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## THE MINERAL RESOURCES INDUSTRY'S CLUSTER BASIS IN LATVIAN REGIONAL DEVELOPMENT

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**Abstract:** *The main subject of the article is the united development module for mineral resource extraction and realization in Latvia (such a mineral resource extraction as gypsum, limestone, clay, dolomite, sand and gravel). This industry's development module is based on business development in regions, by forming clusters in regions and/or between regions.*

*The theoretical foundation of the article is M.E. Porter, M. Delgado, A. Chatterji and others. The authors' researches show that strong regional clusters might contribute entrepreneurship, develop regions and struggle against unemployment.*

*The author of the article has made research about mineral resource industry in Latvia, and it reveals fragmented mineral resource industry and lack of future objectives in mineral resource industry, no consideration about sustainability, innovations neither in technologies nor in product development.*

**Key words:** *mineral resource, competition, cluster, region, development*

### INTRODUCTION

The National economic growth can provide a competitive and sustainable market in all its forms but it quests for environmentally and socially friendly technologies and productions. The aims of the author's work are, firstly, evaluate the mineral resources industry in country and, secondly, define the possible industry's cluster bases (policy) what could provide sustainable industry and market development. In order to implement these challenges, the author put forward the following tasks:

- Describe the importance cluster for competitive development in industry;
- Describe mineral resource industry in Latvian regions
- Assess the mineral resource clusters usage ability in region market;
- Define the cluster strategy direction and tasks (policy) in mineral resource industry.

Written by methodological bases of the domestic and foreign research papers and articles as well as by using the author's research.

### COMPETITIVENESS AND CLUSTER

Different industries are associated with a range of partners who are forming a direct and less close model. These are clusters that are created for a specific purpose, whether it is an informal (formal and informal clusters). One of the cluster theory founders is M. Porter (1990) who has defined cluster as geographically located, close to the interconnected companies, cooperative groups and institutions in a particular field of activity. Cluster creation and maintenance is determined by three factors: geographic concentration (mineral resources extraction, production and realization); cooperation or interdependence; common goals.

Clustering is important for economic development in regions, because regional clusters contribute new businesses, promote employment (*Delgado M., Porter M.E., Stern S., 2010*). Clusters in regions (strong clusters) promote the development of inter-regional competition and development industry as well as cooperation.

**MINERAL RESOURCE INDUSTRY IN LATVIA**

Mineral resource are one of the largest resources in Latvia, which from economic and physical point of view does not recur, but changes its original shape and quality. Mineral resources which are actively involved in economic gypsum, limestone, clay, dolomite, sand and sand-gravel are the most important. Dolomite, sand, sand-gravel and clay are extracted all over Latvian territory but gypsum and limestone in certain regions (Cabinet Regulation No.391 “Regulation in the Planning Regions”). Companies, which operate in mineral resource extraction, processing and distribution field are located throughout all country’s territory.

Mineral resource extraction, processing and distribution are a critical prerequisite of quality mining and, processing peculiarities, these conditions provide the mineral geological exploration and the grouping of mineral resources within categories. After the Cabinet Regulation No. 570 “Mineral Resources Extraction Order” all mineral resource are divided into three categories: “A” explored mineral resources; “N” estimated mineral resources; the “P” predicted mineral.

In the study period, 354 companies participated in the extraction of mineral resource (see in Table 1). From regions the smallest number is 70 companies (V region) and biggest number is 89 companies (R region). The enterprises are divided in different organizational forms (internal structure: funds, staff). Mineral resource industry consists of 5% of large companies, 19% of medium-size enterprises and 76% of small or very small companies. All the sock companies are in the big company category but only one company specializes in the extracting, processing and marketing, other companies are specialized to other industries but in addition acquire and process the mineral resource. There are a lot of limited company (LTD) in regions - from 52.15% to 67.32% of all mineral resource acquirers. Their size varies from one employee to 250 employees and more. The huge problem is farms and other acquirers, because these companies obtain mineral resources irregularly, as well as, farmers and other entrepreneurs are not processing these resource, so they do not increase the value of products.

