



MANAGEMENT OF AGRARIAN PRODUCTION STRUCTURES IN THE CONDITIONS OF GLOBALIZATION PROCESSES

A monograph

edited by

Scientific and
Leading editors:

Vitalii **Nitsenko**

Tatyana **Mostenska**

Abbas **Mardani**



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Odessa - Kyiv - Skudai-Johor - Olsztyn

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This monograph is a collective effort of researchers from Ukraine and Malaysia a wide representation of leading universities on the subject of agribusiness economics and agri-food sector development.

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List of Contents

INTRODUCTION	7
PART 1.	
<i>THEORETIC-METHODOLOGICAL APPROACHES TO MANAGEMENT IN THE AGRARIAN SPHERE.....</i>	13
Chapter 1.1.	
<i>THEORETIC-CONCEPTUAL BASES OF MANAGEMENT OF MODERN AGRARIAN PRODUCTION STRUCTURES</i>	
Y. Ushkarenko, A. Solovyov, N. Kusyk, A. Mardani.....	15
Chapter 1.2.	
<i>DEVELOPMENT OF AGRARIAN SECTOR OF ECONOMY IN THE CONDITIONS OF TRANSFORMATION OF PATTERNS OF OWNERSHIP</i>	
A. Dankevich, V. Nitsenko, A. Mardani, M. Ponomarova.....	31
Chapter 1.3.	
<i>MANAGEMENT OF A PRODUCTION POTENTIAL OF AGRICULTURAL ENTERPRISES: PROBLEMS OF THEORY AND METHODOLOGY</i>	
V. Bugaichuk, I. Grabczuk, S. Kubrak, S.R. Awang.....	41
PART 2.	
<i>MODERN CONCEPTIONS OF DEVELOPMENT OF AGRICULTURAL PRODUCTION.....</i>	53
Chapter 2.1.	
<i>GROUNDING FOR CONCEPTUAL PRINCIPLES OF INTEGRATION OF THE COMPANIES BELONGING TO UKRAINE'S AGRO-INDUSTRIAL COMPLEX AS A WAY TO ECONOMIC STABILIZATION</i>	
N. Skopenko, J. Sagaydack, N. Loganathan, O. Darushin.....	55
Chapter 2.2.	
<i>ASSURING APPROPRIATE ENVIRONMENTAL STATUS OF THE MAIN AGRICULTURAL INPUTS: EUROPEAN EXPERIENCE AND OUTLOOK FOR UKRAINE</i>	
L. Udova, V. Nitsenko, O. Yevdokimova.....	67
Chapter 2.3.	
<i>MANAGEMENT OF AGRICULTURAL AND FOOD PRODUCTS SAFETY: CONCEPTUAL FRAMEWORK, EXPERIENCE OF THE EUROPEAN UNION AND PRACTICE IN UKRAINE</i>	
D. Krysanov, O. Varchenko, A. Mardani, N. Burdeina.....	77
PART 3.	
<i>THE ROLE OF MARKETING IN MANAGEMENT BY MANUFACTURING STRUCTURES OF THE AGROINDUSTRIAL SECTOR.....</i>	125
Chapter 3.1.	
<i>MARKETING OF SUGAR INDUSTRY IN UKRAINE</i>	
A. Doronin, L. Karpuk, O. Zakharchenko, N.Z. Md Salleh.....	127
Chapter 3.2.	
<i>VOLATILITY OF WORLD PRICES AND ITS IMPACT ON AGRICULTURAL PRODUCTION</i>	
K. Prokopenko, N. Mamontenko, N. Loganathan.....	151
Chapter 3.3.	
<i>THE USE OF MODERN MARKETING CONCEPTS IN ENSURING THE SOCIAL ORIENTATION OF THE ENTERPRISES OF THE FOOD INDUSTRY</i>	
T.L. Mostenska, T.G. Mostenska, O. Piankova.....	163

PART 4.

MAIN DIRECTIONS OF IMPLEMENTATION OF INNOVATION-INVESTMENT ACTIVITIES OF ENTERPRISES.....	185
--	------------

Chapter 4.1.

<i>MANAGEMENT OF INNOVATIVE-INVESTMENT ACTIVITY OF ENTERPRISES</i> V. Ilin, O. Ilina, V. Ilin, I. Hanzhurenko.....	187
---	-----

Chapter 4.2.

<i>THE IMPLEMENTATION OF INVESTMENT PROCESSES IN ORDER TO HARMONIZE LAND MANAGEMENT WITH THE EUROPEAN STANDARDS</i> V. Gryshko, M. Zos-Kior, I. Kuksa, M. Buchnev, N. Loganathan	201
---	-----

ABOUT THE EDITORS.....	213
-------------------------------	------------

ABOUT THE AUTHORS.....	215
-------------------------------	------------

Introduction

Globalization processes requires flexible reaction on challenges of external environment and adaptation of enterprises to new economic conditions. Globalization is characterized by intensification of interrelations and interdependence of national economies. Development of world markets for goods, services, labor, capital in the conditions of globalization requires raising the competitiveness of enterprises and augmenting their stability on market, introduction of new instruments of management. The research of problem of globalization allows concluding that this is a multifaceted, difficult phenomenon with a variety of its manifestations, which sometimes have contradictory influence over economic processes.

Globalization influences formation of demand and supply not only at international markets, but on markets of specific countries. The inefficient adaptation to the requirements of external environment leads to the loss of market positions, while re-building of organization structures, review of assortment policy, flexibility of managerial decisions contributes to the effective strategic development and increasing effectiveness of enterprises.

One of the markets which are mostly influenced by globalization is the market for agrarian and food products which is characterized by higher degree of competition and influences ensuring food and economic safety of states.

Thus, the monograph *Management of Agrarian Production Structures in the Conditions of Globalization Processes* is devoted to finding solutions of effective adaptations to the challenges of the environment in the conditions of globalization

Monograph consists of four parts: Part 1. *Theoretic-methodological approaches to management in the agrarian sphere*; Part 2. *Modern conceptions of development of agricultural production*; Part 3. *The role of marketing in management by manufacturing structures of the agroindustrial sector*; Part 4. *Main directions of implementation of innovation-investment activities of enterprises*.

Part 1. *Theoretic-methodological approaches to management in the agrarian sphere*. Chapter 1.1. *Theoretic-conceptual bases of management of modern agrarian production structures* (Yulia Ushkarenko, Andriy Solovyov, Nataliia Kussyk, Abbas Mardani). Authors characterized the factors of influence over the state of agrarian sector, which are determined by: complicated relations with external environment, high dynamics and progressing uncertainty of environmental factors, increasing risk due to the underestimation of specific manifestations of the self-organization of the market environment, increase in the cost of mistakes in management, decrease in efficiency of measures aimed at improving and transforming the existing organizational and legal forms of management, crisis situation in the agrarian production.

These circumstances complicate the process of production management, lead to the need to reduce the time for the preparation and implementation of managerial actions to ensure timely detection of threats and negative influences. This approach increases the efficiency of managerial decisions, which is required by the development of a subsystem of management of agrarian production structures with a focus on the effective

use of information and intellectual resources. Implementation of this approach requires the introduction of preventive management, which is based on the introduction of a system of monitoring and forecasting methods, a balanced combination of formalized and non-formalized methods in management; multivariate approaches and methods used in the adoption and implementation of decisions of any level.

Chapter 1.2. *Development of agrarian sector in the conditions of transformation of patterns of ownership* (Andrii Dankevich, Vitalii Nitsenko, Abbas Mardani, Maryna Ponomarova). The authors consider the peculiarities of the agrarian sector development in modern conditions and concluded that the improvement in the legal and regulatory framework is necessary to increase the efficiency of agricultural enterprises and rural development. Sustainable production development can be achieved by balancing the value of the resource potential and the ability of the land to reproduce its fertility. The main directions of the improvement of economic relations between the units of agricultural holdings are the improvement of the organization and management of the personnel system, optimization of the production structure and the development of optimal models of sector relations. There is a need to improve land leasing by introducing a system of legal regulation of the land lease market and the development of mortgage operations. In addition, an urgent issue which requires solution is the proper functioning of a unified land monitoring system, an increase in rent which corresponds to an economically justified level.

Chapter 1.3. *Management of a production potential of agricultural enterprises: problems of theory and methodology* (Vita Bugaichuk, Inna Grabczuk, Snizhana Kubrak, Siti Rahmah Awang). The authors identified negative tendencies in the competitiveness of material and technical, natural resource and financial potential of agricultural enterprises of Lisostep, Polissya and Transition zone. The main reason is the low level of production potential of most agricultural enterprises.

Part 2. Modern conceptions of development of agricultural production. Chapter 2.1. *Grounding for conceptual principles of integration of the companies belonging to Ukraine's agro-industrial complex as a way to economic stabilization* (Nataliya Skopenko, Julia Sagaydack, Nanthakumar Loganathan, Oleksandr Darushin). Integration allows mobilizing internal resources and reviewing a number of managerial decisions to optimize business and to maintain competitive advantage. The authors conclude that the integration structures are the most attractive investment destinations for private capital, they allow creating the modern efficient production structure to create and to maintain the competitive advantages of domestic agricultural products and companies, the implementation of the export potential of the food industry, provision of food security and economic independence of Ukraine.

The introduction of effective integration processes in the Agro-industrial complex will help to solve the problems associated with the production of high quality food and food products through the development and introduction of new technologies and equipment to increase the production of balanced feed for livestock production, of innovative diagnostic and therapeutic means for preventing and combating the spread of diseases among farm cattle, development of ecologically safe areas to provide producers of baby food with high quality primary products.

The development of integrative interactions helps to stabilize the activity of participants of the integration processes, to increase the turnover of working capital and to expand the financing of investment projects, to increase the competitiveness of agricultural products and food products. This is the result of the improved production management, of

the possibility to maximize the use of available resources and to obtain additional benefits.

Chapter 2.2. *Assuring appropriate environmental status of the main agricultural inputs: European experience and outlook for Ukraine* (Lyudmila Udova, Vitalii Nitsenko, Olha Yevdokimova). The authors emphasize the need for the rational use of agricultural land that should reduce the anthropogenic impact of the agrarian sector on the environment. The effective management of the agricultural enterprise should ensure the effective interaction with the market and to reduce environmental pressures. It is necessary to control the influence of agricultural production (use of mineral fertilizers and plant protection products from pests and agricultural diseases) on water and air. Extensive land use has led to significant destruction of natural ecosystems: land degradation, erosion, salinisation and other negative phenomena. Solving problems and implementing effective land use help to improve the land use structure. The expediency of transition to the landscape and ecological system of land use, which will take into account the characteristics of agricultural land, is substantiated. Such an approach will allow avoiding the negative consequences evoked by the traditional agricultural activities and creating conditions for better use of productive potential of land resources.

Chapter 2.3. *Management of Agricultural and Food Products Safety: Conceptual Framework, Experience of the European Union and Practice in Ukraine* (Dmytro Krysanov, Olga Varchenko, Abbas Mardani, Nadya Burdeina). The authors consider the problem of food safety management which is relevant to all countries. An experience of EU countries in ensuring the safety of safe food products is important for Ukrainian producers. Most enterprises producing fodder and food products have respective certificates confirming that these products meet such safety and quality requirements.

However, the implementation of HACCP programs involves the development and implementation of hygiene procedures for market operators throughout the whole food chain. This approach ensures the production of safe food and effective rules for food handling. The implementation of HACCP programs will ensure compliance with the EU regulatory requirements to the safety and quality of final agricultural and food products.

Part 3. The Role of Marketing in Management by Manufacturing Structures of the Agroindustrial Sector. Chapter 3.1. *Marketing of Sugar Industry in Ukraine* (Andriy Doronin, Lesia Karpuk, Oleg Zakharchenko, Nor Zafir md Salleh). The authors came to the conclusion that increasing the efficiency of the sugar industry is possible via the diversification of sugar factories in Ukraine. In addition, ensuring the growth of the efficiency of sugar beet production is possible via concentrating their cultivation in the most favorable regions for this crop, the soil-climatic conditions of which provide high yields and quality of roots. The increase in sugar beet productivity will meet the need for sugar in the domestic and foreign markets. Diversification of the production of sugar factories allows the production of heat and electricity, bioethanol and biogas. This will allow the production of environmentally friendly alternative fuels – bioethanol, biogas, job creation; to receive additional fodder for livestock breeding; to reduce dependence on imported fuel and to contribute to food security of Ukraine, to increase the profit of enterprises; to create additional jobs.

Chapter 3.2. *Volatility of world prices and its impact on agricultural production* (Kateryna Prokopenko, Nataliia Mamontenko, Nanthakumar Loganathan). The authors identified tools that allow solving problems of volatility of prices and providing farmers with in-

come, including state policy of farmers support. The risk minimization and transferring are considered separately. For example, the use of appropriate production technologies (thanking to the introduction of drought-resistant varieties of agricultural crops or investment into irrigation) by farmers can reduce the risk of harvest losses due to weather conditions. The insurance can reduce the risks associated with the fluctuations in market prices. In addition, there are remedies against such fluctuations as diversification of crop rotation, membership in farmers' cooperatives, etc. In addition, governments can increase farmers' productivity by creating a political and legal framework that will increase their ability to manage risks, increase the degree of stability with respect to external shocks, and increase the supply on domestic market at affordable prices. Implementing measures aimed at combating price instability should ensure a reduction in volatility both in the short-and long-term, reducing the impact of the volatility of food prices on the food production, incomes and availability of food for the poorest population.

Chapter 3.3. *The use of modern marketing concepts in ensuring the social orientation of the enterprises of the food industry* (Tetiana L. Mostenska, Tetiana G. Mostenska, Oksana Piankova). The authors concluded that partakers of the socially responsible marketing should be truthful and consistent in implementing a program of socially responsible marketing. Enterprises offer the market both the general goods and those of everyday demand, so for these products the meanings embedded in the notion of social responsibility will be different. For food products, the basic requirements of social responsibility should be accessibility, quality and safety. Thus, the implementation of the concept of socially responsible marketing is influenced by a set of factors that are individual for each enterprise and will determine the individual way of implementing the principles of socially responsible marketing. Depending on the motive that drives an enterprise, the introduction of socially responsible marketing can be geared towards generating more profit without focusing on social needs, or it may be geared towards solving urgent social problems. The attitude of owners and management of an enterprise determines the desire for the scale and timing of the implementation of the concept of socially responsible marketing activities.

Part 4. Main Directions of Implementation of Innovation-Investment Activities of Enterprises. Chapter 4.1. *Management of innovative-investment activity of enterprises* (Valerii Ilin, Olena Ilina, Vladislav Ilin, Iryna Hanzhurenko). The authors described the state support of the agrarian sector of economically developed countries and offer respective instruments of state regulation of agricultural production for Ukraine. The authors focus on the provision of competitive products at medium and large enterprises, where it is possible to implement the principles of specialization and concentration of production, to accumulate the volume of investment resources necessary for the introduction of the latest technologies and equipment; to create the preconditions for increasing labor productivity and for decreasing production costs.

The authors came to the conclusion that the main goal of the state agricultural policy of Ukraine should be to increase the competitiveness of agricultural products of Ukraine both on the domestic and foreign markets. At the same time, the question of social stability should be at the center of government attention. This is ensured by social protection of the population and the development of rural areas on the basis of innovation-investment model of agrarian sector development.

Chapter 4.2. *The implementation of investment processes in order to harmonize land management with the European standards* (Volodymyr Gryshko, Mykola Zos-Kior, Ihor Kuksa, Maxim Buchnev, Nanthakumar Loganathan). While determining the quality of land use, the authors suggest taking into account the state of the agrarian sector, the prospects of globalization, the sustainable development and the state of food security during the process of harmonizing national agrarian management. According to the authors, this process can be represented as a scheme of harmonizing economic interests of subjects of land relations via their financial and organizational facilities. The influence of the main global trends in the LM sector of Ukraine is dominated by an increase in anthropogenic load. The author's scheme of "domino effect" in realization of investment processes in agriculture allows harmonizing LM according to European standards. In this case, a scheme for the formation of a perspective LM level through the prospects of globalization and internal drivers is suggested.

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PART I.

*THEORETIC-
METHODOLOGICAL
APPROACHES TO
MANAGEMENT IN THE
AGRARIAN SPHERE*

Chapter 1.1.

THEORETIC-CONCEPTUAL BASES OF MANAGEMENT OF MODERN AGRARIAN PRODUCTION STRUCTURES

Yulia Ushkarenko, Andriy Solovyov, Nataliia Kussyk, Abbas Mardani

1. The essence of the term “agrarian production structures”

Agricultural enterprises largely depend on the existing combination of relations of property and forms of entrepreneurial activity, cooperation and integration links, the level of concentration and specialization of production, the emergence of new in scope, forms and connections of the markets for goods, services and resources, as well as the effectiveness of their management.

In market conditions of farming, agrarian formations must take into account the requirements of effective market exchange, the purpose of which is the maximum satisfaction of consumers' needs. In its turn, this raises the need to expand the boundaries of the production and functional interaction of enterprises of all industries, to raise the qualitative level of structural, organizational and technological development, to form a set of scientifically grounded market relations, to expand structural ties in the agro-industrial complex as an integrated production and economic system.

A characteristic feature of the economic development of agriculture lies in the fact that it is increasingly connected with the branches of industry and the sphere of sale of products. Its role is growing in the process of integration, strengthening the interrelationships of industries and enterprises, the emergence of new types of economic ties and improving their content.

In our opinion, the existing definitions of economic entities in agriculture require certain clarifications, the need for which is due to the transformations that it incurred in the last quarter of the twentieth century.

The economic code defines subjects as participants in economic relations, which carry out economic activities, realizing economic competence, that is, it classifies them from the position of law-subject relations (Verkhovna Rada of Ukraine, 2005).

V. Andriychuk defines the agricultural (agrarian) enterprise as a legal entity, the main activity of which is the production and processing of agricultural products, the sales proceeds of which constitute at least 50 percent of the total revenue (Andriychuk, 2013).

The agrarian law of Ukraine identifies agriculture (agricultural production) with agricultural activities and defines an agricultural producer as a natural or legal person engaged in the production and independent processing of the actual crop and livestock produc-

tion. This definition is associated only with the production and processing of agricultural products, regardless of their further use (in their own farm or sale) (Pogribniyi, 2007).

All of the above interpretations, in our opinion, are somewhat simplistic, because they did not explain some important aspects related to the interaction of a number of biological, economic, human and other factors that reveal actions in modern agriculture. Until recently, the traditional approach to the methods of research and development of agricultural technologies was dominated in agrarian science. Now it becomes clear that not all the approaches and methods of the past years are sufficiently effective and safe for the environment and human.

Priority issues of economic management become environmental safety and human health. So, it's time to move not only to new models of nature management, but also to a new, qualitatively different economic model of the relationship between human and nature. Man no longer dictates his conditions in categorical form, because the consequences of such actions turn against him. Now the most effective policy should be considered the policy of adaptation of the model of nature management and agriculture to the local natural conditions and features. Hence follows a reasonable conclusion about the need to introduce a new structure of agriculture or to regulate its management, taking into account natural conditions and the availability of resources.

Researcher A. Fell argues that the agrarian structure is a clearly defined territory, where there are certain pre-determined agreements and rules for its functioning (culture of crop rotation, requirements for keeping livestock, organization of labour) (Laurent, 2014).

In the early 60s of the 20th century, M. Deroua defined the "agrarian structure" as the spatial arrangement and organization of agricultural production in their connection with social factors (social relations, the nature of ownership of land) (Food, 2016).

In the 1970s M. Mazoer re-evaluated the concept of agrarian structures and pointed out to the need to consider them as a combination of agro technical systems and socio-economic policy regulating their functioning and relationships with the subjects of the external environment. In the early 1990s, he described the concept of "agrarian system" as a type of agriculture, which consists of an ecosystem and agrarian structures that exploit it for a long period of time to meet their own and social needs in the industry's products in a regime that preserves and multiplies the potential of the ecosystem (White, 1989).

According to L. Retor, the term "agrarian structure" is limited due to the ambiguous perception of the social significance of the parameters of land ownership (ownership, rent) by peasants residing in a given locality (Sadler, 1991). This limitation can be overcome by introducing the term "agrarian production structure" (hereinafter as APS), which we propose to define as the aggregate of all existing long-term economic, industrial, social and environmental conditions in rural areas of the region. These conditions determine the productivity of production, income and its distribution, as well as the social status of the population.

The proposed concept defines any form of agriculture as a system built on the interaction of natural and artificial ecosystems, as well as the APS, in this case – subsystem that directly produces the products of one or more industries. The main objective of the agrarian structure is to produce the final products to meet their own and social needs, rationally use natural resources and minimize the impact on the ecosystem.

According to its territorial, sectoral and organizational areas, the APS is called upon to coordinate sectoral and regional interests of industry and agriculture.

A large number of organizational and economic entities can be attributed to the APS, from the farms to the agro-industrial associations and holdings. The characteristic features of the APS are that they all belong to the agro-sphere of the economy, and their integrity is based on the commonality of economic relations in conditions if they have economic independence. First of all, it is necessary to define the concept of “system element”, that is, with system-forming factors in the agro-industrial complex (AIC) which form the APS and to arrange them in the certain hierarchical sequence, reflecting their economic subordination, interdependence and belonging to one economic big system. In its turn, each element of the system is the subsystem with its lower-order subsystems, structure, links and goals, which are unified for the entire the APS system by their defining essence. As an indivisible element of the first order system, it is possible to consider the individual worker who has certain skills, qualifications, experience and objects of labour over which he works within the certain technological stage of agricultural production (plowing, harvesting, etc.).

The totality of these stages creates the corresponding full production cycle. In the future, the union of two or more elements forms systems of the higher levels. The first level APS includes subjects consisting of several indivisible elements and perform more complex functions within the completed technological stages of agricultural production. These include primary labour collectives, such as specialized units, households, labour processes in which are performed by several workers (two or more), and they are specializing in the production of certain types of agricultural products. At the second level there are the farms, cooperatives, brigades. The third level of the system is the private, joint-stock, state-owned companies, agro-firms, etc. The fourth level is represented by the inter-farm and territorial associations of district and inter-district (regional) scale (agro-combines, associations of farms, etc.). On the fifth level there are the regional and interregional economic structures (agro-holdings).

The nature of the APS in modern conditions consists in realizing the main tendency of development of agricultural production, namely, in increasing the scale of technological processes, concentration and distribution of labour, the introduction of new technologies and increasing labour productivity, it determines the scale and specialization of individual production systems. This, from the one hand, provides opportunities for the introduction of new technological processes and machines, contributes to the expansion of the boundaries of capital, and, from the other hand, the technological opportunities predetermine the limitations of the distribution of production systems and the growth of functional interaction. The foregoing allows us to affirm about qualitatively new transformation of the functional spheres of agrarian production into an organizational and production structure, which develops on the principles of dynamic stability on the basis of diversification, combining and complementing the production of various forms.

The development of the APS takes place through the way of diversification of agricultural production, which is the result of integration (cooperation) at the end of the production cycle (upwards – at the output), that is, achieving synergy effects by realizing the advantages of the initial specialization, but not as the result of dividing factors at the beginning of the production cycle (downwards – at the entrance) with the loss of the original specialization of various forms of management.

The emergence of new qualities of the APS defines them as production systems, the peculiarities of which are determined by the diversity of property and business relations,

by the formation of cooperation and integration links, by the new parameters of concentration and specialization of production and capital, by the creation of markets for resources, goods and services. At the center of complex structural relations of agrarian production in the modern economic system is placed the APS as a production unit, and the market, as an institutional factor, connects producers and consumers, remaining the main condition for integrating the objective function of agricultural production.

As a result, groups of enterprises are formed are structurally independent of each other, united by a common goal that reflects the integration essence of the economic stability of the APS as a whole.

The transformation of the economic system of the state introduces significant changes in the economic nature of a modern agricultural enterprise. First of all, these changes affect the goals, forms and methods of managing the organization of production. There is a qualitative change in the agrarian market, innovative technologies are being introduced, marketing policy is being strengthened, the production and market hierarchy is growing and the interchangeability of large and small-scale agricultural production is rising, the need for a strategic approach to management arises, and cooperation and integration are developing.

The formation, development and management of the APS should be considered from two perspectives. In the first case, as an agrarian enterprise taking into account the specifics of the primary link, and in the second case, given the nature of the interrelationships of enterprises among themselves and other sectors of the economy, such as those, which depend from existing production relations. Consequently, the level of management integrates the goals and tasks of the APS groups represented by various organizational and legal forms, and associated with technological and functional specialization and cooperation. Theoretical bases of specificity of the agrarian enterprise are considered by many authors through functional connections between the factors of the production process and the results of economic activity (Gvershiani, 1970). In recent conditions, the significant number of subjects of market relations in the agro-sphere, differences in the forms and levels of their organizational and economic isolation and combination lead to an increase in the number of varieties of economic interests, their variability and interpenetration (Norenkov, 2002).

The realities of recent life make it impossible for the existence of natural agriculture, because producers are needed for the means of production and consumer goods, which are possible provided that part of the produce is sold. But to put in dependence on the level of marketability, the level of efficiency of the enterprise would not be correct, since everything depends from the specifics of production and marketing of the certain type of product, the specific situation on the market and the economic conditions of the producer. At the same time, it is important to consider the APS not only and not so much as an industrial and economic unit, but as a factor through which the labour is reproducing in accordance with the social orientation of the agricultural sector of the economy. This task is complicated by the high level of unpredictability of agricultural production and its spatial dislocation, which can't be changed.

At all levels of the agrarian economy, as a result of integration processes, groups of enterprises having common goals, structurally and technologically independent are formed. They can be considered as complicated socio-economic systems, the internal and external relations of which are changing constantly. The conditions for the functioning of traditional management structures, their elements and hierarchy are also changed. The

accelerated development of technologies, the complexity and variety of offered products and services, the reduction in their life cycle, the emergence of a large number of competitive organizations, the increasing demands of customers, the increase in the volume and speed of obtaining information and new knowledge – enumeration and other changes in the external environment make it necessary for enterprises to seek new approaches to management of them. Uncertainty, unpredictability and instability of the external environment, the depth and speed of the changes, that are occurring, will most likely continue to manifest their effect in future.

Thus, the management of such systems must be adapted not only to existing conditions, but also to provide such ability for a long period of time. The need to improve the management of the APS requires taking into account the specific nature of the work of the agricultural enterprise, the nature of the links between them and other industries. All phenomena in the economic agro-sphere must be considered taking into account the specific features of the production relations between all the subjects of the agrarian sector. The specificity of the primary links in agricultural production is due to the peculiarities of soil and climatic conditions, the need to combine the processes of production and reproduction of bio resources. In its turn, this causes the use of fundamentally new management technologies of production, forms of labour organization, etc. The particular importance are taking the links between the process of creating products and the quality of soils, the combination of economic and biological processes of reproduction and conservation of the potential of natural resources.

The management of the APS, as the embodiment of the idea of an intersectoral system approach based on the general laws, and it has much in common with the management of any economic system. First of all, it concerns the general functions of management: analysis, forecasting, planning, organization, coordination and control. The implementation of each of them, both separately and in the system set, must be accompanied by appropriate information and analytical support. An important point is also their prognostic support, which avoids many errors caused by market and other hazards, and which helps to develop timely *a priori* rather than *a posteriori* management decisions.

Let's consider the concept of "subject" and "object" of management in the agro-sphere from the perspective of the goals and objectives of our study. The object of management is what management activity is aimed at. It has spatial and temporal parameters (dimensions, location, natural changes in the process of existence). Objects of the type of management that is considered, there are different, inherent in agricultural production, organizational and legal forms, behaviour and activities of people in them. The objects of management in agriculture are also classified as collectives of people who are subject to organization (creation, formation, improvement) for their further functioning and achievement of a predetermined result.

The object of management is any APS. Receipt of finished product is carried out through production, which includes such technological operations as growing plants and animals, harvesting, obtaining milk, eggs and other products. For the practical implementation of these groups of production and technological operations, it is necessary to have special structural elements as follows: several production processes, machines and devices, production units, significant numbers of agricultural workers, etc. Between these elements of production there are complicated interrelationships caused by the use of the

same machines in different fields, the presence of appropriate weather and climate conditions for all production processes of the given farm or district, etc.

The APS has a structure with the certain centralization of management and the necessary degree of its decentralization for account of specific conditions of work performance and the use of creative approach and initiative of their implementers. It is also necessary to take into account the effect of objective laws of biology and physiology, which determine the natural course of development of plants and animals. In the production process, various factors of influence are inevitably aroused, which must be taken into account when planning and implementing the production process. Obviously, the APS, as the object of management, is a complex system, organized as set of structured interrelated elements exposed to perturbing factors.

For effective management of the APS it is necessary to have a large volume of diverse operational and objective information about the structure of sown areas, the conditions of agricultural land, plants and soils, as well as the expected yield. In addition, as a result of climate change on the planetary scale, there was a need to revise the existing agro-climatic zoning of agricultural areas and the issue of adjusting technological maps for crop cultivation was raised.

The production management system (regulator) can fulfill its role in the event that the set of interrelated structural elements (links) of this production (object of management) are adapted to the perception of the regulator's actions and allow it to obtain the final result. That is the production, as an object of management, must meet a number of requirements that determine the possibility of implementing managerial activities. Regulator and communication system form the management system (MS). The main element of organizational-technical MS is the person who makes the decision. It means an individual or a group of individuals who have the right to make final decisions on the choice of one of several management actions. The communication system includes the direct communication channel through which the input information is transmitted – the set $\{x\}$, which contains the command information $\{u\} \subseteq \{x\}$, and the feedback channel, through which transfers information about the condition of the object of management (OM) – the set of source information $\{y\}$. The set of variables $\{n\}$ and $\{\omega\}$ means, respectively, actions from the environment and indicators characterizing the quality and efficiency of the operation of the controlled subsystem T. The indicators of quality and efficiency are the subset of information about the conditions of the object of management $\{\omega\} \subseteq \{y\}$.

The controllability of the system T means its ability to change its initial parameters E under the influence of management actions of the software in the presence of input C and disturbing D influences and feedbacks of the OS.

The degree of controllability depends on the constituent elements of the object of management and the number of factors that can be identified and taken into account in the management process. Systems with a high degree of controllability require relatively small volumes of computational works and strong feedback communication system (CS), so that the parameters of the final result do not exceed the limits of acceptable values. And in contrast, in systems with the low degree of controllability, most factors are taken into account by calculations and the feedback of the OS should be weak, since the response of the control object to the actions of the regulator R is weak also.

2. Branch, organizational features and management conditions in the agricultural sector of the economy

The controllability, development and functioning of the agro-industrial sector (APS) is affected by a large number of factors. Most of them can not be considered or envisaged, but they determine the risky and stochastic nature of agricultural production. The composition of the factors that need to be taken into account is a function of the content and complexity of management tasks, the instrumental ability to monitor the dynamics of indicators which measure the degree of influence on the system.

The definition, specification and measurement of the influence of the factors acting on the system do not solve the main problem – the search for options for actions that need to be implemented (respond to the variation of factors). Thus, within the framework of solving the particular problem, the following tasks can be identified: selection of factors, identifying factors, developing an appropriate management solution and ensuring its implementation and it is the management function.

The selection and identification of the factors, which affect the system, are referred to not fully formalized and completely un-formalized tasks. At the same time, it is important to take into account the intellectual component of management, a combination of such subjective concepts as a presentiment, intuition, experience, the use of which is inextricably linked with the human factor in management. Examples of some managerial decisions can be considered at the level of achievements of fundamental sciences. The management system should be constantly focused on maximum objectivity, obtaining new knowledge, accepted and evaluated as useful for solving urgent problems, prompting managers to make optimal decisions.

The complex of factors which modern managers take into account today must cover all aspects of the problem under consideration. It is advisable to involve in its discussion multifaceted specialists who can act as experts: managers, advisers, specialists from other companies. This option of decision-making can rightly be called collective. The requirement of observing the principle of systemic nature explains the need to classify the list of factors which must be taken into account in the process of the system functioning.

In the framework of the problems studied, it is advisable to use the following classification of factors: the factors that are controlled and the factors that are not controlled, as well as direct and indirect, continuous, seasonal, multiple and one-time actions, according to the periodicity of accounting, deterministic and random, according to the territorial sign, obvious and hidden. The systematic approach to management allows us to reduce the level of subjectivity, inevitably accompanies the managerial process, in which the main role is played by the person. In general, latent (hidden) factors and reactions arising in response to their actions or influence are the most complicated. The influence and effect of each factor –separately and in aggregate – can only be assessed using an appropriate set of indicators. The complexity of this procedure is explained by the above mentioned characteristics of the object of research and the reasons to which the requirement of adequacy of the set can be added to the goals and conditions of the APS, the peculiarities and multi-variance of the methods of its formation, the complexity of multi-level interdependencies between external and internal factors which constantly change over time, insufficient intellectual and machine-software support, resource limitations, etc. As noted above, all the environmental factors surrounding the system methodologically, it is advisable to divide

into three groups according to the selected three levels – the macro-external, the micro-external and the internal environment of the APS. This distribution corresponds to the three directions of the analysis of the management process in the APS.

