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Research paper

Development of Integration Processes in Agro-Industrial Sphere

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Abstract

Integration processes in the agro-industrial sector are an important factor in increasing the efficiency of its functioning by obtaining a synergistic effect in various economic areas, in particular, economic, organizational, managerial, and social.
As a result of solving the main tasks of the article due to its purpose, the main factors that influence the integration processes in the agro-industrial sphere are revealed; the basic criteria of their systematization are determined; the main tendencies of the integration processes of agro-industrial formations are studied and EBITDA is calculated, through which the impact of capital on efficiency is estimated; the main stages of integration processes management are singled out and the conceptual model of integration processes development of agro-industrial formations is proposed.

Keywords: *agro-industrial integration; efficiency; integration processes; management of integration processes; state support.*

1. Introduction

The formation and development of agro-industrial integration are due to two main factors: on the one hand, the social division of labor and its specialization, on the other hand, the need for close cooperation between specialized industries and types of agricultural and industrial production. Agrarian enterprises enter into integration processes, seeking to reduce the risks associated with production, its dependence on climatic conditions, spontaneous development of the market of agricultural products, the need to increase the competitiveness of production. Processing and servicing companies also seek to provide stable income through the availability of a reliable raw material base, markets for their products and services. World experience of management proves that the establishment of mutually beneficial integration ties of agrarian enterprises with other subjects of market relations can significantly increase their economic stability.
Agro-industrial integration is the greatest effect of adaptation conditions for market economy; it enhances the interest of all the subjects of the integrated structures in increasing the efficiency of production through the use of reserves that are formed at the joints of technological chain. The process of agro-industrial integration at the present stage has both general features, determined by the principles of its formation and development, and specific, reflected in various forms of integrated formations, which operate in a multi-faceted economy. This requires solving a number of questions regarding scientific understanding and improving the mechanism of interaction between the subjects of integration in order to ensure an effective and sustainable reproduction of the innovative type of development in the integrated structures of different organizational and legal forms and types of activities, while respecting the mutual benefit of integration relations for all partners of integration.
The theoretical aspect of the formation and development of integration processes in the system of economic relations of business entities and their production component is contained in the works of well-known foreign scientists. In particular, R. Trifon (1959) notes that "agriculture is experiencing a process of vertical integration with related industries, and therefore, agricultural control in the future cannot remain within the industry itself" (16, p. 734). James Van Horne (2008) states that the joint activity of two or more business entities provides an effect (result) that is greater than their overall result if they worked separately. As a result, the value of an integrated participant becomes higher than the cost of individual participants [4].
According to V.M. Hanhanov (2008) the expediency of agro-industrial integration caused by a number of factors, the main of which are: "eliminating the imbalance between agriculture and industry, reducing product losses, increasing the degree of processing of agricultural products, deepening the specialization of farms, reducing risk in a competitive environment" [6]. Barbara Chmielewska (2009) also recognizes the important role of integration processes in the agrarian sector. In particular, multifunctional development of agriculture is a useful joint decision for all EU countries, since only this model can provide economic stability, efficiency and competitiveness of agricultural production. In highly developed countries of the world, where the excessive concentration of agriculture is limited, there is a remembrance of rural areas, expansion of services, development of social infrastructure [2].
M.P. Butko and V.S. Rodin (2010) believe that in modern conditions agro-industrial integration in Ukraine is becoming more and more important as it guarantees the source of investment and ensures the competitiveness of enterprises. The bases of modern agro-industrial integration are strong investment flows, the establishment and improvement of trade relations of enterprises belonging to one agro formation. Agro-industrial integration becomes a powerful tool for ensuring economic stability and security of agricultural enterprises and related industries [3].

However, despite the sufficient number of scientific studies on this problem, the issues related to the formation and development of agro-industrial formations in determining the results of socio-economic activity of their functioning are still debatable. Therefore, it is necessary to study the prospects of the integration processes development in the agro-industrial sphere and to improve the mechanism of integration interaction of agro-industrial formations in order to ensure their sustainable development.

The purpose of the research is substantiation of the integration processes essence in the agro-industrial sphere; systematization of factors and features of modern integration development; analysis and forecast of the functioning of agro-industrial formations efficiency; definition of management stages of integration processes and construction of a conceptual model for the development of integration processes of agro-industrial formations.

