

INCREASE OF THE COMPETITIVENESS OF FOREST SECTOR OF LATVIA ON THE BASIS OF CLUSTER APPROACH

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Abstract

Globalisation presupposes that the growth of national competitiveness is still one of the main goals of the economic strategy of the majority of states; this factor keeps the urgency of issue of strengthening and expanding the position of the competitive sectors both in the domestic and global markets. In its turn, this problem requires further progress of managing procedures for the national economic system, including the increased employment of the cluster approach, which has become popular in the modern world for the past few decades. Clustering affects economic problems on the level of state; this fact determines the necessity and reasonability of governmental support of the industry. Under the contemporary conditions many countries elaborate the national programmes for clusters development and invest significantly in this sphere. The goal of this paper is identification and generalisation of the cluster approach methods, aimed at the efficient management of the forestry sector of Latvia. Under the condition of proper management of the integration process, the existing potential of the forestry sector of Latvia and development of its prospects will allow the forest sector to become one of the principal "driving forces" of the Latvian economy in the near future. The Latvian government named the forestry among the priority sectors of the national economy. It is planned to stimulate the growth in both the number of enterprises in woodworking and the value added of their products. Forestry has a positive ratio in the export-import balance of Latvia. The forest resources are widely employed in various sectors (timber is a raw material for production of more than 20 thousand products); meanwhile, all well-developed industrialised countries experience the deficit of wood, and this fact is a powerful argument in favour of arranging the well-functioning clusters in Latvia; the forest resources of the country can serve as a centre of these clusters. The paper investigates the possibilities of introducing the cluster approach as a basis for the formation of an efficient forest sector and the development of production with a high value added; as a result, there will be facilitated the sustainable development and economic growth of both forest complex and the national economy of Latvia. An important result of this research is a proposed integrated approach towards the development of the forest cluster and the analysis of its trends development; the analysis has been done on the basis of the calculated coefficients of the industry localisation, the ratios of per capita production, indicators of labour productivity, specialisation rates of the region in the industry, the amount of investments in fixed assets, foreign investment, exports and imports. Stable and successful development of the forestry sector, strengthening its position in the domestic and foreign markets will be the result of a competent and efficient management of all factors affecting the economic situation in the industry and in the country.

Key words: forestry, the cluster approach, competitiveness, value added.

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Introduction

One of the principal goals for the majority of the states in recent times is the growth of national competitiveness by strengthening and expanding the position of the competitive sectors in the domestic and global markets. At the same time the problem of increasing the competitiveness in the context of globalisation requires certain improvement of the procedures of the national economic system arrangement. One of the most efficient tools for solving this problem is the cluster approach. Cluster formation affects the economic problems of national importance; therefore, this process needs certain state support. It is a reason for many countries to develop national programmes and to agree for significant financial costs of creating clusters.

The forest sector of the economy has a substantial impact on improving the competitiveness of Latvia. Forestry is the second largest sector of the Latvian economy (after food production), which gives 20 % of value added of industrial sector; forestry development has great potential and prospects in Latvia.

Timber is used in various sectors of the world economy; it serves as a source of chemicals produced by processing the timber, bark, pine needles. Wood supplies raw materials to produce more than 20 thousand of products. Forestry can become one of the most promising positions and even the "driving force" of the Latvian economy in the near future under the condition of proper management of the processes of integration, specialisation and innovations acceleration.

The goal of this paper is investigation of possibilities for the forest sector development in Latvia with employment of the cluster approach to enhance the competitiveness of the country.

The paper considers the following tasks for achieving the set goal: to determine the factors affecting the competitiveness of the economy of Latvia; to identify and describe the current trends of the forest sector development within the country; to determine the impact of clusters on enhancing the competitiveness of the national economy; basing on the cluster approach, to make the proposals for improving the competitiveness of both the national forestry and the national economy of Latvia.

