establishment position of cluster within cluster formation age curve	
Establishment position of cluster product within product age curve	
Level of social capital in cluster	
Number of cluster advantages	Development capability
Situation of access to materials	
Situation of access to consuming market	
Situation of access to knowledge and human resources	
Level of technology in cluster	
Number of similar clusters	Utilizing other similar clusters' experiences
Years of units performance	Cluster age

Considering that some indices are qualitative and referring to this fact that range of changes of indices is different for each index, it is necessary for scores to be standard. In order to standardization indices and limiting changes of range within zero to hundred; following Table is used. And some points are assigned to indices as mentioned in Table-4.

Table 4: Absolute points

100	80	60	40	20	Evaluation Indices
Above 20%	Between 10% -20%	Between 5% -10%	Between 5% -10%	Less than 1%	**Ratio of value added or product of cluster to value added or product of province**
Above 20%	Between 10% -20%	Between 5% -10%	Between 1% -5%	Less than 1%	**Ratio of value added or product of cluster to value added or product of country**
Above 20%	Between 10% -20%	Between 5% -10%	Between 1% -5%	Less than 1%	**Ratio of cluster level of employment to province level of employment**
Less than 5 million Tomans	Between 5-10 million Tomans	Between 10-20 million Tomans	Between 20-30 million Tomans	More than 30 **Million Tomans**	**Average level of investment to generate a job in cluster**
Above 20%	Between 10% -20%	Between 5% -10%	Between 1% -5%	Less than 1%	**Ratio of number of units in cluster to total business units of province**
Less than 5 million Tomans	Between 100-200 million Tomans	Between 200-300 million Tomans	Between 300-500 million Tomans	More than 500 million Tomans	**Average level of investment to generate a business in cluster**
Above 20%	Between 10%-20%	Between 5% -10%	Between 1% - 5%	Less than 1%	**Ratio of cluster exports to total product export of country**
Above 20%	Between 10% - 20%	Between 5% -10%	Between 1% - 5%	Less than 1%	**Ratio of cluster products export to total sale of cluster products**
Above 20%	Between 10% - 20%	Between 5% -10%	Between 1% - 5%	Less than 1%	**Ratio of cluster products export to total export of province**
Formed		In formation stage		embryonal	**Establishment position of cluster within**

					cluster formation age curve
Growth	Adolescence	Introduction	Saturated	Descend	**Establishment position of cluster product within product age curve**
Very high interaction and very low competition between units of cluster	High interaction and low competition between units of cluster	Moderate interaction and moderate competition between units of cluster	Low interaction and high competition between units of cluster	Very low interaction and very high competition between units of cluster	**Level of social capital in cluster**
5	4	3	2	1	**Number of basic advantages of cluster**
Very undesired	Desired	Moderate	Undesired	Very undesired	**Situation of access to materials**
Very desired	Desired	Moderate	Undesired	Very undesired	**Situation of access to consuming market**
Very desired	Desired	Moderate	Undesired	Very undesired	**Situation of access to knowledge and human resources**
Very desired	Desired	Moderate	Low	Very low	**Level of technology in cluster**
5	4	3	2	1	**Number of similar clusters**
More than 100 years	Between 50-100 years	Between 30-50 years	Between 10-30 years	Less than 10 years	**Years of units performance**

Absolute point of each index is at least 20 and at most 100.
In next step, by imposing weight of each measure on points of each index; theses indices get weights.

Table 5: Weight points

Weighted point of index	Point of index	Weight of index	Evaluation indices
			All indices of Table-3 individually

In this approach firstly, capability of data in their usage and exploitation regards is assessed through factor analysis by Kaiser-Meyer-Olkin samplimg efficiency index test.

This test which is identified by KMO acronym fullfils first goal of factor analysis. It means that mentioned test reveals whether study variables variance are influenced by common variance of some hidden and fundamental factors ?Or, is it possible to state that variance of variables set is result of some

hidden and fundamental factors and not of all such variables? value of statistics of this test is fluctuating between 0 to 1.