2. Main Body

Agro-industrial integration is an objective economic process based on the division and cooperation of social work. On the one hand, there is a division into separate specialized branches of the agro-industrial sphere; on the other hand, there is ensuring the effectiveness of this process through the unification of separate industrial and agricultural structures for the purpose of production and bringing finished products to the end user. It creates common economic features at a certain stage of the development of productive forces, when the agricultural sector of the economy passes into a stage that is close to its nature, level of specialization and concentration to the branches of industry.

The historical introduction of the agro integration component can be considered as a moment of transition from the manufactory to the machine stage of production, under the influence of which there was a separation from the agrarian labor of various technological operations. As time passes, the active development of integration processes takes place in the 70's and 80's of the twentieth century, where interconnection-based integration, the creation of agricultural complexes, agribusinesses, industrial and scientific-industrial associations and agro-industrial systems began to develop [11, p. 28].

However, the post-Soviet structure of such integration did not take into account the harsh conditions of the market economy, which led to the loss of the acquired integration links in the agrarian sector, most of which were held at the expense of state influence.

In the new economic environment, agro-industrial integration is developed under the influence of enterprises adaptation to external economic reality, and it is determined as a purpose of management – to stabilize its position at the expense of objective integration advantages in attracting investment resources and reducing costs. The basis for this is the integration of financial, agrarian, industrial and trade capital with the consolidation of individual enterprises potential in reducing financial risk. The leading condition for such an association is increasing of land resources, as the main means of agricultural production, closing the chain and the formation of a corporate basis of management in the agrarian sector of the economy of the agro holding type – agro-industrial companies.

The peculiarity of modern integration development is that the formation is not "from above" on the principles of administrative pressure, but "from below", as an objectively necessary process of restoration of agro-industrial production in the conditions of a management forms variety, basis of which became economic feasibility and economic incentives [13, p. 69]. This reveals the specificity of modern integrated formations – the creation and operation of structures technologically unrelated to agro-industrial production. Thus, due to direct and indirect participation in the activity of agro-industrial associations, a merger of agrarian capital with the capital of financial and industrial branches takes place. As a result, integration processes are developed according to two main scenarios: partner cooperation on the basis of contractual conditions and the functioning of various organizational structures created on the basis of the pooling of capital and labor of individual economic entities.

In this case, this leads to the systematization of types of domestic integrated agro-industrial formations with their acquisition of the basic interrelated criteria: the level of socialization of ownership (capital) of the participants-partners of the created formation and the degree of economic and legal independence. These criteria determine the fundamentalism of building a system for managing the relationship between partners and developing an economic mechanism for managing integrated agro formations (fig. 1).

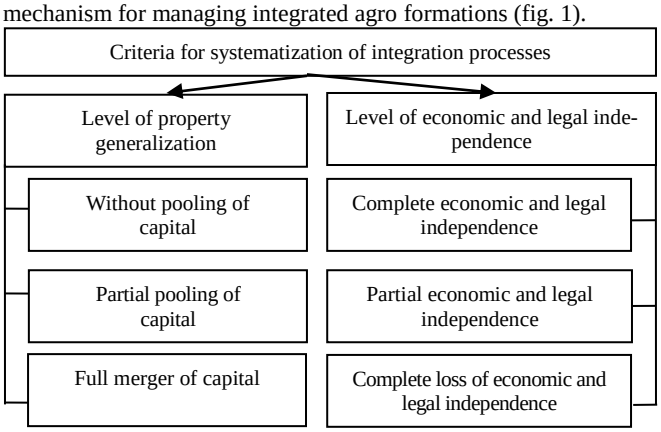

Fig. 1: Criteria for systematization of integration processes in the agro-industrial sphere*
**Source: developed by authors*

An example of high efficiency and impact of agro-industrial integration is the economic development of the United States of America, where it is formed on the basis of economic activity of agribusiness firms in the non-agricultural sector, large capitalist and farm enterprises, which form the leading components of the company's (unlike the industrial one in Ukraine) organizational structure of the food complex. The main enterprises of agribusiness are large research and production associations, which have considerable labor, scientific and financial capital and are among the most powerful state corporations. The economic stability and significance of agribusiness firms have determined their leading role in coordination of inter-farm, inter-branch and agro-industrial ties [10]. Unique experience in the development of the US agrarian sector is provided not only by natural resources – for decades in the first place here there were only significant investments in improving the quality factors. Intensive research and implementation of their results in management practice allowed US producers to take a leading position in many aspects of science and technology: developed system of agricultural universities, active scientific research created the basis for the growth of productivity [8, p. 31].