1. Principal Trends and Opportunities for the Development of the Forest Sector as a Factor Increasing the Competitiveness of the Latvian Economy

Many authors in their publications refer to the fact that the countries with well-developed forest industry usually consider the entire forestry or a "cluster" of national economies as an object of strategic planning, but not separate entities of the industry; moreover, the "clusters" integrate all industries dealing with forestry, starting with the work on cultivation, conservation and deforestation, and finishing with downstream processing of timber.

Starting with 2010, after recovery from the global economic crisis, Latvia has been demonstrating a steady increase in exports of forestry products; this growth mainly appears due to the advance of the local industrial base and also successful competition in the international markets of products with low value added. Many experts in this industry recognise that it is necessary to expand the production of products with high value added for the further successful progress of the industry; this expansion accordingly requires the investment not only in manufacturing but also in scientific and technological potential.

There is no doubt that improving the competitiveness of the industry is hardly possible without the active cooperation between science and industry. Unfortunately, there are very few companies in Latvia, integrating the services of research institutions in their commercial activities, while these institutions deal with designing the innovative technologies and new products. On the other hand, the academic and research institutions also should have the opportunity to share their research results with both public and commercial structures if they are significant for national economy.

Since the demand for clean renewable energy sources is rapidly increasing all over the world, therefore, one of the main directions of the forest industry development, requiring the advance in the coming years, should be one associated with the use of wood energy. This is particularly important, taking into consideration the fact that Latvia is one of the most energy-dependent countries in Europe.

Thus, the production of heating resources made of unused wood can be increased with employment of financing from the EU structural funds

Undoubtedly there is a huge potential for the development of cooperation between the forest and the construction industries. The production of houses from wooden structures is growing; this fact allows not only increasing the volume of deforestation, but also to cooperate in the development of construction standards of timber structures corresponding to the innovative modern technologies.

A government policy aimed at long-term development of forestry is another opportunity for the emergence of a cluster. The activation of the national programme for the development of the forest sector and the related industries "Sustainable Development

Strategy of Latvia 2030" can serve as an example of this policy.

The state forest policy, oriented on the forest complex clustering, is required for multiple purposes: to integrate technology-related sectors and productions in the forestry and timber industry, to increase the profitability of timber and wood processing sub-sectors and enterprises, to enhance the competitiveness of production in the commodity markets, to improve the technical and technological base of the industry.

There is an urgent need not only in modernisation of the existing production facilities, but also in organisation of new production enterprises for cluster arrangement. It can be exemplified by the underdeveloped resin industry employing the wastes of timber industry and machining of wood (sawdust, pine needles, wood chips, twigs, bark, etc.) as raw material, while its products are used mainly in the chemical and pharmaceutical, food and other industries.

Therefore, the formation of the forest cluster in Latvia should be one of the possible forms for a more rational use of forest resources; this will facilitate the efficiency of timber industry, the growth of national wealth and enhance of the competitiveness of both the forest sector and national economy as a whole.

2. Impact of Clusters in Facilitating the Competitiveness of the National Economy

As it has been noted, one of the advantages of introduction of cluster technologies for the enterprise consolidation is the growth of business activity of entrepreneur structures, improving the investment climate within the country, the progress of social, economic, information and integration systems; in its turn, this increase provides the impetus for more intensive development of entrepreneurship, investment and economic recovery of the country [7].

Businesses and organisations within the cluster are mostly independent, and competition within the cluster is very important driving force for the development of the cluster as a whole. For example, according to M. Porter [10], internal competition between firms creates the necessary pressure, stimulating the innovative activity of cluster members. Nevertheless, not all members of the cluster are direct competitors; some of them simply serve different market segments.