First level:

1. Politico-legal – the political structure and its relation to the business. Legislative regulation of entrepreneurial and other economic activities, the degree and level of corruption of state authorities, the adopted lobbying standards, the types and influence of public organizations in the system of state and political decision-making, the development of legal protection of the population and business, the existence of foreign-policy alliances and programs that ensure a sustainable and stable formation of market relations.
2. General economic – the phases of the economic cycle, the level of inflation and unemployment, the general and the distribution of wealth, incomes and savings in society. The tax system and its conformity to the consumer basket of the population. The structure of incomes and expenditures of the population, its purchasing power, working hours and the structure of free time. Changes in the structure of consumption of the citizens. Elasticity of consumption.
3. Scientific and technical – the level of development of science and technology, the pace of scientific and technological progress, the possibilities of basic sciences, the degree of using scientific potential, the connection between science and production, the main directions of scientific research, the structure of research centers. Indicators of economic and technical security of existing and promising technologies. Qualification of the workforce, its educational level. Development of innovative processes of the subjects of the marketing system.
4. Socio-demographic – the total population, its age, sex, ethnic composition and reproduction characteristics. The density of settlement throughout the territory of country, the ratio of rural and urban population, migration. Fertility and mortality, life expectancy, age structure.
5. Ethno-cultural – forms of cultures. Presence of common traditional cultural values and norms of behaviour. Features of cultural and moral values. Language and slang. Nonverbal modes of communication. The level of education. Ethnic and religious structure of the population, the stability of customs and rituals. Dynamics of the culture of behaviour. Development of market mentality of the population.
6. Natural and geographical – the distribution of the territory of the country to economic-geographical areas, the climatic conditions, the supply of essential minerals, energy, the quality of soils, air, water.
7. Environmental – the degree of environmental pollution. The level of public health. Environmental indicators, their standards and compliance. Development of the system of state control over the protection of the environment and regulation of the intensity of the use of natural reserves of fuel, energy and raw materials.
8. The social component refers to the main characteristics of the macro-external environment. It reflects the standard of living of the population, its education, unemployment, the demographic structure of society, its concentration. Social factors shape the style of life, work, consumption and largely affect almost all the APS. New trends create the type of consumer and, accordingly, determine the need for other goods and services, defining new strategies.
9. The economic component of the macro-external environment is characterized by indicators which determine the level and features of market relations: the level of social economic development, the state budget, the availability of resources, the level of population incomes and

unemployment, the tax policy, the inflation, the interest rates, the labour productivity, and the wages. These indicators should ensure the formation and distribution of resources in the system. In addition to these, the other economic factors also operate: the structure of consumption and its dynamics; the economic conditions in the countries of the world; the trade balance indicators; the monetary and financial policies; the trends on the securities market; the level of labour productivity in the industry and the rate of its growth; the tax rates and the like same.

Micro-external factors include:

1. Factors of the market group (direct and indirect):
 - parameters of the market for the sale of products – information about the prices of agricultural products and products of its processing; the activities of competitors, the capacity of markets, the preferences and purchasing power of existing and potential consumers;
 - prices, supply and demand on the markets of information, technology, machinery, equipment, tools, spare parts, etc.;
 - prices, supply and demand in the markets of energy resources, fertilizers, plant protection products, etc. For the agro-producer, information about the dynamics of the market situation and the stable development of markets is important;
 - potential investors and the forms in which they cooperate;
 - potential partners or firms and organizations with which cooperation agreements can be concluded, new facilities and branches will be formed, joint activities will be carried out on the labour market and in the sale of products;
 - other structures of the macroeconomic environment (intermediaries, suppliers), financial institutions, advertising agencies, etc.;
 - contact audiences;
 - availability of engineering and communication networks (power grids, gas pipelines, highways, rail transport, etc.);
 - general level of staff skills in the area of the enterprise and the effectiveness of their use;
 - the availability of regional systems for the collection, processing and transmission of information.
2. Factors of the natural and climatic group:
 - the soil and the possibility of growing competitive products on them;
 - the intensity of photosynthetic active radiation (FAR) in the region and its characteristics during the annual cycle;
 - the thermal regime during the year and its probabilistic characteristics;
 - the diseases and pests of agricultural crops, possible losses from damage of various origins;
 - the ecological situation, the availability of resources for irrigation and the possibility of their use;
 - the characteristics of crops and the possible impact on them of environmental factors.

The third group is the factors which form the internal environment of the APS and affect its condition.

The internal environment of the organization is exposed to the effects of variables on the processes occurring in the organization.

In this case, it is possible to use the distribution of factors to objective and subjective factors. The group of objective factors includes goals, tasks, technologies, financial system, information system, strategies, business processes, management methods and tools, and the like same. The group of subjective factors, determined by the characteristics and re-

relationships of people in the organization, includes common values, organizational style, staff skills, authority, organizational culture, corporate spirit, human resources, basic production assets, resources, etc. In agrarian production a number of natural factors operate directly, which act simultaneously in two forms: as internal, as well as external.

Entrepreneurship in the agro-sphere has certain features due to the significant influence of natural factors on production results, and the use of a special resource – the land. In agriculture, land is both as the instrument of labour, and the object of labour, and as the spatial basis for the displacement of the economy facilities.

Any APS has fixed and circulating funds, which can be presented in natural and in value forms. In natural form, they correspond to constant and variable parts of production. The constant part includes durable goods. The constant part of production is characterized by long-term factors, namely: the area of the land, the number, the location and size of settlements, the number of able-bodied population, the location and condition of roads and communications, the animal productivity, etc. The variable part of production includes the means, composition and capabilities of which can change during one or several production cycles: the workers, the materials used in the production process, the production technologies, the production systems, the methods of performing production processes, the machine maintenance systems, etc.

In agriculture, it is impossible to have an unchanging one-type production technology. It varies in accordance with the soil-geographical zones of the country, the enterprises of the zone, the fields and farms within individual farms because of differences in the conditions of growing agricultural plants and keeping animals, the variation of crop rotations. For these reasons, there is a need for specific production systems in the form of certain forms, the use of natural, production and labour resources in the conditions of this zone, the fields for the development of production technologies corresponding to these conditions.

The general economic system of production consists of the interconnected systems of farming, the animal husbandry, the mechanization, the sales (marketing) of products and the management. The system of crop production reflects the interrelationship and combination of factors from which the soil fertility, the yield, and the profitability of the industry are depended. This group of factors includes the climatic and natural conditions, as well as the hydrogeographical network. The plant cultivation system also includes the rational organization and use of territories, the structure of lands, the area of crops, the system of fertilizers and cultivation of fields, the methods of caring for crops, the control of plant diseases and pests, the seed production and the combination of crops within crop rotations, the agro-forest-melioration, the drainage and irrigation measures, the prospects of expanding the areas of arable land, pastures, orchards, vineyards, berry plants, etc.

Animal husbandry can not to be considered outside its links with crop production. These connections are carried out through the forage base and the types of fertilizers used. The animal husbandry system provides for the justification of the number of animals per 100 hectares of the land, the stocking of the herd and the dynamics of its changes, the carrying out of pedigree and veterinary work, the production of feed, the organization of water supply and feeding of animals, the ways of their maintenance and rational exploitation.

Animal husbandry and crop production systems are based on the corresponding system of mechanization of production, which ensures the implementation of machines and subsystems of production and technological operations in accordance with the require-

ments of certain technologies. The intra-farm system of processing, storing and marketing products presupposes the rational organization of its sale through various channels on the market, the satisfaction of the needs of the economy, the temporary or long-term storage at the enterprise, the processing by own forces or at specialized enterprises.

The APS are needed in services on the supply of machinery, fertilizers, plant protection products and medicines, petroleum products, electricity, water, etc. Servicing and supporting enterprises cooperate with organizations which perform scientific, research, design, construction, installation, commission operations. Agricultural enterprises-producers use services of intermediaries for storing, selling and processing products, which are engaged in bringing products to consumers through the network of wholesale and retail trade enterprises.

Practical implementation of the adopted production systems, that is, agricultural practices, methods of obtaining products and organizing works, is carried out through production processes. Technological processes allow change the internal state and internal quality of the subject of labour. Auxiliary production operations for moving, storing or preparing for the use of objects of labour provide the possibility of performing technological operations. The content of these mentioned operations is determined by the purpose of the production process, which in turn depends on the type of finished product.

In agricultural production there are tense periods that require intensive work for the timely fulfillment of technological operations and complexes of works. In other periods, the intensity of field works is reduced. As a result, there are problems with a uniform load of workers. The objective rules of the development of plants and animals, their biological nature do not leave much room for changing technological operations in space and time. Each specific process of production of agricultural products has a certain rhythm inherent in it. The rhythm of agricultural production, which determines the course of work in the time, the space and the sequence of technological operations, does not remain constant. It can change in a few years (change in crop rotation), every year, within companies, within the time frame for performing individual jobs or operations. The rhythm of production can be influenced by small intervals of time, for example, due to unforeseen stops of machines and mechanisms. The inconstancy of the rhythm of technological processes in agricultural production is an integral feature of the process of producing and selling agricultural products.

In agriculture, the economic processes of reproduction are closely intertwined with the natural ones. Quite often unfavourable climatic conditions cause the loss or shortage of crops. Dependence on natural conditions also necessitates the creation of strategic seed and fodder stocks for the event of the crop failure.

For its development, the agricultural sector of economy is needed in attracting additional financial resources, primarily in the form of the short-term loans, in order to ensure continuous operating activities. Taking into account the existence of the seasonal gap between working capital investment and income generation, enterprises must have sufficient funds to cover these seasonal costs. "It is economically unprofitable to hold own funds for these purposes for a long time. It is much more effective to create minimum production reserves and funds in the calculations to form at the expense of own sources, and in addition, borrowing funds, that is, on the loans accounts" (Wosserman, 1992).

Agro-industrial production is characterized by considerable territorial dispersion of production units, which causes certain difficulties in the implementation of management

processes. This factor also necessitates the use of machinery and labour resources in remote areas and production units located at a certain distance from the location of the enterprise management apparatus. Many types of works are related to the need for rapid movement of workers and the corresponding means of production. It should also be taken into account that workers are mainly living at a considerable distance from workplaces, and therefore the management of the enterprise should be concerned with the issue of creating appropriate conditions for their stay outside the populated areas. This fact raises the question of the location of the fleet of vehicles: distribute it to branches and brigades or concentrate at the central farmstead. Agrarian managers also face the need to settle the issues of the universality of machinery, its storage, rent, leasing, the appropriateness of acquiring certain models and modifications, the need to take into account seasonality and the short term production cycle. Another feature of the use of labour force is due to the dispersal of production, workers generally do not have the clearly defined workplace.

The production process in agriculture also has its own features associated with the fact that, on the one hand, a person participates in it, and on the other hand, living organisms (plants and animals). This feature determines the low predictability of managerial processes. Seasonality of agricultural production also affects the inertia of the decision-making management. For example, the structure of crop rotation can not to be changed within a year. It should be noted that after processing the complex of organizational and technological measures, the number of variants for decision-making in all areas of activity is significantly reduced, and cardinal changes are almost impossible and have forced character. A significant number of managerial decisions, including strategic ones, acquire discreteness due to long period of reproduction, to increase the responsibility for their development and implementation. The aforementioned features determine the special role of forecasting in the complex of actions preceding the decision-making process. It should be based on data obtained over many years, to draw on the experience, intuition of management personnel, experts, technologists and to have an appropriate information base of the accumulated data.

Agrarian production structures are characterized by certain features related to the processes of sales of products and, accordingly, to pricing process. In agriculture, the basis of market prices is the cost of production at the worst fertility soils. Of course, we are talking about the fact that production at the worst quality lands is carried out under normal conditions. Enterprises located closer to the market and have less transportation costs. The difference between public and individual property forms the additional income, which is determined by natural factors or the geographical location of the land plot in relation to the sale market of products. In the latter case, the quantity of agricultural products does not increase, and only its full cost price is reduced by reducing transportation costs.

The seasonal nature of the process of agriculture production and receipt of commodity production gives it discreteness, and its implementation is continuous, since the need for food is constant. The adoption of decisions on the production of certain types of products and the implementation of costs significantly differ from the time of its realization. During this period, prices can be significantly changed, both for products and for resources needed for production. In this case, the time lag between changes in the price and the result of actions aimed at adapting them to the new level is sometimes longer than the annual production-marketing cycle. This is connected with the specific features of different technologies for growing individual crops.

This considered situation significantly complicates the management, increases uncertainties and risks when making managerial decisions and requires their careful calculation based on the analysis of diverse, relevant information, mainly from the external environment. In this case, it is important to involve data on the cyclical annual seasonal price dynamics. Accounting for these indicators facilitates the decision-making of long-term or short-term storage of products or its rapid realization.

To illustrate the above mentioned fact, it is possible with the help of graphs of seasonal fluctuations in prices for grain crops in Ukraine (Fig. 1), which confirm the presence of seasonal waves.

The difficult task for realizing in practice is forecasting price changes under the influence of weather conditions, taking into account the zonal location of agrarian production systems. In a large extent, they can be considered as random and difficult to predict. Nevertheless, there is presented information that over many years agricultural meteorology collects, accumulates and systematizes, and the weather observations in a particular climate zone can be taken as a basis for calculations of the long-term cycles of changing weather conditions. This will make more reliable forecasts of prices for certain time periods, and increase the validity of management decisions. The certain part of the produced agricultural products is used by economic entities for their own needs. This fact forces manufacturers to make additional costs associated with the need to store and process this product.

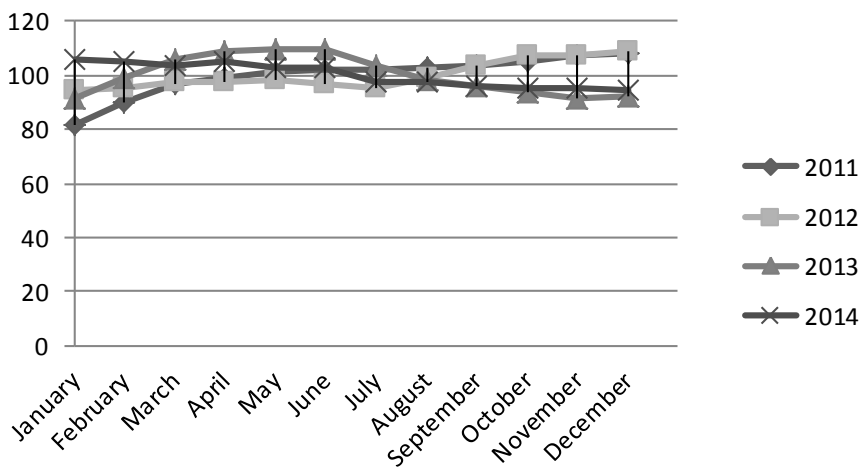


Fig. 1. Indices of average producer prices for cereals in Ukraine by years

Source: own research.

In any case, managers are faced with the problem of multi-criteria in decision-making, that is, a dilemma: to buy seeds, young animals, planting material on the market or to engage in self-sufficiency, what is not always justified from the point of view of the costs of their production, the availability of production opportunities and skills.

The considered features of agricultural production in the certain extent are reflected in the final economic results, therefore managers should take them into account when developing, introducing and improving agricultural management systems. All considered

features of the APS are characterized by the variety of forms and types of economic entities, the wide range of enterprises, different in size, regional, properties, organizational and economic characteristics. But all of them should base their activity on the systemic set of laws, principles and features inherent in agricultural production.

So there are sufficient grounds for conclusions about the possibility of concretizing these pointed laws and principles and laying the methodological foundations for the formation of the subsystem of the APS management. As for the situation in the agrarian sector of the economy it is characterized by existence of a number of features and trends that affect its functioning, in particular, they include:

- the APS and their relationship with the external environment are becoming increasingly complicated;
- the absence of a coherent concept of strategic management of its effect has a disorganized, without signs of systemativeness and scientific foundations of the organization of the APS management;
- revaluation of regulatory market opportunities significantly increased the stochastic conditions of production and marketing of products, the variability of conditions and factors of the economic environment;
- increase of the cost of errors in management (the choice of false directions for the search for effective solutions);
- underestimation of specific manifestations of the self-organization of the market environment increased the level of various types risks;
- lack of the systemic integrated approach to solving the problems of enterprise management in this industry, what reduces the effectiveness of implemented measures aimed at improving and transforming existing organizational-legal forms of managing;
- the crisis condition of the production sector of the agrarian industry forces agricultural enterprises to function in conditions of increased risks, puts forward specific requirements for forecast estimates, whose role in planning increases;
- the high dynamism and the progressive uncertainty of environmental factors.

These mentioned features have as their consequence the significant complication of the process of production management, the reduction of the time to prepare and implement reasonable effective management actions which ensure the timely detection of threats and negative impacts, as well as favourable trends and an adequate response to them. The period of maintaining the effective efficacy of the taken decisions is also reduced, what is required their adaptation to changing conditions or the adoption of new decisions which meet the market situation. This calls for necessity of the development of the subsystem of management in agrarian production structures, which was based on the highly effective use of information and intellectual resources. The pledge of this should be:

- the system information and scientific support of solving problems of the functioning and development of the enterprise – information, knowledge and intellect;
- the focus on ensuring the precautionary nature of management actions based on the system of monitoring and forecasting methods;
- the balanced combination of formalized and non-formalized methods in management;
- the mandatory use of the multivariate approaches and methods in making and implementing decisions of any level.

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Chapter 1.2.

DEVELOPMENT OF AGRARIAN SECTOR OF ECONOMY IN THE CONDITIONS OF TRANSFORMATION OF PATTERNS OF OWNERSHIP

Andrii **Dankevich**, Vitalii **Nitsenko**, Abbas **Mardani**, Maryna **Ponomarova**

The process of land reform during the 1990-2014 triggered the transformation of property relations. In agriculture, there were created new market-oriented economic structures in terms of size and specialization, which use the land leased from farmers. At the same time, the issue of forming effective forms of farming in terms of production and investments and resolving important social and economic issues based on this is the important task of economic science.

Thus, L. Zastavnyuk and V. Zigry note that “despite a number of important institutional, economic and legal measures related to the transition to private ownership of land and its transfer to the ownership of farmers, the formation of market-oriented economic structures and achievement of certain positive developments based on this, the agriculture has long been in a critical state” (Zastavnyuk, 2011).

A. Fedoseyeva maintains the same opinion. In her study, she came to the following conclusion: “The current state of both the agro-industrial complex of Ukraine and the economy is not only a consequence of the country’s development in the past decades, but also the result of mistakes made in the reform of the agrarian sector, which resulted in a sharp decline in the economic potential of the state and the living standards of the population” (Fedoseyeva, 2009).

Analyzing the reform of the domestic agricultural sector in the organizational and economic areas, V. Mesel-Veselyak believes that currently in Ukraine there are three forms of business – private farms, farms and market-oriented agricultural enterprises. In terms of size, they correspond to those of many developed countries of the world, ensuring effective agriculture and showing the overproduction: the first – the Japanese-Chinese model, the second – the European, and the third – the US and the former Soviet Union model. Business patterns created in Ukraine meet the requirements of different businesses: large, medium and small (Mesel-Veselyak, 2010).

Large-scale agricultural enterprises are more effective forms of business compared with the medium and small ones. As noted by A. Dankevich, the concentration of capital in the agricultural production in the form of creation of integrated structures ... in accounted for periods of agrarian crisis, in which farmers experienced financial difficulties, and the land

lost its value, thus investments in the agriculture were economically sound (Dankevich, 2011).

Considering and analyzing the impact of external factors on the efficiency of agricultural production, I. Kirilenko and A. Pavlov concluded that currently, the most effective agricultural businesses are private farms and agricultural holdings (Kirilenko, 2010).

Theoretical and methodological problems of change of ownership and creation of effective organizational structures for agricultural enterprises were considered in the works of famous academic economists: P.T. Sabluk, V.P. Sitnik, V.K. Tereshchenko, V.Y. Mesel-Veselyak, N.N. Fedorov, N.Y. Demyanenko, B.I. Paskhaver et al. However, the formation of a market economy requires a further, in-depth study of new approaches to the system of production organization.

The theoretical and methodological summary of the main provisions of the business entities economic activity in the transformation of property relations and the development of proposals aimed at improving the efficiency of agricultural production.

Structural changes in the forms of land ownership during the 1990-2014 in Ukraine has led to the transfer of agricultural land from the state to the collective and private ownership. As of January 1, 2015, the state ownership share decreased to 26.2%. The collective ownership is minimized (Fig. 1).

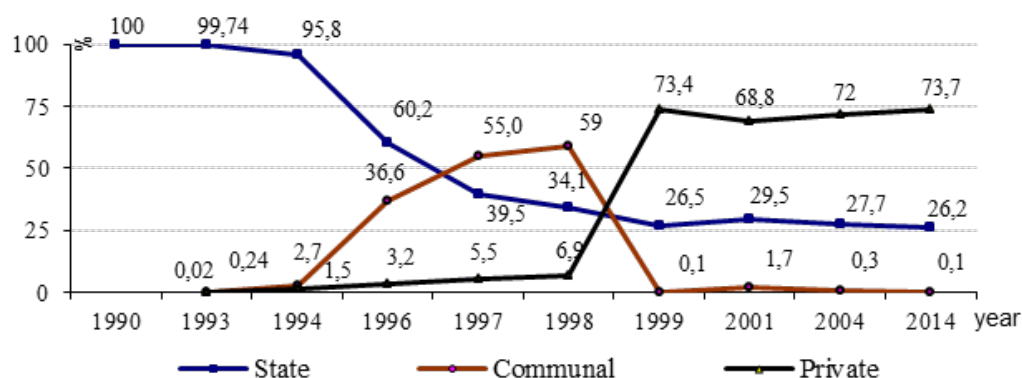


Fig. 1. Distribution of Agricultural Land in Ukraine by Ownership, 1990-2014

Source: built on the basis of Ukraine's State Statistics Committee data.

The turning point in the development of the agriculture was the decree of the President of Ukraine of December 3, 1999 "On Urgent Measures for Accelerating the Agricultural Sector Reform". This decree regulated the lease of land, simplified the procedure for registration of lease agreements, which allowed significantly accelerating the development of new agricultural businesses based on the land private ownership. In accordance with its provisions, since 2000, agricultural enterprises have been representing the leased land in the account, and the rent – in the cost of agricultural products.

As a result of the land reform, there has been created new economy market-oriented businesses based on the land lease. During 2001-2014, the number of businesses in the agricultural sector has increased by almost 22 thousand companies, mainly through the creation of 14 thousand new farms. The land use is dominated by business companies, the sha-

re of which is 49%, and farms, which during this time have managed to extend their land tenure almost 3 times. A significant drop should include the negative dynamics among cooperatives, which have decreased by almost 3 times, and by 6 times for the area (Table 1).

Table 1. Dynamics of Agricultural Enterprises Land Use [April 1, 2001 – January 1, 2014]

Agricultural company forms	Qty.			Land area, thous. ha		
	as of April 1, 2001	as of January 1, 2014	+, –	as of April 1, 2001	as of January 1, 2014	+, –
Business companies	6,641	8,806	2,165	11,222	9,010	-2,212
Private (private-lease) enterprises	3,277	5,690	2,413	4,208	3,198	-1,010
Joint-stock companies	770	677	-93	1650	814	-836
Cooperatives	2845	819	-2026	4999	805	-4193
Farms	1767	15499	13732	907	3000	2093
Other types of agricultural businesses	905	6472	5567	1003	1667	664
Overall	16205	37963	21758	23987	18493	-5495

Source: estimated by the authors according to the State Service of Ukraine for Surveying, Mapping and Cadaster.

Since 2000, the land-lease relations have taken a dominant position in agricultural production, and the rent became an additional lever of social support in the countryside. More than 5.2 million farmers exercise their right to land through leasing arrangements. Proprietors have lost confidence in the businesses where they received land shares and enter into lease agreements with other actors (agricultural holdings) and farms, whose share increased by 41% and 14% in the general structure of agreements, respectively (Table 2).

The size, type and timing of rent payments are set with the consent of the parties and displayed in the agreement. The calculation of the rent is based on inflation indices, unless otherwise stipulated by the lease agreement. The state regulates its lower limit, which is on private lands should not be less than 3% of the land monetary value. The rents can be in cash, kind and time (providing services to the proprietor) forms. Total payments under lease agreements in 2014 reached UAH 11.3 billion, and the average amount of rent for the year was UAH 663 or about \$40 per 1 hectare.

In the lease agreements structure, the share of long-term lease for a period of more than 6 years has increased up to 61%. The short-term lease for up to three years has almost reduced to a minimum and is only 3%. The presence of farms in potential proprietors determines the dominance of the in-kind (agricultural products) rent, which share is 56%.

The largest tenants of agricultural lands are currently agricultural holdings. The examination of expert estimates show that in Ukraine, there are more than 100 large operating holdings, most of which are not allocated to individual business. The formation of agricultural holdings occurs evolutionary, though in a fairly short period of time, which leads to increased social tension in the countryside. The technical refitting of production equipment is accompanied by the optimization of number of employees. At the same time, the sufficient

attention is not always paid to social factors – the adaptation of employees, who are exempt, an individual approach with respect to their possible employment in other positions. For agricultural holdings, the priority is to obtain economic benefit – the profit, and for the society – provide moral and material values of the local community.

Table 2. Lease Agreements and Rent in Agricultural Sector

Index	Ukraine		
	2000	2014	+, –
<i>The share of lease agreements in the context of the entities, %</i>			
With enterprises, where the land was received	85.2	34.0	-51.2
With farmers	4.3	14.4	10.1
With other businesses	10.5	51.7	41.2
<i>The share of lease agreements in the context of their terms, %</i>			
For 1-3 years	45.7	3.1	-42.6
For 4-5 years	41.2	35.5	-5.7
For 6-10 years	11.3	46.4	35.1
For over 10 years	1.8	15.0	13.2
<i>The share in the context of rent payment, %</i>			
money	13.9	41.6	27.7
in kind (agricultural products)	77.4	55.7	-21.7
services	8.7	2.6	-6.1
The rent for 1 ha per year, UAH	73.6	663.8	590.2

Source: estimated by the authors according to the State Service of Ukraine for Surveying, Mapping and Cadaster

The efficiency of an individual enterprise and the public welfare are always in opposition. Under the current conditions, the needs of society in addressing the social issues far exceed the flow of tax payments, which are paid by companies. The analysis points to the poor state of social development of rural areas, which is currently characterized by not only a deep demographic crisis, the decline of the social infrastructure and the extinction of settlements, but also the lack of motivation to work and the high level of unemployment, which is accompanied by an outflow of labor resources.

According to the expert estimates, in 2014, agricultural holdings used 5.6 MIO ha on lease terms, or about 27% of the total land of agricultural enterprises (Rating 20, 2015). It is worth highlighting the first three of them that account for 1.5 MIO ha, incl.: UkrLandFarming – 653 thous. ha, Agroprosperis – 430 thous. ha, Kernel – 390 thous. ha (Table 3).

Table 3. The effectiveness of leased land use by 20 most successful agricultural holdings in Ukraine in 2014

No.	Company name	Leased land area, thous. ha	EBITDA for plant growing, US dollars / hectare of land
1	Svarog West Group	80	700
2	Grain Alliance	50	560
3	Agrospetservis	41	520
4	Chysta Krynyця	50	500
5	Industrial Milk Company	137	420
6	Vinnysia Agribusiness Group	43	347
7	Trigon Agri	49	336
8	UkrLandFarming	653	311
9	Agreyn	130	300
10	Rostock-Holding	60	297
11	Agro Generation & Harmelia	120	244
12	Ukrprominvest-Agro	122	237
13	Agroprosperis	430	231
14	Myronivsky Hliboproduct	380	231
15	Nibulon	82	225
16	KSG Agro	94	200
17	APK-Invest	41	190
18	Ukrainian Agrarian Investments	234	179
19	Agro Invest Ukraine	30	156
20	Astarta	245	124
	Total of 20 agroholdings	3,071	297

Source: estimated by the authors according to the data (Stetsyuk, 2010)

The analysis of the data shown in *Table 3* confirms the thesis that the most effective are agricultural holdings with an area of up to 100 thousand ha. In the case of increasing the area, “the economy of scale starts to work in the opposite direction, and the company’s effectiveness reduces (Rating 20, 2015)”.

A driver for agricultural holdings is the ability to lease the land from farmers for \$40/ha and assign it after a certain period of time on the domestic market for \$100-450/ha to other companies or sell shares of the company for USD1000-1500/ha on the external market (Rating 20, 2015, Stetsyuk, 2010).

For the last few years, the conditions for functioning of agricultural producers have become more complex, as the fiscal pressure from state regulators intensified.

In 2015, the criterion for checking taxes payment by controlling tax authorities was a percentage of turnovers (1% of sales). We conducted a theoretical justification for minimum amounts of taxes based on 1 hectare for main types of crops for 2015. Thus, 1 ha of wheat will create an additional burden of \$4.7, corn – \$6.5, barley – \$4.5, sunflowers – \$7.3, rapeseed – \$7.2 and soybeans – \$3.5. On average, the farmers' expenses per 1 ha will grow by \$5.7. The use of this measure is due to the use of tax evasion schemes by a large number of enterprises (in terms of wages, raw material procurement and product sales).

In addition, it should be noted that according to the amendments adopted by the Law of Ukraine No. 71-VIII "On Amendments to the Tax Code of Ukraine and Some Other Laws of Ukraine Concerning the Tax Reform" dated December 28, 2014, the following tax schemes have been changed for farmers:

- the VAT refund for exporters (grain traders) of crops, except for farmers and enterprises of the trading chain level 1 has been canceled. Thus, the purchase price within the country for different types of products (grain and industrial crops) will be significantly understated (by the VAT amount).

In fact, in Ukraine, there is ban on the refund of VAT on export grain and industrial crops. This is partly explained by the fact that grain producers have to pay the VAT. Therefore, subsidies can occur in the case of VAT refunds from the state budget when grain exports (The Verkhovna Rada offer, 2015).

In turn, the VAT refund to the manufacturer that has self-grown and exported the grain provides only for the refund of VAT actually paid to the state budget. After all, when growing grain, the manufacturer pays the VAT in full without tax incentives in the purchase of seeds, fertilizers, fuels and lubricants and other material and technical resources. It is this amount of VAT that agricultural producers will claim for the refund, like exporting manufacturers of any other products do. In this case, the manufacturer will have no VAT exemptions, since no funds from the direct export will arrive at its special account (The Verkhovna Rada offer, 2015).

In addition, in Ukraine, there are many agricultural producers, who do not enjoy a special scheme and pay VAT on the general grounds. Despite this, in the sale of products directly or through intermediaries abroad, they still will not be refunded the VAT. Thus, the non-refunded VAT on exports of grain for all entities, regardless of whether they use the appropriate privileges or not, is significant tax discrimination (The Verkhovna Rada offer, 2015).

It should be noted that the lack of VAT refund to producers of grain and industrial crops during export is inherently a duty on exports. The actual duty on grain exports violates the Association Agreement between Ukraine and the European Union. For example, the Article 31 of the Agreement states that: "Parties should not impose or maintain any duties, taxes or any other measures having equivalent effect imposed on the export of goods or introduced in connection with the export of goods to another territory". Non-refund of the VAT on exports of grain to its producers is obviously referred to in the Agreement as "the measure equivalent to the export of goods", so it has a direct and serious violation (The Verkhovna Rada offer, 2015).

In today's environment in our country, there are no long-term funding sources. In most cases, banks cannot offer loans for more than a year, and the value of financial resources is very

high, especially when compared with other countries. Therefore, it is evident that the abolition of special schemes will lead to a reduction in capital investments, which in turn will adversely affect the prospects of development of the sector and as a result will have a negative impact on rural development and on the country's ability to compete in global markets (Ribachenko, 2015).

It should also be noted the prolongation of this procedure until the end of 2017.

In general, in 2015, according to our calculations, farmers will not receive about \$1.2 bln in the form of VAT refund in the export of grain and industrial crops, which is approximately equal to \$50 per 1 ha of crops, or \$30 per 1 ton of products sold.

- Cancellation of the fixed agricultural tax (FAT), and transfer of all farmers to the fourth group of the single tax payers as from January 1, 2015. Therefore, from a formal point of view, the FAT has become the fourth group of the single fixed tax. Accordingly, if in 2014, according to the FAT, the farmers paid \$0.46/ha, then since January 1, 2015, they will pay \$5.23/ha, i.e., 11.3 times higher. From this transaction, the government plans to increase revenues to the budget by \$126.4 million, incl. for account of agricultural holdings – by \$23.6 million.
- Increased land tax on farmlands, but no more than 1% of the normative monetary value. According to our estimates, farmers will have to transfer to the budget about \$387.5 million, amounting to approximately \$9.53/ha;
- The tax base for single tax payers from the fourth group is the normative monetary value of one hectare of the farmland (arable land, hayfields, pastures and perennial crops), taking into account the indexation factor of the base (reporting) tax determined as of January 1 in accordance with the procedure specified in chapter XII of the Tax Code. The cumulative value of the land normative monetary value indexation rate in 1995 as of 1 January 2015 is 3.997.

Changes in the regulatory monetary value of land will change the level of lease payments in 2015 as well. In connection with the devaluation of the hryvnia, the farmers will pay not \$40, as a year earlier, but \$28.6.

The enterprises of the agricultural sector that have chosen the regular taxation scheme must pay the income tax. Starting from 2011, the income tax rate was raised from 17% to 18% in 2015.

The negative impact on the final results of economic management was brought by the devaluation of the national currency – hryvnia (four times against the dollar). In general, losses from the exchange rate differences were suffered by domestic farmers focused on the domestic (national) market. At the same time, export-oriented companies (agricultural holdings and traders) have benefited from the national currency rate fluctuations.

In other countries, farmers receive assistance from the state on average of EUR500 per hectare, while in Ukraine, in addition to removing various subsidies, farmers are even taxed. In European countries, for example, the share of government subsidies in the price of food policy amounts to around 36%, in America – 18%, and in Japan, the amount of the subsidy is 60% (Farmers protest, 2012).

If we count all the above novations, we will get not the development trend, but on the contrary, the trend of recession. That is, due to unreasoned state policy, agricultural holdings will suffer losses in the amount of \$100/ha, and even more for some types of products, on 1 hectare of agricultural land.

Accordingly, such measures would increase costs and decrease the net income of agricultural holdings, reduced the area of cultivated land, which will negatively affect the expectations of internal and external stakeholders (Nitsenko, 2012).

The results of the comprehensive study suggest that in order to improve the efficiency of agricultural holdings and to develop the rural area, it is necessary to improve the legal framework for eliminating misunderstandings between them in terms of taxes, namely to regulate their payment within the territories where agricultural holdings operate. The sustainable development of production should be achieved through the harmonization of balance between the value of the resource potential and the ability of land to recreate its fertility. The main directions to improve economic relations between the units of agricultural holdings are the improvement of the human resource system organization and management, optimization of the production structure and development of industry relations optimal models. There is a need to improve lease land relations in terms of introduction of the system of land lease rights market legal regulation and development of mortgage operations.

