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Cluster model of vertical integration as a way of development of branch of hop growing

Goal. Development of the conceptual model of the regional hump cluster and the substantiation of the organizational and economic mechanism of interaction of its participants. **Methods.** Abstract-logical, analysis and synthesis, induction and deduction. **Results** The model of the vertically integrated structure is developed, which will ensure the integrity of the interconnected processes of production, processing and sale of hop products in the form of unions, which will allow to obtain a synergistic effect, to concentrate resources, etc. **Conclusions** The development of the Khmelnych cluster will help to optimize socio-economic, organizational and technological processes, which will enable the industry to improve the productivity of hop harvesting.

Key words: hop harvesting industry, innovation development, cluster, hop industry, integration.

Formulation of the problem. Nowadays, in Ukraine there is a real threat of a significant loss of capacity of the hops industry, but the high demand for its products requires the restoration of production volumes, until the experience gained and the material and technical resources of the hops have not been completely lost. The cluster model has a significant organizational potential for the industry, as it can become the strategic basis for the development of hops in Ukraine. The essence of the Khmelnych cluster is to combine the efforts of similar enterprises, financial, research, educational, trade structures and state institutions to provide production and marketing of hop products that meet international standards. At the same time, the members of the cluster association maintain economic independence, obtaining additional synergistic advantages from the coordination of actions aimed at increasing the efficiency of each participant in the cluster. The experience of the countries suggests that the cluster approach is the basis for dialogue between the representatives of science, the business sector and state institutions and allows them to increase the effectiveness of their interaction in the innovation field. An important feature of the cluster is its innovative orientation, so successful clusters form where the breakthrough in the field of technology and production is being implemented or expected, with the subsequent stabilization of the system of sales and entry into new markets [2]. Effective clusters are formed on the basis of regional features, which turn into sources of competitive advantage. Zhytomyr oblast has real opportunities for the formation of the Khmelnytsky cluster: the presence of favorable soil and climatic conditions, specialized competitive interconnected hops processing and supply resources, agrochemical services, seedlings, skilled personnel, developed infrastructure for training and conducting scientific -research and design works.

The purpose of the research is to develop a conceptual model of the regional hump cluster and to substantiate the organizational and economic mechanism of interaction of its participants. Research methodology.

The object of research is the process of creation and functioning of the regional cluster in the field of hop cleaning as a means of development of the industry. The following research methods were used to solve the problems: abstract-logical - with the help of it, the concept of "regional cluster" was clarified and the characteristic factors that determine the processes of its formation and functioning are specified; Analysis and synthesis - used in the process of developing mechanisms for the creation and functioning of a regional hump cluster. Using the methods of induction and deduction, scientifically grounded results are obtained

and general conclusions are formulated. Research results. Such world scholars as A. Marshall [2], M. Porter [4], S. Rozenfeld [5], E. Feuer [10], G. Farrell, P. van den Hertag, and others have devoted their studies to the cluster model of management. . The questions of the prospect of the creation and functioning of clusters were also dealt with by domestic scientists, in particular E. Asanova, M. Voynarenko [1], N. Semenova [6], S. Sokolenko [7], V. Tretiak [8], V. Chuzhikov [9], Zinovchuk V. and others. They remain insufficiently studied and require a separate scientific study of the problem of development and implementation of regional cluster models in the conditions of functioning of the modern agricultural sector of Ukraine, in particular, the industry of hop cultivation. All this indicates the relevance and importance of the study of the preconditions and mechanisms for the creation and functioning of the regional cluster in the hops industry. Currently, one of the problems of domestic chemists is the low level of prices for their products at a significant cost of production. Manufacturers are forced to sell hops in the middle, rather than through long-term or medium-term contracts with breweries and other processors. The reason for this is that breweries conclude deals and only buy large batches of raw materials of the same grade with stable quality indicators. The overwhelming majority of domestic hops now produces one type of hops in an amount insufficient to provide a minimum supply of supplies. Because of this, producers sell hops for immediate after drying for further granulation and sale, or, paying for the production of granules, sell them at higher, but still unprofitable prices to the same mediator. With the creation of the cluster association, it is advisable to propose a program for improving the varietal structure of plantations to provide sufficient volumes of each botanical honey variety adapted to the conditions of Polissya. The major breweries are large foreign-owned companies that use only imported hops from American and German bitter hops in their technology. Often, the mothers of breweries operating on the territory of Ukraine, who are interested in supplying the hop products of the foreign production, are often motivated by the inadequacy of the quality of domestic products and referring to "allegedly" lack of domestic dairy products of domestic producers of high quality hops. Small and medium-sized breweries, which account for 10% of the Ukrainian beer market, and PJSC "Obolon", in their technologies use hop pellets of type 90 of domestic production, which confirms the high level of domestic hop products. An important source of increasing the efficiency of hops as a result of class association is the possibility of organizing a wide exchange of information, which will enable to clearly coordinate plans and schedules for hop storage, storage, processing and delivery of final products to the consumer. As a result, conditions will be created for a more complete and stable loading of the production capacities of the enterprises involved in the storage and processing of hop products. When forming the hermel cluster's principles, it is necessary to determine the sequence of stages of its creation and development, which will enable to realize and formalize the relations between the entities of the association. The analysis of the economic situation in the industry and in the market of hop products and the research of the structure of production made it possible to develop a conceptual model of the regional hop cluster (Figure). Under the current Ukrainian legislation, the cluster itself is not a specific organizational and legal entity, and its individual entities may have different organizational forms.