In our opinion, the important principle of formation of managerial agro-industrial integration form is taking into account the internal conditions of its activity, and not copying someone else's experience. It is necessary to add also the availability of an investment resource (it can be the resource of founders or integrator or structural entities) and economic feasibility – technological interconnection of structural units in obtaining competitive products. In addition, organization of interaction between all units of agro-industrial formation is necessary for obtaining a synergistic effect of production activity (coherence of action) and the ability of quick adaptation to changes in the legal and tax field (adaptability). Taking into account the purpose of entrepreneurial activity of agro-industrial formation, the effective value of its business (the sum of the market value of products and the liquid value of fixed assets) should be greater than investments in it (the amount of working capital and capital investments). To solve this problem it should interact with the surrounding economic and legislative environment [1, p. 7].

From these positions, it is worth pointing out that the process of formation and functioning of agro-industrial formation is influenced by certain factors, in particular:

– relatively constant – external legislative norms of land use; credit and financial and tax policy of the state; labor resources; soil and climatic conditions;
– variable input (dependence on current assets and capital investments) – affect the cost of production (prices for industrial stocks, wages);
– variable output (affect current assets and liquidity value of fixed assets) – the cost of commodity products, market value of fixed assets, etc.

Integration processes radically change the operating conditions of enterprises. In the integration the subjects are also domestic markets, in which the level of structuring relations between the parties is much deeper than traditional market operations. Accordingly, this changes the economic behavior of participants of such markets. Instead of fierce competition for markets, enterprises use the means of mutually beneficial cooperation, based on the interconnection of the benefits of long-term economic relations [18].

The choice of integration form depends on the content of agro-industrial cooperation and is due to the purpose of creating such unions as associations, agro holdings, agricultural companies, agro-industrial groups. The advantages of this or that integrated formation are characterized by the fact that they can ensure the maximum use of factors that affect both the efficiency of agricultural production and the social aspect of functioning. The latter appears in the unity of socio-economic relations of cooperation in various forms, where the criterion for their evaluation is the creation effectiveness of each of the forms, which depends on the purpose of functioning. Therefore, the main objective of creating large agro-industrial formations is to ensure the growth of product competitiveness, stabilization and renewal of resource potential of participating companies, and, on their basis, eliminate social tensions in rural areas.

Consolidation of material and financial resources, growth of incomes, high efficiency of technological processes with reduction of production costs are the main qualitative parameters of agro-industrial formations activity. Under the conditions of full-scale and flexible planning of economic activity and expansion of the production sphere, it is possible to provide rural population with jobs, reducing the balance of migratory flows of villagers, in particular to stop the outflow of youth from rural areas. In addition, there is a significant impetus in recreating the social infrastructure of the village as an important demographically reproductive factor. Efficiency in achieving such parameters should become a feature of complexity with a certain distribution of spheres of influence on economic and financial activity and implementation of the current tasks of the economic policy of agro-industrial integration.

Proceeding from the above, it is expedient to include to the main motivational factors of functioning efficiency increasing of integration forms in the agro-industrial sphere:

1. The desire of all participants to further deepen of integration and create a mutually beneficial and socio-economic effective system, which includes the maximum employment attraction in the production of agricultural products, their storage, processing and marketing.
2. Obtaining an objective share of the generated income by each participant in agro-industrial integration. At the same time, the current economic mechanism should help to reduce production costs by reducing the number of intermediary services, search for more profitable sales channels of manufactured products, sources of material and technical supply and financing, smoothing out the existing price disparity, etc.

The main motive of the effective activity of agro-industrial formations depends on the system of relations between its structural divisions. However, the most difficult problem is the interconnection of the interests of commodity producers and consumers of end products. At the same time, agro-industrial formations at the present stage take on the negative effects of dual government policy on the attempt to provide support to both agricultural producers and consumers by restraining food prices [7, p. 10]. Therefore, the necessity of improving economic relations both at the state level and at the level of agro-industrial formations has become urgent, taking into account factors of their development (fig. 2).

