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# ОБҐРУНТУВАННЯ ДОЦІЛЬНОСТІ СТВОРЕННЯ АГРОПРОМИСЛОВОГО КЛАСТЕРУ НА ПРИКЛАДІ КОДИМСЬКОГО РАЙОНУ ОДЕСЬКОЇ ОБЛАСТІ

***Актуальність.*** *Світовий досвід регіонального розвитку показує, що рівень просторового розвитку економіки регіонів тісно пов'язаний з їх конкурентними перевагами. В умовах ринкової економіки, при виборі найкращого регіону для інвестицій в різні сфери діяльності, істотний вплив на прийняття рішень бізнес-структурами надає наявність в даному регіоні необхідних умов для ведення бізнесу – розвиненої фінансово-кредитної сфери, комерційних організацій, економіко-правових інститутів, ринково-інформаційних структур, зовнішньоекономічних організацій та ін. У зв'язку з цим виникає необхідність дослідження просторової організації економіки регіону з точки зору можливого посилення конкурентних позицій. Одним із чинників підвищення конкурентоспроможності є впровадження кластерного підходу. Актуальність утворення кластерів на Україні займає чітку зростаючу позицію, особливо в агропромисловій галузі економіки.*

***Мета та завдання.*** *Метою статті є обґрунтування доцільності створення агропромислового кластеру в Кодимському районі Одеської області. Це дасть змогу вирішити актуальні питання соціально-економічного розвитку району, стабілізації та збереження динаміки економічного розвитку та підвищення рівня життя населення Кодимського району.*

***Результати.*** *Формування агропромислових кластерів в регіоні є достатньо складним процесом, коли видимі результати досягаються лише через декілька років. Проте подібні об'єднання чинять позитивний вплив не тільки на окремі підприємства в структурі кластера, але і на економіку регіону в цілому, оскільки відбувається взаємодія трьох секторів: бізнесу, інституцій і влади. Аналіз західного досвіду виникнення життєздатних кластерів показує, що кращі і швидші результати можуть бути отримані коли формування кластера стає предметом цілеспрямованої діяльності всіх зацікавлених сторін. На прикладі агропромислового кластера зроблена спроба об'єднання в один ланцюг взаємопов'язаних видів діяльності від виробництва до кінцевого продукту на конкретній території та забезпечення її стійкого соціально-економічного розвитку. З цією метою проведена оцінка перспективності та адаптованості формування кластеру та визначені сприятливі та стримуючі чинники розвитку агропромислового кластеру у Кодимському районі. Визначені учасники Кодимського аграрного кластеру та представлена модель взаємодії підприємств Кодимського району в межах кластеру "Кодимський".*

***Висновки.*** *У статті обґрунтовано доцільність створення агропромислового кластеру на прикладі Кодимського району Одеської області. Формування аграрного кластеру дасть можливість стабілізації та зростанню виробництва не тільки агропромислового комплексу району в цілому, а і окремих учасників кластеру. На основі формування кластеру буде сформована та реалізована стратегія, на ряду з цим поліпшиться фінансовий стан усіх учасників кластеру.*

***Ключові слова:*** *кластер, структура, аналіз, організація, інвестиції, інновації, оцінка, показник.*

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# RATIONALE FOR THE FEASIBILITY OF CREATING AN AGRO-INDUSTRIAL CLUSTER ON THE EXAMPLE OF THE KODYM DISTRICT OF THE ODESSA REGION

***Topicality****. World experience in regional development shows that the level of spatial development of regional economies is closely linked to their competitive advantages. In a market economy, when choosing the best region for*

*investment in various fields of activity, a significant influence on decision-making by business structures has the availability in this region of the necessary conditions for doing business - a developed financial and credit sector, commercial organizations, economic and legal institutions, market -information structures, foreign economic organizations, etc. In this connection, there is a need to study the spatial organization of the region's economy in terms of possible strengthening of competitive positions. One of the factors of increasing competitiveness is the implementation of the cluster approach. The relevance of cluster formation in Ukraine is clearly growing, especially in the agro-industry.*