The State's position on the effective use of agricultural land should be aimed at establishing the legal norms of penalties for failure to use the land. In this case, it is advantageous to use the historical experience of the Ancient Babylon, in particular, to study Hammurabi's laws, according to which, in the case of non-cultivation of the field throughout the year, the law forced the tenant to pay the owner a rent at the level of 33-50% of the harvest and carry out the main cultivation on this field.

The prospect of lease of land relations should be the permanent land use, the proper functioning of the unified system of monitoring the land-lease relations, the rent increase corresponding to the economic growth, the prolongation of lease agreements, the development of sublease and the creation of conditions for the land rational use and protection. It is appropriate to introduce the model of medium- and long-term lease with subsequent renewal of the agreement, succession of rights or redemption of the land. Subject to lifting the moratorium and introducing the purchase and sale of land, it is appropriate to use the scale of motives and restrictions on their resale. The practical implementation of the proposed measures by agricultural enterprises will attract investment in agricultural production and develop it on the innovation basis.

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Chapter 1.3.

MANAGEMENT OF A PRODUCTION POTENTIAL OF AGRICULTURAL ENTERPRISES: PROBLEMS OF THEORY AND METHODOLOGY

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Introduction

Achieving and retaining competitive advantage of domestic agricultural enterprises in global market is possible under condition of production potential effective implementation. Lack of attention to solving this problem leads to losses of economic benefits due to the growth of current expenditures, improvement of the quality of land resources, advanced training and retraining of manpower, repairing of fixed assets and so on. Under such circumstances, the question of evaluation the effectiveness of the use of production potential and development of recommendations of its increasing in agricultural enterprises is very topical.

It should be noted that so far in global economic literature there is no consensus on the interpretation of the category “production potential”. From what is invested in understanding of the meaning of the term, depends the choice of future directions of its revival. Therefore there is a need to review the evolution of the economic category of “production potential” and the diversity of approaches to its definition.

The term “potential” in the etymological meaning derives from the Latin word “potentia” and means “hidden possibilities” that in business practice through the work may become a reality (Prokhorov, 1989). For the first time the term is mentioned by K.G. Voblym (1924), who identified this term as potential possibility of the country to produce material goods to meet the needs of the population.

There are three main directions in the development of modern concepts to determine the content of potential. Representatives of the first direction claim that potential is a set of different types of resources, needed for the operation or development. In this sense to the components of the potential one can attribute the appropriate labor, material, financial and information resources that are involved into the improvement of the production sphere. They also include the set of resources that provide the required level of organization and management of production as well as resources for education and retraining (Chernikov, 1981; Figurnov, 1982).

The second group considers potential as a system of material and labor factors (conditions and components) which secure reaching goals of production (Ivanov, Odegov & Andreev, 1988). The basis for this approach are the means of labor, objects of labor and labor as factors of production and the elements of new product opportunities formation. This highlights their potential character (Hudokormova, 2002).

Scientists of third direction consider potential as the ability of complex economic

system resources to perform its tasks. From their point of view, potential is a holistic view about the unity of the structure and functions of the object and manifestation of their relationship (Fedonin, Repina & Oleksyuk, 2004). On this basis, the conclusion about the comprehensive staff opportunities to perform certain tasks – the more successfully established the structure of the object and the more matches its structural and functional elements, the higher will be its potential and efficiency.

Synthesizing different scientific views, V.V. Rossokha (2009) proves, that the level of potential, characterizes condition of the enterprise, which is due to the close interaction of the four characteristics that differentiates it from such seemingly close concepts such as “resource” and “reserve”. He identifies four main features inherent potential. The first is that the potential of the enterprise is determined by its real possibilities in a particular area of economic activity, not only implemented, but also unfulfilled through any material and technical reasons. The following characterizes possibilities of any enterprise, which mainly depend on the availability of resources and reserves (economic, social), not involved in the production process. In terms of the third features, potential of the enterprise depends not only on existing capabilities but also on skills of different categories of personnel for its use results in a good production, implementation of services (works) and maximize revenue (profit). It also ensures the effective functioning and sustainable development of production and commercial system. The latter determines the level of results and realization of potential of the enterprise (the volume of production or the revenue, profit), defined as a form of business and organizational structure adequate to it. The author proves that the potential of the enterprise is a complex, dynamic, semi structural system that has a certain block structure. Its object components related to a material form of the enterprise potential. They are consumed and reproduced in varying configurations during functioning.

Each of the researchers adapt content of used terms, their etymological definition and theoretical development to solving some problems of the research in order to fully disclose the investigated problem. Therefore, the famous German professor Lutzi Kruszewicz (2001) observes: “... there is no right or wrong definition. Terms can be created only considering our goals”.

It should be noted that the correct wording of production potential will enable to determine its condition, effectiveness of the use and predict the process of revival under the influence of external and internal factors.

1. Production potential management theory

The production potential of the agricultural enterprise is an integral reflection of the current and future opportunities of the economic system to transform inputs into goods or services, thus meeting the corporate interests of the enterprise. To ensure the effective activity of the enterprises of the agricultural sector, along with the assessments of production potential, an important issue is the implementation and assessment of the state effectiveness of its use. First of all, it allows eliminate the problematic elements in the use of resources and adjust their imbalances that create the structure of production potential in accordance with the mission and goals of the enterprise. Since, production potential is a complex organized system of various interrelated elements appropriate to measure the effectiveness of their use, guided by the general principles of correlation between results and costs. Regarding the assessment of the production potential a structural approach was formed. That allows improving the structure of the production potential, based on

advanced standards and regulatory ratios, the most advanced technologies, organization of production, general and specific subsystems of the enterprise that is used in agriculture.

According to the classification of types of potentials, the model of the agricultural enterprises production potential revival in a vector form has six components: labor; material and technical; natural resources; financial; information and innovative and entrepreneurial. Model “Octahedron of the production potential” has two levels of variability and influences that is reflected in a manner of vectors placement in space and means whether effectively or not available production potential in agricultural enterprises are used.

Production potential is a component of various interrelated elements. So, while determining the level of efficiency of their use it became appropriate to use the proposed methods what allows to evaluate the state and effectiveness of potential at various stages of development. It provides an opportunity to calculate an integrated assessment of the production potential of agricultural enterprises.

Placing of vectors in model “Octahedron of the production potential” shown in Fig. 1.

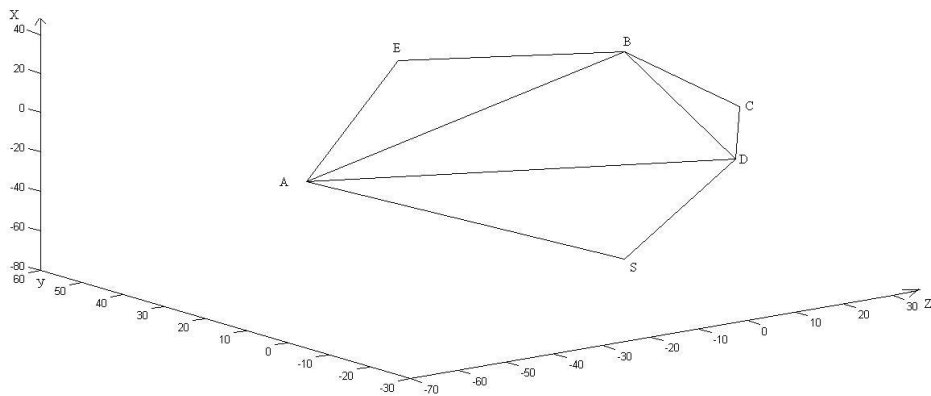


Fig. 1. The spatial model of the production potential of agricultural enterprises

Source: own research.

AB – Natural resource potential

BE – Material and technical potential

BC – Labor potential

AS – Information and innovation potential

VD – Entrepreneurial potential

DS – Financial potential

In the horizontal plane placed labor, natural resources, entrepreneurial, information and innovation potentials. In the frontal plane settled financial, material and technical, labor and natural resources potentials. With the appearance of horizontal and frontal planes it is evident that labor and natural resources are simultaneously included in both planes. This spatial separation, in fact, shows that business and investment information and directions of the production potential of agricultural enterprises in the region constitute the

lower level of the model for economic content and it corresponds to their lower instability and variability. This is due to the essence of the directions, embodied in these vectors.

Higher levels of variability and influence have financial vector, material and technical vector, so they form the top level of the model. Labor vector and natural resource vector through the highest stability, form the base level of the model. Often, only due to the base level of potential, the enterprise does not considered unprofitable. The results of the calculations that give a full description of the integrated assessment of the production potential of agricultural enterprises of Zhytomyr region are shown in *Table 1*.

Table 1. State of components of the production potential of agricultural enterprises of Zhytomyr region

Components	Year					On average in 2011-2015 years
	2011	2012	2013	2014	2015	
Labor potential	0,567	0,493	0,328	0,213	0,194	0,246
Material and technical potential	0,512	0,489	0,411	0,472	0,491	0,553
Financial potential	0,348	0,361	0,324	0,309	0,312	0,271
Information and innovation potential	0,463	0,490	0,412	0,489	0,567	0,670
Natural resource potential	0,682	0,673	0,642	0,606	0,591	0,665
Entrepreneurial potential	0,612	0,654	0,698	0,711	0,780	0,684

Source: own research.

Conducted researches indicate that the integrated assessment of the production potential of agricultural enterprises of Zhytomyr region on average in 2011-2015 reached a critical point and was equal 0.273. In 2011 integrated assessment of the production potential was 0.456 and in terms of spatial fullness of the production potential was low in 2015 its integrated assessment decreased almost doubled to a value of 0.264.

This indicates that the current production potential of the agricultural enterprises is used inefficiently, leading to a decrease in production of gross output and financial resources. It could be directed to reproduction of the production potential. Proportionality of levels of the production potential is reduced and it indicates that there is a weak correlation between the directions of vectors and spatial fullness of the rate of the production potential becomes of a degenerate nature.

2. Production potential management methodology

Over the period under research important components of effective use of all production potential components have gained significant changes. Most of them were reflected on labor potential index, which fell from 0.567 to 0.194. It is closely associated with a decrease in the level of professional skill of workers, “aging” of staff and low labor productivity in most agricultural enterprises. During 2011-2015, average growth of labor productivity on agricultural enterprises of the region observed in 47.52 thousand. USD, or almost 4 times; net income per 1 employee – in 54.8 USD, and profits from operating activities

– in 0.5 UAH. Generally this is due to increased production of highly profitable and less labor-intensive agricultural products by agricultural holdings and corporations operating on the territory of Zhytomyr region. The rent of large tracts of land by agroholdings, corporations, and agrarian firms enables efficient use of multifunctional modern equipment and its rapid payback. Maintenance and use of such techniques requires appropriate training of agricultural employees.

It should be noted that although the labor market is full of labor force, the demand for highly qualified workers in agricultural enterprises is still growing. Major problems of the lack of skilled labor force are: low prestige of work, low wage and degradation due to long-term reduction in agricultural production. In 2011–2015, because of decrease of average wage by almost to 35%, the level of emigration of rural workers to industrial enterprises increased to 12%.

The tendency of slight growth of effective use index of the material and technical potential indicates that agricultural enterprises are seeking for rational use of the available material and technical resources, but the depreciation of the technical means by 80% leads to unpredictable losses of production and reduces its quality. The growth of capital productivity of fixed production assets in 0.24 UAH and of materials return in 0.17 UAH, indicates, at lesser extent, an increase in production volumes and in greater – reduction of quantity and value of fixed assets as a result of depreciation and write-off from the balance of the enterprises. Indexes of decreasing material consumption indicate savings of working capital in agricultural enterprises in 0,003 USD. A reverse trend is observed in terms of energy intensity indexes, reflecting the rising cost of energy resources and the use of outdated power consuming machinery and technologies. Renewal of the agricultural enterprises' technical means requires attraction of financial resources. But during 2011–2015 a decrease of the efficiency of the financial potential was observed in agricultural enterprises. The state of financial potential influences the results of industrial, commercial, financial and economic activities of the enterprise that result in involvement in agricultural production loans at high interest rates, disparity in prices for agricultural products and means of production and labor as well as inefficient channel of goods sales. Regarding the state of natural resources, hyperactive use is observed opposed to labor and material and technical potentials. Due to cultivation of high-yield crops an increase in level of ground returns and profitability of using advanced types of plant and animal species is occurred. In terms of braking of various information channels of agricultural enterprises distribution, lack of awareness results in lower effectiveness of the use of various innovations.

Over the past decades in terms of adapting of agricultural enterprises to market conditions, an increase in effectiveness of the use of business potential is observed. Proportionality of potential levels for this period is 0.8, i.e. close to 1, indicating the close relationship of all components of the production potential. Indicator of the spatial fullness shows that the production potential of agricultural enterprises of Zhytomyr region is classified as degenerate and there is a need to justify measures of its revival.

Grouping of agricultural enterprises by the integrated assessments of the productive potential is shown in *Table 2*.

Table 2. Grouping of agricultural enterprises of Zhytomyr region on integrated assessments of entrepreneurial potential

Levels	Integrated assessment of production potential						2015 up to 2013, +,–	
	2013		2014		2015			
	on average in the group	number of enter-prises	on average in the group.	number of enter-prises	on average in the group	number of enter-prises	on average in the group	number of enter-prises
up to 0.20	0,169	505	0,156	708	0,152	643	–0,017	138
0,21–0,40	0,311	443	0,303	369	0,283	410	–0,028	–33
0,41–0,60	0,524	156	0,508	148	0,484	96	–0,040	–60
0,61–0,80	0,713	94	0,689	112	0,646	109	–0,067	15
0,81–1,00	0,915	61	0,900	75	0,860	81	–0,055	20
On average in the region	0,377	1259	0,325	1412	0,264	1339	–0,113	80

Source: own research.

Carrying out the calculation of the integrated assessment of production potential in terms of agricultural enterprises of Zhytomyr region one can conclude that the highest integrated assessment of production potential occurs in a relatively small part of the agricultural enterprises of about 6% (80 households), which operate in Andrushivsky, Popilnyansky, Ruzhinsky, Chudnivsky and Lubarsky districts. Low rates of effectiveness of the use of production potential demonstrate about 79% of farms (1,000 agricultural enterprises) in Volodar-Volynsky, Chernyakhivsky, Korostensky, Emilchinsky, Luginsky, Baranovsky and other districts of Zhytomyr region. This indicates that there are compelling reasons for reducing the effectiveness of the use of production potential that agricultural enterprises cannot solve of their own.

Grouping of agricultural enterprises according to efficient use of labor potential indicates that, number of households in which productivity is reduced, is increasing year by year. This is explained by the fact that among large and successful agricultural holdings and corporations operate a large part of small farms, private households and commercial companies that are not provided with technical means, and fulfillment of production processes is carried out mostly by hand, which as a result leads to lower productivity.

Regarding the assessment of natural resource potential, in most of agricultural enterprises (51%) occur growth, i.e. farms rationally use the leased land resources and activate innovative activities in order to increase its profitability.

Particular attention should be paid to the deterioration of the material and technical potential of agricultural enterprises through the use of energy and resource-intensive machinery and technologies. Thus, compared with highly developed countries energy – and resource-intensive agricultural products exceed 4-5 times, which is the main reason for its low competitiveness. About one third of agricultural enterprises demonstrate the growth

rate of financial potential. As a result of imperfect monetary and investment policy of the agricultural sector, this trend is changing too.

Grouping of agricultural enterprises by efficient use of information and innovation potential indicates that about 70% of households improve the state of this resource through the use of modern information technologies. However, the rate of entrepreneurial potential of agricultural enterprises is increasing from year to year.

Integrated assessment of production potential according to various organizational and legal forms of agricultural enterprises of Zhytomyr region is presented in *Table 3*.

Table 3. Integrated assessment of production potential according to various organizational and legal forms of agricultural enterprises in Zhytomyr region, according to model "Octahedron of potential" the average for 2011-2015

Components	*	**	***	****	*****	*****
labor	0,499	0,439	0,311	0,192	0,175	0,737
material and technical	0,450	0,435	0,390	0,425	0,442	0,666
financial	0,306	0,321	0,308	0,278	0,281	0,452
innovation and investment	0,407	0,436	0,391	0,440	0,510	0,602
natural resources	0,600	0,599	0,610	0,545	0,532	0,887
entrepreneurial	0,538	0,582	0,663	0,640	0,702	0,795

Source: own research

* Industrial partnerships

** Private enterprises

*** Production cooperatives

**** Agricultural enterprises

***** State enterprises

***** Agro-holdings, corporations and big agricultural enterprises

According to calculations it was determined that the most powerful production potential have agricultural holdings, corporations and big agricultural enterprises. However, the critical state of industrial potential is observed in agricultural enterprises, state enterprises and production cooperatives.

Integrated assessment of production potential in individual agricultural enterprises is given in the *Table 4*.

According to *Table 4*, the highest efficiency of production potential demonstrates Agricultural firm "Agro-Latour" Chervonoarmiisky district and Limited Liability Company "Ukrahrotehtreyd" Zhytomyr region. These enterprises pay special attention to innovation and investment activities. With powerful renewed machine-tractor fleet and renting land areas in different areas, not only in Zhytomyr region but also beyond, it is possible to use fully natural resource potential, material and technical facilities, skilled labor force and financial resources in the creative approach solving economic problems with the help of managers and specialists of agricultural enterprises.

Table 4. The efficiency of the production potential of individual agricultural enterprises in Zhytomyr region, in model "Octahedron of production potential" in the average for 2011-2015

Components	*	**	***	****	*****
labor potential	0,512	0,643	0,486	0,811	0,768
material and technical potential	0,484	0,589	0,490	0,763	0,694
financial potential	0,310	0,511	0,410	0,720	0,752
innovation and investment potential	0,612	0,684	0,312	0,847	0,810
natural resource potential	0,710	0,780	0,740	0,895	0,804
entrepreneurial potential	0,800	0,810	0,780	0,940	0,900

Source: own research

* limited partnership "Agricultural machinery Alexander Karpinski and the company";

** peasant and farmers enterprise named after. Michurin

*** Agricultural enterprises "Svitoch"

**** Agricultural firm "Agro-Latour"

***** Limited Liability Company "Ukrrohohotryd"

Thus, the formation of the full production potential of the agricultural sector should be carried out with the transition of agricultural branches on intensive and investment direction of development, based on intellectual resources. It should also attract agricultural credit system to facilitate the economic development of agricultural enterprises.

Hence, having an integrated assessment of production potential we can conclude that production potential of the agricultural enterprises is currently exhausted and in need of immediate recovery. While increasing production potential it is necessary to observe the optimal ratio of its elements and their balance that will help to increase effectiveness of the use and competitiveness.

The research of competitiveness of production potential allows us to consider it as a comprehensive characterization of potential opportunities for competitive advantage of agricultural enterprises in the future. The competitiveness potential of the company is a complex comparative characteristic that reflects the extent of the benefits of aggregate indicators for assessing business opportunities that determine its success in the certain marketplace over a certain time period in relation to the similar aggregate indicators of agricultural enterprises competitors (Nagornaya, 2010; Miller & Sprmgate, 1998; Reisman, 2004). This is a comprehensive, diversified concept as it involves taking into account interaction of all its components.

Depending on the aims of the research of globalization one can distinguish the following potential competitiveness of enterprises: global leadership; global standard; national leadership; national standard; sectoral leadership; industry standard; threshold level. If the company is below the threshold level, its potential is considered uncompetitive (Pozhnev, 2010).

Depending on the focus of management features we offer four levels of competitiveness potential of enterprises. The first level of competitiveness of production potential is typical for agricultural enterprises with internal neutral organization of management. Director cares only about selling products. He focuses on capacity utilization, despite the problems of competitiveness and customer satisfaction.

Raising the technical level of products, improvement of the structure and functions of organizations in sales and marketing service is considered redundant, because it does not take into account changes in the market and customer's needs. Enterprises of the second level of competitiveness of production potential tend to make their production systems "outwardly neutral". It means that the use of the existing potential of the company ensures the production of goods that fully meet the standards, set by its major competitors. The management of such agricultural enterprises does not pay attention to potential possibilities of agricultural business that would provide some competitive advantages. In the third level of competitiveness of production potential – business leaders understand their preferences in the market of agricultural products somewhat different than their basic competitors. They try not to comply with the standards of production, which are established in their industry. The control system at these enterprises begins actively affect production systems, promotes their development and improvement. The production potential of the enterprise reached the fourth level of competitiveness and significantly ahead of potential competitors. Success in the competition is not so much a function of production as a function of management, depending on the efficiency of management, organization of production (Turner & Hambly, 2004). For the majority of enterprises-competitor a set of resources used in the production process is the same, but the effectiveness of their combination in the current economic system is different. It depends on the quality of management, qualifications of managers, organizational structure and so on.

Now, in the development of market relations potential of the majority of the local agricultural enterprises can be attributed to the first and second levels of competitiveness. However, we should note the progressive changes in the activities of individual enterprises that are trying to move to the third and even fourth level of competitiveness.

Diagnosis of production potential of the agricultural sector in terms of economic situation that now exists in Ukraine, allows us to consider it as a comprehensive characterization of potential opportunities for competitive advantage of agricultural enterprises in the future. For the expertise we involved experts in agricultural enterprises, namely managers, deputy managers on the development of crop and livestock branches, chief accountants and their deputies, economists and other experts. All the experts were suggested a questionnaire with questions about the competitiveness of production potential of farms. In the questionnaire were given the scale of assessment of production potential from 1 to 10.

In each area, including each of the ten companies under analysis determined the average score of each indicator and its importance, the product which made it possible to determine the outcome of expert assessments for all components of the production potential. The overall index of competitiveness of production potential equals the amount reported average weighted numerical parameters for each component.

The competitiveness of production potential of the agricultural enterprise is a complex and multi-concept as it involves taking into account the interaction of all its components: labor, material and technical, financial, natural resources, information and innovation and also entrepreneurial potential.

One option of the assessment of agricultural enterprises' potential of competitiveness is the method of expert evaluations. It should be noted that while assessing the competitiveness of production potential of agricultural enterprises was used the choice of competitors in Zhytomyr region, namely Forest-Steppe zone, Transition zone and Polissya, which

include the allocated zone of radioactive contamination.

The advantage of selecting enterprises competitor within the geographical areas is that the results of this analysis can be used in future plans of agricultural enterprises' development. Thus within agricultural enterprises of Forest-Steppe zone, Transitional zone and Polissya were selected 10 enterprises from each zone. Separately in Chernobyl zone 10 enterprises attributed to high level of radioactive contamination of Zhytomyr region, were selected. Among them were selected agricultural enterprises with different natural and climatic zones, soil fertility, specialization, economic and social conditions.

Based on the outcome indicators, considered in assessing the competitiveness of production potential of agricultural enterprises was created the standard enterprise. For each agricultural enterprise the ratio standard was determined with the help of indicator ratio to that of enterprise-standard.

In particular, calculations of agricultural enterprises' production potential of competitiveness in Forest-Steppe zone, justify the conclusion that private agricultural enterprise "Yerchyky" for competitiveness of production potential is the leader among competitors. Overall rating of competitiveness of production potential of this enterprise is 6.81. Among all components of potential the highest were labor (1.80) and entrepreneurial (1.35) potentials. The high level of competitiveness of labor potential in the private agricultural enterprise "Yerchyky" achieved through the age structure, level of education and skills of the staff.

Thus, on this agricultural enterprise the average age of employees is 43 years old, about 55% of workers have higher and medium specialized education. Company annually directs on improvement of professional skill for about 10% of specialists and workers in different sectors, not only to advanced agricultural enterprises in Ukraine, but also abroad.

The determining criterion for evaluating the competitiveness of entrepreneurial potential is the quality of production, which graded 9. But material and technical (0.95), natural resources (0.98), financial (0.90) information and investment (0.83) potentials reached the level of almost 1.

Compared with the enterprise-standard best competitive position of production potential demonstrate agricultural enterprise "Friendship" (6.17), Limited liability company "Sihnet Center" (5.77), Peasant and farmers enterprise named after Michurin (5.50). But all agricultural enterprises have low competitiveness of production potential.

An unstable trend occurs for competitive components of production potential of enterprises in Forest-Steppe zone. The highest estimates is observed with r (1.36) and entrepreneurial (1.20) potential, but financial (0.57), material and technical (0.73), information and investment (0.76) and natural-resource (0.82) potentials are slightly lower. Hence, the level of competitiveness of production potential components can focus on the priorities of their revival in agricultural enterprises of Forest-Steppe zone.

The assessment of competitiveness of production potential of agricultural enterprises in Polissya shows that agro-production cooperative "Lighthouse" should be considered as benchmark enterprise in which the competitiveness of production potential is 6.61.

The lower position of competitiveness demonstrate agricultural farm "Svitoch" (5.59), agricultural farm "Agro-com" (5.45) and limited liability company "Agro-Baranivka" (5.31) and so on. As for the competitiveness of components of production potential it should be noted that the highest level of competitiveness belongs to the entrepreneurial and labor potentials, the level of which is 1.14. Compared with the entrepreneurial and labor potential,

lower level of competitiveness is shown with financial – on 0.54, information and investment – on 0.49, material and technical – on 0.48 and natural-resource potentials – on 0.31.

Enterprises of Polissya area show a high dependence on external financial sources (banks, credit unions and other stakeholders); the state of innovation and investment activities of enterprises is insufficient (in 2011-2015 innovations implementation by 1.8% and investments by 2.3% increase in agricultural sector); low supply of technical equipment is – about 50% of depreciation is 72%.

It is significant that competitiveness of production potential of agricultural enterprises of Polissya inferior to competitiveness of enterprises of Forest-Steppe zone on all components of production potential and points to necessity of the acquisition of qualitatively new features.

The analysis of the competitiveness of production potential in the Transition zone shows that the biggest competitors of agricultural enterprises are Limited Liability Company “Vertokyyivka” of Zhytomyr region. The overall level of competitiveness of production potential of “Vertokyyivka” amounts to 6.60 and is below the level of enterprises competitors in Forest-Steppe zone on 0.21 and almost equals the competitiveness of enterprises of the Polissya region.

Among agricultural enterprises of zone with radioactive contamination enterprise leader of competitiveness of production potential is agricultural Limited Liability Company “Radichi” of Volodar-Volynsky district.

Negative tendency is observed for competitiveness components of production potential including financial, material and technical, natural resource and innovation and investment components. Such a level of competitiveness of production potential indicates a pattern of adoption of the necessary decisions to determine the strategic direction of its revival.

It should be noted that the negative trends in the competitiveness of the material and technical, natural resource and financial potential of agricultural enterprises of the Forest-Steppe zone, Polissya and Transition zone also found in agricultural enterprises of zone with radioactive contamination. Entrepreneurial and labor potential positioned higher level of competitiveness.

Thus, the analysis of the efficiency of production potential shows that on most of agricultural enterprises of the region, production potential is used inefficiently. The study found that the main reason for this situation, first of all, is a low and degenerate state of the production potential on most of the agricultural enterprises that prevents the full extent of its use and leads to a reduction of businesses income. Simultaneously, agricultural firms, corporations and agricultural holdings, with its powerful production potential, with its rational use replace inefficient farms, capturing lands of rural areas.

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PART 2.

MODERN CONCEPTIONS OF DEVELOPMENT OF AGRICULTURAL PRODUCTION

Chapter 2.1.

GROUNDING FOR CONCEPTUAL PRINCIPLES OF INTEGRATION OF THE COMPANIES BELONGING TO UKRAINE'S AGRO-INDUSTRIAL COMPLEX AS A WAY TO ECONOMIC STABILIZATION

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Introduction

Globalization processes occurring worldwide trigger structural changes in the world's economies, requiring industrial transformation and transition to a socially-oriented and innovative economic management. Today, the overwhelming majority of Ukrainian companies see the need to mobilize domestic resources and re-examine a number of managerial matters in order to optimize their business activities and maintain competitive advantage. Integration as an objective process of company's development in any industry is one of the ways to retain its competitive edge and strengthen market position.

Integration, as well as integration processes are widely-investigated issues covered in the papers by foreign and domestic scientists. R. Coase, G. Donaldson, F. Krueger, R. Lipsey, G. Myrdal, J. Tinbergen and others have examined the basic conceptual approaches to establishment and development of integrated ventures. Promotion of integration processes, current developments in integrated venture management are covered in the works by I. Alexeyev, I. Ansoff, P. Drucker, Y. Ivanov, T. Mostenska, G. Umantsiv and others. The specific nature of integration in agro-industrial sector, methodological and practical aspects are analyzed in scientific publications by V. Ambrosova, A. Karpenko, I. Lukinova, P. Sabluk and A. Khvostov. In view of the aforementioned, it must be noted that this topic is not new, however, dynamic business trends, the ever-changing external and internal business environment of the companies and specific nature of the industry dictate the need for research and improvement of existing practices, finding alternative directions and ways to develop integrated ventures, generating adaptive theories and merged companies' management systems. This explains the relevance of the chosen topic.

The objective of this research is to provide rationale for conceptual principles of integration of Ukrainian companies belonging to the AIC as a way to balance out and stabilize the economy. The set goal is achieved by:

- investigating integration as an effective tool for stabilization of Ukraine's economy;
- analyzing the benefits and drawbacks of integration processes in the country's AIC;
- identifying functions of integrative interaction;
- outlining the motives for agro-industrial integration.

The methodological framework of research is a system of general scientific and special methods, whereby the processes and phenomena have been studied in their linkages. Fundamental premise to the strategic analysis and management, scientific works dedicated by domestic and foreign scholars to establishment and functioning of integrated ventures, along with the theories of complex social and economic systems' management provided the theoretical basis for the research.

In the course of study, such theoretical methods as logical and economic analysis, expert appraisal, system analysis, synthesis, induction, deduction and analogy were applied.

Main part

Systematization of various theoretical and methodological approaches allows to state that integration is a complex notion which can be interpreted as: 1) a process (merger of varied elements which, in turn, leads to emergence of brand-new and improved opportunities for the newly-formed integrity and change in the properties of the elements); 2) a result (state of integrity and consistent functioning of the components); 3) an integrated whole (organic unity of a whole and its components). Hence, integration is organizational and economic process, whereby different types of business entities merge in an attempt to improve competitiveness, boost competitive advantages and operational efficiency. Integration of the companies into a unified system, development of new industrial and economic ties in order to improve quality and increase the market power of integrative interaction participants can be achieved either through conglomeration of property (so called rough integration) or partial merger and redistribution of functions (i.e. soft integration).

The key purpose of integration as a form of merger is to:

- expand business activities and achieve the required scale of production to maximize return on investment;
- have a prospect of capital concentration and increased capital movement, and as a result to optimize investment process and build-up investment resources for highly efficient plants;
- reduce expenses at all stages of production process, particularly, by increasing the capacity load, centralizing marketing, advertising, distribution channels and implementing joint procurement;
- reduce the amount of taxes and neutralize antimonopoly legislation;
- minimize the risks associated with the interaction between different partners within the industry, and in particular, those linked to supply stability;
- improve participants' economic strength in connection with creation of opportunities for provision of aid to unprofitable businesses which are essential in the technological chain of end product manufacture;

- improve quality control and create a unified quality control mechanism;
- optimize and stabilize the range of end products;
- overcome narrow focus of the companies;
- improve the use of industry's human resources and arrange training for required specialists;
- improve the quality of management in individual companies as a result of partner crosscheck according to integrated venture and increasing opportunities for improved sharing of managerial experience (Bilousova, 2009; Klebanova et al., 2010).

Integrated ventures have a number of advantages and disadvantages. The advantages can be arranged in the following groups (Minayeva et al., 2002):

1. organizational ones: ensuring single strategic planning and management; building stable inter-company relations; using general socio-economic structure; identifying common key-priority activities; unified advertising policy;
2. financial ones: unified financial policy allows making large investment, maneuvering financial resources and concentrating them at the points of growth, minimizing financial risks, ensuring easier access to the capital markets; unified tax policy allows optimizing taxation; asset portfolio diversification; unified pricing policy;
3. production and economic ones: ensuring the possibility to create closed-loop manufacturing chains from production of raw materials to finished product output; using the benefits of manufacture diversification; increasing economic interest in efficient operation among all association participants; reducing transaction expenses; receiving result from the scale of production;
4. those related to human resources: general recruitment policy; wide opportunities for staff rotation, education, retraining and advanced training; possibility to develop more effective incentives for staff's professional advancement; improvement of corporate culture, promotion of solidarity and mutual support;
5. others: building competitive advantages; internal stability, increasing adaptive capacity, boosting corporate image and prestige, promoting a single trademark; increasing economic strength and creating opportunities for group lobbying.

However, alongside with significant advantages, there is a number of problems and obstacles on the way to creation, development and operation of integrated associations. The ones that can be singled out are imperfection and ambiguity of regulatory and legal framework, lack of developed practice in integration field, bureaucratic barriers, complexity and duration of coordination process in the ministries and agencies, antimonopoly restrictions regarding capital concentration, conflict of interests of potential association participants, lack of qualified integration advisors, management team's insufficient expertise and experience in the field of integration, problems associated with obtaining necessary information from association participants in order to work out a long-term program of activities, emergence of information asymmetry between the association participants etc.

In addition, the shortcomings of creation and development of integrated ventures are the possibility of market monopolization. Creation of excessively large organizational structure and branching result in poor management of the structural units and vulnerability by removal of one of the vertical chain links etc.

Depending on the initiator (integrator) and the purpose of integration, a distinction is made between the types, nature, forms, directions, strategies and scope of integration processes (horizontal, vertical, conglomerate, forward and backward, technological, ma-

nufacturing, food, market, financial and credit, etc.), length of integration chain and form of the new association.

Linkages within integrated ventures, benefits and drawbacks, directions for the development and its sustainability should be examined in a particular sector. We believe that agro-industrial complex, where 17.5% of the population are employed according to statistics, is the most illustrative. Agro-industrial complex is a multi-industry sector of Ukraine's economy which includes three following groups:

1. industries manufacturing agricultural products (cultivation of corn, vegetables, fruits, animals, birds, etc.);
2. industries processing, storing and selling agricultural products;
3. industries manufacturing and providing agricultural industry with production means (agricultural machinery industry, production of artificial fertilizers, feed concentrates etc.), fuel, energy, heat, vehicles etc.

Horizontal, vertical and conglomerate integrations are typical for Ukrainian agro-industrial complex (*Table 1*).