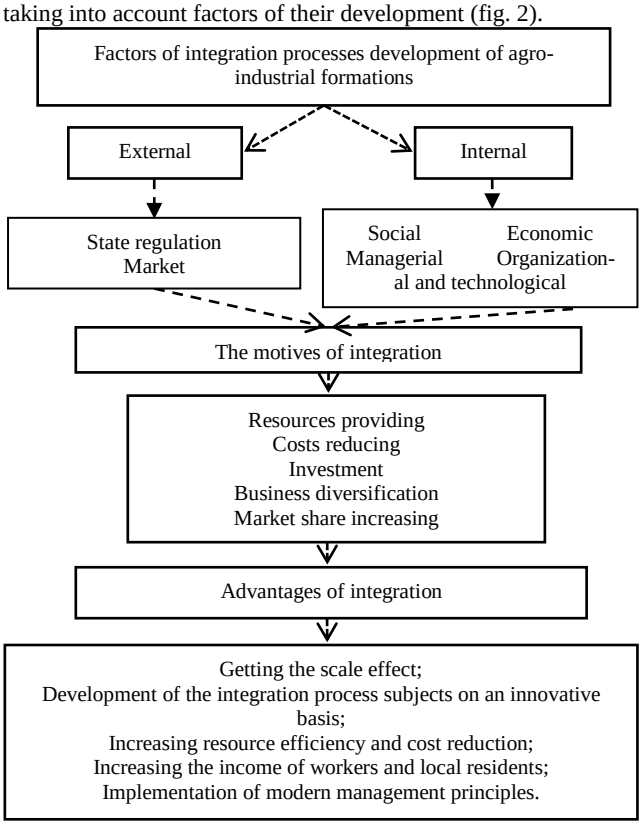

Fig. 2: Factors of integration processes development of agro-industrial formations*
**Source: developed by authors*

It should be emphasized that one of the key tasks of agro-industrial formations development is the concentration of material and financial resources of consolidated agrarian and industrial enterprises with the aim of using them in perspective projects under the current conditions of limited investment resources. Such interaction of agribusiness enterprises within the integrated structure can be developed in different directions.Thus, on condition of the narrow specialization of the main enterprise integrator, which, for example, specializes in the production of livestock products and produces several of its species, links are established between its structural subdivisions according to a certain scheme of support of the livestock sector – growing fodder grain with its processing, forage crops, in-depth processing of meat and dairy products and bringing it to the end consumer through its own trading network [15, p. 58].

In a diversified orientation of the enterprise integrator links are developed in several schemes, each of which has a clear industry direction: one group of enterprises grows crop production in terms of its species, the second one is engaged in the cultivation of productive animals, the third one is engaged in processing of crop and livestock products, the fourth one – in realization [12, p. 29].

In this case, it is traced both full employment of labor resources by types of activities in the off-season period due to the possible inter-sectoral movement, and the full return on invested capital and the effective use of means of production in agro technological processes.

The most promising forms of integration links are: the creation of processing enterprises by large-scale agricultural enterprises; the organization of associations for the joint processing and sale of products by agricultural and processing enterprises, the interaction of agribusiness formations with enterprises of different industries. Such interaction is achieved through the creation of integrated formations that differ in the coverage of different industries, units of a single technological chain, composition and number of participants, type of interaction (production, financial), etc.

Fairly effective participants in the integration processes are financial and industrial groups, corporations, agricultural holdings, as well as financially stable enterprises of the first and third sectors of agro-industrial complex. Having free capital, potential investors are looking for objects for its profitable investment.

Among the large-scale producers of agrarian and industrial enterprises an important place is taken by agro holdings that represent a number of legal entities (participants), who are connected by contractual or property relations, and act as the main company (integrator) in the activity of other participants.

Agro-industrial integrated structures perform many functions that are appropriate to combine into two blocks: system-forming and reproductive-functional. Having a systemic nature, they form a basis, as a rule, around a central company integrator, which unites both the participants of the corporation and enterprises that are not part of it, but cooperate on a contractual basis. The activity of such a corporation is carried out within the limits of a certain territory, which has a "center" and "periphery", through which a holistic and indissoluble production and economic process is provided.

In the absence of state support, agrarian enterprises are losing profits due to specific conditions of production, in particular, a significant dependence on natural climatic conditions, a long production cycle, seasonal nature of production, a high degree of monopolization in resource-supplying, processing areas. Therefore, it is obvious that without an investment in the agrarian sector it is impossible to carry out an expanded reproduction there. Inflation of capital ensures development, competitiveness of the industry, and, ultimately, the level of employees' incomes.