Separate small companies also have certain benefits of the cluster development; these benefits may include the reduce of costs of the enterprise current activity, growth of the product (services) value added, increasing flexibility and competitiveness in the process of new products and technologies creation, the opportunities to enter new markets. This effect of successful functioning often appears due to the fact that the actions of one company have an impact on other companies within the cluster. Therefore, the benefits are spread along all connections within the cluster: new producers coming from other

industries, accelerate the advance of the entire cluster, facilitating the progress of research; there takes place the free-flowing exchange of information and the rapid spread of innovations through the channels of suppliers or customers having the contacts with numerous competitors through networking; relationships within the cluster result in new methods of competition, contributing to the innovation creation. Clustering on the basis of vertical integration does not generate the spontaneous concentration of a variety of scientific and technological inventions, but it forms a certain system of dissemination of new knowledge and technologies. Moreover, the most important condition for the effective transformation of inventions into innovations and innovations into the competitive advantages is the formation of a stable network between all cluster members [13].

The interaction between the related industries also increases on the basis of the clusters development; it contributes to multiplication effect. After entering the foreign markets, the competing companies become the strategic partners, providing the joint promotion of their products and increasing the growth of export. All these factors facilitate the socio-economic progress and enhance the competitiveness of the regions and the national economy.

According to M. Porter's theory (2008), clusters grow only in the environment providing the combination of all relevant factors, resources and competences, reaching a certain scale, a certain critical threshold and gaining a key role in determining the economic sphere. There is a need in principal and sustainable competitive advantage over other regions due to higher productivity, innovation and new businesses. Classic examples of successful development of cluster initiatives are as follows: clusters

of computer technology in Silicon Valley (USA), logistics cluster in Rotterdam (the Netherlands), and the timber cluster (Finland).

The importance of clusters is proven by the experience of many advanced economies, where the processes of clustering are one of the most promising areas of economic development.

Governments of the countries with advanced economies have recognised the critical importance of improving the competitiveness of their economies through clustering. Therefore, according to the experts' assessment, about 50 % of the economies of the leading countries have been participating in clustering in recent times as a result of deliberate and purposeful action (see Table 1). In accordance with the European Cluster Observatory data (Cluster Observatory URL: <http://www.clusterobservatory.eu/index.html>) there are over 2100 clusters within the EU; they operate in various industries, employing about 43 million employees, which is approximately 38 % of the total number of employed. For example, Finland, whose economic policy is based on clustering, during the 2000s take the leading positions in the world competitiveness rankings. Due to clusters with high productivity, this country, possessing only 0.5 % of global forest resources, provides 10 % of world exports of wood products and 25 % of the paper. There are successfully functioning cluster structures in Germany (chemistry and engineering) and in France (production of food, cosmetics). Clusters number also grows in Denmark, in the Netherlands, Italy, Austria, Great Britain, Spain, Slovenia and other countries. China, Canada, Japan, and South-East Asia are also very active in clustering process.

Table 1. The number of active clusters in some countries of the European Union (2011)

Country	Number of Clusters	Total employment in industry clusters, pers.	The average number of employees in one cluster, pers.
Germany	314	6 693 224	21316
Italy	234	6 165 837	26359
Great Britain	182	4 730 155	25 990
France	165	4 209 316	25 511
Poland	161	2 117 813	13 154
Switzerland	62	790 799	12 755
Sweden	65	722 136	11 110
Finland	34	445 534	13 104
The Netherlands	83	1 201 176	14 472
Estonia	9	134 318	14 924

The results of the numerous studies have confirmed the positive correlation between the high competitiveness of the country and the presence of successfully developing clusters in it. According to the studies [5] innovation activity of the companies operating within the clusters is about 60 %, while this indicator for the companies outside clusters is only 40–45 %. The analysis of 160 clusters revealed that about 60 % of the clusters are global or national

leaders, and only 20 % have a low degree of competitiveness [5].

Basing on these indicators, the theoretical hypothesis that the formation of clusters is the part of the competitiveness growth can be confirmed by practical experience of many countries. This is demonstrated by the records of global competitiveness rankings (see Table 2), showing the apparent correlation between the cluster activity and a position in the ranking.