The more value of this statistic move closer to digit 1, it means that process of factor analysis for this variable is right and proper, but if its value becomes less than 0.5; then factor analysis is not required.

In next step, factor analysis confirms importance and level of effectiveness of indices and states this confirmation as recognition of shares of factors set in expression of each index's variance. According to Tables of this stage, importance of considering and utilizing all nineteen indices are confirmed and all of these indices must be used in factor analysis approach.

During next step of test, factors are defined and a Table under the name of "total expressed variance" is formed or recognition of each factor's share in expressing variance of all indices is formed and out of nineteen factors which were defined in compliance to particular indices, only those factors are selected on basis of Kaiser's measure that their special value is more than digit one.

Hence, out of nineteen factors, we can consider six factor and reduce those to these five factor. These factors are: product ability, job generation ability, export ability, development capability, using experiences of other clusters and cluster age. Other factors with special values less than one are eliminated.

Furthermore, in aggregation of statistical population in this Table, it shows that first and seconf factors have major shares in expressing variance of indices.

RESULTS AND DISCUSSION

Presentation of Prioritization Results

Based on each considered factor by factor analysis approach, ranking is conducted according to average value of involved indices. By using six districted factors and calculations with computer, following ranking may be provided:

Table 6: Final ranking

Indices averages approximation	Cluster	S/N
9200	**zink**	**1**
7900	**Hand woven carpet**	**2**
3700	**Coppersmiths**	**3**
3690	**shoe**	**4**
3450	**knife**	**5**
3430	**Olive and its products**	**6**
3290	**Dairy products**	**7**
2885	**Filigree workers**	**8**
2770	**Tourism**	**9**

Referring to this Table; the first strategic cluster of Zanjan province is cluster of zink industries and the last cluster is tourism clastur. And eventually, there are 9 strategic development clusters for Zanjan province that are applicable (Yeganegi, 2015).

Table 7: List of weights and points for businesses in Zanjan province (Hajali, 2014)

Point index																			Weight measure						
19	**18**	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**age**	**Generality.**	**Dev. Cap.**[1]	**Export ability**	**Job generating ability**	**Production ability**	
80	20	80	80	80	80	80	80	80	100	100	100	100	80	100	40	40	100	80	30	30	40	50	40	50	ZinC
100	100	80	100	80	100	100	80	60	60	60	100	80	100	80	80	60	60	80	50	40	30	40	40	30	Hand woven carpet
60	60	60	60	60	60	80	80	60	60	20	40	40	100	40	80	40	40	40	30	30	30	20	30	30	shoe
100	20	40	60	60	80	80	60	60	20	20	20	40	60	40	80	20	40	20	50	30	30	20	30	30	Coppersmiths
100	20	60	80	60	80	60	60	60	60	20	20	80	60	40	80	20	10	20	50	30	30	20	20	20	knife
100	20	60	80	60	80	80	60	60	60	20	20	80	80	40	60	40	80	20	50	20	20	20	30	30	Olive and its products
60	40	60	60	60	80	60	40	60	60	20	20	40	40	20	20	20	60	40	50	30	30	30	20	20	Dairy products
100	20	60	60	60	40	40	60	60	20	20	20	20	100	20	60	20	60	20	50	20	20	20	20	20	Filigree workers
100	20	60	40	40	60	60	40	20	20	20	20	20	80	20	20	20	20	20	50	20	20	20	30	20	Tourism

1. Dev. Cap. = development capability

Summary and Conclusion

In this article, firstly industrial clusters of Zanjan province were identified. Then these clusters were assessed and ranked according to the advantages and capabilities which can maintain to help the regional development of province. This approach can be utilized to other industrial clusters in other provinces. The most important feature of this approach is that it is free from personal preferences in selection for developments which is a guarantee for the national interests. In this article, by exploiting all conducted studies, it is found that zink industry cluster in at first priority of development and tourism cluster is positioned at last prioprity.

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