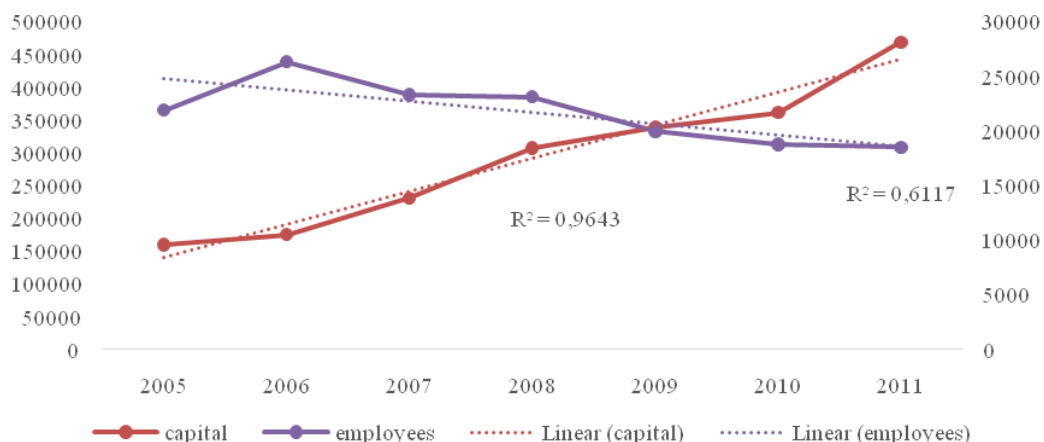
**Table 1**  
**The mineral resource extraction companies structure in Latvia planning regions (2005 – 2011)**

Planning regions	Total number of listed companies	Sock company, %	A limited liability company (LTD), %	Farms and other, %	Regularly extract mineral resource, %
R region	89	9.10	52.15	38.75	51.7
V region	70	11.26	54.44	34.30	51.9
L region	83	4.23	58.05	37.72	56.8
Z region	74	10.31	55.68	34.01	57.4
K region	78	6.31	67.32	26.38	59.4

Source: author designed table from LEGMC dates

Many mining site are not used regularly, especially for of dolomite, sand, sand-gravel mining and utilization. Table 1, column “Regularly extract mineral resource” shows that the regions of the fixed mining companies operate intermittently from 51.7% to 59.4%. Data’s shows difficulties in the local workforce usage and local infrastructure development.

There are some large companies in mineral resource industry that dominate, for example, in gypsum, limestone and clay industries, but of course, these companies are not located in one area.



**Figure 1 Companies capital and employees trends in study periods**

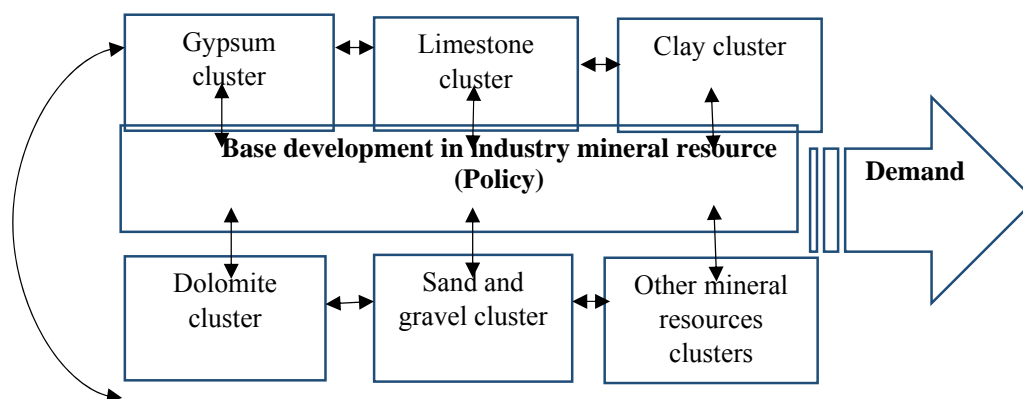
Of course many farms and others entrepreneurs do not have equipment for production to extracted mineral resources or to the production of the finished products.