Table 2. Ratings of innovativeness and competitiveness of the European Union countries

Country	Global Competitiveness Ranking, years 2014-2015	Ranking of the World Innovation Index, 2014
Germany	5	13
Italy	49	31
Great Britain	9	2
France	23	22
Poland	43	45
Switzerland	1	1
Sweden	10	3
Finland	4	4
The Netherlands	8	5
Estonia	29	24

The problem of identification of clusters is urgent today. The most common methods for identifying clusters are as follows [2]:

- identification of clusters on the basis of official government statistics, by multivariate data analysis determining the industries having common inbound and outbound communication, thereby linking industries into clusters;
- identification of clusters on the basis of indirect data analysis and expertise, as well as the calculation of the coefficients of localisation.

The foundation of M. Porter's approach [9] to the clusters identification is calculation of regional coefficients of industries localisation.

There is also intentional arrangement of clusters from top to down with a significant impact of the state. O. Solvell (2009) called it "constructive forces": political action and cluster initiatives within which the socio-political and business leaders deliberately concentrate their efforts to facilitate the development of clusters and regional business climate.

3. Proposals on the Composition, Structure and Scale of Cluster Formation in the Forest Sector in Latvia

The "indicator of specialisation" has been analysed for putting the reasonable proposals for the formation of the forest cluster; the indicator has been calculated according to the formula presented below. Indicator of specialisation in the public sector compares the share of the public sector in the economy with a share of the sector as a whole in the EU. The value higher or smaller than one indicates respectively the higher or smaller level of sector specialisation. The higher is the value of the indicator, the higher is the degree of specialisation.

$$S_{i,j} = \frac{VA_{i,j} / \sum_j VA_{i,j}}{VA_{EU,j} / \sum_j VA_{EU,j}}$$

where:

$VA_{i,j}$ is a value added generated within j industry of i country;

$\sum VA_{i,j}$ is a value added generated by all industries of i country;

$VA_{EU,i}$ is a value added generated within j industry in the EU-27 countries;

$\sum VA_{EU,i}$ is a value added generated by all industries in the EU-27 country;

Indicators of Latvian sector are as follows: Rural, forestry and fishery for year 2000 is 2.01, but in 2010 they already increased to 3.05; this value change means the importance of this sector and its specialisation, which are rapidly increasing in the Latvian economy.

Promoting clustering in the process of choosing the most prior areas for development, it is necessary to estimate the coefficients of localisation, since the analysis of indicators supports the identification of the region and the groups of objects which can arrange the manufacturing core of industry cluster.

The importance of the industry for the regional economy is determined on the basis of coefficients: export-oriented industry, import-substituting industry, or industry for regional needs.

The coefficient of industrial localisation is calculated via the ratio of the industry share in the production structure of the region to the share of the same industry in the national economy. Thus, if the value of the localisation coefficient is greater than 1.25, then the industry is export oriented; if it is in the range from 0.75 to 1.25, it is advisable to refer it to the import-substituting one; if the localisation coefficient value is less than 0.25, it is the industry functioning within the region [11].

The coefficient of per capita production is calculated via the ratio of the specific weight of the region industry in the corresponding structure of the country industry to the specific weight of the region population in the country population.

The coefficient of specialisation of the region in this field is defined as the ratio of the region specific weight by the industry in the country to the specific weight of the region in the country GDP

If the estimated indicators are greater than or equal to one, then this industry is the industry of the region market specialisation. Corresponding calculation results are presented in Table 3.

Considering the below presented results it is possible to conclude that Vidzeme region possesses the greatest potential for clustering, since this region

demonstrates the maximum value by all coefficients (coefficient of industrial localisation, coefficient of per capita production, specialisation coefficient). For instance, the coefficient of industrial localisation shows the value of 2.49, and it indicates that the analysed industry is the industry of the region specialisation; this fact is confirmed by the specialisation coefficient equal to 2.5. The calculation of the per capita production coefficient can be significantly affected by the performance of the total population of the region and the number of the economically active population. Nevertheless, comparing the overall picture of the values of the coefficients, it is again possible to note the high values of indicators for Vidzeme region. The second position in terms of the coefficients value belongs to Zemgale region. The high values of the coefficients in this region can be affected by the fact of presence there such research and academic institutions as Latvian Academy of Agriculture and the Faculty of Forestry and the presence of companies which use the results of their scientific investigations. Next position, considering the degree of high performance belongs to Kurzeme region, while the lowest values of indicators are demonstrated by Riga and Riga region.