In the first years following independence, a significant private sector of both agricultural producers and the products obtained as a result of their processing emerged specifically within the agro-industrial complex. However, the tendency for disconnection of "agricultural producer – processing company – trading company" linkage has intensified after privatization of agricultural and processing companies. As a result, in today's Ukraine no conditions for sustainable functioning of integrated systems "raw material production – raw material storage – raw material processing – product manufacturing – sales of products" have been created yet (Klebanova et al., 2010).

Thus, the burning issue consists in finding effective measures to be used for the economy stabilization and, especially, revitalization of the economy of the AIC's key industries, namely agricultural production and processing. We believe that the factor which is crucial for activity intensification of the AIC's companies is the development of inter-economic relations and extension of integration processes that combine agricultural production particularly with food-manufacturing industry and other branches of the agricultural sector in order to establish integrated economic system adapted to the existing market conditions in the best possible manner.

However, it is necessary to point out that the nature of relationship between agriculture, fields of production and maintenance servicing, supply and processing industries is rather contradictory.

On the one hand, cooperation and integration are mutually-beneficial for economic entities operating in various fields of the AIC due to the fact that interindustrial and cross-industrial differentiation of labor, creation of stable raw material zone, cultivation of mutually-beneficial economic relations between the primary producers and processing companies facilitate long-term planning, efficient production and sales of products.

On the other hand, there is an imbalance of economic interests which is typical for the buyers and sellers. The conflict between the entities of the agro-industrial complex got aggravated in connection with transition to the market economy. Most companies are privately owned, and so their owners are the ones who are responsible for resolving issues associated with management of economic activities and establishing relations.

Table 1. Functionality advantages and disadvantages of integrated ventures in Ukraine's AIC and food-manufacturing industry

Food-manufacturing industries	Advantages of integrated venture creation	Disadvantages of IS creation	Example of integrated ventures in Ukraine's AIC and food-manufacturing industry
Horizontal integration			
Industries where production does not depend on seasonal supply of raw materials (confectionery, brewing, tobacco) and other industries (dairy, bakery)	Increase in market share; reduced competition; opportunities for setting and maintaining market prices; observance of quality standards; legal and financial control over structural units; lobbying	Market monopolization; creation of excessively large organizational structure	Konti Production Association, AVK Group of Companies, SUN InBev Ukraine, Philip Morris International, Imperial Tobacco Group, Khliprom Group of Companies LLC, Danone-Unimilk Ukraine Group
Vertical integration			
Industries that are associated with raw material factor (sugar, dairy, meat processing, winemaking, oil and fat industries) and other industries (brewing, baking)	Uninterrupted provision of production plants with raw materials having required quality; reduction of production costs; waste-free production; legal and financial control over structural units	Vulnerability by removal of one of the vertical chain links	Myronivsky Hliboprodukt PJSC, Avangard Agricultural Holding, Astarta Holding, Kernel Group Holding, Investahroprodukt, Wimm-Bill-Dann, National Alcohol Traditions LLC, Obolon Corporation, Roshen Confectionary Corporation, Ukrzernoprom Group of Companies, Khlip Stolytsi LLC, TiS Holding
Conglomerate integration			
Association of companies belonging to different food-manufacturing industries	Diversification of activities; increase in production profits by expanding the scope of activities; minimizing business risks; winning market share in other markets; lobbying	Creation of excessively large organizational structure; branching which results in poor management of structural units	Hetman LLC (liqueurs and spirits, vegetable-canning, confectionery industries); Chumak JSC (fruit-and-vegetable-canning, oil and fat industries, macaroni product manufacture); NESTLÉ (coffee, beverages, confectionery, gastronomy (cold sauces, seasonings, soups), baby and special foods, breakfast cereals, pet food, ice cream)

Source: summarized by the author.

Among the entities of integration associations within the AIC, it is worth emphasizing agricultural organizations, companies engaged in processing of the raw materials, trading companies, financial institutions, companies providing services to members of the integration associations and other economic entities.

Stabilization of the agricultural production is impossible without overcoming the conflict of interests existing between agricultural producers and companies operating in other fields of the AIC (agroservice, supply, processing and trading companies) based on cooperation and integration development under mutually agreed terms (Andriychuk, 2009; Bilousova, 2009; Skopenko, 2011).

As far as agro-industrial integration is concerned, it normally implies development of industrial and economic ties between the industries and agricultural companies which are interconnected and focused on bringing together their material interests both technologically and objectively in the course of production and sales of end products made out of agricultural raw materials (Skopenko, 2011).

In other words, the agro-industrial integration can be understood as a process of restoration and establishment of various links between companies and sectors of agro-industrial complex, namely manufacturing ones (expressed as pooling of manufacturing resources or results of manufacturing activities chiefly in tangible form); organizational and economic ones (which manifest themselves in joint ventures in the field of production organization and planning, introduction of innovative technologies and management methods, creation of specific integrated ventures); economic ones (which materialize in cost measurements and are applied to distribution-exchange-consumption field, including deliverables of economic activities); social ones (associated with organization of joint actions and measures to ensure the appropriate functioning of the human capital) (Skopenko, 2011).

To sum up the aforesaid, the very essence of agro-industrial integration lies in creation of a set of various industrial-economic and socio-economic links, uniting together the efforts of separate and independently operating companies in agricultural, industrial and infrastructural sector of the economy and aimed at establishing an integrated production, economic and management system to ensure rational use of natural, labor, industrial and investment potential of certain territory and improve product competitiveness.

Agro-industrial integration is often thought of as:

- convergence of interests, strengthening of industrial and economic ties and relations between direct and indirect participants of agro-industrial reproduction process (Nesterchuk, 2009);
- process of technological, economic and organizational merger of interconnected stages of production, procurement, storage, processing and provision of food products and consumer items made out of raw materials of agricultural origin to consumers (Skopenko, 2011);
- form of association or systematic state of agro-industrial production participants (Lahodiyenko, 2005);
- specific form of territorial and production, cross-industrial combination, merger of companies belonging to different industries, which have separate technological processes, yet are connected technologically, organizationally and economically based on optimal production concentration aimed at creating end product (Mocherny, 2000);
- both as a process designed to strengthen production ties and economic relations and merger of individual participants of agro-industrial production (Vorobyov, 2007);

- methods or mechanisms, whereby participants of agro-industrial production are united into a single operational mechanism (Kharitonova, 2006).

It is our opinion that agro-industrial integration supports parity and equivalence of exchange between agricultural companies throughout the technological chain from the field or farm to the consumer.

In contrast, agro-industrial integration is a process focused on establishing stable industrial and economic links between the economic entities of the AIC based both on joint ownership and joint operation agreements targeted at production of end product and allowing to increase the market power of integration participants.

Based on particular properties of integrative interaction between the companies belonging to the food-manufacturing industry and the AIC, we can single out its key functions described below (Andriychuk, 2009; Skopenko, 2011):

1. Organizational function, which involves improvement of the integrity and effectiveness of the AIC by establishing interindustrial regional groupings; optimizing sectoral structure due to capital movement between the companies; establishing and developing long-term relationships between the companies originating from different industries and regions; ensuring certain orderliness between companies belonging to different industries; speeding up capital circulation etc.
2. Stimulating function. Integrative interaction involves improvement of sustainable development of the companies operating in the food-manufacturing industry and the AIC in general, development of so called “points of growth” of the companies, along with establishment and development of long-term ties between integrated ventures and other market players. This results in increased efficiency of the industries, optimized industrial and regional structure of production plants, reduced duplication of functions, expenses and prime cost of the end product delivered by the integrated ventures, ensured development of innovative processes, achieved positive synergy and competitive advantages.
3. Resource-related function. Integration contributes toward the inflow of investment money into the AIC and food-manufacturing industry, propels provision of targeted state financial support to high-potential businesses. Concentration of material, labor, financial, information and other resources of integrated ventures belonging to different industries and regions takes place, which, in turn, promotes concentration and acceleration of capital reproduction, broadens options for mobilization of required financial resources, attracts investment and facilitates economic growth of the food-manufacturing industry and the AIC as a whole.
4. Conciliatory function, which ensures systematic integrity and unity of different industries and regions, fosters mutually-beneficial strategic interindustrial and inter-regional relations, also ensuring coordination of interaction between integration participants, procedure and sequence of the product being at different reproductive stages.

The above-described functions allow identifying different levels, specific nature and basic properties of integrative interaction between the companies belonging to the food-manufacturing industry and the AIC. Integration efficiency of the companies within agro-industrial complex and sustainable development of integrated ventures depend on how well these are implemented.

The need for easing the crisis developments in the agricultural sector, creating conditions necessary to increase the volume of agricultural production in order to provide the population with food products and the industry with agricultural raw materials, ensuring

effective functioning of processing companies generates the need for integrated associations. In this day and age, it is explained by diversified nature of production of the system entities, the fact that certain companies have no means to set up competitive production that ensures introduction of intensive technologies for manufacture of certain products, the need to combine all stages of the technical process which would enable comprehensive use of raw materials, specialized cooperation between interconnected industries which allows manufacturing high quality end product of sufficient quantity at a competitive price. In addition, there is a certain imperfection of economic relations between producers and processors of raw materials, input suppliers and product distribution which leads to an increased number of intermediaries and their share in distribution of revenues, while a disparity in prices can be observed (domestic procurement prices for agricultural raw materials of the livestock do not cover the expenses and do not promote the increase in output of products; higher prices for fuel and lubrication materials, agricultural machinery, fertilizers, etc.). Underdeveloped system of procurement, storage, primary and advanced processing of agricultural products, poor quality of agricultural raw materials, small sizes of farms and private farm businesses, their low profitability, significant portion (over 50%) of population's farms being engaged in manufacturing agricultural products are another reason for uniting the efforts (Andriychuk, 2009; Bilousova, 2009; Skopenko, 2011).

The need for integration is also explained by its social orientation, i.e. the need to meet not only industrial, financial and economic, but also social needs of integration process participants.

In view of this, we can determine and systematize the key motives for agro-industrial integration, as follows (Klebanova etc., 2010):

1. The companies merge in an effort to acquire or increase their market power, which is a natural tendency to monopoly. Integration increases the ability of associations to participate in price discrimination, improve profit margin and create barriers to entry into the industry. Any benefits resulting from integrative interaction with the use of additional competitive advantages strengthen the company's position, forcing the competitors to employ integration strategies to enhance their own positions in the market.
2. Large integrated formations have significant lobbying power and may use administrative resources to address a variety of issues, when necessary.
3. Integration allows confronting high risks which are typical for the market economy.
4. Motivation for acquiring the right of ownership. Being a criterion for social status, property becomes a stimulus for its constant increase. Notably, the effect of this motive can be considered both at the level of organizations and at the level of certain individuals.
5. In terms of economic theory, another important motive is the economies of scale and the economy cut resulting from diversification of production. Thus, as a result of production concentration and integration, the economies of scale, so-called "technical and technological economy" emerges. Growth in production and integration allows expanding the limits of optimal use of machinery and equipment, and achieving the economy cut in the field of internal control and coordination. The more dispersed agricultural producers' activities are, the harder it is for them to exercise interests for expansion of their operation. In the context of sales and distribution uncertainty, large-scale productions which are able to offer greater output at lower costs have the upper hand. Within the framework of the integrated venture which ensures a closed-loop production, pro-

cessing and sales of products, economies of scale in the field of commercial activities, the so-called “effect of product assortment width” is achieved through diversification and expansion of product diversity. This economy emerges, when production costs are reduced in proportion to diversification of production.

6. Enhancing capabilities of own product differentiation by acquiring the ability to control more elements of the production process or sales methods. The key idea of integration is to increase the added value as the basis for differentiation and fixing of higher aggregate prices which cannot be achieved by other organizational structures. In addition, vertical integration provides the company with the means to enhance quality control at all stages of production.
7. Large integrated ventures also have unique advantages in the field of financing and insurance. Agro-industrial formation can enter banking market and implement large investment projects easier. Thanks to significant turnover, availability of liquid assets (buildings and structures, up-to-date industrial equipment), possibility to receive guarantees from the public authorities and social significance for the region, large integrated agro-industrial ventures have greater credit and investment potential and so they are able to obtain long-term bank loans or financial resources in the stock market. Merging assets of the companies leads to increased capitalization and improved credit score, allowing the companies to take out the loans on beneficial terms. Also, integrated associations often bring banking institutions or credit organizations into their structure in order to establish control over promotion of financial flows and speed-up payments for products sold according to manufacturing chain from agricultural production to trade, as well as to attract investment.
8. In the current business climate, no stand-alone company – no matter how big it is – can provide funding for and use full-scale high-end technology. High technologies are usually interindustrial in nature and can be used in multi-industry economic complex more efficiently. For this very reason, ensuring complete cycle “science – technological development – investment – production – sales – consumption” and getting effective eventual results are only possible within integrated association.

Advisability to create and develop integrated ventures in Ukraine's AIC is explained by the objective need to bring together efficient production of agricultural raw materials and their industrial processing. In our opinion, creating effective integrated formation (association) is possible under the following conditions, namely proximity of production and processing, interest from potential participants (grassroots initiative), existence of a competent leader who can unite like-minded individuals and take charge of the formation (association) and support from the administrative authorities.

In view of this, the most competitive and most adjusting to the changes in the external environment are the integrated multi-purpose associations which help unlock the potential of all components of the integrated system to the fullest degree, ensure complete cycle “science – innovative solutions – investment – primary production – raw material processing – end product manufacture – sales – consumption” and take the agro-industrial production to the brand-new level of development.

Therefore, expansion of integrative interaction and creation of various integrated ventures is mutually-beneficial for all economic entities operating in different agricultural sectors by promoting uncertainty reduction in the supply and sales, creating stable raw material zones, establishing mutually-beneficial economic relations between the primary producers and processing industries, concentrating production facilities, re-establishing ties

with science and simplifying diffusion of innovations, restraining competition and intensifying barriers to the entry into the industry, promoting emergence of economies of scale etc.

Conclusions

We believe that integrated multi-purpose associations are the most attractive investment objects for privately-owned capital which in the long run will open the door to their transformation into modern efficient production structure, enabling to increase competitive advantage of domestic products and companies, unlock the food-manufacturing industry's export potential, ensure food safety and economic independence of Ukraine.

The integrated ventures allow improving economic mechanisms of ecosystem exploitation focused on restoration of the environment and farming lands, creating highly-efficient and environmentally-sustainable agricultural ecosystems which would ensure significant increase in cultivated crop yield and productivity of livestock farming. The introduction of an efficient strategy for integration development in the AIC will help address problems associated with production of high-quality food stock and food products by developing and introducing new technologies and equipment to increase the production of well-balanced feed for livestock breeding, using innovative diagnostic and therapeutic agents to prevent and control the spread of diseases among farm animals, environmentally-safe areas to provide baby food manufacturers with high-quality raw materials. Integration will also help improve biotechnological processes of agricultural raw material processing, as well as obtain new general and special-purpose products, using enzymatic and biologically-active agents, system for food storage throughout its way from raw material to finished product and from field or farm to the consumer, ensuring maximum quality preservation and reduced loss in product biological value through the use of state-of-the-art technology and equipment which eliminate the possibility of bacterial, chemical and physical contamination. Joining the companies' efforts triggers synergistic effect and promotes the use of auxiliary and food-industry waste to produce high-quality feed for livestock farming, development of manufacturing technology for production of brand-new food products with intentionally-changed chemical composition, according to the needs of the human body (food products intended for mass consumption by people belonging to various age groups, in particular children and the elderly, therapeutic products used to prevent illnesses and improve body's immunity and resistance to the negative environmental impact, food products intended for the athletes, military personnel and certain population groups living under extreme conditions). In addition, the integration process propels improvement of control over conditions of manufacture, procurement, supply, transportation, storage and sale of products, as well as creation of a system for manufacture of quality-assured food products (Andriychuk, 2009; Bilousova, 2009; Skopenko, 2011).

As can be seen from the above, integrative interaction development facilitates stabilization of the economy of its participants, increase in working capital turnover and expansion of funding provided to investment projects, blistering production pace and competitive growth of agricultural goods and food products, enabling producers to improve manufacturing management, make the best use of available material, labor and other resources and receive additional benefits from jointly-conducted operations at various stages of reproduction process, properly compete in the international market and reduce food product dependency on other countries.

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Chapter 2.2.

ASSURING APPROPRIATE ENVIRONMENTAL STATUS OF THE MAIN AGRICULTURAL INPUTS: EUROPEAN EXPERIENCE AND OUTLOOK FOR UKRAINE

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Introduction

The development of the agrarian sector of Ukraine depends on the efficient use of natural resources potential, which is the basis for agricultural production. At the same time, agricultural producers must also comply with the requirements of conservation and preservation of the ecological components of the environment. Contemporary state of Ukraine is characterized by excessive use of natural resources. The research results indicate that in Ukraine, almost a ton of natural resources is spent per unit of GDP, but in the USA it is only 3 kg. In Ukraine, the total energy consumption per unit of GDP is 3.5 times higher than in Poland, and 8.3 times higher than in developed European countries (Ivanyata, 2012).

Land used for agricultural production is a significant component of the natural-resource potential of the agricultural sector. It consists of 41.5 million hectares of agricultural land (68.8% of the territory of Ukraine), including 32.53 million hectares of arable land (53.9%), 7.8 million hectares of natural grazing land – hayfields and pastures (13%). The plowing of agricultural land has reached 72%, and in some regions it is more than 88%. Unproductive land is being cultivated, including riverine meadows, pastures and land slope. If Ukraine occupies 5.7% of the territory of Europe, 18.9% is agricultural land and 26.9% is its arable land. The effectiveness of the use of land in Ukraine is considerably lower than in average for Europe (Verkhovna Rada of Ukraine, 1998).

Rational use of agricultural land and reduction of anthropogenic impact of the agricultural sector on the environment must ensure the effectiveness of management of both: agricultural enterprises and a consumer market. Yet being used, the land resources as one of the most important ecological components of the environment, have experienced a significant environmental burden.

Agricultural production also affects the water and air – the use of mineral fertilizers and plant protection products against pests and diseases of agricultural plants are partially washed out and get into water sources. The use of technology in the field work, transportation of products and raw materials entail emission of pollutants into the atmosphere. All this confirms the relevance of the issues to be covered in the section of the monograph.

It should be noted that Andriychuk V.G., Kvasha S.M., Luzan Y.Y., Lupenko Y.A., Makarenko A.P., Malik M.U., Paskhaver B.U., Sabluk P.T., Khvesyk M.A., Shpykulyak O.G., Shpychak O.M. and others have made a significant contribution into the development of theoretical bases of regulation of agrarian sector of the Ukrainian economy. Ukrainian agricultural scientists Bomba M.J., Grabak N.H., Kovaliova O.V., Moldavan L.V. and others have made an important contribution to the consideration of the development trends of natural resources used in agricultural production.

The question of ecologization of agricultural production, explaining its importance and role for the consumer are described in scientific works of Kupinets L.E., Mylovanova E.M., Skalskyi V.V., Sokil L.M. and many others, each of them held his approach and has made his own contribution to the description of the process. Nowadays, however, no consensus on the coverage of the ecological status of natural resources (land, water etc.) used in the production of agricultural products has been reached. The aim of our research foresees in the process of reviewing and summarizing the European experience of cleaner production to identify the main mechanisms that may be adapted in Ukraine.

1. World practice of agricultural production based on greening

World practice identifies the following principles of agricultural production, taking into account the environmental management areas (Concerning the improvement of agro-ecological conditions of agricultural functioning, 2015).

1. The establishment of agriculture rules – The Code of Good Agricultural Practice (regulated by the EU Directives “On protection of water resources against pollution caused by nitrates from agricultural facilities”, “Good conditions of agriculture and the environment” (EU Directive 1782/2003/EEC), Joint standards of Good farming practices (the EU Directive 1257/1999/EEC), and others.

2. The spread of low-cost (balanced, compromise, adaptive) production systems: LISA / LEISA analogues (Low (external) input sustainable agriculture (Soil Facts, 2014), Bio-intensive Mini-Farming, Biodynamic Agriculture, Effective microorganism technologies (Kobets, 2005), and others. LISA/LEISA technologies which are the most widely used in the world got the state support in this group.

These models are based on a thorough understanding of the natural processes, aimed at improving soil structure, reproduction of its natural fertility and contribute to the formation of environmentally sustainable agricultural landscapes.

3. Development of organic (biological, ecological) production – it involves extensive use of biological approaches in agricultural production (manure, green manure, minimizing tillage, biological structuring and loosening the soil, biological nitrogen transfer in organic compounds, biological control of weeds, pathogens and pests), the non-use of pesticides, or use them only for seed treatment, a ban on the use of GMO, and others (Tsarenko, 2002).

4. The combination of technologies in agricultural production with environmental protection measures. The need is caused by a combination of the agricultural production specifics, which is characterised by a long operating cycle, a wide territorial dispersion and close relationship with the biotic and abiotic factors of the environment that hinders the implementation of environmental protection measures in isolation from the production process.

Organically-biological agriculture was founded in Switzerland in 1940 provides for no use of fertilizers, pesticides and other products. The key is crop rotation, soil fertility is

maintained by organic fertilizers and mechanical and thermal means (Shevchuk, Satalkin & Belyavsky, 2004) are used to control weeds. From the perspective of agro-ecology this is the most elaborate system, which allows to control the natural substance cycles in agro-ecosystems of each individual economy. Biologization of production is achieved through maximum stimulation of soil microflora activity (Zubets, Medvedev & Balyuk, 2010).

Every year agricultural land where organic agriculture is introduced is increased in the world. Overall, Europe has 23% of global organic farmland and there are four countries where more than 10% of all agricultural land is under organic agricultural production, they are: Liechtenstein (30%), Austria (16%), Switzerland (11.1%) and Sweden (10.8%). The largest land area occupied by organic farming in Europe is in Spain (1.1 million hectares), Italy (1 million hectares) and Germany (0.9 million hectares). European country where located the majority of companies involved in organic production is Italy (over 44 thousand producers). Organic production in Switzerland occupies 35% of the food market, in Germany and Austria – 25% (Belinskaya, 2012).

The European experience shows that 73% of organic products are sold through a network of retailers, 15% – direct sales by the manufacturer and markets, 12% – through specialty shops, including online shops. In the USA, organic products are sold, primarily in local markets. In addition, the United States opened “organic” restaurants and cafes, and ordinary restaurants offer dishes from organic products. Organic baby food market is developing rapidly.

The world's largest share of agricultural land (35%) where organic products are grown is in Australia and Oceania (includes Australia, New Zealand and several island states). 99% of them are organic farmland (97% – extensive pastures) located in Australia.

Many developing countries are becoming powerful producers of organic products, more than 12 million hectares of agricultural land (which is about one third) is used for it. Majority of this land is cultivated in Latin America, Asia and Africa occupy second and third positions respectively. In Latin America, 23% of processed global land area is used for organic production. The main countries in the region are Argentina, Brazil, Uruguay and the Dominican Republic. Latin America exports 90% of organic products (tropical fruit, cereals, coffee, cocoa, sugar and meat) to Europe, North America and Japan. Local markets sell such products mainly in large cities. An important factor contributing to the development of organic production in Latin America is government support, including effective current legislation and standards.

The total area of farmland where organic products are grown in Asia is a little more than 3.3 million hectares (9% of the world's agricultural land area occupied by organic production). The largest producers of these products in Asia are China and India (because of large areas under wild plants). In China, Bangladesh and Thailand an important area of organic production is aquaculture. The majority of certified organic products in Africa and Asia are intended for export.

In Africa, about 3% of the world's agricultural land is used for the production of organic products which are mainly located in Uganda, Tunisia and Ethiopia (Tomashevskaya, 2013).

Another common way of conducting agricultural production in Europe is a conservative farming – technology (processing, fertilizing, irrigating) of growing crops aimed at the greatest possible conservation of biodiversity, soil properties, protection against degradation. In large parts of Europe organic farming is seen as part of conservative farming (Zubets, Medvedev & Balyuk, 2010).

So-called compromise agriculture, which corresponds to the concept of producing organic products in an environmentally non-waste production is seen as an alternative agriculture (Zubets, Medvedev & Balyuk, 2010). Development of compromise agriculture took place around the end of the XVIII century in Western Europe and Russia at the same time. Compromise idea was to include in the used means of influencing the field and agricultural plants such elements, which together with the maximization of yields prevented or at least slowed the rate of loss of arable land its main consumer quality – the fertility of the soil and would not lead to environmental degradation in the agricultural sector (Minkova, 2015).

After the reform of the EU FAP in 2003, the principle of cross compliance requirements have become mandatory for the EU countries and are divided into:

National – Good agricultural and environmental condition (EC Directive 1782/2003/EEC), aimed at preventing the abuse of agricultural land regardless whether the agricultural production is carried out or not;

Europe-wide – requirements of 19 Directives and Regulations EU environmental protection, animal welfare, human health, plant and animal species, united in “Statutory Management Requirements”, certain EU Regulation 1782/2003/EEC;

Potential – the requirements stipulated by the legislation of individual countries, but not included in the «cross compliance» requirements yet. For example, the Ministry of Environment, Food and Rural Affairs of the UK introduced requirements for the farmers about having land (pastures), which can't be included to crop rotations for 5 years or more (state support is given in case of compliance with environmental conditions) (Introduction – Cross compliance requirements, 2014).

In Germany, farmers are required to comply with good agricultural practice, which is specified in the legal regulations by the Federal Government. Direct subsidies are paid to the farmers under the Agricultural Policy in full “package” – only if they comply with the established requirements for appropriate agricultural practices and certain principles of “cross compliance” as the EU legal requirements (Agrarian Report, 2011). The main requirement is that the agricultural land is kept in good agricultural and environmental condition and “cross compliance” refers to the implementation of obligation to protect the environment, food safety, animal health and protection.

In Germany pastures that are constantly used as intended occupy 28% of agricultural land. This is a significant part because farmers get supported in the framework of the “Milk of meadows and pastures” programme: subsidy for hay and grazing land is given to milk producers and it amounts to 37 euro per hectare of meadows and pastures and 21 euro per milk cow. In this country meadows and pastures are characterized by rich flora and therefore agro-ecological programmes on environmental protection is an important tool for preserving biodiversity in the agricultural ecosystem (Agriculture of Germany, 2011).

Agro-environmental programmes are carried out on 29% of farmland and aimed primarily at maintaining diverse crop rotation, regionally adapted varieties and types, supporting the development of extensive meadows and pastures. Farmers are supported under the federal programme “Ecological farming”, training courses, educational and informational activities are conducted for them. More and more businesses switch to the environmental management methods. In 1996 the share of such companies was only 1.3% (7.4 thousand units.) with a total area of farmland share of 2.1%, and in 2008 its share reached 5.3% (19.8 thousand units) 5.4% of the area of agricultural land (Agriculture of Germany, 2011).

In the context of strengthening the management of greening agriculture within the EU, so-called “greening”, the German law of 26.02.2014 interprets that 30% of the unbound state support will depend on agricultural production technologies that contribute to climate protection and environment (A new system of European unrelated support in agriculture since 2015, 2016). For these funds, farmers must fulfill a number of obligations: the protection of natural grassland, grow a wider range of crops in rotation (at least three crops) and allocate part of arable land under “special land use for environmental purposes”.

EU law stipulates that from 2015 farms principally allocated 5% of their arable land under “special land use for environmental purposes”, the land should be used for hedges, water protection zones and so on. In Germany the Law of 26.02.2014 provides a number of options for the use of land. In particular, the special premises of permissible agricultural use, for example, growing legumes (to fix nitrogen in the soil), and growing intermediate crops (soil cover) (Popova, 2015).

Farmers cover the “cross compliance” requirements costs. If the requirements are not met, the amount of subsidies from European and national funds gets reduced.

2. Agro-ecological conditions for the functioning of agricultural production in Ukraine

Ukrainian agrarian policy is aimed at the implementation of economic tasks of agro-food sector and in fact contains no environmental component, though agricultural and processing technologies which are widely used nowadays cause contamination of soil and other natural resources.

Production of quality and safe agricultural products and raw materials is impossible without taking into account the ecological state of the agricultural sector and the use of environmentally friendly agricultural technologies. It is well known that imperfections in the crop and livestock technology, violation of evidence-based approaches of conducting agricultural production as a whole, pollution and inefficient use of land, water and biological resources are factors reducing productivity of agricultural production, raw material quality and production.

The level and efficiency of the use of land resources are determining factors in ensuring a balanced development of the agricultural sector, the preservation of the biological characteristics of the soil, forming the ecological and food security.

Progressive deterioration of the quality land condition, reduced soil fertility pose a real threat to the revitalization of the crisis, especially in the context of the focus on the development of organic farming.

One of the main factors reducing the productivity of land resources is the degradation of agricultural landscapes as a result of long-term use of farming systems which are not greening focused, violation of the optimal structural and functional organization of the territory, the balance of its basic stabilizing components, resulting in reduced erosion resistance of agricultural landscapes, deterioration of their ecological status (Furdichko & Stadnik, 2012).

It should be noted that in Ukraine, the agricultural land area which has a propensity for water erosion in 13.3 million hectares (32% of the total), including 10.6 million hectares of arable land. Eroded land includes 4.5 million hectares of heavy and middle eroded and 68 thousand hectares which have lost humus horizon. Wind erosion is systematically exposed to more than 6 million hectares, and during the years of dust storms this number is up to 20

million hectares. In Ukraine up to 15 million tons of humus, 0.3-0.9 million tons of nitrogen, 700-900 thousand tons of phosphorus, 6-12 million tons of potassium are lost every year because of erosion, which is significantly more than amount of fertilizers used. This leads to pollution and degradation of rivers, ponds and other forms of the hydrosphere (Furdichko et al., 2013).

Humus is the most valuable organic and biologically active component of the soil. A century ago the Ukrainian soil contained an average of 4-6% of humus, and now – 3.2%. It should be noted that when the soil contains less than 2.5% of humus – it is not black soil. According to the materials of agrochemical certification of agricultural land, which is carried by branches of the Institute of Soil Protection of Ukraine, it is determined that every 5 years our soils lose an average of 0.05% of humus. In monetary terms, for twenty years, this amounts to about 450 billion hryvnia. To maintain a proper balance of humus in the soil it is necessary to make annually about 8-10 tons of organic fertilizer per 1 hectare of cultivated area. In connection to a number of livestock reduction in recent years the soil gets only 0.5 tons of manure. Each year, the soil loses about 400-500 kg of organic elements per hectare and unfortunately it is not possible to replenish this loss. 100 years needed to get 1% of humus (Datsko, 2016).

Even having low crop yields negative balance of organic elements in agriculture is about 100 kg/hectare which is caused by a significant decrease in the use of organic fertilizers on the one hand, and on the other by a high level of tilled land, failure to comply with evidence-based crop rotations, a large share in the structure of sown areas of industrial crops, dominated by monoculture in some regions.

The results of studies of agricultural scientists indicate the successful implementation of the principles of biological farming in the farms of the western region of Ukraine. Biologization of agriculture contributed to the improvement of agro-physical and agro-chemical indicators of soil fertility, reduction of the contamination of crops by 25-40% and the amount of crop pests, enhancing the biological activity of the soil at 6.5-7.5%, a decrease in amount of nitrates in agricultural products by 10-12% compared to products grown by conventional techniques (Shuvar, 2003; 2005).

In Ukraine there is a number of laws that provide mechanisms to encourage enterprises to sustainable, environment-friendly utilization of productive resources in agriculture as well. These include the Land, Water and Air Code of Ukraine, Law of Ukraine “On Environmental Protection”, “On protection of land” and others.

The Strategy of State Environmental Policy of Ukraine until 2020 was adopted in order to ensure environmentally sound wildlife preservation and improve the state of environment in Ukraine (Verkhovna Rada of Ukraine, 2011). Its main objectives:

- to reduce on average of 5-10% of arable land in the country excluding: the slopes over 3°, the land of water protection zones; conserving of degraded, unproductive and technologically contaminated farmland subsequently foresting it in the forest and steppe zones by 2020;
- to develop and implement by 2020 the management of agricultural landscapes agro-forestry practices on the principles of sustainable development;
- to create the conditions for a broad introduction of environmentally-oriented and organic farming technology.

Implementation of the Strategy objectives will create conditions for ecologically safe environment for population activities, implementing ecologically balanced system of na-

ture, preservation of natural ecosystems. World economic activity experience should be used in Ukraine, taking into account the requirements for environmental protection.

Sustainable environmental management in agriculture starts with the organization of the territory – creating optimized agricultural landscapes with environmentally sound and appropriate ratio of farmland, woodland, land protection and conservation value (Ridey, Strokal & Rybalko, 2011).

In the EU countries crop rotation is a prerequisite for environmentally balanced and economically viable land use. Monoculture management in Ukraine causes the third part of organic elements to return to soil, which leads to soil erosion.

The efficiency of management of the agricultural enterprises is largely dependent on a set of crops that are grown, its ratio, thus on the structure of sown areas. Rational structure of sown areas shall ensure that the requirements regarding the alternation of crops in crop rotations, respectively, with the soil and climatic conditions and enterprise specialization. The scientific principles of crop rotation include proper selection of precursors and an optimal combination of single-species cultures in compliance with the permissible frequency of their return to the same field.

Basic soil-climatic zones of Ukraine have their own characteristics, specific to each of them. In Ukraine three major climate zones are defined – Polissya, Liso-step and Step. Scientific institutions designed tentative schemes of crop rotations for enterprises of different specialization in every zone of Ukraine (*Table 1*) (Organization of system of crop rotation and structure of sown areas, 2012).

Table 1. Estimated crop rotation schemes

Field number	Step (central, southern and south-eastern regions)	Liso-step (northern, central and western regions)	Polissya (the most fertile soils)
1	Black fallow	Perennial herbs	Clover
2	Winter wheat	Winter wheat	Winter wheat
3	Winter wheat	Sugar beet	Lint
4	maize	maize	Potatoes
5	Barley	leguminous crops	leguminous crops
6	Sown fallow	Winter wheat	Winter wheat
7	Winter wheat	maize	Lupine, row crops, buckwheat
8	Sunflower	Ardent cereals with additional sowing of perennial grasses	Winter and ardent grain with clover

Source: Organization of system of crop rotation and structure of sown areas, 2012.