During the economic crisis, mineral resource extraction declined the same situation was in processing and sales volumes and the number of employees decreased while share capital increased (Figure 1). Calculated capital linear trends show that the coefficient of determination is  $R^2=0.94$ , it is a significant upward trend, but the estimated staff linear trend is downward and the coefficient of determination shows  $R^2=0.61$ , it is a considerable reduction. This indication of the industry's efforts to mobilize domestic resource to cheaper produce final products. In this period also increased physical persons (landowners) in mineral resource extraction, but these physical persons not produce final products.

### MINERAL RESOURCE INDUSTRY'S CLUSTER

Cluster is a possible solution for mineral resource industry development, new business formation in regions and unemployment reduction. Strong cluster demands a professional training of personal and cooperation with science (Delgado M., Porter M.E., 2010).

Mineral resource market in Latvia is fragmented, particularly in the dolomite, clay, and sand and sand-gravel extraction, processing and marketing. Gypsum and limestone mining and processing are concentrated in two regions but products are realized throughout the national territory. The dolomite mining and processing are located in four regions (except K region) but distribution in all territory. Sand and sand – gravel extraction, processing and marketing cover the entire territory of the Latvia.



**Figure 2 Mineral resource industry's cluster model**

The strategy creation is the fundament for development in the mineral resource industry. AHP's (*Analysis of Hierarchy Process*) analysis shows that, in order to provide development it is needed to attract investment (including foreign investment), develop the building materials production and innovate new technologies and products (Saaty, T.L, 2008). Innovative product are extremely important in such fields as clay production, quartz sand enrichment and for glass industry and dolomite production development. (Figure 2).

The development in industry is based on strategic national development. The strategy for building industry development is taken into account in the European Union (EU) guidelines on the development of and trends in the industry.

Industrial development, including mineral resource extraction, processing and distribution in the field, always can be determined by sustainability, development can be provided by different activities: efficient use of resource (all the resources), sustainability in market and green jobs. The report *SMES, Resource Efficiency and Green Market (2012)* highlights that companies increasingly draw the attention to the efficient use of resources (based on energy saving, industrial waste reduction, secondary resource use), it is planned in the next few years that efficiency will increase by 80%.

By giving experts forecast EU industrial development trends and by using author's research, the cluster can be defined: *as an effective and rational (sustainable) mineral resource extraction, use and marketing in regions and export*. In order to achieve these goals, it is necessary to consider tasks below:

- Create and develop cluster of mineral resources mining, processing and distribution in order to increase the competitiveness of the sector (relation to EU strategy *EUROPE 2020. A strategy for smart sustainable and inclusive growth*).
- Establish legislative conditions for sustainable and rational use of mineral resource extraction, processing and realization taking into account the transport distance, energy – efficient resource use.
- Create a precondition for innovative technologies and products (niche products) for the market (region market) and for the export.
- Promote rational resource exploitation and utilization, educate and inform consumers about product characteristics and the rational use.
- Provide an opportunity for consumers to buy high-quality products from mineral resources in all regions of Latvia.

The large number of firms with low level specialization, geographically dispersed cannot develop a strong cluster. In order to develop strong clusters, it is necessary to

involve these firms in other clusters, such as the forest cluster or other, that will allow develop inter-industries and new businesses.

## CONCLUSIONS

1. Lot of companies operate in mineral resources industry, these companies acquire, produced and distributed final products, together there are 354 companies, 5% of them are big companies, 19% -middle companies and 76% - small companies.
2. The theory of the cluster development is based on the geographical concentration of companies, industry specialization which allows create new businesses; increase the number of jobs and innovation.
3. Mineral resource industry cluster in Latvia is defined as *an effective and rational (sustainable) mineral resource extraction, use and marketing in regions and for export.*
4. Cluster development strongly affects other industries especially when cluster is fragmented, weakly geographically concentrated and located in small areas. Then strong inter-regional cooperation and inter- industries are needed for cluster development in the mineral resource industry.

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