***Aim and tasks**. The purpose of the article is to substantiate the feasibility of creating an agro-industrial cluster in the Kodym district of Odessa region. It will help to solve topical issues of socio-economic development of the district, stabilize and preserve the dynamics of economic development and raise the standard of living of the population of Kodym district.*

***Research results**. The formation of agro-industrial clusters in the region is a complex process, with visible results being achieved in just a few years. However, such associations have a positive impact not only on individual enterprises in the cluster structure, but also on the economy of the region as a whole, as three sectors interact: business, institutions and government. An analysis of the Western experience of the emergence of viable clusters shows that better and faster results can be obtained when the formation of a cluster becomes the focus of the targeted activities of all stakeholders. On the example of the agro-industrial cluster, an attempt was made to integrate into one chain of interconnected activities from production to the final product in a specific territory and to ensure its sustainable socio-economic development. To this end, the prospects and adaptability of the cluster formation were evaluated and the favourable and restraining factors for the development of the agro-industrial cluster in the Kodym region were determined. The participants of the Kodym agrarian cluster are identified and the model of interaction of the enterprises of the Kodym district within the Kodym cluster is presented.*

***Conclusion**. The article substantiates the feasibility of creating an agro-industrial cluster on the example of the Kodym district of Odessa region. Formation of agrarian cluster will allow stabilization and growth of production not only of the agro-industrial complex of the district as a whole, but also of individual participants of the cluster. Based on the cluster formation, a strategy will be formed and implemented, along with this will improve the financial status of all cluster members.*

***Keywords**: cluster, structure, analysis, organization, investment, innovation, evaluation, indicator.*

**Problem statement and its connection with important scientific and practical tasks.** New competitive tendencies have emerged in the form of competitive regional positions, due to the transformation of the territorial and international subsidies on the basis of the detailed and operational special halls. There is a need to formulate the technology of technological sounds among the countries of the region, as well as the fact that the number of great enterprises is better, which may include their own needs.

All of the time, in view of the traditional industrial policy, agro-industrial policy, in particular, the economy's singing clause is considered, but a great deal of publicity is important, it's possible to observe, linked with one goods-manufacturing and information flows and often geographically concentrated in the open.

**Analysis of the recent publications on the problem.** There are different theoretical and methodological ambushes in the form of agribusiness clusters in the apprenticeships of O. Bakumenko [2], M. Voinarenko [3; 4], L. Glushchenko [5], Yu. Golovnya [6], O. Dirdonova [7] , V. Zakharchenko, V. Osipova [8] V. Krupina, A. Pelekhatogo [9], L. Markov, M. Yagolnitser, I. Teplova [10], V. Timochko, Y. Kovalchik, R. Padiuk, O. Govda [12]. Researchers offer to concern the different definitions of the "cluster", the establishment of clusters in the lower galleys of the economy, and only one by one to vote on the basis of the fact that there is only one competitor. The studies are not final, they indicate that in many regions of Ukraine this path is fundamentally possible, which justifies the presented model for creating an agro-industrial cluster.

**Allocation of previously unsolved parts of the general problem**. Cluster formation is based on the combination of science, technology, production, economics and management to increase the competitiveness of products. That is why the author of the article noted the need to create an agro-industrial cluster in the Odessa region, analysing in this connection its competitive advantages for the region. Therefore, in this work we will attempt to justify the agro-industrial cluster based on the Kodym agricultural firm (Odessa region) and, thus, ensure the stability of the socio-economic development of the Kodym region.

**Formulation of research objectives (problem statement).** The main objective of the agro-industrial complex is the reliable provision of the country's population with food, and industry - agricultural raw materials. Innovative methods for solving the problem of ensuring the sustainability of the development of grain production is the creation of territorial production complexes - clusters that can concentrate significant

financial, technological, innovative and labour resources around themselves, which ensure economic growth and increase the competitiveness of agribusiness sectors.

**An outline of the main results and their justification**. Clustering the agrarian economy is a systemic innovation process of territorial-sectoral network integration of enterprises and organizations interconnected by the common interests in a particular activity, to ensure the rational use of resource potential, increase the production of final products and increase its competitiveness in the market and promote the sustainable development of agricultural production and rural areas [6]. The agro-industrial cluster is an innovation-oriented, geographically localized integrated structure with elements of a network organization, including various sectors of the agro-industrial complex included in the technological chain of creating added value, and differs from traditional vertically integrated structures (Fig. 1).