Recommended schemes of crop rotations are adjusted to the specific circumstances of each enterprise. It is the most appropriate crop rotation with short rotation.

The above mentioned variants of crop rotation systems require agro-technical and organizational-economic assessment. Agro-technical evaluation of design options for crop rotation provides compliance of their agricultural technology system, fertilizing, place-

ment, crop rotation, etc. From an organizational point of view the crop rotation system is evaluated for compliance with accepted specialization of the enterprise, the rational use of human and material resources. Economic assessment of crop rotation is carried out in terms of: the cost of gross and market products; labor and equipment costs; net income per hectare of crop rotation; margins, costs, labor costs per unit of basic products (Organization of system of crop rotation and structure of sown areas, 2012).

Taking into account the above mentioned requirements for the EU, in Ukraine at the state level it is necessary to develop and implement a set of rules for agricultural practice in accordance with applicable in the Member States of the EU Code of Good Agricultural Practice. It should contain items concerning the volume of applying fertilizers, anti-erosion measures, the requirements for the conservation and use of organic fertilizers, crop rotation systems and others.

Compliance requirements for farmers growing agricultural products will make it possible to reduce the negative impact on the environment, improve the overall system of agriculture, promote new technologies of agricultural production, which include most environment protection requirements and are focused on achieving ecological balance (moldboard soil tillage, organic agricultural production, etc.).

Given the European experience of cross-compliance, it should be noted that only if the farmers stick to the environmental requirements for agriculture they could get financial support under any government programs in Ukraine (loans with reduced interest rates, support for animal industries, etc.).

The introduction of agricultural support by analogy with the approach of cross-compliance will facilitate the implementation of the Association Agreement between Ukraine and the EU on environmental policy integration into sectoral policies and encouraging sustainable agriculture. The use of this approach in domestic practice is provided by the updated draft of state budget for 2017, where direct support is given to farmers, small and medium in particular, by providing subsidies for 1 hectare of sowing.

It should be noted that in 2015 the Ministry of Agrarian Policy and Food developed a Single comprehensive strategy and action plan for the development of agriculture and rural areas in Ukraine for 2015-2020, the aim of which is to increase the competitiveness of agriculture and to promote balanced (sustainable) development of rural areas according to international and European standards.

As part of the strategic direction 10 "Environmental protections and management of natural resources, forestry and fisheries in particular" the development of five areas is considered: water, soil, pesticides, nitrates and minimum environmental standards; development of organic agricultural production and risk; forestry; bioenergy and fishery. At the same time, considerable attention is paid to the prospects of the implementation of the basic principle of the common agricultural policy of the EU regarding the integration of environmental concerns into agricultural production.

Findings and prospects for further research

Development of extensive land-use principle has led to considerable destruction of natural ecosystems: reduce area of forage land, vegetation degradation, erosion, salinization and other negative phenomena, which require improving land use structure and the creation of efficient organization of the territory. Switching to landscape and ecological

land use system will take into account features of agricultural land, will help to avoid many of the negative effects of the traditional ways of farming and will be able to provide a better use of the land productive potential and its qualitative diversity.

This might happen due to the differential placement of plants to ensure reliable protection of land-based adaptive ways of using the forms and spatial planning, the structure of sown areas optimization and the use of resource-saving technologies.

One of the negative environmental manifestations of modern agriculture is a high level of plowing of agricultural land, which is about 94% in agricultural enterprises. In the households index of arable land is significantly lower and is within 74%. It should be noted that the households are characterized by a larger share of ecology stabilization land than enterprises of the corporate sector.

The preservation and improvement of soil fertility is the key to the introduction of organic farming techniques. To achieve positive results you need to place the crops optimally within each particular enterprise, use organic fertilizers effectively, use the benefits of agriculture biologization expanding the area under perennial grasses, etc.

The implementation of a Single integrated strategy and action plan for the development of agriculture and rural areas in Ukraine for 2015-2020 will contribute to the development of balanced agriculture, environmental protection, as well as bring the practice of agriculture in Ukraine to implement the best practices of European agriculture. Further research suggests a more profound study of the ecological status of water and air.

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Chapter 2.3.

MANAGEMENT OF AGRICULTURAL AND FOOD PRODUCTS SAFETY: CONCEPTUAL FRAMEWORK, EXPERIENCE OF THE EUROPEAN UNION AND PRACTICE IN UKRAINE

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1. Scientifically-methodical principles of single normative space of European Union and feature of its formation in Ukraine

Adoption in Ukraine's strategic course associative, and then full membership in the European Union Association Agreement EU-Ukraine (Association Agreement, 2014) accompanied by the appearance of a number of global challenges and issues, including the question of increasing the competitiveness of domestic goods pushed to the fore. Its essence is to ensure that products applicable requirements of the directives and regulations of EU and international and European standards. Regarding domestic agricultural and food products, is a key condition of its exports to the EU Member States in favor strict adherence to EU regulations concerning its safety and quality for consumers. In a broader sense refers to the regulatory framework or normative component (regulatory or normative dimension space) economic environment in which entrepreneurs operate in the agricultural and food sector (personal and peasant farmers, agricultural processing and food-company).

However, for an objective analysis of the situation with the state regulatory space directly in the EU must first apply to the assessment of the nature of fundamental scientific categories and their definitions, which are long-term operating problems, researchers said. In addition, due to expansion of research involved in terms of other disciplines and they were given treatment, which revealed the deeper features of a particular problem. Important basic categories of economic science, that is, its conceptual and categorical apparatus includes such popular notions as "space", "economic space", "space society" (Shults, 2010), "medium", "economic environment", "medium enterprise (external, macro, micro, internal)" and others. Abroad analysis of key macro factors (called PEST-analysis) have the following components: political and legal, economic, socio-cultural, technological environment (Saenko, 2006). Therefore, it is important to evaluate the relationship and interdependence between such basic concepts as "space and environment".

The scientific literature is used a wide range of phrases, the main of which is the term "space".

However, the corresponding load meaningful phrase provide the following features: geopolitical, humanitarian, research, economic, information, life, social, space, cultural, scientific, educational, religious, etc. market. Often, before defining feature space used is another important characteristic, namely only. In addition, the “space” can be specific or sectoral colors, namely, agricultural, industrial, geographical, water, air, peripheral, media, medical, network, cellular, tourism, finance, urban and more. In addition, the space can be specific in its dimension, such as: global, world, European, regional, areal, local as well as mega-, macro-, meso-, micro- and even nanoposts.

An analysis of these features to draw this conclusion: narrow sectoral boundaries or “spot” use of the term “space” show a tendency to expand, consolidation, enrichment, acquisition of additional features as a result of institutional changes as in a particular community, and throughout the international community. This is reflected in the fact that the shared (common or uniform) rules for the specific types of spaces for a variety of geographically close countries, the transformation and convergence of basic principles of economic and social policy of conducting neighboring countries. This desire to unite in various forms necessary to achieve the key objective for these countries: efficient and rapid solutions to common or similar problems. Thus, the use of such features as a global, world, European, regional, areal, local displays the geographical location of the integration process at different hierarchical level.

The term “single” is used not as a single, but as a unifying definition or description that includes all the elements (objects, components, particles) that make up its own specific space. Thus for different types of spaces that term can combine rather different components. In addition, the basic nature of this association is to integrate not only these components, but also directly to different spaces that combine and operate on a single regulatory and organizational and institutional framework or system of institutions that generate relevant information flows or broadcast social and cultural values, or in the implementation of various international integration programs. One of the most prevailing among existing associations need to specify the “*single economic (regulatory) space*” of the EU. It was formed in the voluntary association of member states, which began with the 50’s. Its limits are common principles of entrepreneurship, harmonized rules for foreign economic relations, functioning unified system of technical regulation, introduced common (common to all) sanitary and phytosanitary measures, already for a long time demonstrated the effective functioning of the European model of food safety, removed any restrictions the movement of people, goods, services, capital in its internal borders, but with the exception of third countries.

Summarizing the wide range of publications studying the problem should be noted that for the economy “space” there are reasons to consider, especially as the area where the natural resources, material objects and people that combines a variety of legal forms of to ensure the achievement of their goals. In this context, the “*environment*” in practice and in the theoretical sense, including economic and social conditions, which is different livelihoods of local populations and production activities of business entities.

Thus, environmental or external to each business entity “*environment*” includes a set of environmental conditions, economic, social and institutional structures, and other factors that enable, mediate and accompany its business. However, besides the above-mentioned elements and factors significant impact on entities engaged in formed economic ties and social relations are the kind of network structure in which the company is held and based or with which conduct manufacturing and other activities.

Thus, the “space” acts as a bulk operation Environmental entire economy, its regional units, i.e. different clusters. It (“Space”) is revealed through configuration territorial consolidation of production facilities, organized flow of resources, technology direction and intensity of relationships, the closeness of economic relations between business entities and spatio-temporal parameters (i.e. chotyrohmirnist: length, width, height and time). However, the “environment” can be described as external to the particular business entity conditions and factors of its order within the space-time continuum in which the company operates. So common between “*economic space and economic environment*” is that the company, as legally independent and elementary particle national economy operates directly in the part of the economic space that is included in the scope of his interests, which extends the impact of productive capacity (raw zone resource provider) and within which are purchased and sold products (markets of raw materials, energy, finished products).

However, difference between “*economic space and economic environment*” is that the environment of a particular business entity (PBE) is only part of the economic space, although the impact of PBE and can spread beyond the specific space. For example, the impact of the international corporation that conducts operations in various parts of the world, beyond the direct economic space of the country in which the head office and its main production units. So, it is a zone of direct influence of the enterprise, which can not be stable at different times. As the business structure in different periods of time is at the stage of the life cycle, which takes place at a particular time, the real part of the economic area, which is within its influence, compared with the previous stage, expanded or minimized. However, such a straightforward relationship – it is extremely rare, and the vast majority of situations is changeable and even contradictory. This is because here their dominant role played by communications company with the environment: its density, diversity, vectors and intensity information, investment, logistics and other resource flows. In this respect, each company is unique, that is, only if a single entity.

However, there is sufficient reason to distinguish between “*economic space and economic environment*” on grounds such as the material basis of the operation of businesses and organization-legal, but in a broader sense – institutional environment that is no less and sometimes more value than the base. It covers legislation and regulations, traditions, customs, status and functions of the enterprise, social behaviors staff. Since this research priority is economic space and its normative component (regulatory framework), it is appropriate to his diagnosis and the line segment: agricultural (or agricultural and food) and off-agricultural sectors.

Research has established criteria for the selection of individual spatial systems (sub-systems society) different hierarchical levels. The most common of them on a territorial basis (i.e., clear the limited economic relations, processes and phenomena spatial scope) and by type of activity (The Association Agreement between Ukraine, 2014), although there is expansion of a number of criteria structuring economic space. According to the first (regional) approach isolated regions of different taxonomic levels (macro-, meso- and micro-) and not just a second-level features in this case are the geographical position, cultural and ethnic origin, specific economic conditions, zonal differences, function, performed by the region in the social division of labor, and the presence of inter-territorial interaction between business entities located in different regions, between regions so directly, that is, complex structures.

The second approach is to design indirect economic relations, processes and pheno-

mena occurring in the economic area, its coordinates. This spatial boundaries can be vague, that is blurred, extend beyond territorial units intersect and overlap one another as interest entities are not limited to the borders of the town, region or country. The more such crossings, *vzayemoprnykn* and circulation, the more dense is economy. In this section you can isolate and analyze economic space enterprise sector, industry sector, a separate individual, group, community, etc. (Olshanskaya, Fashevsky, Belokon & et al., 2009).

However, as in the present conditions defining characteristic acts interpenetration and interweaving close relatives or related concepts, then placed in a “*pure*” economic space of the country, territorial and production complex or a region impossible. This is because the elementary particles that make and basic elements of economic space are quite complex relationships and interactions with similar or different functional purpose objects of other types of spaces, which ultimately contributes to their mutual enrichment.

Since the early 2000s there was acceleration of unification and integration process in various sectors of economy, humanitarian sphere, public administration and so on. Even then acquired “*rights of citizenship*” and began actively used phrases (terms), reflecting current realities, including: a single educational space (Rybka, 2004), the only research space, a single energy space, the only cultural space, a single regulatory space, the only media space and others. In these examples, the basic term “space” is complemented basis (educational, cultural, regulatory, etc.) and through their union formed a generic term (normative space). Another feature is “only” is a component of an integrated concept of “single regulatory space” (SRS) and means: *on the one hand, as a general, i.e. one in many countries; and on the other hand, and this is necessary to emphasize – reflects the trend towards convergence, harmonization and integration of regulatory frameworks (measurements of spaces) around the world in a single, common for all.*

Note that the agricultural and food sector in Ukraine are diverse transformations that carry controversial impact on the primary production structures. Therefore, the domestic agricultural sector requires deep diagnostics, meticulous and objective assessment of the current situation in order to develop scientifically based approaches and directions and complex legislative and regulatory measures, investment, innovation and technological and practical. Their implementation should ensure the withdrawal of domestic production to the level of requirements introduced in the EU. This is a key condition for the integration of agricultural and food sector of Ukraine to the domestic market of the Member States and the production of agricultural and food products, which in terms of safety and quality is free to come and realize the European market. So we are talking about forming a common economic space, which is based will be based on the unity of the legal framework and its common agricultural domain for Ukraine and EU Member States.

Thus, the agricultural and food sector economic space serves an integral part of public space and the Ukraine is quite dynamic, organizationally and functionally structured orderly system of agricultural and food production and related types of business. In this system, integrated business entities of various legal forms (from private farms to agricultural holdings, from micro entities to large food processing) which are interconnected and technologically and economically. Their operation is aimed at solving the main task: meet the priority needs of members of society in a safe and high-quality agricultural and food products in sufficient quantities and at reasonable prices based on the rational use of the process involved in the production of natural, energy, human and other resources.

Normative space agrosphere Member States enshrined directives and technical regulations, systems of standardization, metrology, accreditation, conformity assessment, market surveillance and best practices set out in the regulations diverse European Union. In other words, the required space – a territorial and economic environment of businesses within which all business organizations adhere to a common “*rules of the economic game*”: adopted standards and specifications, special requirements, best practices, technical regulations, and in a broad sense – basic technical regulations, including market surveillance of compliance regulations, sanitary and phytosanitary measures concerning the safety and quality of agricultural and food products.

For modern conditions specified regulatory space may be limited to individual enterprise sector (economic activity), region, country, union of countries, including members of the European Union. Hard borders as the economic environment and regulatory space does not exist; it may be continuous, and fragmented, as well as fully formed, and in the making. Thus, the required space (normative dimension) is the key component, ie, one of the most important aspects of the economic environment. Another close in content component acts as the legal and regulatory framework of business and legal forms of business activity, where and for direct involvement are formed, take the signs normalized economic action and made economic relations between business entities.

However, a significant problem is how common “*rules of the economic game*” applied in everyday production activities of enterprises and to what extent. Unambiguous and transparent business entities adopted “*rules of the economic game*” suggests a uniform or unified economic environment, and subject to the availability of territorial gaps – the integration of individual fragmented parts in “*single regulatory space*”. The process of European integration, aimed at ensuring the entry of domestic entities in this space, basically involve adapting production to the requirements of regulations.

Standard component (regulatory framework) Economic Space introduced and operated for the past thirty years in the Member States. In Ukraine during the 1998-2016 a set of regulations has been developed that largely formed regulatory support agricultural and food sector. In its basic parameters regulatory framework designed to comply with European regulations, and therefore technical regulations must be harmonized with the base model technical regulations for the agricultural sector. In this regard it is important to analyze and reveal the nature and structure of the agricultural and food sector regulatory Ukraine, its difference from similar, operating in the EU, and on this basis to offer their areas of convergence and adaptation to European standards of domestic enterprises. Compliance with this condition will act as a guarantee of domestic enterprises producing safe and high quality agricultural and food products, which, subject to other components (certificate of conformity) is free to enter the food markets of the Member States.

As a clear idea of the required space (or dimension) agricultural and food sector in domestic science has not yet been formed, its existence is possible only if the functioning of economic space. Thus, the current regulatory framework is one of the economic space measuring agricultural and food sector, an indicator of its progressiveness in accordance with modern concepts of economic environment. Given that the study is aimed at the diagnosis process of integration of national agricultural and food sector in the EU single regulatory space, it is important to reveal the structure of the current regulatory framework of the agricultural sector and to characterize it.

As for the structure of the term “*single regulatory space*”, then the system includes the following levels, structural elements and activities of the relevant subjects for the restructuring and consolidation of space, namely:

- A set of state central executive bodies (CEBs), corporate organizations and institutions and civil associations involved in varying degrees of development and adoption of modern regulatory framework and its implementation requirements in the economic area agricultural and food sector;
- Structure of regulations and regulatory framework of economic space, which is identified through the technical regulations and sanitary and phytosanitary measures;
- CEB activities on completion of market surveillance for compliance with mandatory requirements for safety and quality of agricultural and food products;
- Activity of economic entities on the implementation of the requirements of regulations directly in the field of agricultural and food enterprises based on adaptation of the agricultural sector to the current regulatory framework. Consequently, the domestic regulatory system should be harmonized with the base model technical regulations, which operates in the EU;
- Management of building the regulatory space on the part of CEB, corporate bodies and NGOs directly within the EEA and interaction with the specialized institutions of the EU and other international organizations.

Formation of a single regulatory space of the domestic agricultural and food sector under current conditions – a dynamic process that involves several interrelated steps, acts as a reflection of the real impact of the EU to Ukraine and is aimed at the approximation and harmonization of national regulations with European and domestic enterprises to adapt its requirements. Ultimately, reforming the national system of technical regulation (STR) as one of the important components of the integration of Ukraine into a single regulatory space of the European Union, will be accompanied by a number of diverse transformations and changes, including:

- *Firstly*, the completion of the STR in accordance with the base model technical regulations for the agricultural sector of the EU;
- *Secondly*, convergence, integration and union of the main components of the national STR, which now are at different stages of formation;
- *Thirdly*, the increasing influence of national STR processes comply with European regulations on domestic enterprises safety and quality of agricultural and food products;
- *Fourth*, the formation, organization-building and practice of public market surveillance of compliance with regulations on safety and quality of agricultural and food products;
- *Fifth*, the implementation of sanitary and phytosanitary measures in the domestic agricultural and food sector according to European standards;

Sixth, the convergence and integration of STR with a European base model and the emergence of the basis of the new integrated components – single regulatory space (SRS) EU-Ukraine.

Objective indicator of the process will be smooth flow of domestic agricultural and food products to the food markets of the Member States, the SRS's ability to further develop the ability to self-preservation and integrity under opposition from internal transformations and damaging external influences. Analyze and systematize establishment, structure and diversified activity on the formation of modern regulatory Economic Area agricultural and food sector.

In shaping the regulatory framework agricultural and food sector participate organi-

zational structures with different legal status, but the results of their work will be not only legal, but direct practical value. Legal documents that will form a complex lace, meaning “cloth” regulatory space should have:

- *Firstly*, the different legal status (binding – voluntary – is recommended to perform only certain areas or entities);
- *Secondly*, to respect the hierarchy in terms of “the strength of their influence” (laws – ordinances – resolution – orders – regulations – recommendations);
- *Third*, a broad set of regulations for the practical implementation (technical regulations – national standards – standards enterprises – technical conditions for production – codes established practice – basic programs and simplified procedures proportionate to risk and based on the approaches and principles HACCP).

Among the institutions of government national authorities involved in almost all the subjects of the highest echelon, including the Parliament of Ukraine, President of Ukraine, the Cabinet of Ministers of Ukraine, who make the laws, issuing decrees, approve technical regulations and are preparing other regulations, ordinances, orders, orders, prescriptions and more. For the sphere of technical regulation when analyze on a “bottom-up” link next two are the ministries of Economic Development and Trade (*Economic Development*) and Agriculture and Food (*the Agriculture Ministry*). *Ministry of Economic Development* is the main body in the system of central executive bodies to form and implement state policy in the sphere of technical regulation (standardization, metrology, certification, evaluation (confirmation) of compliance, accreditation of conformity assessment, quality management).

However, given the specificity of agricultural and food products of the functions of technical regulation assigned to the Ministry of Agrarian Policy of Ukraine. In particular, one of the main objectives of the Agriculture Ministry is to develop and implement the state policy in the field of safety and quality parameters of individual foods. In this connection, it must be emphasized that the scope of the functions assigned to the Ministry all the food resources of the launch of their growth (i.e., including the creation of genetic material) to the ultimate level – consumption of finished products, and due to this the requirements for food raw materials and processes of production, their engineering, manufacturing, agrochemical, veterinary and other support, including compliance with safety and quality parameters.

Meanwhile, the Agriculture Ministry is also tasked to develop technical regulations, standards and other regulations, realization of functions in the sphere of technical regulation and inspection, review and abolition of sectoral regulations, preparation of annual work plans for Standardization (within the powers defined by law). Standards and technical regulations should cover all the products and apply as general requirements for the products and processes of production (horizontal level), and for specific types of agricultural and food products – from cultivation to consumption (vertical slice). To implement these and other problems in Ukraine was established more than 160 *technical committees for standardization* (TC), including in the Agriculture Ministry – about 30.

Formation of the agricultural and food sector space provides a broad set of diverse regulations, which should cover all aspects of the given object of research. In this connection, it is advisable to give the established definition of basic documents:

- *Normative document* – document containing rules, regulations, general principles, procedures or specifications relating to various activities or their results.

Today is established the following hierarchy of regulations, including the Law of Ukraine, decrees of the President of Ukraine, the Verkhovna Rada of Ukraine, decrees and orders of the Cabinet of Ministers of Ukraine, central executive orders and regulations. However, directly in STR legislated so vertical regulations:

- *Technical regulations* – legal act, approved by the Verkhovna Rada of Ukraine, the Cabinet of Ministers of Ukraine, joint or separate decisions of the European legislative bodies – the European Commission, European Council, European Parliament, which is defined product characteristics or related processes or methods production and service requirements, including the relevant provisions, *with which compliance is mandatory*. Technical regulations may also contain requirements to terminology, symbols, packaging, marking or labeling that apply to a specific product, process or production method. Technical Regulation contains sanitary measures. In the absence of technical regulations for a particular object of regulation, approved by the Verkhovna Rada of Ukraine or the Cabinet of Ministers of Ukraine applied, if technical regulations of the European Union;
- *Standard* – a document developed by consensus and approved by an authorized organization that sets the rules, guidelines or characteristics related activities or its results, including products, processes or services, compliance with which is optional. The standard may include requirements to terminology, symbols, packaging, marking or labeling that apply to a specific product, process or service. The standard does not contain requirements for food safety established sanitary measures;
- *Technical specifications* – a document approved by the market operator, which identifies the technical requirements for food and / or processes of production.

We note that the European Union has developed a kind of hierarchy structure and regulations of different legal status, namely:

- *EU directives* – legislation that set the same for all member countries of the Community requirements for safety, life and health, environment and natural resources and more. Directive shall enter into force on the day (or twenty days) of their publication in the Official Journal of the European Communities (Official Journal of the European Union – OJEU). They are binding, but implementation legislation in EU member states, taking into account national specificities. To implement their provisions, each country chooses the form and means;
- *EU regulations* – are binding in all its components and are directly applicable in all Member States. Most of the regulations are acts of unification of rules that carry European integration. Regulation shall enter into force twenty days after publication in the OJEU. As for the production of food and animal feed, the Directive establishes the basic safety requirements that are implemented and become binding as regulations which are relevant links to existing rules in standards;
- *EU decision* – are binding only upon those to whom they are addressed. The decision is often a means of implementing other EU regulations and apply only to specific cases;
- Recommendations and conclusions of the EU – is not binding and only adopted to implement the requirements of statutory documents or other acts of the EU.

The most common tool for implementing the legal and regulatory environment that continues to grow in the EU are the standards: international, European, national, regional (interstate) standards bodies, private (corporations and groups) and enterprises. EU standards are applied producers voluntarily. Obtaining universal acceptance standards

provided by the publication in the OJEU source data and only then it is considered as harmonized. Products that meet the requirements of the harmonized standards shall be deemed consistent with the fundamental requirements.

The total number of standards prepared by international and European organizations for standardization (ISO, IEC, ETSI, CEN, CENELEC), is about *70 thousand Units, including for agricultural and food sector (agriculture and food processing) – more than 2.1 thousand* (Inclar Apex, 2011).

As for the structure of the agricultural and food sector regulatory framework, it is possible to present these elements (Krysanov, 2016): the legal framework; standards; technical regulations; accreditation of conformity assessment bodies; conformity assessment procedures; Market Supervision over compliance with mandatory requirements. *The structure (first part) should be supplemented with the second part – sanitary and phytosanitary measures* (The Association Agreement between Ukraine, 2014). Analyze the results of the transformation of post-regulatory system in the European base model for each of these components. It will evaluate the passed way and need to be done to achieve equivalence with European national STR, namely:

1. *legal basis* – already has fifty of the laws of Ukraine: basic, framework, for certain products and for the control of economic activity, and a dozen bills that require primary decision to bring national legislation STR in compliance with European legislation. It includes over 1.7 thousand EU directives, regulations, decisions and amendments are related to agricultural legislation – 40% (agriculture and food) (Inclar Apex, 2011);
2. *standards* – because as of mid-2016 National Fund regulations amounted to about 30 thousand. Standards, including 15.1 thousand. National, including 11.3 thousand. Harmonized with international and European regulations. During 2006-2015 canceled the validity of 19.4 thousand international standards. However, remain in force until the beginning of 2018 at 13.5 thousand. Interstate standards Ukrainian State Standard (USS) and State Standard (SS) identical to 1992 to prevent the emergence of “legal vacuum” of 2018 is necessary to distinguish between requirements that are fixed in SS on required (safety) and keep them in technical regulations and voluntary (quality) and transfer them to the standards (which still need to develop and harmonize with European);
3. *technical regulations* – there TR 50, of which 46 developed based on the regulations of the EU (40 – required for use). It defined product characteristics or related processes and production methods, with which compliance is mandatory. TR can contain requirements to terminology, symbols, packaging, marking or labeling (Verkhovna Rada of Ukraine, 2014). Lack TR food enhances the current legal disorder and burden of this connection of additional regulatory approvals. Hence, the need to expand work on TR: complete development still “dormant” and start preparing new technical regulations (as well as draft laws of Ukraine on certain types of food);
4. *accreditation of conformity assessment bodies* – its essence is certification by the National Accreditation Agency of Ukraine (NAAU) the fact that a particular conformity assessment body (CAB) meets the requirements of harmonized national standards for conducting certain activities on conformity assessment (testing, calibration, certification, control). The result of internal activity NAAU began more than six accredited CAB, operating in Ukraine, but with expired certificates of accreditation is still more than 360 CAB. So last required to match the requirements of regulations and conduct their accreditation. Regarding international recognition NAAU, the European Association for Accreditation (European co-operation for accreditation – EA) acknowledged that all activities NAAU meet the regulatory requirements in

Europe in the field of accreditation. So NAAU conducting activities which has been recognized at EU level. However, NAAU is a member of the International Laboratory Accreditation Cooperation (International Laboratory Accreditation Cooperation – ILAC) and a signatory to the Multilateral Agreement (the Agreement on Mutual Recognition) (Multilateral agreement – MRA) in areas of accreditation of testing and calibration laboratories and inspection bodies. Thus, accreditation, provided NAAU in the above areas is equivalent accreditation granted national accreditation bodies – signatories of the ILAC MRA in 80 countries. It offers direct access to accredited CAB International and European best practices for conducting work on certification helps eliminate technical barriers and simplification of border crossing procedures of the Member States and the WTO: the presence of European or international certificates of quality / safety of the products exported, it eliminates the re-certification;

5. *conformity assessment procedures* – include procedures for sampling, testing, monitoring, evaluation, verification, registration, accreditation and approval and combinations thereof. They are carried out by accredited CAB. The end result is to ensure that the products (processes, systems, staff, organ) meets the requirements of the law. However, the requirement of time – mutual recognition of all Member States EA certificates of accreditation certificates and test reports issued by them. Prior to EA includes 26 EU member states. In Ukraine, created the necessary conditions, compliance with which is a guarantee equivalence of test results and the basis for their mutual recognition by Member States EA;
6. *Market Supervision over compliance with mandatory requirements* – the final link in national STR, which should be equivalent to the European model of market surveillance. According to the “Blue Guidance” market surveillance aimed at ensuring that products meet the applicable requirements, providing a high level of protection of public interests such as health and safety in general, health and workplace safety, consumer protection, environmental protection environment and security, while ensuring that the free movement of products is not restricted more than is permitted by law harmonized Union. Market surveillance guarantees citizens equal protection throughout the single market irrespective of origin (“Blue Guide”, 2014). Note that products placed on the market after evaluating its compliance with regulatory requirements (summarized in the laws of Ukraine, technical regulations, standards, codes of established practice) directly by the manufacturer (in the case of low risk to consumer safety), the other party (accredited CAB), or third side (reference laboratory). To ensure effective control by market surveillance should be assigned the appropriate powers provided material and financial resources and qualified personnel for implementation of assigned functions and the planned activities and tasks. One of the most difficult and vital technical regulation serves the agricultural sector. So the situation there and in food markets should track one body, that is, the State Service of Ukraine on Food Safety and Consumer Protection.

Thus, there is sufficient reason to conclude that in all components of STR Ukraine marked notable progress. However, to complete the approximation of national STR with the base model EU technical regulations necessary to carry out complex final work in order to complete its formation and balance for all elements. Only with the following recognition can provide a national system of technical regulation equivalent to the European base model.

It must be emphasized that the model presented above transformation of post-Soviet Ukraine's regulatory system in the base system of technical regulation, which was introduced in the EU, based on new approaches, such as:

- a) *"splitting" regulations* that were fixed in the ex-Soviet standards into three main groups: basic (fixed in the laws of Ukraine), mandatory (technical regulations), voluntary (in standards);
- b) *raise the national system* of accreditation of conformity assessment requirements to the level of European and international accreditation organizations in recognition of their equivalent;
- c) *raise the conformity assessment bodies* (bodies with inspection of management system certification bodies, personnel certification requirements (general, quality and competence) testing and calibration and medical laboratories) at the level of requirements stipulated harmonized national, European and international standards, to ensure mutual recognition of certificates of accreditation certificates and test reports, which take place in countries participating in European and international accreditation organizations;
- d) *raising the conformity assessment procedures* that are provided for domestic conformity assessment bodies, the level of claims, which follow CAB member countries of European and international accreditation organizations;
- e) *forming instead of post-Soviet system of state control* over compliance with regulatory requirements in each enterprise of the State Service of Ukraine on Food Safety and Consumer Protection, which deals with supervision (control) over compliance with regulatory requirements products which are put on the market;
- f) *the demarcation and consolidation of responsibility*: the production of safe and quality products – with the manufacturer for safety of products put on the market – for the state, and the degree of quality of the products purchased by households – directly to the consumer.

Regarding the second part of the food safety system – *sanitary and phytosanitary measures (SPS)* – then their implementation has developed a comprehensive strategy (The Cabinet of Ministers of Ukraine, 2016). It includes three sections: Public Health; Animal Health; Phytosanitary measures. The total number of 270 events, including sections on: almost 80, about a hundred and more than 90 events; terms of their training – 2016-2019, introducing – 2016-2020 biennium. Implementation – is implementing the requirements of the Directives, executive directives, regulations, enforcement of regulations, decisions, enforcement of decisions and recommendations of legislative and other EU legal framework Ukraine.

Note that sanitary and phytosanitary measures envisaged SPS Agreement (*Appendix A, p. 1*), and their practical implementation include:

- All relevant laws, decrees, regulations, requirements and procedures including inter alia end product criteria;
- Production processes and production methods;
- Testing, inspection, certification and approval;
- Quarantine treatments including relevant requirements for the transport of animals or plants or to the materials necessary for their survival during transport;
- Provisions on relevant statistical methods, sampling procedures and methods of risk assessment;
- Requirements for packaging and labeling that are directly related to food safety.

So, at the end of implementation of SPS, i.e. after 2020, and taking into account the real convergence of domestic STR with basic European model of technical regulation can be an objective basis for recognizing as equivalent to national food safety system with a system of food and feed animals operating in the European Union.

Diverse activities of government agencies that are involved in the formation of regulatory agricultural and food sector, to varying degrees based on and consistent support of European and international organizations to this directly or indirectly relevant. On the Ukrainian side, except the Ministry of Economic Development and the Agriculture Ministry, had previously been involved Ministry of Health of Ukraine, Ministry of Environmental Protection of Ukraine, the National Commission Ukraine Codex Alimentarius National Accreditation Agency of Ukraine and a number of regulatory agencies (public service: veterinary and Phytosanitary, technical regulations, sanitary and epidemiological, plant quarantine, state inspections, on consumer protection, agriculture, environmental). From September 2014 began State vet services reorganization and related control structures and formation on their base of *the State Service of Ukraine on food safety and consumer protection* (The Cabinet of Ministers of Ukraine, 2015). Formation of its territorial network will be completed this year and they started in April 2016 to perform the functions of market surveillance of products displayed on the market. So take some time to master out its powers and functions, test them in practice (identify “bottlenecks”, inconsistency or duplication of functions, lack of competence) and make the necessary adjustments.

As for international organizations, their role has been particularly active in the second half of the 2000s, that is, when Ukraine has implemented programs and standardization work carried out to improve the current system of state regulation of food safety. The forms of support were different: funding projects to assess the situation in the sphere of technical regulation and preparation of proposals for the adaptation of the European model; Direct participation of Ukrainian specialists in various seminars abroad to study the experience of practical work and regulators; funding for the development of quality infrastructure in Ukraine; organization and financing directly in Ukraine conferences and seminars for experts on various topical issues of formation of food safety and more.

Active role in the financing of various projects and technical assistance received the following international organizations: the International Finance Corporation (IFC), World Bank Group, Canadian International Development Agency (CIDA), Agency for International Business and Cooperation EVD (EVD) and the Swedish Agency international development cooperation (SIDA). Performed projects “Business environment and enterprise development in Ukraine” and “The investment climate in Ukraine”. These and other projects ended specific conclusions and practical recommendations for public administration in relation to intensify the process of regulatory reform in Ukraine.