Investments in the development of the agrarian sector and the food industry from other sectors of the national economy are necessary and justified. Due to disproportionate development of the economy branches, in particular, in the oil and metallurgical industry there is accumulation of money, while in the agro-industrial complex there is a shortage of them. Therefore, investments into the agro-industrial complex have become one of the areas of free money use.

Creation of agro-industrial formations has radically changed the production-economic and financial relations of enterprises of various industries. In particular, until their establishment, agrarian enterprises were largely unprofitable, with an outdated technical and technological base. The level of organization of production, labor and its payment, technical and technological condition did not allow them to function as an independent economic entity. When creating integrated agro-industrial formations, integrators (investors), which, having certain monetary resources and opportunities to obtain loans in banks, created favorable conditions for the development of agro-industrial production. At the same time, considerable attention is paid to providing financial resources for current expenses and acquisition of equipment that allows agrarian enterprises to greatly improve the economic situation and increase profitability.

It is worth noting that among the largest agricultural companies in the world, according to the size of the land bank, there are two Ukrainian agro holdings, in particular Ukrlandfarming and Kernel with a land bank size of 0.7 and 0.3 million hectares, respectively (Fig. 3).

Foreign capital controls 2.4 million hectares of agricultural land in Ukraine, and the total land area of black soil in the cultivation of agro holdings is about 15%. In particular, in the rating of TOP-100 agrarian companies, the first ten have a land bank of 2840 thousand hectares, or about 7% of Ukrainian agricultural land they process (fig. 4). Fig. 4 shows the largest agro-industrial formations that rank first in the volume of the land bank, as well as in the production and export of crops, meat and dairy products, distribution of agricultural machinery, spare parts, plant protection products, mineral fertilizers and sowing material. The top 10 companies with an asset of 120 to 570.5 thousand hectares are listed; they show high yields of modern hybrids and use of the latest technologies in the agricultural sector and represent the domestic products to the world community.

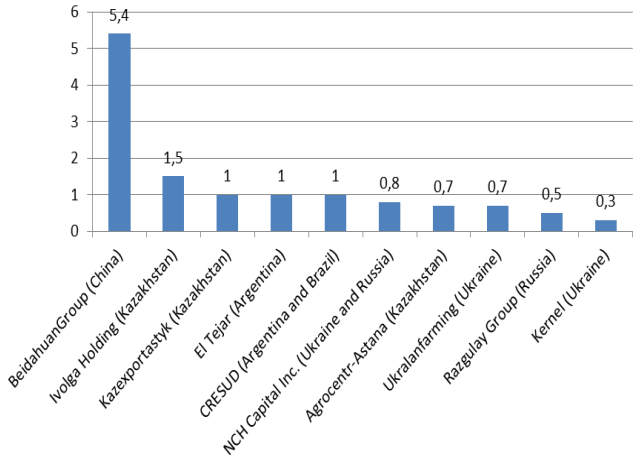

Fig. 3: The largest land banks of the world, million hectares*
**Source:*
http://www.ulf.com.ua/ua/our_business/crops_farming/land_resources/

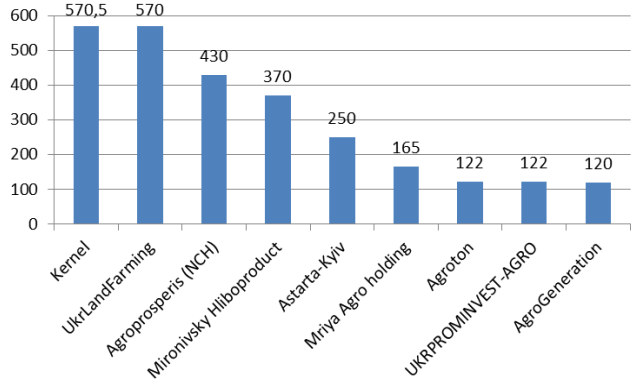

Fig. 4: Top 10 agro holdings of Ukraine by volume of the land bank at the beginning of 2018, thousand hectares*
**Source: built by the authors with the information from http://latifundist.com/rating/top100#*

Currently, the competitiveness of the agro-industrial complex is not provided by small farms, but by agro-industrial formations, which use innovative production technologies. Participants in integration formations have opportunities to attract additional capital and financial rehabilitation. At the same time, the "effect of scale" is achieved that manifests itself in increasing revenue from sales and lowering the cost of production (table 1).