The economic mechanism determines the behavior of members of the cluster, each of which has its own economic interests. The parameters of the economic mechanism in the cluster determine the benefit of the participants and ensure their interaction without legal control over the assets. Formally, the free entry of individual subjects into a cluster and the outcome of it is a key motive for the transfer of business entities within the cluster. The core of the cluster. In connection with the transition of the Ukrainian food industry to modern brewing technologies, no domestic brewery, including mini breweries and breweries of restaurant type, no longer use pressed coniferous hops, but rebuilt to use hop products - Granules and extracts. The advantage of using hop pellets in front of coned hops is that, during the chilling of the wort, the dispersion, extraction and isomerization of alpha acids improve. Granulated hops are more convenient to dispensing during the packing and whipping of wort. In addition, the volumetric mass of granulated hops is much smaller than that of compressed, and therefore the transport and warehouse costs are reduced.

Fig. Model of scientific and production regional hump cluster

Recycling companies that are manufacturers of competitive products on the market of honey can become the core of the cluster. They must be provided with a sufficient amount of hops to be produced by agricultural enterprises, which will enable the formation of large volumes of hops of the same grade and of homogeneous quality to meet consumers' demand for volumes and the stability of the supply of products.

The formation of a regional hop collection cluster should take place around the company-leader - processing plant (granulator) - which processes the pressed hop in granules, which are a very competitive product on the world market, especially made from aromatic varieties. Now in the region there are 2 granulators, which convert convex hops and store hop products until they are sent to the consumer. One of the granulators belongs to the Ukrainian-German company Hopstein Ukraine LLC, which enables the production of home-made hops to world markets. The enterprise has perhaps the best workshop in Europe to produce granules of hop type 90 and can process about 1600 tons of "green gold" per season, ie three times more than today's entire domestic industry. The participation of foreign capital and the use of the brand by the well-known firm Hopsteiner have the potential for effective sales of products, in particular contracts (marketing function). At the same time, the core of the cluster is the channel through which some of the information about foreign industrial innovations in the hop-hole industry is received. The main element of the cluster, which is the production base, is the industry's hop industry, closely associated with service enterprises that are engaged in supplying the necessary types of resources and services. Satisfaction of the economic interests of the participants in the hermel cluster depends to a large extent on several factors: production capacity of the raw material base, demand level, prices for a certain type of hops and alpha acid. Due to the presence in the cluster of the reprocessing and selling enterprise for storages, transaction costs are saved for the search for consumers and information on the sale of products. The cluster approach to the production organization around the processing complex offers the opportunity to expand its activities on the international hop markets and create joint ventures. Enterprises that are already involved in the export of hop products will be able to help other members of the hermel cluster enter the foreign market and jointly promote their products. An isolated enterprise that operates independently in the market will not have such opportunities.

Raw material zone The basic element of the classroom is the raw material area, represented by the geographic concentration in the Polissia of independent hops of different forms of ownership. The viability of the cluster depends on the implementation of their products and the level of their competitiveness. The remaining elements of the cluster education are represented by groups of enterprises that provide the work of the hymel farms and promote the promotion of their products on the market. However, all class members remain formally free, do not lose their organizational and economic independence. Their participation in the cluster is not documented, and relations between the entities within the cluster should be built exclusively on contractual relations. At the same time, the association of chimeras and other members of the cluster should take the form of establishing an association of business leaders - members of the cluster (non-profit partnership) through the signing of agreements or protocols on cooperation in certain areas. Unlike non-cluster enterprises, cluster-based enterprises have better conditions for establishing relationships with suppliers, banks, better adapt to consumer demands, have wider access to highly skilled labor, newer ones

Development of scientific institutions. In addition, participation in a cluster pool allows participants to use resources more rationally, to reduce certain types of costs, focusing on the type of activity they are specializing on, and the transaction costs that are inseparable from the isolated location of the hop-enterprises. Currently, agricultural enterprises have to make business plans, where it is necessary to clearly outline the varietal structure of plantations. Knowing how much hops to grow in Ukraine, brewers and hops will be able to set up cooperation channels.

Segment power Representatives of the authorities are interested in the development of the cluster, whose activities will contribute to the growth of the region's economy and its competitive advantages. Authorities and state institutions should develop strategic plans for hopper development in the region, provide informational support to projects within the framework of the development of a cluster association.