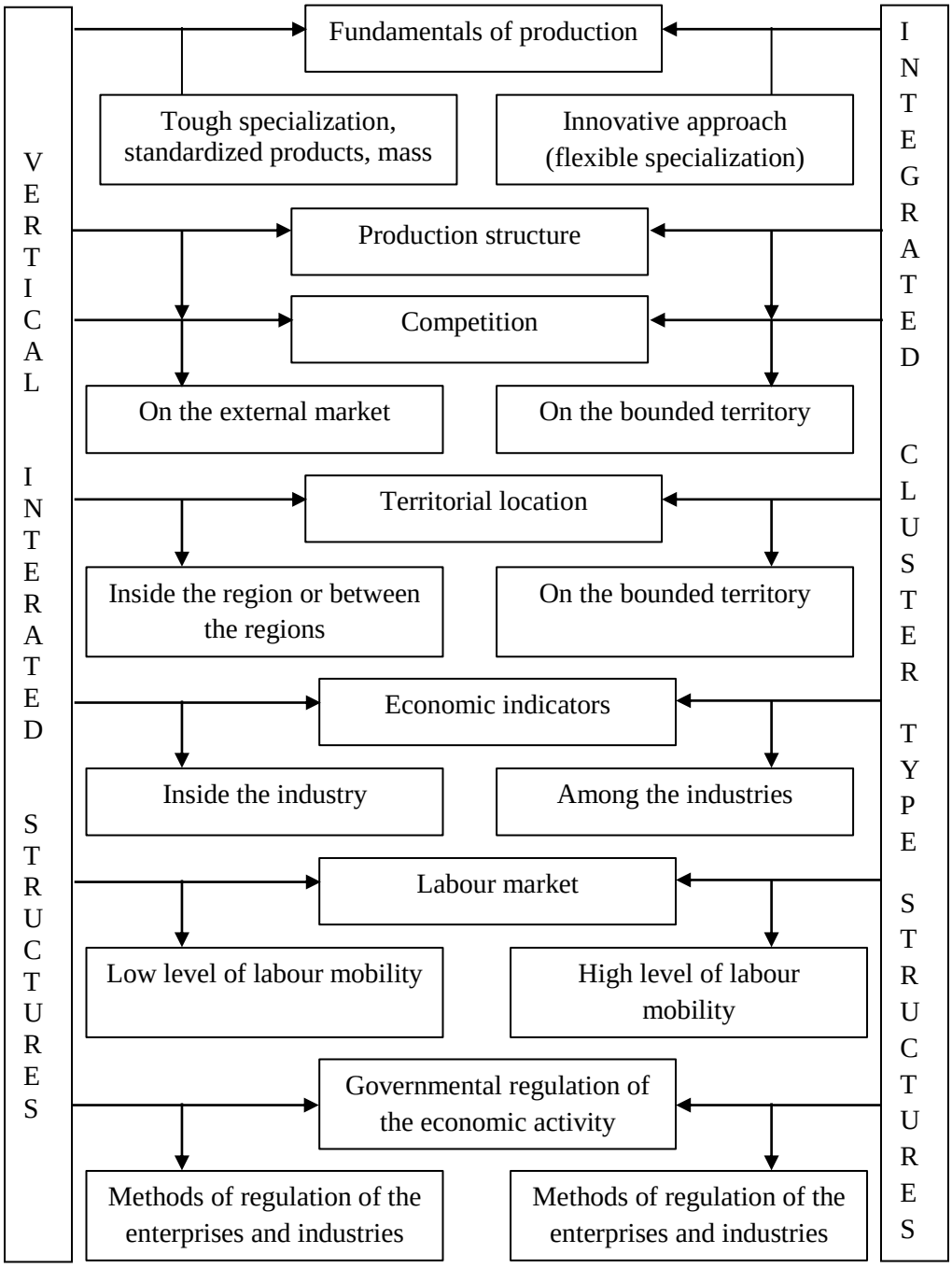


Fig. 1. Comparative characteristics of vertically integrated structures and cluster-type structures