Nevertheless, Riga and Riga region are the leader in absolute terms, due to the high level of industrial production development and the presence of

concentrated highly skilled and qualified workforce, advanced infrastructure and scientific capacity.

A special role in the cluster is given to small and medium-sized businesses, which might work in cooperation with large industrial enterprises. Such closely interlinked cooperation of small business and cluster major manufacturers provides small and medium-sized business with not only the flexibility and stability, but also the competitiveness, which is typical for big businesses.

The most optimal model for a timber cluster arrangement is the Anglo-Saxon model [8]. The State creates favourable conditions for the formation of the cluster, and the further development of the cluster takes place in the framework of public-private cooperation on mutually beneficial conditions.

The cluster should develop in accordance with the principle of vertical production chains; these chains form the core of the cluster by the successive stages of the production process (for example, supplier – producer – marketer – consumer), or by a network formed around the parent enterprises [6].

The proposed structure of the production component of the forest cluster is shown in Figure 1.

Table 3. Potential for clustering the forest complex presented by regions of Latvia

Region	Volume of timber products production, th. of Euros	The volume of industrial production, th. of Euros	The share of the forestry products in the industrial production	Coefficient of industrial localisation	The share of the region in the total population	The coefficient of per capita production	The share of the region production in national GDP	The share of the region in the production of national forestry	Specialisation ratio
Riga and big Riga	1002953	7438160	0,13	0,77	0,5	0,27	0,67	0,51	0,8
Vidzeme	326020	745280	0,44	2,49	0,1	4,34	0,07	0,17	2,5
Kurzeme	258892	1440722	0,18	1,02	0,13	1,39	0,13	0,13	1
Zemgale	266127	952654	0,28	1,59	0,12	2,28	0,09	0,14	1,6
Latgale	107182	595448	0,18	1,03	0,14	1,26	0,05	0,03	0,6
Latvia (total)	1961174	11172264	0,18	-	1	-	1	-	-

Source: authors' calculations on the basis of statistic data presented by Latvian Statistics Office (csb.gov.lv)