These trends in Ukraine illustrate the data presented in the table No. 1 on economic indicators of economic activity of large, medium and small enterprises that is also characteristic for agrarian sector. The amount of net profit received by enterprises of Ukraine in 2016 amounted to UAH 29.7 billion; however, this amount could be much higher, if not losses incurred by small enterprises. The total amount of income received by small and medium-sized enterprises amounted to UAH 61.9 billion, while the losses of small enterprises amounted to UAH 32.2 billion, that is, more than half of the profit. The structure of profitable and unprofitable enterprises shows that 73% of the total population of enterprises received profits, 27% – losses.

Traditionally, most commodity producers use the net profit indicator to assess the efficiency of their business; however, this indicator should be used to assess the outcome of the work, and at different stages of the production process, it is necessary to pay attention to other types of profit. Net, gross, margin, operating profits, EBIT and EBITDA, EVA and dozens of others are indicators that allow understanding better how efficient an enterprise operates. EBITDA is the financial result of formation, excluding the effect of the structure of capital (interest paid on borrowed funds), tax rates and depreciation policy of the enterprise. EBITDA is an indicator that shows the rate of return on investment [5].

Table 1: Financial results of enterprises with distribution to large, medium, small and micro enterprises of Ukraine, 2016, million UAH*

Types of enterprises	Total	Profitable enterprises		Unprofitable enterprises	
		number	financial result	number	financial result
Financial result before taxation					
Ukraine:	69887,8	73,4	443012,1	26,6	373124,3
large enterprises	61222,7	65,8	158665,9	34,2	97443,2
medium enterprises	32816,5	76,1	177033,7	23,9	144217,2
small enterprises	-24151,4	73,3	107312,5	26,7	131463,9
including microenterprises	-34639,9	72,3	37963,0	27,7	72602,9
Net profit (loss)					
Ukraine:	29705,0	73,0	396745,4	27,0	367040,4
large enterprises	46850,0	65,8	139545,0	34,2	92695,0
medium enterprises	15061,8	75,5	157901,7	24,5	142839,9
small enterprises	-32206,8	72,8	99298,7	27,2	131505,5
including microenterprises	-37341,4	71,9	35325,8	28,1	72667,2

**Source: State Statistics Service of Ukraine (2017) http://www.ukrstat.gov.ua/*

Using the application of the linear trend line, we forecast the average value of EBITDA in agro-industrial formations of Ukraine for 2018-2022. The linear trend line calculates the points using the following formula: $y=ax+b$. The approximating function has the form: $y=17,6x+287$ (fig. 5).

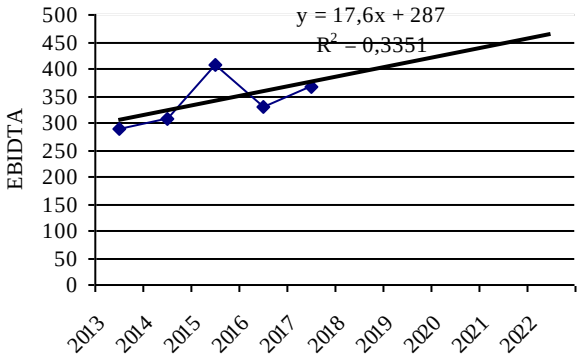

Fig. 5: Analytical equalization of EBIDTA average value of agro-industrial formations in Ukraine, 2013 – 2022, $/ha*
**Source: developed by authors*

Thus, the projected average value of EBITDA indicator in agro-industrial formations of Ukraine in 2018 will be 392.6 $/ha, 2019 – 410.2 $/ha, 2020 – 427.8 $/ha, 2021 – 445,4 $/ha, 2022 – 463.0 $/ha. Therefore, agro-industrial formations are at the stage of growth and have significant potential for development. It should be noted that the greatest part of the value added in the production is formed at the stage of processing of agricultural raw materials. At the same time, raw material is the most important component of any final product, therefore, the majority of Ukrainian agribusiness formations are vertically integrated, combining production, processing and marketing of agricultural products.

Agricultural integration contributes to the development of both agricultural and industrial production; first of all, due to the fact that integrated formations have the opportunity to invest in the agro-industrial sector, the macroeconomic effect is expressed in improving the financial conditions of the industry's reproduction.