The positive predicted outcomes of the functioning of the Khmelly cluster are the growth of employment in the region, the volumes of production and revenues to the regional and central budgets, as well as the limitation of a significant part of the social functions of local authorities with the transfer of their implementation to the entrepreneurial sector. The Regional Center for Scientific Support of the Zhytomyr Oblast is a scientific center that provides the functioning of a regional association. The main goal of the center is the integration of scientific, production, financial and investment resources for the implementation of priority projects for Polissia.

Segment science and education. A prerequisite for successful cluster activity is an internal source of innovation such as research institutions, such as the Institute of Agricultural Policy of the Polesie (IISP) of NAAS, which produces its own technological and other innovations or adapts to the

regional peculiarities of obtaining others. Domestic or foreign scientists. The scientific divisions of this institution specialize in breeding improvement of hops, certification of Ukrainian varieties in accordance with European and world standards, and the introduction of the latest energy-saving technologies for cultivating crops. The use of innovative technologies makes it possible to expand the scope of production in the classroom by offering additional hop products. Together with product quality control, development and approval of production standards, this segment should investigate the external environment of the market, in particular forecasting the dynamics of demand and its output for cluster enterprises. On the basis of IISP, schools for upgrading skills for specialists in the honey industry (managers of enterprises and specialists of the lower levels) were established. The necessary element of the cluster is the institutions that provide the transfer of experience in the field of cultivating hops and preparing the courses of the corresponding profile. They can be real educational institutions - Zhytomyr National Agroecological University and Zhytomyr Agricultural College. They have a scientific and training base for training specialists in this field of production. Financial-banking segment. Given the large number of enterprises in the cluster and the need for continuous improvement of their activities, an important element of the cluster must be financial institutions - banks, since loans are often the only source of investment attraction. It is important to take into account the common interests and initiatives of all subjects of the cluster, except for loans, it is necessary to involve budget or grant support for the territorial development of such an association.

The funds of the Zhytomyr Regional Fund for Enterprise Support, regional and local budgets (within available financial resources), enterprises' own funds can be used to finance the activity of the cluster. A desirable step, which will stimulate cluster mergers, will be the development and implementation of a privileged tax burden for all cluster participants. The system of financial and credit services includes: a financial and credit infrastructure geared towards servicing agricultural producers of hops, a mechanism for credit relations with commercial banks and a mechanism for out-of-bank lending. These are commercial and cooperative banks, credit unions, agro-industrial and financial groups, insurance companies, etc. The main function of this structure is the preferential lending and insurance of the participants in the hermes cluster. Council cluster. In clusters formed on a voluntary and mutually beneficial basis, the unifying factor is the council. She cooperates with government and other entities in the region and beyond. It consists of heads of companies, organizations, enterprises, representatives of regional administrative structures. The cluster council has only coordinating, analytical, and similar functions. The structure of management, in the form of a coordinating council (representatives of structuring and marketing hops and processing enterprises, educational institutions, research institutions, infrastructure enterprises) should be formed for interaction, distribution of responsibility among the participants of the integration association. The Coordinating Council will control the cluster development strategy, directions and coordination within the cluster, and will distribute tasks between the board and the participating enterprises. The responsibilities of the board in the field of production will lie in the formation of a long-term business model; In the scientific and investment spheres - in the coordination of research, research and design works and the introduction of innovations; In financial policy - in attracting investment resources; In social and personnel policies - in recruiting staff, forming a corporate culture of a cluster. The management of the activity of the proposed regional hermel region cluster will be carried out by a coordinating council headed by the head, the most influential head of one of the profile subcluster or one of the organizations (participants) of the cluster education. Assist him in this activity, the deputies - the leaders of technological subcluster. Production and financial holding. When a cluster has a significant number of participants, having developed links within its own borders, areas of activity, regions and will have non-market commercial assets in the form of interconnections that promote free exchange of information and help coordinate economic activities, it is considered to be elderly . This will result in the emergence of new regional entities (holdings), which will increase the prestige and attractiveness of the cluster and will facilitate the accession of more companies and new companies. So, merging with a commercial bank, a hermetic cluster can create a production and financial holding company, attracting additional financial resources for its development in the event of high demand in the market for its products. The cluster can also be rebuilt into one or more new clusters that focus around other activities. The cluster can be successful for decades, and may become part of a new cluster or reach a stage of decline.

Conclusions

The development of the Khmelnych cluster will help to optimize the socio-economic, organizational and technological processes that will make it possible to increase the efficiency of the industry of hops, namely: to form homogeneous batches of products, to carry out the initial processing of hops and to organize sales of products, to ensure the implementation of integrated mechanization. Production processes and the cultivation of new high-yielding, competitive hops, as well as the development of strategic programs for the development of the industry, targeted programs territorially. Development, introduction by enterprises and organizations of the system of effective management on the basis of logistics and controlling. The clustered approach to the organization of the economy of the industry will help attract investment, increase innovation, reduce the cost through synergy effect, improve product quality, expand sales markets, increase export volumes and increase the competitiveness of all enterprises - cluster and industry players.

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