However, in 1997 the European Commission introduced a new tool for the integration of the regulatory framework in the EU legislation of beneficiaries *Twinning* (Twinning, n.d.). *Twinning* – a tool for institution building in the context of EU enlargement and a new form of direct technical cooperation between the authorities of the Member States and the EU to empower beneficiaries of state authorities, their structure, regulation and staffing and so on. Already implemented over two thousand projects *Twinning*, and CIS countries it has become available since 2005 (Tacis). Ukraine was one of the first, which were covered by this project. *Twinning* project can be both classic (up to 36 months and a budget of up to 2 mln. Euros) and lightweight (up to 6 months and a budget of 250 thousand Euros). With the implementation of the *Twinning* project the partners (partners) to share the benefits, including:

- Exchange of experience and knowledge based on equal communication between twinning partners (“between civil servants”);

- Implementation of best practice of the authorities of the Member States;
- Complementarity in the case of a consortium;
- Achieving compliance with national law in a particular field of EU norms and standards;
- Conducting training sessions, improving professional training and career opportunities;
- Establish long-term working relationships, professional networks to improve awareness of the country in the EU;
- Development and implementation of regulations that are adapted to the requirements of the EU and is a prerequisite for the implementation of agreements (joint agreements, action plans, integration into a common internal market of the European Union);
- Changes in organizational practices and culture, improve communication and coordination between the partners of the *Twinning* project and others.

One of the most important regulatory agencies, which provides communication infrastructure national accreditation with European and international, serving National Agency of Accreditation of Ukraine (NAAU). *This is a fundamental condition for achieving equivalence (mutual recognition) conformity assessment services to be provided and the Ukrainian and European and / or international conformity assessment bodies (CAB), accredited for this relevant accreditation bodies.* To domestic accredited CAB can provide conformity assessment services that would be recognized in Europe and worldwide, NAAU has become a regular member of ILAC and EA, should be – IAF. To this end NAAU was provided and continues to be given to various international aid.

To this we add that in 2015 the European Commission Directorate General of neighborhood and talks on expanding cooperation with NAAU held in Kyiv seminar on “European practice accreditation of conformity assessment bodies in the direction of food safety.” The seminar was attended by over a hundred professionals. The said direction of cooperation will also be actively used to improve Ukrainian institutions of various regulatory agencies.

2. European model for the safety of agricultural and food products

The system of food safety and animal feed, which is formed and functioning of the European Union, is the result of many rounds of lengthy negotiations and multilateral international agreements related to the regulation of international trade. The first of these is the GATT-47, after watching its provisions complement and expand GATT became 78, and already it updated version – GATT 94. The successor to GATT became the World Trade Organization (WTO), which was established in January 1995 after signing 15.04.1994 relevant multilateral agreements in the city Marrakech (Morocco). While the organization consisted of 128 countries in September 2015 were 161 WTO member country and the negotiations for it were still 22 countries. The negotiations on WTO accession Ukraine was launched 30/11/1993, and after compliance with all procedures and signing relevant documents 16.05.2008 it became a full member of this organization.

In the preamble to the Agreement Establishing the World Trade Organization (WTO Agreement) recognizes the right of every country to direct the development of trade and economic entrepreneurship to address such important tasks:

- Raising standards of living, ensuring full employment and a significant and steady growth of real income and effective demand;
- Expansion of production of goods and services and trade, taking into account the optimal

use of the world's resources in accordance with sustainable development;

- The desire to protect and preserve the environment and improve the means for doing so in a manner that is consistent with their respective needs and concerns at different levels of economic development;
- The desire to develop an integrated, stable and a longer multilateral trading system, covering GATT-94, previously achieved results of trade liberalization efforts, and the results of the Uruguay Round of multilateral trade negotiations 1986-1994 and others.

The preamble of the TBT Agreement, 94 (Technical Barriers to Trade) states that no country should be prevented from taking measures necessary to ensure the quality of its exports or protect the life or health of humans, animals or plants, protection the environment, or to prevent deceptive practices, at the levels it considers appropriate, subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where prevail the same conditions or a disguised restriction on international trade, and must comply with other provisions of this Agreement and others.

General principles and approaches to ensure the protection of life or health of humans, animals or plants, environmental protection, have found a specific introduction and implementation of the European Union. In this respect, the fundamental starting point – the nature and structure of sanitary measures envisaged SPS Agreement (*Appendix A, p. 1*), and their practical implementation, namely:

- All relevant laws, decrees, regulations, requirements and procedures including inter alia end product criteria;
- Production processes and production methods;
- Testing, inspection, certification and approval;
- Quarantine treatments including relevant requirements for the transport of animals or plants or to the materials necessary for their survival during transport;
- Provisions on relevant statistical methods, sampling procedures and methods of risk assessment;
- Requirements for packaging and labeling that are directly related to food safety.

With specific regard to businesses, for objective assessment mechanisms, tools and “technology” to guarantee the safety of food and animal feed advisable to seek legal and regulatory framework and the practical experience of the European Union.

You must be noted that food security is one of the cornerstones on which was formed and sought to provide its citizens the European Union. In particular, in order to develop concrete measures to build the EU internal market 28-29.06.1985 was published by the Council and approved by the White Paper “Completing the internal market” (Commission of the European Communities, 1985). The book contained about three hundred measures must realize the Commonwealth until 1992 and which were grouped into three main objectives, namely:

- a) Eliminate physical borders by refusing checks on persons and goods at internal borders;
- b) Elimination of technical frontiers, ie the elimination of barriers that existed in national regulations concerning the production of goods and services by harmonizing relevant standards or mutual recognition;
- c) The elimination of tax frontiers, such as overcoming obstacles caused by differences in indirect taxation, based on harmonization or convergence of rates of value added tax and excise duties.

Through all of the White Paper “Completing the internal market” is held idea of a new

concept of legal harmonization. According to it should happen harmonization of member states of the European Union and this should be a powerful impetus for the internal market and the transition to a common market.

Meanwhile, 07/05/1985 EU Council of Ministers adopted a resolution on a new approach to technical harmonization and standards. It included four main principles on which the new approach was based, in particular:

- a) harmonization of legislation is limited to establishing, by issuing directives, based on Article 100 of the Treaty establishing the European Economic Community, the essential safety requirements, compliance with which is mandatory (or other requirements in the interests of impersonal circle of people) to be met by products on the market which thus can move freely within the Community;
- b) the task of preparing the technical specifications needed for the production and introduction into the market circulation of goods that meet the basic requirements set by the Directive, given the current state of technology, relying on organizations competent in the field of standardization;
- c) These technical specifications are not mandatory and maintain the status of voluntary standards;
- d) However, public authorities are obliged to recognize that products manufactured in accordance with harmonized standards (in their absence – the requirements of national standards), deemed to meet “*essential requirements*” established by that Directive.

However, the implementation of key provisions of this resolution is possible, provided that the capacity of said system. You need to fulfill two conditions: first, to provide quality assurance standards in respect of “*essential requirements*” established by Directives; and secondly that public authorities fully held accountable for the safety (or other specified requirements) on its territory.

Another Resolution on the Global Approach to conformity assessment, the European Council adopted 21.12.1989. It was released additional fundamental principles, the most important of which are:

- a) a consistent approach in the EU legislation is ensured through the development of modules for the various phases of the conformity assessment procedures and by establishing criteria for the use of such procedures for identifying and notifying authorities for such procedures and for the use of CE marking; (Notification – formal registration certification body (CB) by the EU Commission in the official list of the EU by assigning appropriate number);
- b) the generalized use of European standards relating to quality assurance (standard series EN 29000) and the requirements to be fulfilled by the above relevant bodies (standards series EN 45000), the creation of accreditation systems and the use of techniques are actively distributed in all Member States as well as at the level of the Community.

Note that the series of European standards EN 29000 regulate the development of quality systems and EN 45000 – evaluation, quality system certification and accreditation of quality system certification. European standards series EN 29000 are analogous to international standards ISO 9000, which includes three standards describing three quality system, and twenty-two standards containing guidelines and guidelines for selecting and building systems, such as (latest version):

- ISO 9001: 2015. Quality Management System. Requirements;
- ISO 9002: 2008. Quality Management System. Model for quality assurance in production, installation and service;
- ISO 9003: 2008 Quality Management System. Model for quality assurance in control of the finished product and its trials.

In member states of the European Union national standards for quality systems is developed or created directly on the basis of ISO 9000 or refer to standards EN 29000 series. To the family of European Standards EN 45000 series includes:

- EN 45001. General requirements for the testing of laboratories;
- EN 45002. General requirements for assessment (certification) testing laboratories;
- EN 45003. General requirements for accreditation bodies laboratories;
- EN 45011. General requirements for bodies operating product certification;
- EN 45012. General requirements for bodies operating certification of quality systems;
- EN 45013. General requirements for bodies operating certification held certification of personnel;
- EN 45014. General requirements for the application of provider.

The essence of the Global Approach to conformity assessment, which was defined in the resolution of the Council of 21.12.1989, was the fact that, on the one hand, to provide the necessary conditions for reliable conformity assessment, and the second, to promote confidence between the parties to trade relations through competence and transparency of conformity assessment bodies. Thus, the main objective of this concept is to build confidence in the certification of suppliers to test results, the activities of control and authorized by the application of certification and accreditation. When using this procedure the participants of trade relations between producers and consumers will form the necessary confidence:

- The quality and safety of products;
- The quality and competence of the testing laboratory;
- The quality and competence of the certification body;
- The quality and competence of the bodies that accredit testing laboratories and certification bodies.

Thus, in the second half of the 1980-s was formed only institutional and legislative, regulatory and organizational framework of a common economic space and the regulatory environment, which created the necessary conditions for the organization of the common internal market in the European Union's borders. And in the 1990-s, carried out active development of quality infrastructure the main components of which were and are metrology, standardization and conformity assessment. At the same time, conformity assessment interacts with other fields, including: system management, accreditation and equivalence of accreditation of testing and calibration laboratories and certification bodies of products and services, quality management systems and environmental management, staff and of control between countries or industry associations, metrology, standardization and statistics and others.

It should be noted that since the early 90-s laid the basic foundations of security products, which later began to be differentiated by type of industrial goods. Crucial in this respect was the directive 92/59 EPC – on general product safety, which was confirmed following imperative: any consumer goods present on the national markets of the Member States EPC should be safe. This means that the product under normal or reasonably anticipated conditions of use, taking into account the life not cause risk or minimal risk to life and health. The magnitude of this risk is the general criterion of security of any consumer product. In assessing the risk included: product characteristics, including its composition, packaging, storage conditions; the impact of other goods in cases of joint use; clearance

labeling, instructions for use, information on the product provided by the manufacturer; category of consumers for whom the product is intended.

Directive 92/59/EPC applies to all products that are no industry guidelines and complements the national legislation in the part where it covers only certain aspects of safety. In the absence of sectoral directives goods in accordance with Directive 92/59/EPC, is considered safe if it meets national standards (standards). In the absence of a national standard for safety assessment can be used international standards adopted technical regulations and even science and technology. Requirements for product safety as producers are obliged to comply and those who provide their sales (transportation, storage, sale).

After nine years, it was recognized that Directive 92/59/EPC must make a number of amendments in order to complement, enhance or clarify some of its provisions in the light of experience acquired, new significant changes in the security of consumer products, and changes made to The contract, especially in article 152 on public health, and article 153 concerning consumer protection, and in the light of the precautionary principle. Therefore, in the interests of clarity, it was made a full review and adopted a new Directive of the European Parliament and of the Council 2001/95/EC – on general product safety (from 03.12.2001).

However, the formation of scientifically based legislative and regulatory foundations of modern infrastructure and quality has set the need to significantly improve the protection of consumers and their confidence in providing safe food. This was inspired by crises in the food industry, have been associated with acute outbreaks of diseases in farm animals (foot and mouth disease, transmissible like a sponge encephalopathy of cattle, poultry plague, sex hormones in pork, antibiotics in honey, dioxin in feed, eggs and poultry, etc.) (Gryshchenko, 2013). All this led to the development and study of new approaches to risk management in food safety and led to public debate. They were initiated by the “Green Book” (1997) and had led in January 2000 “White Paper on food safety” (White Paper on Food Safety). The basis of food safety on the principles underlying the new (1985) and Global (1989) approach.

It should be noted that in the European Union in the 1990 developed the following practices: development of the new bill is based on the so-called “White Paper» (White Paper), which often proceeds the “green book» (Green Paper). The latter is a document of the European Commission (EC) (Green Papers, 2006), the aim of which is to initiate public discussion and initiate a process of consultation at European level on specific topics, in particular in terms of social policy, the single currency, telecommunications and more. The result of these discussions and consultations may be later published “White Paper”, which is an official document of the European Commission. “White Paper” (2006) containing practical recommendations for Community action in certain sectors of the economy, developed by official agencies and experts in the relevant specialty. If the Council supports a “white book”, then it becomes a program of action of the European Union in the relevant industries.

“The White Paper on Food Safety” consists of nine chapters, summary and additions. The “White Paper” concept of food hygiene related not only to the final product, but also extended to the entire food chain, including primary production. These provisions are a key reference point in the formation of modern legal framework aimed at ensuring proper control in the production of food, animal feed and efficient control of their safety, the necessary basis for the creation of a unified and transparent system of food safety (SFS) throughout the food chain. The global and integrated approach to SFS provided with modern legal framework regulating clear duties and responsibilities of all participants in the food chain

according to the principle “from farm to fork” and involves the following basic points:

- *First*, based on food safety is the position on recognizing animal beings with feelings, and so manufacturers are obliged to take care of their terms in three areas: cultivation, transport and slaughter of animals. This is a complex concept covers all components of their animal health and nutrition, animal welfare, care about their welfare and permanent veterinary control, protection and plant health, compliance with health standards for processing and preparing food;
- *Secondly*, mandatory state control of all links in the chain of production and consumption of food, the safety of all kinds;
- *Third*, responsibility for compliance with the principles of safety is differentiated by all levels of government: a) European Commission (forming the legal basis and the obligatory organization of official controls); b) the national authorities (the organization comply with standards of the food business operator); c) the food business operators (compliance with manufacturers, suppliers and distributors within their responsibilities and minimizing risks);
- *Fourth*, to ensure respect for the health, safety, protection of economic and legal interests of consumers and their right to an objective and timely information;
- *Fifthly*, including consumers, as the final link of the food chain, in public discussion of food safety problems, learning new rules and requirements (personal responsibility for the proper storage, use and preparation of food), taking into account their wishes and comments at improving the system monitoring compliance with the principle of transparency in European politics of food safety at all levels in order to increase confidence in the producers of food resources etc.;
- *Sixth*, the implementation of the Commission of effective monitoring and evaluation of performance of national authorities, of their ability to implement effective biosafety system at both the country and direct food producers, as evidenced by the results of the examination (audit and inspection) some of them to determine the compliance of enterprises with the requirements of technical regulations and others.

“White Paper on food safety” issue also includes risk analysis, traceability and prevention of food hazards, such as (Tavlui, 2014):

- a) Risk analysis is considered as the foundation on which policy is based food safety. In addition, three separate steps apply risk analysis: risk assessment (economic advice and information analysis) risk management (legal supervision and evaluation system) and notification of risk (between all participants of the food chain);
- b) a prerequisite for a successful policy on food and feed have traceability of food products, their ingredients. Traceability must ensure that in the event of a health risk to consumers, you can take steps to retirement of relevant feed and food;
- c) when approving decisions on risk management, if possible, use preventive methods;
- d) for regulation at European Community level should take into account other important factors that are important to protect the health of consumers and to promote fair management in food trade. These factors include environmental issues, animal welfare, sustainable agriculture, consumer demands for quality products, providing true information and identify important characteristics of the product, including methods of processing and production.

It should be noted that the main provisions of the “White Paper on Food Safety” became an important foundation for the development in the first half of 2000 these years a number of regulations of higher authorities of the Community which were later called primary EU law and which are still in force. Among them, the most important are those that directly relate to the fundamental principles of food safety and scientific and metho-

dological support in their implementation in practice, including:

- Regulation (EU) №178/2002 “On determining the general principles and requirements of food Code for the establishment of food safety and the establishment of measures to comply with food safety”;
- Regulation №852/2004 of the European Parliament and the EU Council “On food hygiene”;
- Regulation (EU) № 853/2004 of the European Parliament and the Council “On establishing specific hygiene rules to be applied to food products of animal origin”;
- Regulation №854/2004 of the European Parliament and the EU Council “On departmental control certain products of animal origin intended for human consumption”;
- Regulation №882/2004 of the European Parliament and the EU Council “on official controls to ensure conformity with feed and food law, regulations, health and animal welfare”;
- Commission Regulation (EU) №2073/2005 “On the microbiological criteria applicable to foodstuffs”;
- Regulation (EU) № 764/2008 of the European Parliament and the Council “On establishing procedures for the application of certain national technical rules to products lawfully sold in another Member State and repealing Decision number 3052/95/EU.”

At the same time, it is necessary to draw attention to the fact that in parallel with the development of a new generation of regulations occurred and significant changes in relations between consumers of food and food producers, intermediaries and shopping centers. In order to overcome consumer mistrust quality, and most importantly – food safety began to play the crucial role of food-trading corporations, shopping malls, purchasing patterns and retail. This they began to implement a quality management system assessment and regulatory compliance capabilities for all participants of food production chain, including feed manufacturers. But the initial trade structure each put forward their own demands on suppliers of food and independently developed criteria for their evaluation. Checks, i.e. suppliers audits conducted various trade bodies several times a year, required considerable time and resources diverted staff from work and showed their very low efficiency. In this connection, suppliers of products or had to adapt to these requirements or implement it only in their retail outlets. When they were producers of large amounts of products, they have to deliver different commercial structures and adapt to the requirements of each of them, this created many problems objectively and put the necessity of unification.

Thus, in the early 2000 it was considered appropriate and necessary to create a unified assessment system vendor products. The solution to this current problem was first held in 2002 in Germany through the introduction of international standards for food (International Food Standard – IFS). This standard was widespread among the manufacturers own brands that supply products to retailers. Their certification for compliance with IFS suggests that proper quality management system is functionally capable, and proof of this is the certificate that was issued by the European Commission notified the certification center. Later began to develop other standards, including BRC Food, BRC I, HACCP, GlobalGAP, ISO 9001, ISO 14001, ISO 22000, FSSC, which, as demonstrated practices actually become an instrument of competition among suppliers to retailers and rapid promotion of its products market. Their defining characteristic is that each of them positioned higher than the previous level of guarantees not only quality but also product safety. Note that these standards differ orientation requirements (standard on a system or product), depth of use (horizontal

or vertical standard) and wide coverage (regional, national or international) (Tavlui, 2014).

In the basic regulations of the EU have been further developed, in-depth and detailed practical guidance a number of fundamental principles. In particular, Regulation (EC) №172/2002 of the European Parliament and of the Council (from 28.01.2002) were consistent and deep relationship and the implementation in practice these successive and interrelated terms: *risk-prevention traceability, transparency – food products and animal feed, international standards. We expand them more and taking into account practical direction.*

In section 1 “General principles of food law” Regulation 178/2002 (The European Parliament and of the Council, 2002, p. 5-10) *sets out common principles which form the legal basis of horizontal EU legislation.* They are based upon the achievement of common objectives in the area of food. These include (*a summary of the key provisions*):

- *Common tasks.* A legislation is system of food safety (SFS) pursues one or more of the general objectives of a high level of human life and health and consumer protection, and includes fair practices in food trade, taking into account, where appropriate, the protection of animal health and their conditions of detention, plant health and the environment. SFS aimed at achieving free movement of food and animal feed in the Community manufactured or sold in accordance with the general principles and requirements of this Chapter;
- *Risk analysis.* SFS is based on risk analysis except where this is not appropriate to the circumstances or nature of the event. Risk assessment should be based on the available scientific evidence and should be made independent, objective and transparent manner. Risk management should take into account the risk assessment, and in particular the conclusions Authority (European Food Safety Authority of products) other reasonable factors and the precautionary principle if requirements are appropriate, in order to achieve common objectives SFS ;
- *The precautionary principle.* In special circumstances, may be adopted interim measures of risk management needed to ensure a high level of health protection chosen by the EU, while waiting for further scientific information for a more comprehensive risk assessment. Measures taken based on the precautionary principle must be proportionate and no more restrictive of trade than is required to achieve a high level of health protection that the EU has chosen, taking into account other factors;
- *Consumer protection.* SFS is aimed at protecting the interests of consumers and facilitate the implementation of consumer competent choice about the foods that they consume. It aims to prevent: (a) fraudulent or deceptive practices; (B) the falsification of food; (C) any other practices which may mislead the consumer;
- *Principles of transparency* (Section 2) *include public consultation and public awareness.* Public consultation should be open and transparent and carried out directly or through representative bodies, during the preparation, evaluation and revision of SFS, except where the urgency of the issue does not allow this. If there are reasonable grounds to suspect that food or animal feed may pose a risk to human or animal health, depending on the nature, seriousness and degree of that risk, public authorities must begin to take the necessary steps to inform the public about the nature of risk health, identifying the most complete food or animal feed, or type of food or animal feed, the risk that they may present, and the measures that are taken or to be taken to prevent, reduce or eliminate this risk.

In section 3, “General obligations in the food trade” established *requirements for food and feed* (The European Parliament and of the Council, 2002), namely:

- *Food products and animal feed imported into the Community* for placing on the market within the Community must satisfy the relevant requirements SFS or conditions that are approved by the Community;
- *Food products and animal feed exported from the Community* or re-exported from the Community for placing on the market of a third country must satisfy the relevant requirements SFS, unless otherwise required by authorities of the importing country, or meet the established laws, regulations, standards, codes of practice, or other legal or administrative procedures in force in the importing country;
- *International standards*. Without prejudice to their rights and obligations, the Community and the Member States: (a) promote the development of international technical standards for food and animal feed, as well as the development of sanitary standards; (B) promote the coordination of standards for food and animal feed; (C) promote the development of agreements on recognition of the equivalence of specific measures relating to food and animal feed; (D) pay particular attention to the special development, financial and trade needs of developing countries, to ensure that international standards do not create unnecessary obstacles to exports from developing countries; e) promote consistency between SFS and international technical standards, ensuring in this way that a high level of protection, which is selected by the Community is not reduced.

In section 4, “General requirements of food law” *systematized requirements for food safety and animal feed, traceability and responsibility for compliance with the law* (The European Parliament and of the Council, 2002), especially major ones are:

- *Requirements for food safety*. Food should not be placed on the market if it is unsafe. Food products are considered hazardous if they: (a) are harmful to health; (B) unfit for human consumption;
- *Safety requirements for animal feed for the animals*. For animal feed if they are dangerous should not be placed on the market or fed to any farm animals. Animal feed considered dangerous for the intended use if they have a negative effect on human or animal health; make the food derived from animals are used for food, unsafe for human consumption;
- *Method of presentation*. Without prejudice to more specific provisions SFS, advertising and presentation of data on food or animal feed must not mislead the consumer;
- *Responsibility*. Operators whose activities are related to food and feed for animals at all stages of production, processing and distribution within the activities under their control must ensure that food and animal feed requirements SFS which of their activities and shall verify that such requirements;
- *Tracking*. The ability to track food and feed for animals used for food, and any substances intended for introduction into food or animal feed, should be ensured at all stages of production, processing and distribution. Market operators whose activities are linked to the food, feed for animals should be able to identify who supplied food, animal feed, animals used for food production, or any substance intended for administration to food or animal feed;
- *Responsibility for food*: food market operators (hereinafter – FMO).
 1. If FMO considers or has reason to believe that the foods that he has imported, produced, processed, manufactured or distributed without the requirements of food safety, it must immediately begin the withdrawal of food from the market and inform the competent authorities. If products could no longer reach the consumer – must effectively and accurately inform the consumers about the reasons for their withdrawal and recall back from consumers products already delivered to them when other measures are not

sufficient to achieve a high level of health protection.

2. FMO shall, within their respective activities, initiate procedures to withdraw from the market products that do not meet the requirements of food safety and promote food safety by transferring the relevant information required to track food and to cooperate in the case relevant trials.
 3. FMO shall immediately inform the competent authorities if foods that he put on the market may be harmful to human health; the measures taken to prevent risks to the final consumer and shall not prevent or discourage any person to cooperate with the competent authorities, if it can prevent, reduce or eliminate the risk that comes from food.
 4. FMO cooperate with the competent authorities in the implementation of measures to prevent or reduce the risks that are the food that they supply or supplied;
- *Responsibility for animal feed*, operators of market of forage are for animals (hereinafter – FMO).
1. If FMO considers or has reason to believe that the animal feed which it has imported, produced, processed, manufactured or distributed without satisfying the security requirements for animal feed, it must immediately begin the removal of animal feed from the market and inform competent authorities.
 2. FMO shall, within their respective activities, initiate procedures to withdraw from the market products that do not meet safety requirements for animal feed, and promote food safety by transferring the relevant information needed to track animal feed and collaborate if appropriate trials.
 3. FMO shall immediately inform the competent authorities if it considers or has reason to believe that the animal feed, which he put on the market can not meet the safety requirements for animal feed; the action taken to prevent risk arising from the use of animal feed and shall not prevent or discourage any person to cooperate with the competent authorities, if it can prevent, reduce or eliminate the risk that comes from animal feed.
 4. FMO should encourage the competent authorities in the implementation of measures to prevent risks, which are animal feed which they supply or set.

Opening the mandatory requirements of EU legislation for food and animal feed, and the associated problems and risks that have found their logical solution in Regulation (EU) number 178/2002 of the European Parliament and of the Council (from 28.01.2002) (The European Parliament and of the Council, 2002, p. 5-20), while it is necessary to draw attention to the organization prevent their occurrence in practice under conditions of food processing production. The most appropriate in this respect is codified in Regulation (EU) number 852/2004 of the European Parliament and the Council on the hygiene of foodstuffs (from 29.04.2004) Basic principles of safe agricultural and food products in the food chain (The European Parliament and of the Council, 2004), namely:

- Responsibility for food safety lies with the food industry;
- Is necessary to ensure food safety at all stages of the food chain, starting with primary production;
- It is important that food products that can not safely be stored at ambient air, especially for frozen food stored at one and the same temperature in all stages of the food chain;
- General procedures for the use of procedures based on HACCP principles, together with the use of critical hygiene practices should raise the level of responsibility in the food industry;
- Guides to good practice application is a valuable tool to assist food business operators at all

levels of the food chain in observing hygiene rules and the application of HACCP principles;

- Must determine microbiological criteria and temperature control requirements based on hazard assessments conducted by scientists;
- Need to ensure that imported products meet the EU requirements for food safety;
- Imported products have the same or similar standards of food hygiene, which are made in the EU.

It should be noted that for the period of time that has passed after the adoption of this resolution was developed and tested a number of diverse instruments pre-requisite programs (basic programs) and prevention of the emergence of risks and / or prevent or minimize their impact in case of detection. These requirements found necessary practical detail when developing standards and implementing their demands on enterprises in the EU member states, specialized in the production of food and / or feed for animals. However, given the need to monitor the progress of Ukraine to the European model of safety it is advisable to analyze the situation that emerged in the domestic agricultural sector is that concerns not only the food-processing facilities, but also at primary production entities.

3. A retrospective of the concepts of quality management and food safety in terms of market and planned economy.

It must be emphasized that as a result of the former USSR virtually independently of the global economy in the post-Soviet republics formed a unique management model production of quality products, which was based on the key provisions of the state standard (GOST), as shown above. However, the adaptation of post-Soviet Ukraine to regulatory approaches and basic principles which formed the base model technical regulation that has been successfully operating in the European Union encourages the search and use of adequate attitude to quality control systems that are introduced in the domestic agricultural and food sector. So, should more thoroughly analyze the approaches and principles on respect which formed the quality management system in a market economy in order to realize their positive characteristics for the Ukrainian economy.

In theoretical terms, the term “quality” is interpreted very broadly (quality of life, quality of climatic conditions) and relatively narrow (quality of goods and services). But in retrospect, the first priority was the issue of quality, later added and safety of food, and in the context of integration into the European Union in the first place came the safety of agricultural and food products. This is clearly seen in the transformation of Ukraine titles framework law on food safety:

- Law of Ukraine “On quality and safety of food products and raw materials” (from 23.12.1997 Number 771/97-VR);
- Law of Ukraine “On the safety and quality of food” (from 23.12.1997 771/97-VR as amended on 06.09.2005. The following amended);
- Law of Ukraine “On basic principles and requirements for safety and quality of food” (the Law of Ukraine “On amendments to some legislative acts of Ukraine concerning food» of 22/07/2014 1602-number UII).

However, the basis of quality control on the principle “to ensure compliance with regulations concerning product and manufacturing technology.” The structure of the regulations, which were set requirements for products and processes of manufacturing, included:

- *In the Soviet period (up to 1992)*, state (USSR) standards (GOST), national standards Ukrainian (NSU), standards-governmental organizations (mostly scientific and technical so-

cieties) standards enterprises, technical specifications for production;

- *In the period of independence of Ukraine (1992):* Standards of the USSR, which were legalized by granting them the status of international, i.e. CIS (GOST), state (1993 and national – since 2003) standards of Ukraine (SSU) harmonized national standards (GOST ISO; ISO EN), technical regulations, the laws of Ukraine on certain types of food, national standards (NS) industry standards (GATS), standards organizations of Ukraine (SOU) specifications for production.

Differentiated legal status of the above-mentioned regulations, varying degrees of responsibility for the violation, lack of coordination (gaps and / or overlapping) periods of validity and protracted timeframe force obsolete regulations require deep analysis of the situation in the field of standardization, technical regulation, management of safety and quality on the agricultural sector of Ukraine and taking into account the theoretical principles and experience of advanced countries.

In this regard, there was a problem to diagnose the formation of management quality and safety in terms of planning and the policy and market economic systems, as well as significant changes in the role of various regulatory documents to ensure compliance with the safety and quality of agricultural and food products.

Note that in today's globalized economic environment, one of the important tools of consumer loyalty to products in favor of its safety and quality, for which they are "voting with their wallets". Meanwhile, under the fierce competition in the markets of agricultural and food products should be aware that the quality of the product – it is only a derivative of a concept – "quality management" and "quality of" a synonym for which is "perfect" (organization, company or institution). In turn, the perfection of the agricultural enterprises – is not only quality products, but also reduce its cost, improve productivity, increase competitiveness, create new jobs and more (Buryak, 2013). For these reasons the view, however, more and more deeply analyze the development of theoretical and methodological principles of quality and safety of agricultural and food products in the light of the transformation of conceptual approaches, the introduction of the standards and technical regulations in processing food production in order to strict compliance with safety and quality of food products and evaluation of conformity. Particular attention should be paid to the implementation of quality management systems and safety based on national, European and international standards, and especially – the effectiveness and efficiency of their functioning in the modern world.

Systematics, synthesis and elaboration of conceptual approaches to quality management system took place at the turn of the nineteenth and twentieth centuries, when establishing the streaming (conveyor) industrial production and quality control has become an integral component. Note that the system management techniques as an object of research and international experience, it is thoroughly covered in the works of local and foreign (Buryak, 2013; Yakubovsky, 2014; Karpenko & Komkov, 2007). Among experienced professionals should draw attention to the work, which systematically singled out and different periods of the evolution of scientific principles and trends of quality management³⁰. In particular, the proposed transformation of the hierarchical model of quality management concepts, which are listed below, but of adjusting to modern scientific views and methodological approaches to this problem:

- *First* – early twentieth century. – The concept of control of production processes and technical parameters of production (continuous production control, culling of parts that do not meet the necessary requirements);

- *The second* – 20-40 years. XX century. – The concept of process-oriented management (statistical quality control methods, sampling, control Shuharta cards, table plans and sampling) in order to meet production requirements and regulatory parameters that are fixed in standards;
- *The third* – 50-60 years. XX century. – The concept of total quality control (Total Quality Control – TQC), Shuharta cycle, Deming (P – D – C – A: Plan – Plan, Do – carries, Check – checks, Act – Act); documenting the quality of regulation with a view to cooperation in quality between senior and middle managers and specialists of the department of quality, determine their powers and responsibilities; shift from simple detection of defects in output to prevent shortage during its production; introduction of certification by a third party. The trend shift from price factor of competition in the market to factor in the quality of goods;
- *The fourth* – 70-80 years. XX century. –The concept of comprehensive quality management (Total Quality Management – TQM); the concept of quality and flexibility; Deming System fourteen principles of quality management and its seven “deadly disease”. Development and implementation of international standards for quality management systems (ISO 9000 standard), providing evidence about the ability of enterprise customers maintain the quality. The trend shift from factor to factor quality goods quality used technology;
- *The fifth* – since early ‘90 of the twentieth century. – The concept of environmental protection and product safety, based on the emergence of a new generation of international quality standards (ISO 14000 series standards). They were set requirements for environmental protection and product safety as an adequate response to the challenges of globalization and the interests of society. The trend shift from technology to the quality factor of the quality of human resources, quality of education, quality of intellectual resources, quality of living areas and material well-being, and in the broadest sense – to improve the quality of life of society.

In 2000, the World Health Organization (World Health Organization – WHO) has developed, formulated and adopted the Global Strategy for Food Safety, whose mission is “reducing the proportion of diseases caused by food, the general level of public health and social environment” (Yakubovsky, 2014). Unlike the traditional approach (hazard evaluation directly from food) in the Global Strategy approach linked to the main focus on the concept of consideration and prevent occurrence of food risks at all levels of the chain for the production and supply of agricultural and food products to consumers.

With specific regard to the food industry, the long time it dominated the traditional methods, such as inspection and / or quality control of food products. The introduction of the system for controlling food safety associated with the beginning of the 1960s, when the development and production of food products for special purposes (for food astronaut during long interplanetary expeditions in space) used a system Hazard Analysis and Critical Control Points – HACCP (Latin – «Hazard Analysis and Critical Control Points»). HACCP concept was officially presented by «Pillsbury» in 1971 at the First American National Conference on

¹ Management System William Edwards Deming: a) **fourteen principles of Quality Management**: consistency purposes; new philosophy; away from dependence on mass control; end the practice of procurement for the cheapest price; enhance each process; type in practice training and retraining; leadership; banish fear, services, offices; discard the empty slogans and appeals; remove any number of rules and objectives; allow employees to be proud of their work; encourage the pursuit of education; commitment to improving the quality and effectiveness of senior management; b) **seven «deadly disease» Quality Management**: no permanent goal; focus on the short term; reliance on readily available information (and lack of focus on data collection for process improvement); annual assessment of competencies; frequent changes in management personnel; company focus solely on clear quantitative indicators; excessive medical costs and others.