For agro-industrial complex, integrated structures are important in terms of formation of a new structural and functional level, which combines interregional formation (agro-industrial complex) and the territory. As experience shows, the efficiency of the created integrated structure functioning is most likely in the presence of a leading enterprise integrator, as one of the prerequisites for the establishment of agro-industrial formation. In addition, the main enterprise should not only outperform the development of others, but also become organizational and technological leader among the participants of the integrated formation with its inherent management functions.

Management of agro-industrial formations is carried out on corporate principles. It is also expedient to pay considerable attention to the principles that are aimed at achieving certain social outcomes, which depend on the level of corporative management development. Integration processes management improvement in agro-industrial formations should be guided by the study of the impact of the current integration field on the socio-economic development of the region. Integration processes management in agro-industrial formations is characterized by us as a socio-economic process, which makes it possible to determine the need to improve the development of agro-industrial integration, including the regional level. Also, management provides the quality of education improvement in order to perfect both economic and social life in rural areas (fig. 6).

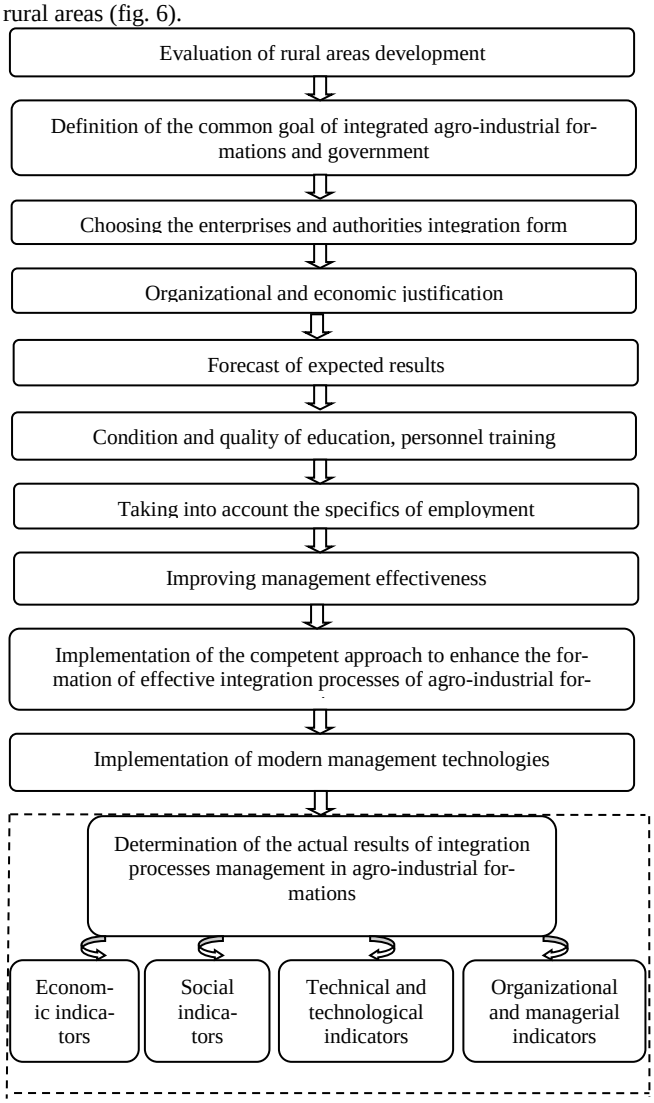

Fig. 6: Stages of integration processes management in agro-industrial formations*
**Source: developed by authors*

However, in conditions of spontaneous market relations, there is a need to build adequate financial and economic support for agro-industrial formations from the state. This suggests a certain system approach to increasing the efficiency and ensuring the sustainability of integrated structures, which involves the development and implementation of a complex of organizational, economic and managerial measures at all levels.

The conducted research on the development of integration processes of agro-industrial formations makes it possible to construct their conceptual model (fig. 7).

