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**THE DATA MINING OF CLUSTER STRUCTURE OF AGRICULTURAL
ENTERPRISES OF THE KIROVOHRAD REGION WITH USING THE
MAPS OF KOHONEN**

Transforming of land relations and ownerships led to the significant structural changes in the agricultural sector of economics, the differentiation of agricultural farms by dimensions and indicators of economic efficiency of economic activity.

The complication of market relations and the formation of a new post-industrial paradigm of economic development require the use of cardinal new techniques and methods of conduction of the researches of efficiency in agriculture, which causes the actuality of use of the intellectual approaches to the study of economic phenomena and problems.

The aim of the research is to study the organizational and economic structure of agricultural enterprises of the Kirovograd region by dimensions of land use and the valuation of their impact on the efficiency of economic activity using modern methods of data mining.

The practice of successful economic activity of many domestic agricultural farms indicates that their effective functioning in the conditions of competitive market environment is ensured by the rational use of the available resource potential through the introduction of the perspective technologies of production and adoption of optimal administrative decisions. In view of the above-mentioned, today it takes the important value the problem of optimization of the dimensions of enterprises; upon reaching of their main parameters it will ensure not only a high economic efficiency of economic activity and competitiveness of production, but also the financial stability and sustainable development of agriculture.

In our view, under the optimization, it should be understood the achievement of such scale of concentration of manufacturing resources of enterprises at which the comparative advantages from their increase will ensure lower costs for a unit of

products and higher level of profitability, including at the rate of 1 ha of agricultural lands.

The peculiarity of study of this problem in the conditions of Kirovograd region is the lack of a developed branch of stockbreeding in the region and the significant differentiation of agricultural enterprises in sizes of land use, which makes it difficult to conduct a comprehensive economic and statistical analysis of it using the method of groupings.

Among the latest achievements in the sphere of information technologies that have found wide application in economic researches of scientists was distinguished the data mining. The data mining is a relatively new method in science, which includes a complex of methods of identification the hidden objective laws or interconnections between variables in large arrays of raw information of various origins.

It was used the method of multidimensional cluster analysis in our research with use the self-organizational Kohonen maps, allowing visualize the objects with similar properties.

The researches of the relationships between the dimensions of agricultural farms in the region and the indexes of the efficiency on the basis of Kohonen maps of self-organization allowed to conduct the systematic analysis of the structure of agricultural enterprises and to determine the rational sizes in terms of the multidimensional impact of different factors of internal and external environments. With the help of this data mining tool in the system Deductor was conducted the cluster analysis of the structure of 487 agricultural enterprises of the Kirovograd region in 2013, owing to this were founded the groups with different size of land use and economic indicators of the efficiency of economic activity. It was set that the most efficient agricultural production was in farms of the first and the third cluster, where the average size of agricultural lands was 5567 and 1194 ha.

References

1. Andriichuk, V.H. (2006), *Efektivnist diialnosti ahrarykh pidpriemstv: teoriia, metodyka, analiz* [Efficiency of activity agrarian enterprises: theory, methodology, analysis], KNEU, Kiev, Ukraine, 292 p.
2. Andriichuk, V.H. (2009), "Above the concentration of agroindustrial production and land resources and its consequences", *Ekonomika APK*, no. 2, pp. 3-9.
3. Lupenko, Yu.O., Mesel-Veseliak, V.Ya. et al. (2012), *Stratehichni napriamy rozvytku silskoho hospodarstva Ukrainy na period do 2020 roku* [Strategic directions of development of agriculture in Ukraine for the period till 2020], Kiev, Ukraine, NNTs "IAE", 182 p.

4. Prysiazhniuk, M.V., Zubets, M.V, Sabluk, P.T., Mesel-Veseliak, V.Ya., Fedorov, M.M. (2011), *Ahrarnyi sektor ekonomiky Ukrainy (stan i perspektyvy)* [Agrarian sector of economy Ukraine (state and perspectives)], NNTs IAE, Kyiv, Ukraine, 1008 p.
5. Mesel-Veseliak, V.Ya. (2008), "Optimal sizes of agricultural formations industrial type in Ukraine", *Ekonomika APK*, no. 3, pp. 13-20.
6. Mesel-Veseliak, V.Ya. (2006), "The development of forms managing in agrarian sector of Ukraine (the results, problem)", *Ekonomika APK*, no. 12, pp. 34-41.
7. Dankevych, A.Ye. (2011), "Influence of sizes land uses on the production level", *Ekonomika APK*, no. 9, pp. 29-33.
8. Hutorov, A.O. (2011), "Theoretical and practical aspects of formation the rational sizes of the agricultural enterprises", *Ekonomika pryrodokorystuvannia i okhorony dovkillia*, DU IEPSR NAN Ukrainy, Kiev, Ukraine, 292 p. – S. 228-234.
9. Dusanovskyi, S.L. (2014), "The development of forms managing and social protection of village", *Rol nauky u pidvyshchenni tekhnolohichnoho rivnia i efektyvnosti APK Ukrainy* : [The role of science in improving the technological level and efficiency of the AIC of Ukraine], *materialy IV vseukrainskoi naukovo-praktychnoi konferentsii*, [Proceedings of the 4th All Ukraine scientific-practical conference], (Ternopil, 15-16 May 2014), Part 2, Krok, pp. 75-77.
10. Tymoshevskiy, V.V., Bidylo, M.I., Mokierova, V.V. (2010), "Economic and mathematical justification of establishing the optimal size of agricultural of land use", *Innovatsiina ekonomika*, no. 4 (18), pp. 41-43.
11. Kohonen, Teuvo (2001), *Samoorganizuyushhiesya karty* [Self-Organizing Maps, 3rd edition], Translated by V.N. Ageeva, BINOM, Laboratoriya znaniy, Moscow, Russia, 655 p.
12. Barskiy, A.V. (2004), *Neyronnye seti: raspoznavanie, upravlenie, prinyatie resheniy* [Neural networks: recognition, management, decision-making], *Finansy i statistika*, Moscow, Russia, 176 p.