The meaning that is embedded in the definition of a cluster and which determines the advantages of a cluster over the traditional perception of market organization is the presence of not only formal, but mostly informal relationships between enterprises that are members of the cluster, creates a positive effect that

affects all enterprises. In addition to enterprises, the cluster includes a society of territorial formation, which forms a cluster. This creates additional mutually beneficial relations between enterprises and the population. The formation of agro-industrial clusters in the region is a rather complicated process, the visible results of which are achieved only after a few years. However, such associations have a positive impact not only on individual enterprises in the cluster structure, but also on the economy of the region as a whole, since three sectors interact: business (commercial organizations, credit institutions), institutions (universities and research centres, public organizations, trade and chambers of industry) and authorities (local governments, tax administrations, regulatory structures).

The advantages of the cluster in the field of agro-industrial production include the realization of the region's competitive advantages in food production related to the geographical location, climate, zones of agro-industrial production of the regions, pursuing an effective employment policy in the region and the development of rural infrastructure, increasing entrepreneurial activity in the region by agribusiness markets and the development of the innovative potential of agribusiness enterprises through the rapid spread of innovation to all enterprises of the cluster.

There is an algorithm for creating a cluster association (Fig. 2), which consists of seven stages [12].

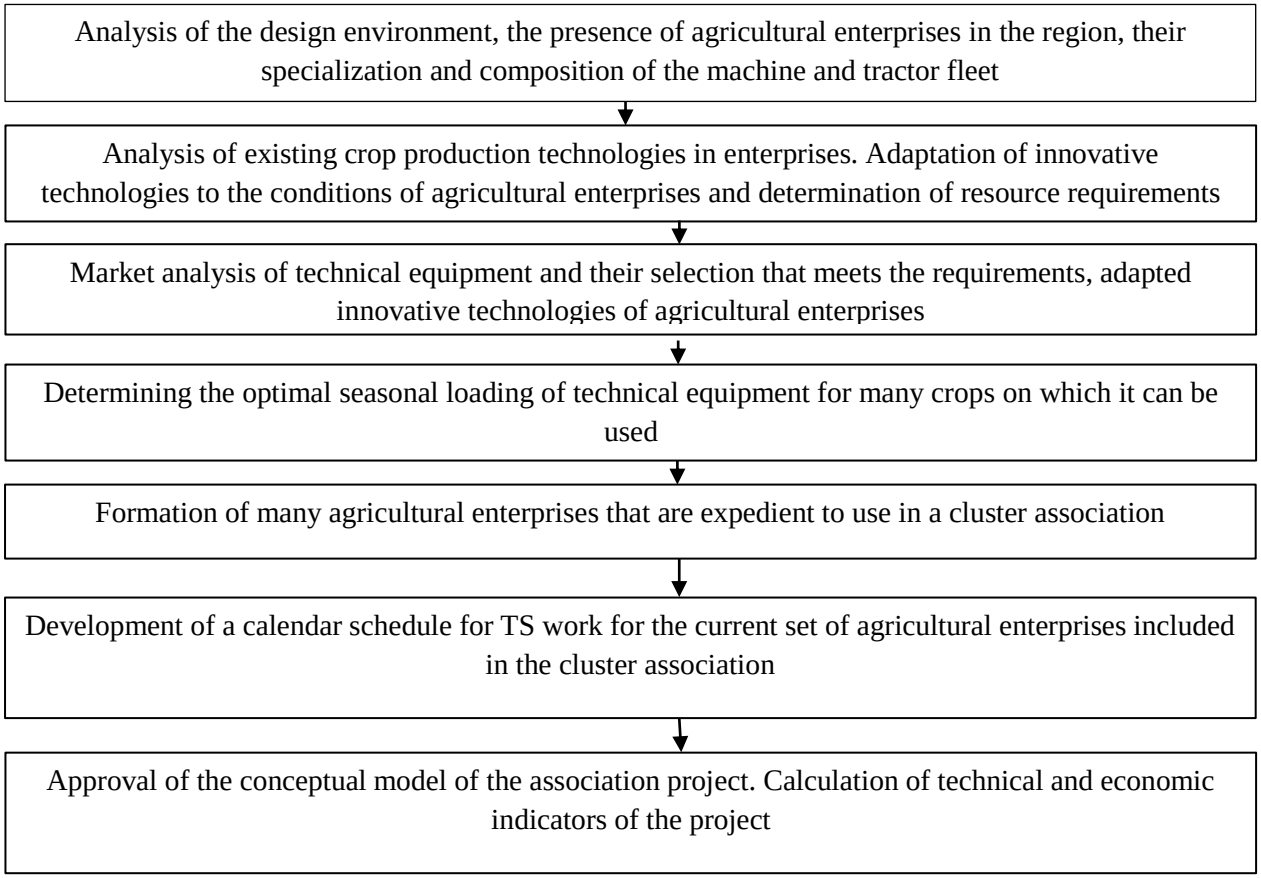


Fig. 2. Algorithm for the formation of a cluster association of agricultural enterprises

The solution to the problem of mastering the cluster organization system, both in general in the agro-industrial complex of Ukraine and in the Odessa region, is carried out very slowly and without state support. In the Odessa region on the initiative of the International Fund for the Promotion of the Market since 2004, work began on creating clusters in the region. During 2008-2019 in Odessa region, organizational and explanatory work was carried out between entrepreneurs, scientists, financial institutions and authorities in a number of districts and cities of the region. As a result of this activity, promising farming models were developed in the Bolgradsky, Kiliysky, Frunze districts based on a multidisciplinary cluster. But today, only in the Bolgradsky district, purposeful work is underway to create a cluster.