Food Safety. Its main characteristic – compliance with two dominant principles to guarantee food safety: the principle of consideration and taking into account all stages of production and supply of food to consumers and the principle of identification and control of hazards. For almost half a century period it has proved its effectiveness, was approved and adopted by international organizations (*World Health Organization; Codex Alimentarius Commission; International Commission on microbiological food safety*). Its use allows you to move from test development to final product safety (preventive) measures, implementation of which is aimed at ensuring food safety in all links in the food chain under the concept “from farm to fork”.

This is regarding the origin, development and promotion methods of management system on the territory of Europe, the USA and Japan. As the experience breakthrough on the priority areas of technological support in some countries or regional units had their extension of their distribution in production, which were located in other associations of states.

As for Ukraine, as part of the former Soviet Union, it has accumulated in its economy virtually the entire range of tools, means and mechanisms of production management system and methods of production of quality products that were introduced at the enterprises of various branches of the All-Union national economy. But usually it passed with a certain lag from their introduction in the territory of other Soviet republics, in the first place – the Russian Federation. Priority was given to the military-industrial complex and the dominant sectors of industry (heavy and power engineering, to production of a wide range of vehicles, etc.). In particular, the beginning of the introduction of systematic approaches to quality management is considered the organization in 1955 at an aircraft factory in Saratov system of defect-free manufacturing products (*system ODFMP*), enterprises Gorky region in 1958 was introduced the system of “Quality, reliability resource of the first products” (*system QRROTFP*), the Yaroslavl engine plant in the 1962-1964 biennium. – A system of organization of work to improve the moto (system rules) and in almost the same period (1961-1967) – Lviv system defect-free work (*SDFW*). On the introduction of quality management system for processing-food enterprises had not yet discussed.

At the time the food industry was introduced first input control of raw materials and outgoing finished goods, although the technological requirements and held control throughout the processing chain. He covered the tracking values relevant quantitative and qualitative indicators that reflect the dynamics processing processes, in order to prevent deviations from normative parameters and/or their timely correction. For a long time the main means of control of the final product was an organoleptic method, which was carried out with the direct participation of specialists of the control and using human senses. But this method could identify only a limited number of indicators: appearance, taste and smell, consistency, internal structure, clarity (turbidity), etc., and moreover, when they lack credibility. However, in order to improve the reliability of control later on the basis of laboratory studies using physical and chemical methods have begun to analyze the situation and change the characteristics of food raw materials and finished products. However, these methods because of their of complexity, complexity and duration of the research have shown their inability and even ineffective. Under these conditions, only the introduction of modern physical methods (optical, electric, ultraviolet, thermal, etc.) allowed to change the situation.

At the same time, the emergence of various factors influenced a large number of microorganisms in the environment and transfer their activities directly in agricultural production is accompanied by bacterial contamination of food materials. Another reason

– failure to comply with sanitary conditions of production and storage of agricultural raw materials and is accompanied by the occurrence of oxidative processes, the appearance of various fungi and so on and so required of its microbiological research. These studies have been able to execute qualified and specialized only in the laboratory, and the establishment and accreditation of laboratories is possible only for large enterprises and organizations that belong to the state system of technical regulation and consumer protection. Since the range was accredited laboratories and is now very limited, we were only sample surveys.

Practice shows that of sensory, physical, chemical and microbiological control and the results of such studies can objectively assess the situation regarding the quality of a particular party food. However, the main problem was and is to prevent cases of food risks or minimize their consequences for consumers in every link of the food chain.

Thus, the transition to the industrial processing of food raw materials and the manufacture of the final product, i.e. for direct human nutrition problems guaranteeing its quality and safety, prevent risks to consumers pushed to the fore, acquired priority and became the subject of theoretical developments and teaching materials for their practical solutions.

In order to more adequate perception of progress in the implementation of quality system management, and later safety of agricultural and food products, detailing their essential features and characteristics of the different economic systems was developed paradigm. It covers a period of 60 years, when these methods began to be implemented in Ukraine, and still with the emphasis on the test range of areas (Table 1).

This fundamental change note the role of standards in ensuring compliance with regulatory requirements in the manufacture of products. Given the directive planned economy to comply with the standards of the USSR (GOST) were mandatory. “Non-compliance punishable by law” – this record was placed on the first page of each regulations. In the transition to market methods of managing the situation has changed (see Subsection 1).

In addition, the state withdrew from direct responsibility for controlling the production process – now responsible for all output and its regulatory compliance rests with the producer. However, in order to implement the assumed functions of product safety, it actively shapes public market surveillance system for trade in agricultural and food products on their compliance with the mandatory requirements.

Changed legal framework and practical nature of standards: mandatory from voluntary status he acquired for the manufacturer and it mainly regulated by quality products as well as the requirements for its production processes. The Law of Ukraine Food Safety (Verkhovna Rada of Ukraine, 2014) noted that *standard* – a document developed by consensus and approved by an authorized organization that sets the rules, guidelines or characteristics related activities or its results, including products processes or services, *compliance with which is optional*.

However, the responsibility for product safety performance relies on *technical regulations*. According to the Law of Ukraine (Verkhovna Rada of Ukraine, 2015) *technical regulations* – legal act, which defined product characteristics or their related processes and production methods, including relevant procedural provisions, *the observance of which is mandatory*.

Technical regulations approved by the Cabinet of Ministers of Ukraine have the status of regulations of direct action as the laws of Ukraine, and therefore their requirements are mandatory for compliance by all manufacturers. Note that in Ukraine on the basis of legislation of the European Union (ie EU directives and technical regulations) has

developed and adopted 46 technical regulations, including 40 technical regulations are mandatory for application (Vitkin, 2015). To implement the Law of Ukraine “On Technical Regulations and Conformity Assessment” (Verkhovna Rada of Ukraine, 2015), which came into force on 10.02.2016, it is necessary to prepare projects another 33 regulations and implement them in accordance with the applicable legislation.

However, it should be noted that until now remain valid specifications, although their state registration canceled. Technical requirements – a document approved by the market operator, which identifies the technical requirements for food and / or processes of production should be noted that “food business operator (hereinafter – *operator market*) – an entity that carries out activities for or without for-profit and which manages the power for which the primary production, manufacture, sale and / or turnover of food and / or other sanitation facilities (except for materials in contact with food), and is responsible for implementation of this Law and legislation on safety and some quality food. By operators are individuals, if they carry out activities for or not for-profit and engaged in the production and / or circulation of food or other objects of sanitary measures. Operator market agri-food market is also considered (Verkhovna Rada of Ukraine, 2014). So are entrepreneurs, engaged in cultivation of agricultural raw materials, its processing and production and sales of finished food products. We believe that the continuation of this normative document as technical conditions are a temporary measure, due to the diverse range of circumstances, including: the lack of standards for certain products and processes, exclusive products and foods, making them no threat to health or with minimal risk to consumers.

Table 1. PARADIGM [comparative characteristics] of the system to ensure safety and quality agricultural products with different [regulatory and market-based economic systems]*

Planned and administrative economic system (1960-1980)	A socially oriented market economic system (1990-2010)
1. The essence, the main mission of the chosen concept of quality/safety	
Orientation to compliance with applicable regulatory documents (agreements for production, routings, specifications and standards) in the process of growing of agricultural raw materials and their processing to production of finished food products	Focus on providing consumers with safe and high quality agricultural products and food products with the lowest cost of their cultivation and processing, to maximize profits
2. Legislative-methodical bases and medico-biological requirements and sanitary-hygienic standards	
Medical-biological requirements and sanitary norms of quality food raw materials and food from 01.08.1989 No. 5061-89 (Mbws); Addition to Mbws from 01.08.1989 No. 5061-89 (19.11.1991 No. 122-12/805); Sanitary rules and norms (SanPiN); Hygienic standards (GN); the Maximum permissible concentration (MPC) and approximate permissible levels (SDT) harmful substances, etc.	Agreement on the application of sanitary and phyto-sanitary measures (the SPS Agreement-94), together with the General agreement on tariffs and trade 1994 (GATT-47); Agreement on technical barriers to trade (TBT Agreement-78); Codex Alimentarius Commission; the New and Global approaches to establish a „common regulatory space“ on the territory of member countries of the European Union
3. Toolkit for implementation the concept of quality/safety	
Requirements of standards and specifications for raw materials and food products, which include quantitative and qualitative parameters of components and finished products, processing technology and storage conditions	Directives, Regulations, Decisions and Recommendations of the European Union, the international and European and harmonized national standards on safety and quality of agricultural products and food products

Planned and administrative economic system (1960-1980)	A socially oriented market economic system (1990-2010)
4. Management system (management) the quality/safety	
The system of integrated quality management: Dnipropetrovsk, Lviv and Sumy on the basis of standardization (all only for industrial, that is, with the exception of food industry enterprises)	<p>Modern management system: <i>ISO 9000 – series international standards, which systematized the requirements for quality management systems of organizations and enterprises (latest version of DSTU ISO 9001 : 2009 – quality management system);</i> <i>ISO 14000 series – environmental management system</i> <i>DSTU ISO 14001-97 the safety management system environment);</i> <i>HACCP – hazard analysis and critical control points (DSTU 4161-2003 system of food safety management. Requirements);</i> <i>ISO 22000 : 2005 (DSTU ISO 22000: 2007) system of food safety management. Requirements to all organizations in the food chain;</i> <i>Integrated management system – combining several standards and models to enhance synergistic effect</i></p>
5. The provision of „rights of citizenship“ control systems (management) the quality/safety certification bodies	
The introduction of certification of the functional systems of management of enterprises of Ukraine took place only in the late 1980s and in the absence of national authorities was carried out by international certification authorities	<p>International certification authorities: Bureau Veritas (1828), Lloyds Register of Shipping, Société Générale de Surveillance, German Lloyd, Det Norske Veritas, TUV Rheinland, American Petroleum Institut, Maritime Register of Shipping; National certification: UkrSEPRO (1996), Ukrainian Association for quality, a certification of management systems „PRIROST“</p>
6. The role of managerial staff (senior management) Enterprise	
The implementation of administrative measures to ensure the development and implementation of quality management systems (to improve the efficiency of production at industrial enterprise and training of staff efficient use of resources, accountability for work quality and btdcvctl products, putting the „first presentation“	The creation of a favorable moral climate in the company with the aim to improve the culture in the production, implementation and certification of safety management systems/quality, orientation of the team on the unconditional compliance with the system requirements process approach and constant improvement of security/quality arkaroola products
7. Focus safety/qualityProducts	
Low levels of defects (i.e. btdcvctl) industrial products	Orientation to satisfaction of needs in safe and quality food products based on the results of a survey of consumer demands and their customization
8. Control over observance of requirements of normative documents	
Representatives of Gosstandart of the USSR, Department of technical control of the enterprises through direct control of the quality of the production process, the departments of quality management based on the analysis of quality/defects of products, the development of plans for the improvement of quality of products and their implementation, conducting „Days of quality“	The implementation of the requirements contained in the international and European standards for manufacturers is voluntary, at the same time the technical regulations of the European Union, based on the requirements of standards, codes of practice and other regulations is a prerequisite

Planned and administrative economic system (1960-1980)	A socially oriented market economic system (1990-2010)
9. The role of engineering staff and shop workers	
Orientation to ensure strict adherence to the mainly quantitative rather than qualitative indicators of performance targets	Clear fulfillment of the requirements of HACCP, required documentation of the violations, their analysis and elimination. A phased implementation of HACCP according to the product specialisation of the enterprises – to 20.09.2019 G.
10. Methods of control	
Directive methods: certification of production on conformity to applicable regulatory requirements, evaluation of conformity of products to requirements of state Standards, approved specifications, and enforcing a stable level of quality during the entire product life cycle. The introduction of state acceptance of production on 1,5 thousand industrial enterprises (1987)	Product certification (self, consumer, third party), the functional certification of management systems (quality, safety, environmental protection, occupational safety and health, information security, social responsibility), state market control and supervision over execution of mandatory requirements arkaroola products
11. Responsibility for violation of requirements of normative documents	
On the first page of each normative document (GOST) always contained the following paragraph: „non-compliance is punishable by law“ – that is, its requirements are binding. However, they almost universally violated, even at the enterprises of the military-industrial complex. For non-compliance with standards practiced by the withdrawal of premiums, fines, administrative penalties	In case of discrepancy between arkaroola of production requirements, inspection shall be conducted for all food chain with the aim of identifying those parts where they are violated. Production shall be suspended until elimination of the violations established, and in difficult cases selected (cancelled) license or other document. Range of penalties: administrative and criminal liability, fines, seizure of goods not meeting the above requirements to a full stop of production. Dangerous products withdrawn from the market by the manufacturer and at his expense to dispose of
12. Markings or labeling of products	
GOST 1.9-67 „State sign of quality. The shape, size and manner of the use“ – to indicate a high quality series of domestic certified products (since 1967)	CE (FR. Conformité Européenne) – the European conformity (confirms the product conformity with European safety standards for human, property and environment); PDO (Protected Designation of Origin) – protected designation of origin (product, closely associated with its territory); PGI (Protected Geographical Indication) – protected geographical indication (product associated with its territory); TSG (Traditional Specialities Guaranteed) – traditional product (traditional production methods and guarantees compliance preparations); Organic farming – organic agriculture; Label Rouge Label Rouge: a high quality product; UKRAINE: „Quality“; BioLan the Biolan Ukraine „national conformity mark“; „a Good sign“

Planned and administrative economic system (1960-1980)	A socially oriented market economic system (1990-2010)
13. The ratings of companies and products	
Socialist competition for the fulfillment of planned indicators of production (per month, quarter, year, five years) between enterprises in the same industry, their internal organizational units (departments, shifts, teams, units, individual employees) compliance schedules summarizing production activities for a certain period of time and determining the winners	Models of perfection: the Japanese name Deming, an American named Baldrige, EFQM European (describes any organization using nine criteria: Leadership; Strategy; Staff; Partnership and resources; Processes, products and services; results that relate to Customers, Staff and Society; Key results. Criteria include 32 sub-criteria); Levels of enterprise excellence: recognition of excellence in Ukraine in Europe; quality Competitions: – national – international in CEE – award for excellence EFQM; the all-Ukrainian quality competition „100 best goods of Ukraine“ (held annually)
14. The effectiveness of the control systems (management) safety/quality	
Low and very low effectiveness of functioning of systems of governance due to the lack of competition between enterprises in terms of planning and policymaking of the economy and low motivation of interest of the employees in high results of their own work	The high efficiency of functioning of systems of management of the companies that received the certificate of the international certification authorities. Low productivity enterprises certificate on safety management system/quality issued the national certification bodies
15. Modern and functional model of management (management) safety/quality	
Zakonservirovat and brake to scientific and technical progress, the nature of the normative documents of the former USSR (GOST and TU) later played the role of a significant factor to justify a start (since the mid 90's those years) reconsideration of standards that were developed and approved prior to 1992, all in the power of intergovernmental normative documents or their cancellation, the harmonization of national standards with European and international regulatory documents and the like. At the end of 2015 the Fund of national standards in Ukraine was 30247 normative documents, which 9014 – harmonized with international and European standards. In the food sector of the total number of normative documents exceed 3,4 thousand, including the national more than 1.8 thousand of them harmonized – 0,9 thousand standards	<i>The system of certification producers of agricultural products pogarskiy:</i> <i>GlobalGAP (GAP – Good Agricultural Practice – good agricultural practice);</i> <i>„IFOAM basic standards concerning organic production and processing“;</i> <i>The corporate standards of food safety management:</i> <i>BRC (British Retail Consortium – the standard of the British retail consortium); IFC (International Food standard is an international standard of food production);</i> <i>Diagram FAMI-QS (Feed Ingredients and their Mixtures Quality System – feed ingredients and their mixtures quality system); GFSI (Global Food Safety Initiative – global initiative for food safety).</i>

Source: Developed by the authors.

Conditional denotations: №1-15 are the Essence is signs of the systems of safety / of quality of agrarian and food products

At the same time, it is necessary to draw attention to trends spreading in Ukraine at different periods of the implementation process of system management methods in the field of quality and food safety, and their efficiency and effectiveness. In this connection diagnostics identified and agreed for the time periods most remarkable characteristics of quality management systems, and later the safety of agricultural and food products (Table 1) allows you to organize and offer some important conclusions, and to link them with appropriate practice, introduced in this field foreign companies, including:

- In the Ukraine to the problems of threats to human health from food products increased attention on the part of scientists actively began to emerge after the accident – the spread of radionuclides in the environment, contamination of food raw materials, their storage and distribution differentiated between participants food chains, including man as the final link. Due attention is also paid to the development of standards on pollution raw food and ready-made food different types of radionuclides and heavy metals other harmful organisms, processing methods and methods to reduce their concentration and the establishment of minimum, maximum and standard values of different types of pollution and so on. Mostly these types of studies conducted allied scientific institutions in 80 years;
- Basic regulations medico-biological and hygienic nature of the agricultural raw materials and food products were released late the existence of the former USSR, but they are still in force, and in the absence of their own development is a period of time will perform its core regulatory function;
- The first positive examples of implementation of system management methods were actually introduced in Ukraine since the mid 90's. This was a result of the redemption of the food industry, which has been in collective ownership, foreign corporations and modernization of technical and technological base, involving the parent companies of foreign advanced technology, fully meet the requirements of European and international standards for production processes and products. Another option – building in Ukraine new enterprises based on modern European technologies;
- The first attempt to introduce systematic management methods in domestic enterprises took place in the early 2000s, that is, when really started out of the national economy with the economic crisis and the European Union was introduced only (internal) market for the smooth movement of goods between the Member States. However, insufficient professional level of national certification centers and low demand to companies that commissioned projects implementing quality management systems, to achieve the desired level of perfection of production had the effect of formal implementation. That is why, according to experts, more than 20% of certified quality management systems in Ukraine actually function (Kalyta, 2011).

In European countries, leading retailers and food companies develop and implement their own (private) standards that provide enhanced safety and quality of agricultural and food products than conventional. When it adopted the minimum safety guaranteed when implementing HACCP (The International Institute for Food Safety and Quality, 2010). On its own food production companies provide and the products of their suppliers require a certificate of conformity of management system standards and a certification schemes recognized by GFSI (Global Food Safety Initiative – Global Initiative for Food Safety) (Slyva, 2015). The key idea GFSI «Certified once – accepted everywhere» is that the company which has been certified for compliance with a standard recognized by the GFSI, no need to additionally certified by another equivalent standard. Today GFSI recognized these ten standards and certification schemes, including: FSSC 22000 (version dated October 2011); IFS Food Standard (version 6); BRC Global Standard (version 6); SQF CODE (7 publications, 2 level); Global Red Meat Standard (GRMS) (4 edition, version 4.1); GLOBAL GAP (version 4); Canada GAP Scheme (version 6); Global Aquaculture Alliance Seafood Processing Standard (2 edition of August 2012); PrimusGFS Standard (version 2.1 in December 2011); IFS PACsecure. In addition, GFSI recognized standards and certification

schemes that imposed on more than a dozen major companies producing food products and ingredients that are private, including: Hormel Foods Corporation, The Coca-Cola Company, Kraft Foods Inc. Migros, Danone, Sodexo and others.

Thus, in the member states of the European Union demands of consumers in terms of improving trust and confidence in product safety, reducing the likelihood of food risks go to a higher level and are implementing through the implementation of standards and certification schemes recognized by GFSI. Penetration of these companies in the food market demonstrates that Ukraine gradually included in the scope of their interests and it will encourage domestic agricultural producers to step up their efforts to implement modern business management systems.

4. Introduction of the management systems is on the enterprises of agrarian and food sector of Ukraine

One of the important indicators of promoting agricultural and food sector of Ukraine into the EU market may be the availability of certified accredited CAB functional management systems: safety, quality, environmental management. However, to recognize the functional role of systems management indicator of national agricultural and food sector integration in the internal market of the Community may, in our opinion, only strict compliance with several important preconditions (i.e. prerequisites), namely:

- *First*, the company should have advanced (modernized) technical and technological base that is able to produce a modern range of products that will meet the requirements of international and/or European regulations and be competitive in the food market of the Community;
- *Secondly*, the company officially introduced and certified safety management system (HACCP or ISO 22000: 2005 (ISO 4161-2003 Ukrainian version or of ISO 22000: 2007) or further introduced another (quality, environmental management) to create an integrated system accordance with applicable regulations;
- *Thirdly*, certification performed NAAU accredited conformity assessment bodies (CAB), specializing in conducting of certification of management systems;
- *Fourth*, local CAB accredited for compliance with the European EN 45012 “General requirements for bodies operating certification of quality systems” or the international standard ISO/IEC 17021: 2011 “Conformity assessment. Requirements for bodies operating audit and certification of management systems. “For management system certification of food additionally applicable requirements of the standard ISO/TS 22003 “management system of food safety. Requirements for organizations engaged in audit and certification of food safety management”;
- *Fifth*, the certificate issued to the enterprise management system is a key reason for its recognition in the member states of the European and international accreditation organizations EA and ILAC;
- *Sixth*, the presence of the company certified management system simplifies obtaining the certificate for compliance with food safety and quality requirements according to European requirements and the basis for the recognition of domestic products such that corresponds to the “essential requirements” Union harmonization legislation (“Blue Guide”, 2014).

Let us analyze the situation in the agricultural and food sector on the implementation of management systems for each component separately, namely industry for the production of food, beverages and tobacco products, as well as in agriculture, forestry and fisheries.

Table 2. Structural transformation industry manufacture of food products, beverages and tobacco products*

Name indicators	Unit measurement	2001	2006	2010	2013	2014	2014 to	
							2001	2010
1	2	3	4	5	6	7	8	9
1. The number of enterprises	Units	9079	8379	6551	6407	5528	60.8	84.3
2. Of them large and medium	Units	2398	2305	1358	1215	1051	43.8	77.3
3. The cost of fixed assets	mln.UAH	21454	50263	91985	116776	125745	In 5.8 times more	136.7
- depreciation of fixed assets	%	42.2	48.4	45.1	48.5	47.2	+5.0	+2.1
of them into sections:								
a) 10. Food production	mln.UAH	16540	38286	66309	82552	87559	in 5.3 times more	132.0
- depreciation of fixed assets	%	55.6	52.1	45.2	47.0	42.5	-13.1	-2.7
b) 11. The production of beverages	mln.UAH	4133	9744	22025	29132	32604	In 7.9 times more	148.0
- depreciation of fixed assets	%	36.4	38.4	44.5	55.1	62.5	+26.1	+ 18.0
c) 12. The production of tobacco products	mln.UAH	781	2233	3651	5092	5582	In 7.1 times more. + 13.1	152.8
- depreciation of fixed assets								
- depreciation of fixed assets	%	26.2	28.7	35.4	36.3	39.3	+ 13.1	+3.9
4. The number of full-time employees, including:	thousand people	548.5	566.7	417.9	402.4	349.4	63.7	83.6
- large and medium-sized enterprises	thousand people	478.6	520.0	369.6	358.6	313.2	65.4	84.7
- small businesses	thousand people	69.9	46.7	48.3	43.8	36.2	51.7	74.9

Source: Compiled and calculated by: (State Statistic Service of Ukraine, 2015; State Statistic Service of Ukraine, 2014; State Statistic Service of Ukraine, 2014, The Activity of entities of large...; State Statistic Service of Ukraine, 2015, The Activity of entities of large...).

The meat packing, food processing disclosed in *Table 2* statistics. In relatively better condition are companies that belong to the section 12 *Tobacco production*. Typically, they are part to the business entities with foreign capital, depreciation of fixed assets significantly lower than the bulk of enterprises – 39.3%, and therefore fitness for work exceeds 60%. Peak production potential updates with foreign technology took place in the middle of those 90 years and their further operation took place in strict compliance with the requirements for production technology tobacco products. All five large and medium-sized enterprises equipped with modern systems of management and therefore the prospect of their further operation is not burdened by special problems.

Diametrically opposite situation under 11. *Drinks production*: almost all large and medium-sized (more than 120) companies provided management systems (or they are introduced). But the very high rate of depreciation (62.5%) suggests that there is a clear distinction between entities with different backgrounds capital. In our view, companies with foreign capital are in a better position compared to facilities that are owned by entities of the national capital.

Note that the first of them – are businesses that were built in Ukraine since independence, or at different times bought in collective owners. By means of the new owners was carried out radical modernization of the main and auxiliary production and transport and procurement departments. Almost all production facilities equipped with certified systems management and employees engaged sufficiently proficient to perform their production duties that prevents output in violation of regulations. So just subgroup companies for the production of beverages with domestic capital and require special attention to identify strategies for further development. According to expert estimates, the number of medium-sized enterprises where no safety management system / quality is within 30-40 units.

Almost a similar situation in the 10. *Food production*: the number of large and medium-sized enterprises at 920 units. (Depreciation of fixed assets – 42.5%, and suitability for work exceeds 57%), the drop in depreciation OZ almost 5 pp. clearly correlated with the reduction of the number they more than three hundred of production capacity. This can be explained by the withdrawal fixed assets of the balance sheet entities. However, only 700 units, provided systems management, with a minority of them (foreign capital) is certified by the international certification centers, and more – in the home. The latter subgroup together with enterprises for the production of beverages where no management system just may be the ground on the selection and testing strategies for entry into the European economic environment, including mechanisms and instruments for adaptation (adapting) their facilities and products to the regulatory requirements of the European Union.

Note that at the beginning of 2016 (*Table 3*) functional management system implemented and certified at more than 700 enterprises, and the development and implementation stage – in about one hundred (820 in total for entrepreneurs). The structure of these functional systems control the number of specialized systems management amounted to:

- ISO 9000 (Ukrainian version of ISO 9001: 2009) – the requirements for quality management systems of organizations and enterprises (QMS), certified management systems – 413 units, In a state of development and implementation – 22 units;
- ISO 14000 (ISO ISO 14001-97) – Environmental Management System (Safety Management System Environment), respectively, 30 and 10 units;
- HACCP (ISO 4161-2003) – Hazard analysis and critical control points (system of food safety. Requirements), respectively, 279 and 91 units;
- ISO 22000: 2005 (ISO ISO 22000: 2007) – a system of food safety. Requirements for any organization in the food chain, respectively, 438 and 77 units.

Table 3. The prevalence of quality management systems and food safety in the food industry of Ukraine, units

The types of economic activity (food industry)	Implemented and/or is introduced the functional management system according to requirements of international standards:								Implemented and/or implemented functional management systems of all kinds:			Reference (2014): just the food industry
	ISO 9000		ISO 14000		HACCP		ISO 22000					
	In a state of development and implementation	Implemented (certified)	In a state of development and implementation	Implemented (certified)	In a state of development and implementation	Implemented (certified)	In a state of development and implementation	Implemented (certified)	just	including:		
organized										in stage introduction		
1	2	3	4	5	6	7	8	9	10	11	12	13
Meat	5	53	0	5	15	85	24	52	239	195	44	75 ⁰
Dairy	1	63	1	5	11	70	14	61	226	199	27	40 ¹
Distillery	1	52	0	4	4	20	2	14	97	90	7	10 ²
Alcohol	1	22	1	0	3	4	1	2	34	28	6	5 ⁵
Beer Soft	0	31	2	6	5	39	12	15	110	91	19	49 ⁶
Oil and fat	0	31	0	2	5	40	0	19	97	93	5	47 ¹
Sugar	2	19	1	1	4	6	3	8	44	34	10	9 ¹
Patisserie	7	33	1	2	11	43	5	26	128	104	24	11 ⁶
Canning	1	15	1	1	4	17	6	11	56	44	12	33 ⁵
Bakery and pasta	1	29	1	0	10	27	14	23	105	79	26	115 ⁸
Fish processing	0	7	0	0	1	20	0	13	41	40	1	19 ³
Other	3	58	2	4	4	67	10	35	183	164	19	136 ⁰
Only Ukraine	22	413	10	30	77	438	91	279	1360	1160	200	552 ⁸

Source: Internal data of the Department of food of Ministry of agrarian policy and food of Ukraine as of 01.01.2016.

Legend: ISO 9000 (latest version of DSTU ISO 9001: 2009) is a series of international standards, which systematized the requirements for quality management systems of organizations and enterprises (quality management system) ISO 14000 series (DSTU ISO 14001-97) – environmental management system (safety management system environmental); HACCP (DSTU 4161-2003) – analysis of hazards and critical control points (management system of food safety. Requirements); ISO 22000: 2005 (DSTU ISO 22000: 2007) system of food safety management. Requirements for any organizations of food chain.

Meanwhile, the share of management systems for functional groups was respectively: quality – 32% of environmental management – 3% safety (HACCP + ISO 22000) – 65%. In June 2014 the proportion was as follows (in%): 40: 1.8: more than 58.

Thus, a clear tendency that manufacturers prefer to implement safety management systems (where one and a half times more than the quality systems in general, and the number only those systems implemented – almost eight times more). Thus, recycling-food enterprises prefer the introduction of functional SME that minimize risk to market unsafe food.

Thus, the total number of 1.05 thousand. Large and medium-sized enterprises in almost 700 facilities implemented (or implemented) HACCP (or its equivalent – of ISO 22000: 2007), and in some cases – one or two other systems (ISO 9000 and/or ISO 14000). Consequently, the remaining food-processing facilities, including small and those where there are only a quality management system for safety or the environment, should ensure time-bound implementation of permanent procedures based on HACCP principles.

Note that the traditional approach to the assessment of the situation and prospects justify the introduction of HACCP in food processing enterprises (large and medium) was acceptable to the entry into force of the Law of Ukraine framework of food safety (Verkhovna Rada of Ukraine, 2014). It aims at the approximation of national systems guaranteeing food safety from European. At its core – differentiated responsibility of all participants in agricultural and food chain to ensure regulatory compliance on a “farm to table”, as well as clear procedures performed by HACCP. The main characteristic of food safety management is that for market operators clearly assigned responsibility: to ensure the traceability of the production of the final product on a “step back, step forward” (string control). In other words, the company must have accurate information about raw materials and other ingredients where and when they arrived, and in violation of the regulations concerning their safety or quality – to return to the supplier.

At the same time, the company must store information about where and who was sent to output, storage period which – three to six months after the closing date of implementation of the work was put on the packaging the labeling. This approach is much easier to find a particular culprit problems with safety and quality of food and other participants in the food chain – to prove their innocence, if necessary – to withdraw the items from sale.

Note that without a HACCP on agricultural and food sector enterprises Ukraine will not be able to implement the quota for the supply of products, as provided for by the Association Agreement EU-Ukraine. Meanwhile, deep and detailed analysis of the situation showed that today in agriculture has generated such biologically safe production sectors, namely:

- *Organic production*: about 300 operators of organic products and certified area of agricultural land exceeding 400 thousand ha;
- Production of environmentally friendly agricultural raw materials for the manufacture of baby food and dietetic 60 primary producers;
- *Primary producers in the holding company that is grown agricultural raw materials* for the production of safe and high quality agricultural and food products in compliance with harmonized national or European standards;
- *Primary producers, who introduced their own “pre-requisite programs”* and fully focused on the production of safe and quality food raw materials;
- *Primary producers in the composition of food-trading corporations* (ATB, large pocket, Eco-Pro-

ducts, Cocktail, BILLA, METRO, Novus, etc.), Grown safe and quality products and supply of commercial enterprises. Basic requirement: strict compliance with cultivation technologies, harvesting, delivery and timely implementation of these products.

Returning to the issue of implementation of HACCP note that it takes time and considerable resources. In this regard, the Law of Ukraine provides for entry into force of certain legislative provisions at different times. Given this conduct groups of enterprises by types of processed foods and depending on their size.

We emphasize that the law of Ukraine (Verkhovna Rada of Ukraine, 2014) by market operators assigned responsibility for implementation of legislation on individual safety and quality of food within the activities they carry out. By operators include entities engaged in primary production, production and/or circulation of food and other sanitation facilities. Since primary production (production and growing production, including harvesting, milking, breeding animals to slaughter, hunting animals, fishing and harvesting wild plants), its application is not mandatory, the agricultural producers can use flexible or simplified application procedures based on HACCP principles and approaches (the so-called basic program or programs required prior actions), provided low risk for food safety (International Organization for Standardization, 2011). Similar programs have previously applied for those processing food facilities in which no functional management system, including small businesses (International Organization for Standardization, 2009), in order to determine their readiness for implementation of HACCP. In the case of lack of training – for them previously implemented programs required prior actions (program prerequisites). Only in this way can ensure compliance with regulatory requirements for safety and quality of the final agricultural and food production policies in the EU.

Approximate number of food-processing enterprises in three groups, selected in accordance with the terms set by law implementing HACCP (Verkhovna Rada of Ukraine, 2014), is:

- *The first group* – facilities that carry out activities with food, which is a part of the raw ingredients of animal origin (except small capacity). The codes for the classification of types of economic activity CTEA-2010: 10.1 – meat and meat products; 10.2 – Processing and preserving of fish, crustaceans and molluscs; 10.5 – production of dairy products. Terms implementation of HACCP – until 20.09.2017. Number of capacity – about 200 units. Should be implemented – about 50 units;
 - *Second group* facilities that carry out activities with food, which included no raw ingredients of animal origin (except small capacity)*. Terms implementation of HACCP – until 09.20.2018 p. Codes for NACE 2010: 10 – food production; 11 – Beverages; 12 – manufacture of tobacco products. Number under CTEA 2010 (a difference of terms) = $(10 + 11 + 12) - (10.1 + 10.2 + 10.5)$ = more than 800 units. Should be implemented – about 250 units;
 - *The third group* small capacity***. Terms implementation of HACCP – until 09.20.2019 g, Total – about 4.5 thousand units, including without micro (up to 10 employees) – 1.2 thousand units.
- * The rest of the food-processing facilities (except small capacity). Note that *raw ingredients of animal origin* completely correlate with the definition under the Law of Ukraine the following phrases: *unprocessed food product* – a food which had not been processed, in addition to severing, cutting, separation of bone cutting, breaking, skinning, cleaning, tryminhu, removal or other shell membrane, cooling, freezing and thawing;

** According to the Law of Ukraine (Verkhovna Rada of Ukraine, 2014), *small power* – power that supply food products to the final consumer, are no more than ten people working staff, occupying an area of no more than 400 square meters, or power, which do not provide food to the final consumer and have no more than five people working staff. This definition in terms of the number of working staff (no more than ten people) coincides with the definition of micro, imposed by the State Statistics of Ukraine, but other parameters – completely different. That is why our study assume that the number of small capacity corresponding to the number of small businesses. But for a comprehensive assessment of the situation it is necessary to conduct a special survey of small businesses on a specially designed program.