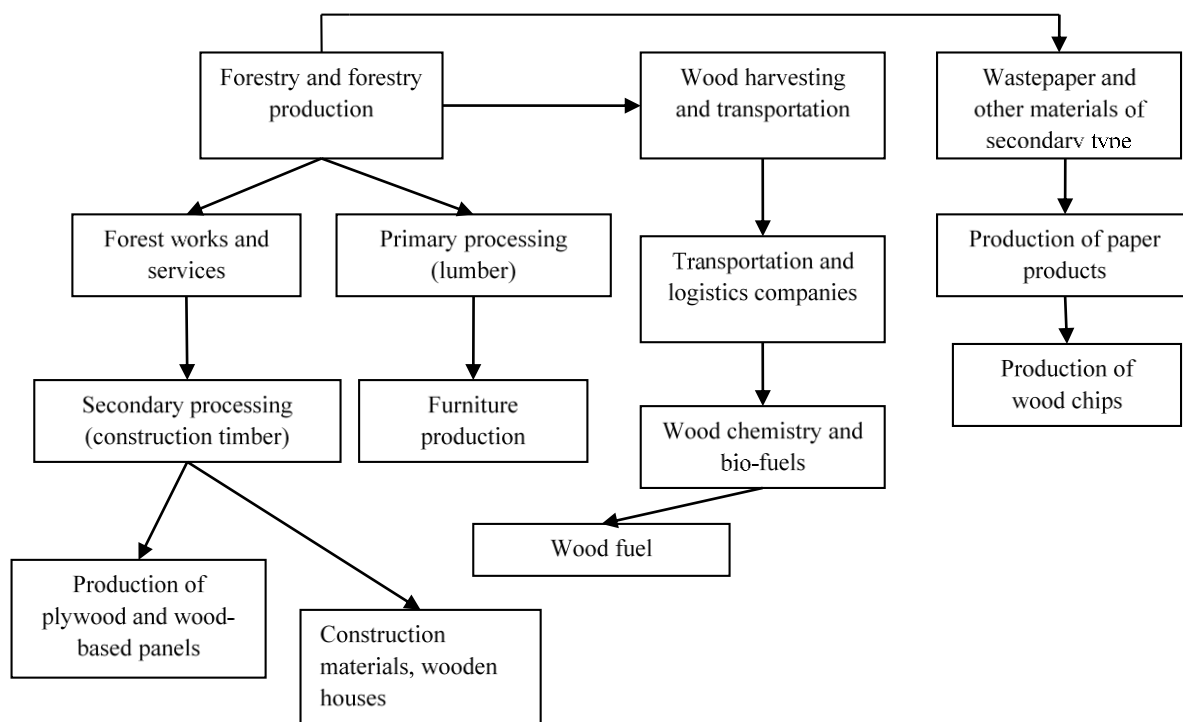


Fig. 1. Structure of the production component of the forest cluster

Not only the existing forest industry enterprises, but also the production companies planned for the future can enter the cluster. Therefore, the development of enterprises within the cluster is closely linked to the arrangement of new producing capacity, which in their turn form a new processing industries and related companies. A peculiarity of this cluster model is a compound potential of logging and processing complexes oriented on obtaining the synergy effects from such cooperation. It is necessary to expand the wood chemical industry; this expansion should be produced by the employment of low-quality wood and timber wastes for the production of bio-fuels, which will allow implementation of the available forest resources by 100 %. Cluster infrastructure should be maintained by the relations with institutions of vocational training, research and technological institutes, and government agencies at all levels of authorities.

It is important to attract the funds of credit organisations and banks besides the co-financing of enterprises for financing the development of innovative products within the cluster.

This aggregation of enterprises allows combining the process of production activities of wood suppliers and processing companies, while promoting a strategy of short-term planning, which, in its turn, allows optimisation of transportation and other schemes aimed at continuity of production cycles. According to the opinion of leading experts in economics, the development of the cluster and the real

benefits from its activities appear with a time lag of 5–7 years.

In general, the structure of the forest industry cluster is shown in Figure 2.

Arrangement of the forest clusters allows concentration within the territorial unit with intensified infrastructure of such functions as lumbering, wood processing (including furniture manufacturing), pulp and paper industry, biochemical production, specialised machinery, printing industry, transportation, construction and other objects of economic activity.

It is important to establish relationships between both direct participants of cluster and related industries; the mutual connections between the cluster direct participants take place via the development of cooperation between the companies basing on the general concept of advance; under these conditions the cluster is competitive. Such well-established relationship will directly affect the growth of the efficiency of production and competitiveness of their products and increase of the employment level; high productivity, competitiveness, innovation, synergies, the development of scientific and technological base, increase in investments, and the long-term and dynamic development of the economy as a whole within the country can be achieved via the advance of forest cluster. This means that the formation of the cluster will create new chain of value added of the produced products.