In this paper, it is proposed to create an agro-industrial cluster in the Odessa region, namely in the Kodym district. Kodym district has more than 68 agricultural enterprises, manufacturers, elevators, processors and enterprises offering services. The main goal of creating an agricultural cluster in the Kodym

district is to solve pressing issues of the socio-economic development of the region, to stabilize and maintain the dynamics of the economic development of the region, which should provide an increase in the standard of living of the residents of the region.

For a more detailed picture, we will make calculations to assess the prospects and adaptability of cluster formation in a certain area:

1. Ip1 –The share of innovatively active enterprises of the industry in the region ($Qin.ent.industry$) in the total number of innovatively active enterprises of the region ($Qin.ent.$):

$$\text{Ip1} = (Qin.ent.industry)/(Qin.ent.) \quad (1)$$

2. Ip2 –The share of data on the main capital projects of the district ($I\ industry$) in the general information on the main capital projects of the district ($I$):

$$\text{Ip2} = I\ industry\ /\ I \quad (2)$$

3. Ip3 – The share of the employed population in the region by district ($Ib$ industry) to the number of employed population in the district ($Ib$):

$$\text{Ip3} = Ib\ \text{industry}/Ib \quad (3)$$

4. Ip4 – The share of exports of industry products in the area ($E\ industry$) to the total volume of exports of goods in the area ($E$):

$$\text{Ip4} = E\ industry/E \quad (4)$$

5. I adapt – Share of industry output in the region:

$$\text{I}\ adapt = P\ industry/P\ country \quad (5)$$

Summarize the calculated indicators in table 1.

Table 1

**Assessment of the prospects and adaptability of cluster formation in the Kodym district**

| Indicators | Calculation result | Possible values |
|---|---|---|
| 1. The share of innovatively active enterprises of the industry in the region in the total number of innovatively active enterprises of the region (Ip1) | 0,88 | $0.68<I_{персп}<1$ |
| 2. The share of investments in fixed assets of the industry in the district in the total volume of investments in fixed assets of the district (Ip2) | 0,75 | $0.68<I_{персп}<1$ |
| 3. The share of the employed population in the region by district to the number of employed population in the district (Ip3) | 0,75 | $0.68<I_{персп}<1$ |
| 4. The share of exports of industry products in the area to the total volume of exports of goods in the area (Ip4) | 0,86 | $0.68<I_{персп}<1$ |
| 5. The share of industry output in the area (I adapt) | 0,0014 | - |

According to the calculations made, it can be said that all indicators are in the range of acceptable values – this means that the formation of an agro-industrial cluster in the Kodym district of Odessa region is advisable, since this will positively affect the development of the region and the development of the process of selling grain products.