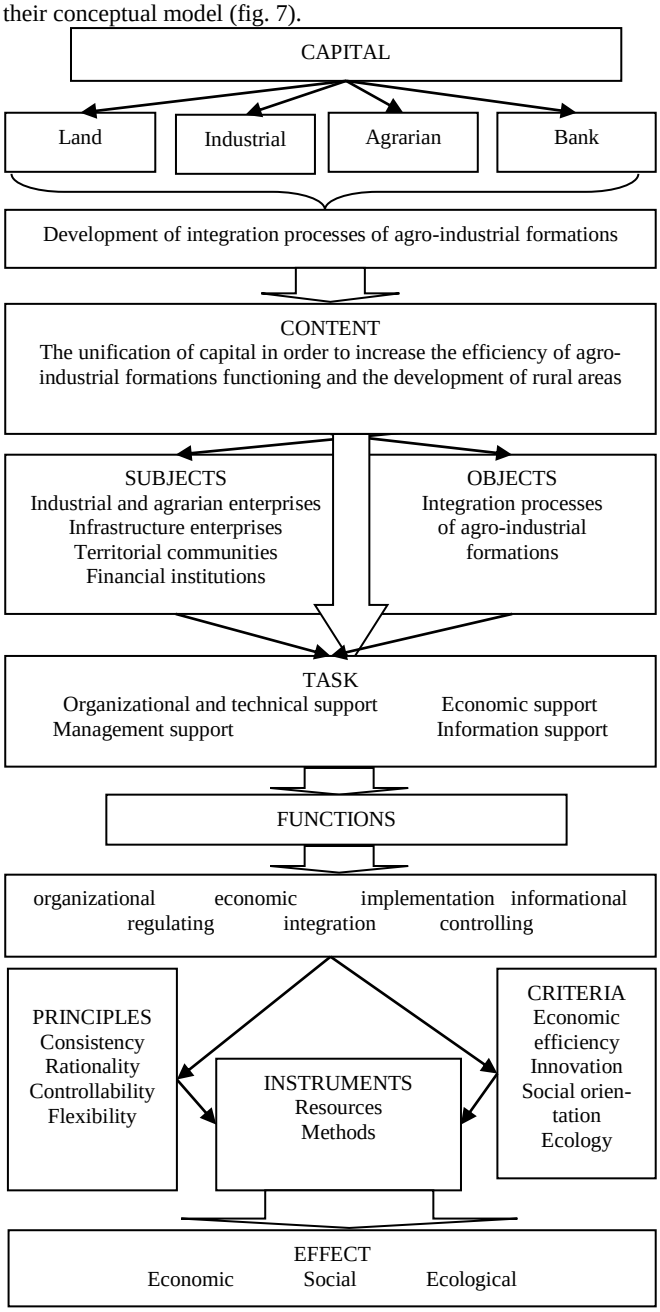

Fig. 7: Model of integration processes development of agro-industrial formations*

**Source: developed by authors*

Realization of the model will enable to ensure the effective development of integration processes in agro-industrial formations. Taking into account the exceptional importance of integration processes development for improving the efficiency of the functioning of agro-industrial formations, a criteria base and a system of indicators of productivity in the agrarian sector of economy, as components of the integration mechanism, need researching.

3. Conclusions

The activation of integration processes is conditioned by the need of commodity producers with their intention to combine joint activities to reduce aggregate costs and attract investments to ensure increased production, as well as state measures to stimulate the development of agro-industrial integration to overcome the negative tendencies in agro-industrial production. Agro-industrial integration enhances the interest of all subjects of integration in increasing the efficiency of production processes. This provides an opportunity to solve a number of economic expediency issues and improve the mechanism of interaction of economic entities with regard to mutually beneficial cooperation in the field of integration relations in a multifaceted economy.

The result of the study of integration processes development in the agro-industrial sphere was the identification of the main factors that affect them, including external, represented by market, regulatory and internal, which are related to economic, organizational, managerial and social aspects of the functioning of economic entities.

It is determined that the main criteria of integration processes systematization in the agro-industrial sphere is to consider the level of generalization of ownership and the level of economic and legal independence of participants in the integration process.

According to the results of the analysis of trends in the integration processes development of the agro-industrial sector, it is revealed that the best economic results of management are demonstrated by large and medium enterprises, most of which are represented by vertically integrated formations.

Among the indicators by which the influence of capital on the effectiveness of the formation is estimated, it is worth using the EBITDA, which, according to our estimates, will increase from $ 392.6/ha to $ 463.0/ha over the period 2018 – 2022.

Taking into account the importance of managing integration processes in the agro-industrial sector, the main stages of its implementation in agro-industrial formations are defined, starting with the formulation of the common goal of integrated formations and authorities, to the definition by means of indicators system of management activity actual results in this area.

Summing up the results of the research, a conceptual model for the development of integration processes of agro-industrial formations has been constructed, which will provide an opportunity to ensure their effective development and achieve the best results in economic, social, organizational and managerial spheres of activity.

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