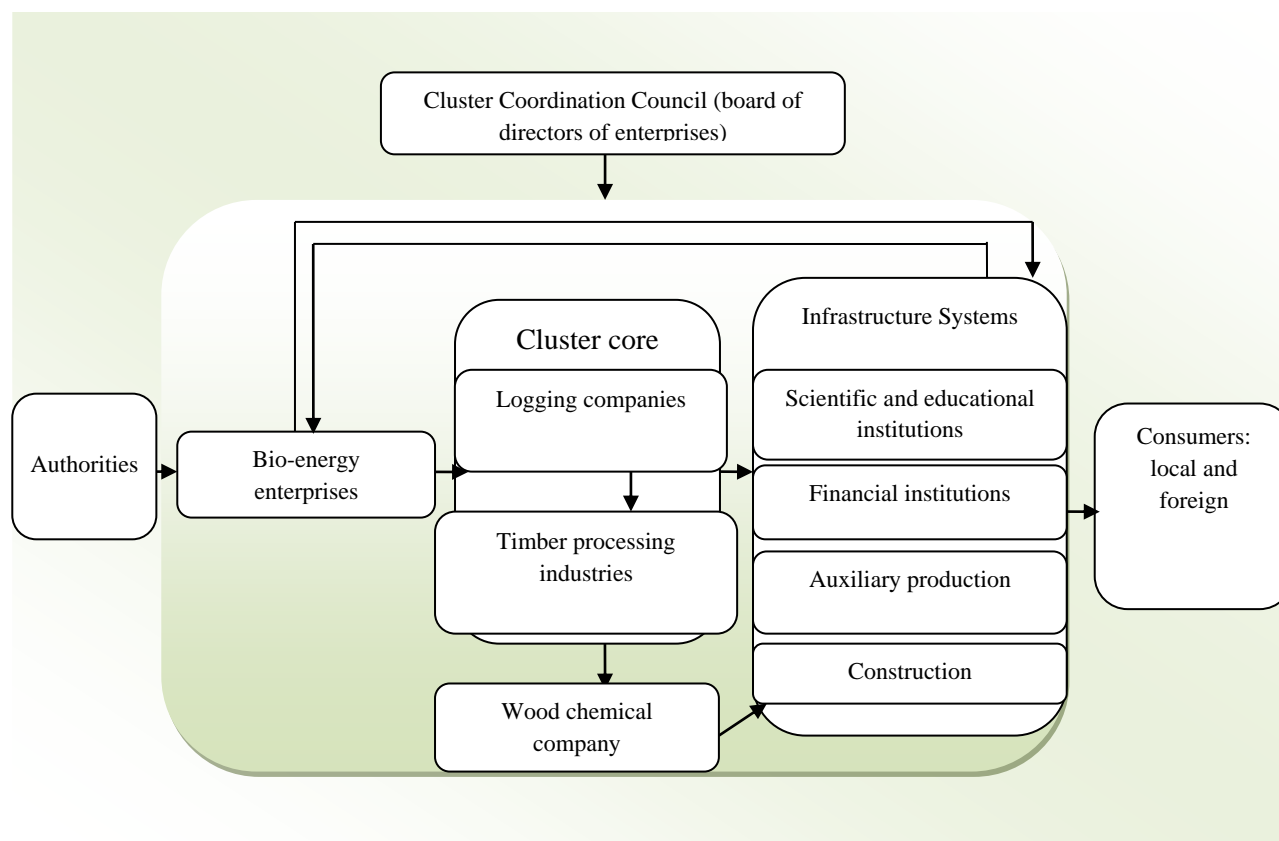


Fig 2. The structure of the timber cluster

Conclusion

The results obtained in the process of the research under consideration allow concluding that the potential attributable to the arrangement of forest clusters able to unite all the subjects of the forest sector in Latvia; it can also ensure the growth of the competitiveness of the cluster itself, its members, as well as related and accompanying industries.

The prerequisites for arranging the clusters in the timber industry of Latvia are as follows:

- Availability of the necessary and readily accessible forest resources;
- The proximity of the domestic and overseas markets of forest products;
- Availability of timber production and production structures of small and medium enterprises;
- Advanced infrastructure;
- A high level of skills of workforce employed in the forestry sector.

Certainly, it is necessary to achieve unanimity of interested parties of the forest sector for the effective implementation of existing preconditions, as well as the proper public policy.

Arrangement of the forest cluster allows creating the strong and competitive industry, contributing to the stabilisation of the business prospects for the successful development in the collaboration with other sectors and other interested parties.

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