The next step in the work is to determine the favourable and constraining factors for creating an agro-industrial cluster in the Kodym district of Odessa region (Table 2).

From the constructed table we see that the environment for the formation of an agro-industrial cluster in the Kodym district of Odessa region is quite favourable.

Forecast indicators of the development of agricultural production in the 2020 region are determined taking into account the production potential of objective circumstances prevailing in providing the industry with material and technical resources.

Table 2

**Typology of factors for the development of the agro-industrial cluster in the Kodym district**

| Stimulation factors | Restraining factor |
|---|---|
| A large volume of grain production and the availability of opportunities to increase productivity | Low quality business climate for the development of small and medium-sized businesses |
| High entrepreneurial activity of the population in the field of grain production. | A high degree of depreciation of fixed assets and insufficient funds to introduce new technologies |
| Small area of the region, a positive indicator for logistics activities. | |
| The program of socio-economic development of the district for 2020 | |

In a tabular form, we will get acquainted with the main participants in the design model of the agro-industrial cluster of the Kodym district (Table 3).

Table 3

**Participants of the Kodym agricultural cluster**

| Cluster participants | Location | Business activity |
|---|---|---|
| 1 | 2 | 3 |
| Cluster Management Centre | | |
| LLC Agro company «Kodyma» | Kodym-Odessa city | Cultivation and sale of grain and industrial crops |
| ALLC named by Michurin | Kodym city | Cereal production, grinder services, oil mills |
| Alex FC | Kodym city | Production and sale of barley |
| LLC Grabovoskoe | Kodym region, Grabove v. | Cultivation and sale of grain and industrial crops |
| LLC Ivashkivske | Kodym region, Ivashkov v. | Cultivation and sale of grain and industrial crops |
| LLC AC Kodym | Kodym region, Lisogorka v. | Cultivation and sale of grain and industrial crops |
| FC Saturn | Kodym region, Bashtankov v. | Cultivation and sale of grain and industrial crops |
| ALLC Terra | Kodym region, Shershentsi v. | Cultivation and sale of grain and industrial crops |
| Educational, research institutions | | |
| Kodym District State Seed Inspection | Kodym city | Checking the quality of agricultural seeds |
| Odessa State Agrarian University | Odessa | Scientific developments |
| Processing enterprises | | |
| Mayak ALLC | Kodym city | Processing of products |
| LLC Kodym elevator | Kodym city | Processing and storage of products |
| Regional a/c administration | | |
| Kodym District State Administration | Kodym city | Management of work of agricultural enterprises of the district |
| Service-providing enterprises | | |
| Feed factory | Kodym city | Pulp, bran, cars |
| LLC «Sovteh» | Odessa | Services (plant protection) |
| Service providing companies | | |
| AFC Borisove | Kodym city | Trade of agricultural products |
| Consumers of agricultural raw materials | | |
| Kodimsky Hlib Combinat | Kodym city | Manufacturing of bakery products |
| Private bakery "Bulochka" | Kodym region, Grabove v. | Manufacturing of bakery products |
| Private bakery "Natalka" | Kodym region, Lisogorka v. | Manufacturing of bakery products |
| Private bakery "Bread" | Bashtankov | Manufacturing of bakery products |
| Private bakery "Nadiya" | Kodym region, Shershentsi v. | Manufacturing of bakery products |
| Private bakery "Ivashkov" | Kodym region, Ivaskov v. | Manufacturing of bakery products |

From the tabular data, we counted 23 participants in the cluster, which includes: research institutions; consumers of agricultural raw materials, namely the Kodym bakery and private bakeries; in villages where the main manufacturing enterprises, trade and intermediary enterprises are concentrated; enterprises providing services, namely plant protection services, and enterprises that "provide agricultural producers with machines and sowing services; processing enterprises; educational institutions and regional agricultural management. All cluster members have a good location, from a logistic point of view - this is beneficial for enterprises.

Previously, as a pre-planned study, one should give a financial and economic analysis of the cluster participants (Table 4) and evaluate the possible prospects from the implementation of this step (Table 5).

Table 4

**A Summary table of indicators of the financial condition of LLC Kodym Agro Company (before joining the cluster)**

| Indicator | Value | | | Deviation 2017 from 2016. |
|---|---|---|---|---|
| | 2015 y. | 2016 y. | 2017 y. | |
| 1 | 2 | 3 | 4 | 5 |
| 1. The liquidity of the enterprise: | | | | |
| 1.1. Absolute liquidity ratio | 0,01 | 0,53 | 0,014 | -0,521 |
| 1.2. Adjusted liquidity ratio | 0,07 | 0,08 | 0,09 | 0,01 |
| 1 1.3. Total liquidity ratio | 0,21 | 0,42 | 0,21 | -0,2 |
| 1.4. working capital | -7458 | -7588 | -9153 | -1565,5 |
| 1.5. manoeuvrability coefficient | -0,3 | -0,81 | 0,29 | 1,1 |
| 2. The financial stability of the enterprise: | | | | |
| 2.1. coefficient of independence | -2,56 | -1,07 | -2,63 | -1,56 |
| 2.2. Financial stability ratio | -2,5 | -1,05 | -2,57 | 0 |
| 2.3. coefficient of financing | -0,71 | -0,51 | -0,72 | -0,21 |
| 2.4. investment ratio | -11,18 | -11,6 | -15,77 | -4,171 |
| 3. Turnover: | | | | |
| 3.1. The turnover period of current assets, days | 135 | 3272 | 117 | -3155 |
| 3.2. The average period of repayment of receivables, days | 40 | 92 | 18 | -74 |
| 3.3. Average repayment period K3, days | 1 | 428 | 9 | -419 |
| 3.4. The average shelf life of goods and materials, days | 76 | 514 | 87 | -427 |
| 4. Profitability, %: | | | | |
| 4.1. total assets | 1,6 | 0,18 | 3,12 | 2,94 |
| 4.2. equity | -0,01 | -0,01 | -0,18 | -0,17 |
| 4.3. investment | -0,12 | -0,32 | -1,69 | -1,37 |
| 4.4. products sold | 8,7 | 1,7 | 0,14 | -1,56 |
| 4.5. sale | 5,4 | - | - | - |

Kodym district is rich in agricultural enterprises, therefore, the number of enterprises in the formed cluster may increase, we list the main conditions for joining the Kodym agricultural cluster:

- financially sustainable enterprises;
- well recommended in the market of agricultural raw materials;
- Established relationships with suppliers and customers;
- the availability of qualified personnel.

Let us visualize the interaction model of the formed Kodym cluster in Fig. 3.

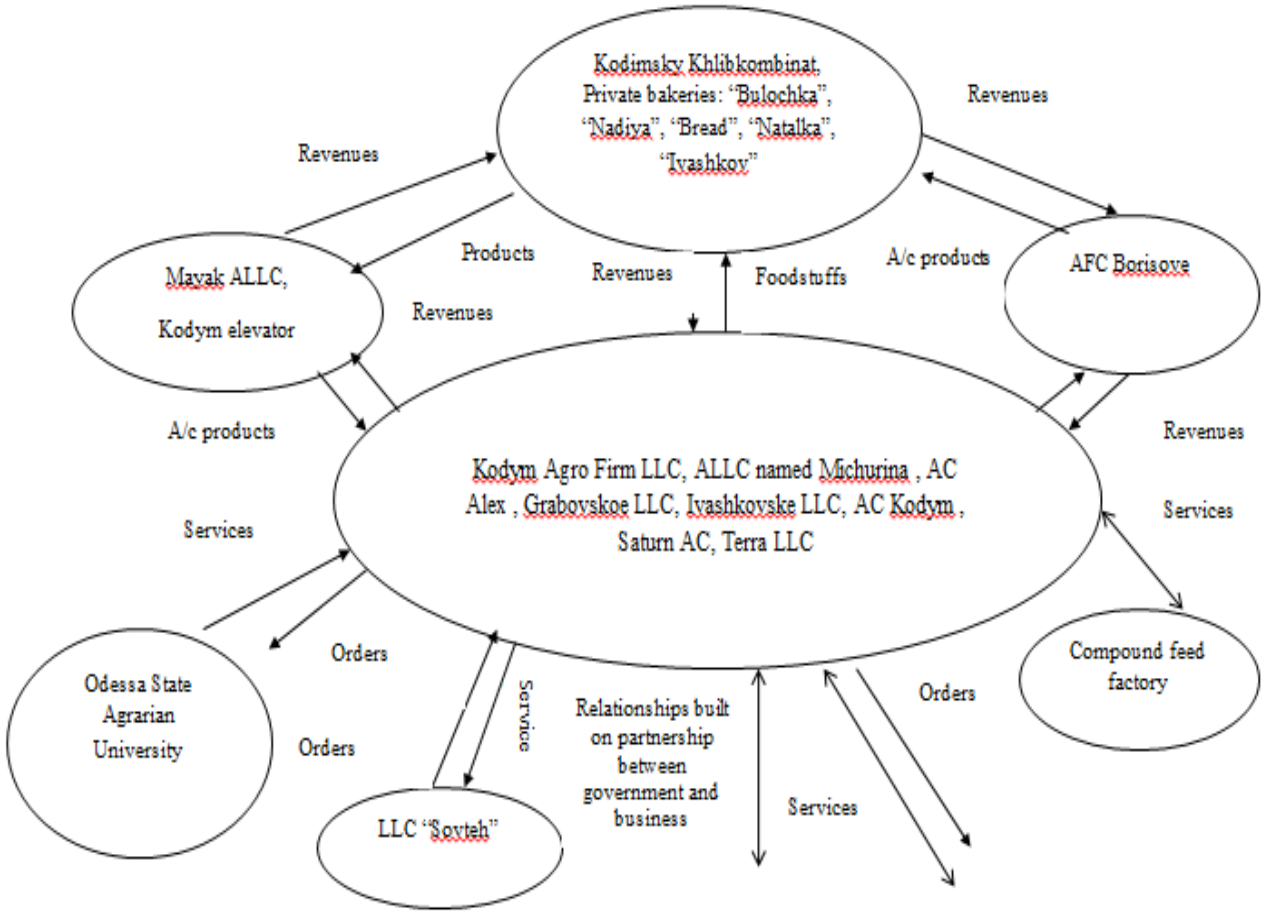


Fig. 3 An approximate scheme of interaction between enterprises of the Kodym district within the Kodym cluster

Table 5

**Financial and economic indicators of "Kodym Agro Firm" LLC: before and after (forecast) entering the cluster**

| Indicators | Before entering the cluster, thousand UAH | After entering the cluster, thousand UAH | Deviation, thousand UAH |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| Fixed assets | 597,7 | 834,8 | 237,1 |
| Current assets: | | | |
| productive reserves | 1565,8 | 1234 | -331,8 |
| finished products | 2527,8 | 234 | -2293,8 |
| accounts receivable | 930 | _ | _ |
| Current financial investments | 151,8 | 151,8 | _ |

| | | | |
|---|---|---|---|
| cash | 17,4 | 32,5 | 15,1 |
| equity | -8558,5 | -6834,3 | 1724,2 |
| Current responsibility: | | | |
| Short-term bank loans | 11577,1 | 4765,3 | -6811,8 |
| Accounts payable for goods, work, services | – | – | – |
| Current liabilities with the budget | 3 | _ | _ |
| Current insurance liabilities | 27 | 12,1 | -14,9 |
| Current pay obligations | 59 | 78,3 | 19,3 |
| Net sales revenue | 10795,8 | 13765,3 | 2969,5 |
| Net profit | 1615,3 | 4111 | 2495,7 |
| Cost of sales | 11471 | 9654,3 | -1816,7 |

**Conclusions and perspectives of further research**. The formation of the agrarian cluster will make it possible to stabilize and increase production not only of the agro-industrial complex of the region as a whole, but also of individual members of the cluster. Based on the formation of the cluster, a strategy will be formed and implemented, along with this; the financial situation of all participants in the cluster will improve.

A general analysis of the possibilities for developing a cluster structure of production indicates that in many regions of Ukraine this path is fundamentally possible - fairly strong enterprises in many sectors of the economy, developed medium and small businesses, and viable infrastructure enterprises. All this creates a thorough environment for creating full-fledged viable clusters.

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