To guarantee the safe production of agricultural and food products for domestic enterprises is appropriate to apply advanced foreign experience implementing HACCP. The main requirement – to ensure the effective functioning HACCP should be conducted before evaluating specific production readiness on the possibility of its implementation. In case of non-production with the minimum requirements – must develop and implement a number of measures for special purposes, based on codes of established practice and procedures of modern sanitary control. In this regard, priority attention should be given to companies included in the I (first) group (meat, dairy and fish products) and where no SMS (safety management system) for which the Law of Ukraine (Verkhovna Rada of Ukraine, 2014) determined the final HACCP implementation date – 20/09/2017.

Experience in businesses where implemented and operated SMB food shows the following. Just the owners of food-processing facilities, where so far no SMbs in this regard and should actively pursue practical action designed to radically improve the situation. They should be a catalyst for positive change in the areas of production and procurement of safe and quality food raw materials. The aim is to provide the necessary assistance to producers of meat, dairy and fish raw materials, which will then proceed for further processing and production of finished food products. However, food-processing enterprises should actively participate in the implementation of pre-requisite programs and maintain appropriate conditions for the functioning capacities relating not only primary production, but also other relevant sub-level agricultural and food chain, including (The Ministry of Agrarian Policy and Food of Ukraine, 2012).

2.4. *Program prerequisites, HACCP system should cover the following processes:*

- 2.4.1. Proper planning of production, auxiliary and amenity rooms to avoid cross-contamination;
- 2.4.2. Requirements for state facilities, equipment, repairs, maintenance of equipment, calibration, etc., as well as measures to protect food from contamination and impurities;
- 2.4.3. Requirements for state planning and communications – ventilation, water supply, electricity and gas supply, lighting, etc.
- 2.4.4. The safety of water, ice, steam, auxiliary materials for processing (processing) of food products, objects and materials in contact with food;
- 2.4.5. Clean surfaces (procedures for cleaning, washing and disinfection of production, auxiliary and domestic buildings and other surfaces);
- 2.4.6. Health and hygiene personnel;
- 2.4.7. Protect product from impurities; waste production and waste, their collection and removal from power;

2.4.8. Control of pests, determining the type, prevent their occurrence, means of prevention and control;

2.4.9. Storage and use of toxic compounds and substances;

2.4.10. Specifications (requirements) to control raw materials and suppliers;

2.4.11. Storage and transportation;

2.4.12. Control of the process;

2.4.13. Labelling of food and consumer awareness.

The implementation of these objectives with a view to ensuring compliance processes possible if:

- *Firstly*, the modernization of technical and technological basis of agricultural and food processing, manufacturing and introduction of modern management of production processes;
- *Secondly*, to ensure compliance with market operators engaged in primary production, and use of power, to which the production and / or circulation of food products, the level of sanitary requirements provided for by Article VII Law of Ukraine (Verkhovna Rada of Ukraine, 2014);
- *Thirdly*, the formation of a modern system of traceability of raw materials (indicators of quality and safety) systems procurement (purchase) of raw materials and other ingredients, system sales of the finished product;
- *Fourth*, training, professional development and training of technical personnel to the new conditions of industrial activity and the introduction of personal responsibility for the improper performance of professional duties and so on. Personal responsibility for the technical staff responsible and conscientious performance of their duties in accordance with the staff list and in accordance with the requirements SMB tracking parameters critical control points (CCP) production process and prompt response to their rejection – is the “alpha and omega” system safety management agricultural and food products.

Development and implementation of these measures requires some investment and training for responsible use of the above good practice. Given the limited time to introduce all the rules above Law of Ukraine (Verkhovna Rada of Ukraine, 2014), the main producers for final food products, in our opinion, are three possible approaches to the preparation and selection of models in plain-term (i.e. two to four years):

- *Seek financial and material resources* for the drafting of innovation and technological modernization, and its implementation in order to drive recycling, food production to a new level, and the design, implementation and certification of SMBs;
- *Most of the remaining potential capacity*, operated, and the entry into force of the said rules – to stop and dismantle production. This does not exclude such an option as the construction on land liberated from outdated facilities, the new enterprise using modern technology;
- *To amend the existing quality management system* and / or environmental management system for environmental safety (i.e., the creation of integrated systems) during the relevant works to bring manufacturing to regulatory requirements that are implemented and respected in the European Union.

In this context, there is reason to evaluate and prospects of agricultural producers: a large part of them can adapt to the new requirements of the modern globalized production, the second – will be focused only on the needs of families in organic food crops and backyard livestock, and others – gradually closes production, and quite often due to the absence of the younger generation for its maintaining, and often to complete its liquidation.

However, for a group of operators (The Ministry of Agrarian Policy and Food of Ukraine, 2012) possible and appropriate to implement procedures based on HACCP principles, providing simplified their use in all cases given species (nature) process technology, which provides operators, and sizes of power. Requirements for the development, implementation and effective enforcement procedures under the simplified approach must be proportionate to the risk. In determining the applicability of a simplified approach to procedures accounted for hazards associated with process and food product, the likelihood of their impact on food safety.

Control of hazardous factors provided simplified equivalent measures that are effective in the application of procedures based on HACCP principles. In facilities with low risk (not made preparation, handling or processing of food) hazards can be controlled through the use of assumptions. In such cases it is sufficient only application of the principle of 1 HACCP “hazard analysis” and not allowed to use other principles of HACCP.

4.5. *These facilities may include (list is not exhaustive):*

4.5.1. Movable and / or temporary facilities (tents, kiosks, counters, moving vehicles to trade);

4.5.2. Power, exercising and cooking for beverages (bars, coffee shops, etc.);

4.5.3. The capacity of performing simple process steps for the preparation of food (such as cutting), provided that the proper prerequisites programs, such operations;

4.5.4. Power, transport or store pre-packaged foods or foods that do not spoil quickly (long term storage).

In implementing these models perspective of the vast majority of food-processing enterprises and entities of initial production will be adapted to European regulatory space, and their products – to flow freely on the food markets of the Member States.

At the same time, it is necessary to draw attention to the fact that in the implementation of HACCP has the right to exist and this food is that it can definitely be described as low quality, that is manufactured using low content of natural ingredients, various additives and substitutes (soy, cereals) etc. However, its safety for consumers must be guaranteed, and the composition of the product for certain listed on the label. But if the manufacturer will bring to market unsafe food, then for such violations under the framework of the Law of Ukraine food security (Verkhovna Rada of Ukraine, 2014) provides for the imposition of fines, which significantly increased compared to the previous size.

5. Epilogue [summarizing results of integration of agro-food sector of Ukraine into the European Union internal market]

In the food industry, there are about 5.6 thousand companies, including:

- Large and medium-sized enterprises – 1.05 thousand employing 313.2 thousand employees;
- Small businesses: the number – about 4500 units, Including without micro (up to 10 employees) – 1200 units, where generally employed 36.2 thousand workers.

In the primary production (agriculture, forestry and fisheries) are more than 46 thousand economic structures, including rustic – 44 ths. business entities, including:

- Large enterprises – 28 units and more than 46 thousand employees;
- Average – about 2.6 thousand companies and about 0.3 ths. individual entrepreneurs (IEP), where there are more than 360 thousand employees;

- Small (not micro) – About 4.5 thousand companies and about one thousand individual and micro enterprises (up to 10 employees and payroll) – respectively about 10 thousand. And nearly 25 thousand, where there are over 150 thousand employees.

In *Table 4* the results of targeted government agencies at various levels are summerized, industry associations agricultural and food sector and interested companies, whose efforts since the late 1990s were aimed at ensuring the transition from post-regulatory system in the European base model technical regulations. The first – a model of rigid state control over compliance with requirements of state standards (SS) at each company, and the second – the base model technical regulations established and successfully operates in the European Union. Its fundamental difference – the entire responsibility for compliance with regulatory safety parameters coined production relies on the manufacturer, which it produces, and the quality – the consumer that it is buying according to your preferences and depending on their financial capabilities. In *Table 4* the results of targeted government agencies at various levels are summerized, industry associations of the agricultural sector and interested companies whose efforts are focused on ensuring the transition from the post-Soviet model of rigid state control over compliance with requirements of SSU SS every enterprise to the European base model technical regulations when the responsibility for compliance with regulatory safety parameters coined production relies on products that it produces, and the quality – the consumer, which it buys according to their preferences and depending on their financial capabilities. With specific regard to technical regulations, over the first five main components is a significant advancement and approaching the final phase, and the sixth – level access to practical creation of system of market surveillance for compliance with the mandatory requirements of the food production industry. To ensure the formation of public market surveillance need at least one year of practical work and on its results – adjusting the legal framework, improving the territorial structure, professional development specialists, forming the image of the territory of the EU, WTO and other international organizations as a reliable national market surveillance authority issued certificates that can be trusted fully.

These indicators (p.7 *Table 4*) apply only to food, beverages and tobacco, for which the NASSR system is mandatory. However, since the primary production (production and growing production, including harvesting, milking, breeding animals to slaughter, hunting animals, fishing and harvesting wild plants), its application is not mandatory, the agricultural producers (p. 8 *Table 4*) can use flexible or simplified application procedures based on HACCP principles (so-called basic program or programs required prior actions), provided for low-risk product safety (International Organization for Standardization, 2011). Similar programs have previously applied for those processing food facilities where no functional management system, including small (International Organization for Standardization, 2009), in order to determine their readiness for implementation of HACCP. In the case of establishment of unpreparedness, then they also previously implemented programs required prior actions or basic programs. Note that the basic program (program prerequisites) HACCP into account the following (The Ministry of Agrarian Policy and Food of Ukraine, 2012):

- The use of pre-requisite programs HACCP involves the development and implementation of procedures for market operators hygiene throughout the food chain that are necessary for the production and supply of safe food for human consumption, as well as the rules for handling food;

- Program prerequisites are mandatory and are designed for efficient functioning of the food safety and control hazards and should be developed, documented and fully implemented by market operators before applying the HACCP system. The scope of the pre-requisite programs should cover all potential threats to safety. Only in this way can ensure compliance with regulatory requirements for safety and quality of the final agricultural and food production policies in the EU.

Table 4. Summarizing the results of the convergence of national technical regulation system [TRS] for food complex with the base model of the EU and implementation of functional systems management, basic programs and simplified procedures based on HACCP principles in the agricultural sector of Ukraine

Situation at the end of April 2016	Should be developed (to implement)
1. Legislative and regulatory framework	
adopted and enacted about 50 laws of Ukraine (basic, framework of food safety for certain types of products, control of economic activity);	Adopt and implement more than a dozen draft laws of Ukraine, including key, „On state control in the field of safety and quality of food and feed, animal welfare,“ etc.;
2. Harmonization of national database standards	
National standards base includes 30 thousand. Regulations, of which harmonized with European 10 thousand. And 13,5 thousand. SS and SSU SS, the validity of which was canceled in December 2015 year, but extended to early 2018 year to business was able to adapt to new conditions;	To prevent „legal chaos“ in 2018 need to implement a range of measures: - Divide the requirements of SS and SSU SS required to (fix technical regulations (TR) and voluntary (Pin to national standards); - Develop plans and estimate the volume of work for Standardization (SS revision and elaboration TR); - To seek funds for the work of standardization (development of national standards and TR);
3. Development of technical regulations	
Approved 50 technical regulations, of which 46 developed based on the regulations of the EU (40 – required for use);	Resume work for Standardization (TR sector): - See „mothballed“ laws for certain types of food and implement them; - To refine the list of technical regulations on the safety of agricultural and food products and to develop in a matter of priority; - Complete development of „dormant“ and expand the work to develop new TR;
4. Accreditation of conformity assessment bodies	
Accredited in accordance with the requirements of harmonized national and international standards 620 of Conformity Assessment Bodies (CAB);	It should intensify work to bring into line with the requirements of harmonized national and international standards and conduct accreditation at the CAB 340;

Situation at the end of April 2016	Should be developed (to implement)
5. Conformity assessment procedure	
<p>- Conformity assessment – proving that the requirements for product, process, system, person or body made by testing, monitoring or certification;</p> <p>- Conformity – issue a declaration of conformity (certificate of conformity) based on a decision that is taken after appropriate (necessary) conformity assessment procedures that have proven to their satisfaction;</p> <p>Number of claims TRS components Name situation at the end of April 2016 should be developed (to implement)</p>	<p>To ensure equivalence (unity) test results and their mutual recognition must sign an agreement on mutual recognition between NAAU (National Accreditation Agency of Ukraine) and ILAC (International Laboratory Accreditation Cooperation), which will remove barriers (re-testing products) at moving goods between countries that are signatories to this Agreement (about one hundred countries). This agreement was signed with the European Association for Accreditation (EA). Members of EA today has 26 member states of the European Union;</p>
6. State market supervision of compliance with regulations	
<p>Cabinet of Ministers of Ukraine „On optimization of central authorities“ (from 10.09.2014 year №442) established State Service of Ukraine on Food Safety and Consumer Protection (State Border Guard Service of Ukraine) by the State Veterinary and service and liquidated State Border Guard Service of Ukraine, Sanitary-epidemiological service Inspectorate sanitary-epidemiological service</p>	<p>To ensure the success of the new service must:</p> <ul style="list-style-type: none"> - Complete reorganization and / or liquidation of regional offices and liquidated inspection service; - Complete filling staff vacancies in management, institutions and organizations in the regions, cities and districts; - To provide the necessary facilities departments and institutions where they do not exist; - Provide adequate funding (about 1 bln. USD)
7. Implementing functional management systems in the food industry	
<p>Management system introduced functional management systems:</p> <p>ISO 9000 (Ukrainian version of SSU ISO 9001: 2009) – the requirements for quality management systems of organizations and enterprises (QMS), certified systems – 413 units., In a state of development and implementation – 22 units.;</p> <p>ISO 14000 (SSU ISO 14001-97) – Environmental Management System (Safety Management System Environment): 30 and 10 units.;</p> <p>HACCP (SSU 4161-2003) – Hazard analysis and critical control points (system of food safety. Requirements): 279 and 91 units.;</p> <p>ISO 22000: 2005 (SSU ISO 22000: 2007) – a system of food safety. Requirements for any organization in the food chain: 438 and 77 units.</p>	<p>It is necessary to introduce functional:</p> <ul style="list-style-type: none"> - Facilities that carry out activities with food, which is a part of the raw ingredients of animal origin (except small capacity) *. Terms implementation of HACCP – until 20.09.2017 year. Number of capacity – about 200 units.; - Facilities that carry out activities with food, which included no raw ingredients of animal origin (except small capacity). Terms implementation of HACCP – until 20.09.2018 year. Number – more than 800 units.; - Small capacity. Terms implementation of HACCP – until 09.20.2019 year. The total amount – about 4.5 thousand units., Including without micro (up to 10 employees) – 1200 units.; <p>* The rest of the food-processing facilities (except small capacity). Note that raw ingredients of animal origin completely correlate with the definition under the framework of the Law of Ukraine on food safety following phrases: unprocessed food product – a food which had not been processed, in addition to severing, cutting, separation of bone cutting, breaking, removing the skin, removal or other shell membrane, cooling, freezing and thawing;</p>

Situation at the end of April 2016	Should be developed (to implement)
8. Implementation of basic programs and simplified procedures based on HACCP principles in primary production	
Introduced various functional management system, baseline programs and simplified procedures based on HACCP principles in primary production, estimated at about a thousand farms	should be implemented basic programs and simplified procedures based on HACCP principles in primary production for more than 40 thousands of businesses primary production. Of them: - Average – about 2600 enterprises and about 0.3 thousand individual entrepreneurs; - Small (not micro) – About 4,500 companies and nearly one thousand individual entrepreneurs and micro enterprises (up to 10 employees and individual entrepreneurs) – respectively about 10 thousand and nearly 27 thousand.

Source: developed by the authors.

It should be noted that as the proportion of primary production enterprises, which introduced functional management system, estimated a few percent, but now they do not have a significant impact on the situation in the production of food raw materials.

So, except operators of food and feed business where functional management system already certified or in the process of practically all natural and legal persons involved in the production and / or treatment facilities sanitary measures (food, animals, intended for human consumption, and for processing aids and materials in contact with food), subject to the introduction of basic programs and functional safety management system (HACCP and SSU ISO 22000: 2007). The deadline for implementation set by the Law of Ukraine framework of food safety – until September 2019 year. So here is just a matter of priority efforts should target economic entities of the agricultural sector to solve the problem.

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PART 3.

*THE ROLE OF MARKETING
IN MANAGEMENT BY
MANUFACTURING
STRUCTURES OF THE
AGROINDUSTRIAL SECTOR*

Chapter 3.1.

MARKETING OF SUGAR INDUSTRY IN UKRAINE

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1. Tendencies of Market Development of Plant Output

Crop production has always been and remains the main industry of the agricultural sector of Ukraine, which ensures not only food security of the country, but also export of agricultural foodstuff. To provide the population with the produce of both crop and animal origin depends on the development of this industry. There are all necessary conditions: fertile soils, favorable climatic conditions, larger domestic and foreign markets, favorable geopolitical position of Ukraine in the middle of Europe, the availability of seaports, etc. And yet, the dynamic development of crop industry does not provide the population of the country with animal products, which leads to the necessity to balance consumer market through a large part of pork import.

At the same time the production efficiency of crop industry is insufficient. Therefore, external economic activity for Ukrainian producers plays a primary role both in the context of crop production export and its processed output, and import regulation in accordance with the requirements of the World Trade Organization.

It is worth mentioning that those achievements, which are associated with the development of domestic market of plant production output in the conditions of constant transformations, require further research. The search of external segments of the world food markets and the presence of the domestic agricultural products there become more and more important.

In Ukraine in the early 90ties of XX century, during the transition to market relations, the conditions of free pricing were created for all branches of the national economy, and approximately commercial values were introduced for agriculture; they grew much slower than those of goods and services consumed in agriculture, which resulted in price disparity in favor of farmers. This, in turn, affected the structure of sown areas of agricultural crops, namely the increase of industrial crops due to their higher profitability.

Thus a noticeable increase of an industrial crop share in the total sown area of agricultural crops in 2001-2016 was recorded – 13.5% in 2001 to 32.3% in 2016 (*Table 1*) (State Statistics Committee of Ukraine, 2001; State Statistics Committee of Ukraine, 2005; State Statistics Committee of Ukraine, 2015; State Statistics Committee of Ukraine, 2016). Share of industrial crops is increasing in total sown area was due to the expansion of sown areas under sunflower – 9.0% in 2001 to 22.1% in 2016 and the emergence from the 2008 soybeans and rapeseed crops – to 6.9% and 1.7% in 2016 respectively.

The share of grain and leguminous plants decreased – 55.8% in 2001 to 53.6% in 2016. Besides, the share of food crops decreased – 32.8% in 2001 to 24.9% in 2016, while the share of grain forage crops increased – 23.0% in 2001 to 28.7% in 2016.

A considerable decrease of forage crop share – 22.8% in 2001 to 7.2% in 2016 was recorded, which had a negative impact on the development of livestock production in Ukraine. The structure of sown areas remains almost unchanged concerning potato and vegetable and melon crops – 7.9% in 2001 to 6.9% in 2016 (State Statistics Committee of Ukraine, 2001; State Statistics Committee of Ukraine, 2005; State Statistics Committee of Ukraine, 2015; State Statistics Committee of Ukraine, 2016).

Table 1. Structure of agricultural crops sown area in Ukraine by the 2001-2016 [farms of all categories]

Agricultural crop	Structure of sown area by the years, %				
	2001	2005	2014	2015	2016
Grain and leguminous crops including:	55.8	57.6	54.3	54.7	53.6
food	32.8	30.3	24.0	27.2	24.9
wheat (winter and spring)	25.5	25.6	22.3	25.5	23.2
rye (winter and spring)	3.3	2.4	0.7	0.6	0.5
rice	0.1	0.1	0	0.1	0.1
millet	1.3	0.5	0.4	0.4	0.4
buckwheat	2.6	1.6	0.5	0.5	0.6
haricot	0.1	0.1	0.1	0.1	0.1
grain fodder	23.0	27.3	30.3	27.5	28.7
barley (winter and spring)	14.7	17.3	11.1	10.4	10.6
corn	4.6	6.6	17.2	15.2	15.9
oat	2.1	1.8	0.9	0.8	0.8
leguminous (without haricot)	1.4	1.5	0.8	0.9	1.1
sorghum	0.1	0.1	0.3	0.2	0.3
Industrial crops	13.5	20.2	31.0	31.1	32.3
including:					
sunflower	9.0	14.4	19.3	19.0	22.1
sugar beet (factory)	3.5	2.5	1.2	0.9	1.1
soybean	-	-	6.6	8.0	6.9
rapeseed (winter and spring)	-	-	3.2	2.5	1.7
Potatoes and vegetable and melon crops	7.9	7.8	7.0	6.8	6.9
including: potato	5.7	5.8	4.9	4.8	4.9
vegetables	1.8	1.8	1.7	1.6	1.6
Fodder root	22.8	14.4	7.7	7.4	7.2

Source: own research.

Agricultural producers form the structure of their sown areas under the influence of many factors. The main ones are: structure of agricultural lands, their quality, specialization, product demand, and availability of means of production and labor resources, and climatic conditions.

Rational structure of sown areas guarantees the production of the required amount of grain, industrial and forage crops, potatoes, vegetables in a proper range, all crops have good forecrops, and it facilitates the creation of proper agronomic and economic conditions; all this eventually enhances crop capacity. This structure makes it possible to use farm land most efficiently, to create proper crop rotations, as each crop requires a good forecrop. In recent years, the the share of crops which are in great demand has increased (sunflower, corn for grain, soybean), which resulted in the violation of scientifically-grounded crop rotations. A failure to follow crop rotation, a simplified tillage system and plant management caused worsening of phytosanitary state of the fields and, in turn, the increase of pesticide load which affected both the environmental ecology and people's safety.

The socio-economic crisis in Ukraine had a negative impact both on the development of agriculture in general and crop production in particular (*Table 2*) (State Statistics Committee of Ukraine, 2006; State Statistics Committee of Ukraine, 2016).

Table 2. Production of main agricultural crops in Ukraine in 2001-2015 [farms of all categories]

Agricultural crop	Production by years, thousand tons				2015 in % to	
	2001	2005	2014	2015	2001	2014
Grain and leguminous crops including:	39706	38015	63859	60126	151.4	94.2
wheat (winter and spring)	21348	18699	24114	26532	124.3	110.0
rye (winter and spring)	1822.5	1054.2	478.0	391.1	21.5	81.8
rice	68.9	93.0	50.9	62.5	90.7	122.8
millet	266.5	140.6	178.0	213.2	80.0	119.8
buckwheat	387.6	274.7	167.4	128.1	33.0	76.5
barley (winter and spring)	10186	8975.1	9046	8288.4	81.4	91.6
corn	3640.7	7166.6	28497	23328	640.7	81.9
oat	1115.7	790.7	612.5	488.5	43.8	79.8
leguminous	827.3	757.5	481.1	502.1	60.7	104.4
Industrial crops						
including:						
sunflower	2250.6	4706.1	10134	11181	496.8	110.3
sugar beet (factory)	15575	15468	15734	10331	66.3	65.7
soybean	73.9	612.6	3882	3931	5319	101.3
rapeseed (winter and spring)	134.6	284.8	2198	1737.6	1291	79.1
Potatoes and vegetable and melon crops						
including: potato	17344	19462	23693	20839	120.2	88.0
vegetables	5906.8	7295.0	9638	9214.0	156.0	95.6
Fodder root	7712.7	8015.1	6995	6187.5	80.2	88.5

Source: own research.

In Ukraine, in 1990 the production of grain and leguminous crops amounted to 51.0 million tons, then in 2000 it was only 24.4 million tons, so we have a reduction of sugar beet production – from 44.2 million tons in 1990 to 13.2 million tons in 2000, but we see the increase of sunflower production – from 2.5 million tons in 1990 to 3.4 million tons in 2000. And only in later years, grain production was growing rapidly: from 39.7 million tons in 2001 to 60.1 million tons in 2015, or by 51.4%. During this period there was an increase among grain crops, namely, sunflower production – by 6.4 times – up to 23.3 million tons in 2015.

At the same time in 2001-2015 rye production reduced by 78.5% – to 391.1 thousand tons, millet by 20.0% – to 213.2 thousand tons, buckwheat by 67.0% – to 128.1 thousand tons, barley by 18.6% – up to 8288.4 thousand tons, oats by 56.2% – to 488.5 thousand tons, leguminous by 39.3% – to 502.1 thousand tons.

A significant increase in sunflower production is observed – from 2.2 million tons in 2001 to 11.1 million tons in 2015, or by 5 times, soybean by 53.2 times – to 3.9 million tons, rapeseed by 12.9 times – to 1.7 million tons. Potato production is growing dynamically by 20.2% – to 20.8 million tons in 2015 and also vegetables by 56.0% – to 9.2 million tons. Production of fodder root decreases gradually over the years by 19.8% – to 6.1 million tons in 2015 (State Statistics Committee of Ukraine, 2006; State Statistics Committee of Ukraine, 2016).

In this period, the observance of the elements of crop growing technology, the major ones are plant nutrition and plant protection from pests, diseases and weeds along with soil-climatic conditions of Ukraine, ensured the increase of crop yield of the following crops: grain and leguminous crops by 51.7% – to 4.11 t/ha in 2015, in particular of rye on 25.1% – to 2.59 t/ha, rice by 45.9% – to 5.34 t/ha, buckwheat by 49.2% to 1.0 t/ha, corn by 76.2% – to 5.71 t/ha, oat by 16.0% – to 2.32 t/ha, sunflower by 2.3 times – to 2.16 t/ha, sugar beet by 2.4 times – to 43.58 t/ha, soybean by 82.2% – to 1.84 t/ha, rape by 2.1 times – to 2.59 t/ha, potato by 49.3% – to 16.14 t/ha, vegetables by 67.3% – to 20.61 t/ha, fodder root crops by 19.6% – to 28.86 t/ha (*Table 3*) (State Statistics Committee of Ukraine, 2006; State Statistics Committee of Ukraine, 2016).

So, in 2001-2015 years the growth in production of some agricultural crops was recorded, due to both their share increase in the total sown area and their yield increase, including: sunflower, soybean, rapeseed. Due to crop capacity increase alone the production of wheat, sugar beet, potatoes and vegetables was increased. The decrease in the production of rye, buckwheat, barley, oats and fodder roots occurred because of the reduction of their share in the total sown area, as well as their productivity decrease.

It should be noted that in recent years grain and leguminous crops have occupied a significant share in the structure of the areas under agricultural crops (2016 – 53.6%), among them are wheat (2016 – 23.2%), barley (2016 – 10.6%), corn (2016 – 15.9%).

On the basis of the polynomial model that describes the level of grain and leguminous crops productivity in Ukraine in 1913-2015, the forecast of their crops capacity was made, and it envisaged its increase (*Fig. 1*).

Thus, in Ukraine there are all preconditions for the increase of the production of grain crops which provide food security as well as export of the produce.

An extensive development of trade relations of Ukraine in the grain market is to be mentioned. The major agri-food products of the Ukrainian export to European Union countries are raw materials of crop production (seed of grain and oil-bearing crops), crude sunflower and other oils.

Table 3. Yield of main agricultural crops in Ukraine in 2001–2015 [farms of all categories]

Agricultural crop	Yield by years, t/ha				2015 in % to	
	2001	2005	2014	2015	2001	2014
Grain and leguminous crops including:	2.71	2.60	4.37	4.11	151.7	94.1
wheat (winter and spring)	3.10	2.85	4.01	3.88	125.2	96.8
rye (winter and spring)	2.07	1.73	2.58	2.59	125.1	100.4
rice	3.66	4.34	5.0	5.34	145.9	106.8
millet	1.06	1.17	1.8	1.89	178.3	105.0
buckwheat	0.67	0.69	1.22	1.0	149.2	82.0
barley (winter and spring)	2.60	2.06	3.01	2.95	113.5	98.0
corn	3.24	4.32	6.16	5.71	176.2	92.7
oat	2.00	1.76	2.51	2.32	116.0	92.4
leguminous	2.01	1.89	2.14	2.04	101.5	95.3
Industrial crops including:						
sunflower	0.94	1.28	1.94	2.16	229.8	111.3
sugar beet (factory)	18.26	24.82	47.65	43.58	238.7	91.5
soybean	1.01	1.45	2.16	1.84	182.2	85.2
rapeseed (winter and spring)	1.24	1.46	2.54	2.59	208.9	102.0
Potatoes and vegetable and melon crops including: potato	10.81	12.84	17.64	16.14	149.3	91.5
vegetables	12.32	15.71	20.78	20.61	167.3	99.2
Fodder root	24.12	27.31	32.29	28.86	119.6	89.4

Source: own research.

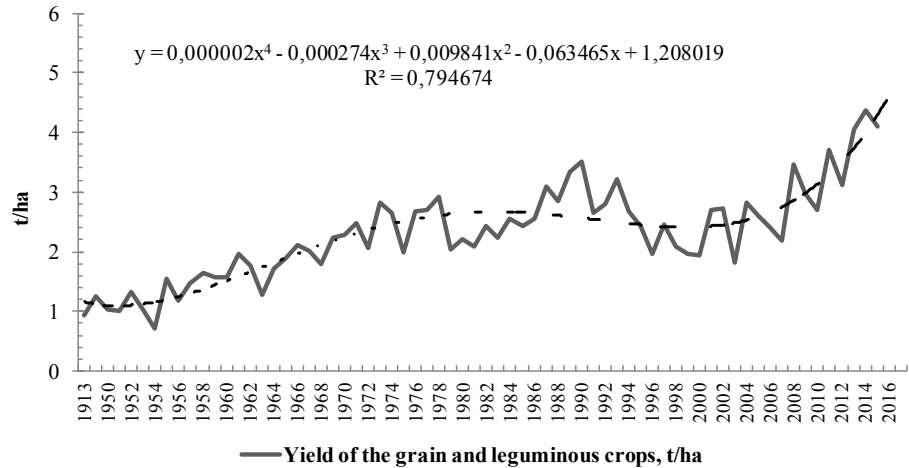


Fig. 1. The dynamics of the grain and leguminous crops yields in Ukraine by years

Source: own research.

Taking into account a favorable condition of external markets and price advance, farm producers increase their sown areas under industrial crops in Ukraine. In particular, a high profitability level of sunflower, soybean and rapeseed encourages producers to increase the sown areas under these crops, compared with those under other crops (*Table 4*) (State Statistics Committee of Ukraine, 2009; State Statistics Committee of Ukraine, 2011; State Statistics Committee of Ukraine, 2013; State Statistics Committee of Ukraine, 2014; State Statistics Committee of Ukraine, 2015; State Statistics Committee of Ukraine, 2016).

Table 4. Economic efficiency of main agricultural crop production in Ukraine in 2008-2015 [agricultural enterprises]

Agricultural crop	Level of profitability, %					
	2008	2010	2012	2013	2014	2015
Wheat	17.6	9.6	11.8	2.4	28.0	36.4
Barley	19.8	-0.4	11.4	0.6	18.3	28.3
Corn	10.6	29.9	19.8	1.5	26.2	50.3
Seeds of sunflower	18.4	64.7	45.8	28.5	36.5	80.5
Sugar beets	7.1	16.7	15.7	2.7	17.9	28.2
Soybean	1.3	16.4	23.4	15.8	34.5	38.6
Rapeseed	51.3	26.6	21.4	8.6	29.2	44.3
Potatoes	7.9	62.1	-21.5	23.0	9.2	24.2

Source: own research.

As it can be seen from *Table 4*, the level of production profitability of sunflower seed increased from 18.4% in 2008 to 80.5% in 2015. During the same period the productivity level increased, as follows: soybean – from 1.3% to 38.6%, sugar beet – from 7.1% to 28.2%, corn – from 10.6% to 50.3%, wheat – from 17.6% to 36.4%, barley – from 19.8% to 28.3%, potatoes – from 7.9% to 24.2%, %, and on the contrary, the profitability level of rapeseed decreased from 51.3% to 44.3%.

In 2012-2013, the reason of the loss of grain industry efficiency is a poor development of agrarian market and infrastructure of grain sale, the lack of an effective mechanism of state regulation of grain produce pricing in the conditions of both grain overproduction and harvest failure, a high level of credit rates and an inadequate budget support of the branch. Presently, government regulation of the grain market in Ukraine does not play a stimulating role as to grain production and it cannot respond effectively to the challenges of the global economy.

It is advisable to work out and apply the efficient mechanisms of crop market regulation on a national level. To stabilize prices of the output of crop production, the government has to apply purchasing and commodity interventions, to coordinate and adjust the pricing policy in the national and international markets.

The orientation of the Ukrainian export on raw materials makes Ukraine's positions vulnerable in foreign markets, as the demand for them is not stable and it is characterized with considerable price variability.

It should be stated that in Ukraine export of grain crops increases and the largest import share from the EU is meat and by-products, this tendency can have a negative effect on the development of the domestic livestock industry in the future.

Hence, the main directions of the enhancement of crop production adaptability in current conditions are: to place agricultural crop fields in favorable soil and climatic conditions, to develop cultivars and hybrids, adapted to the natural conditions of Ukraine, to transfer crop production to post-industrial development models, to provide raw material base for the development of bioenergy, to create forage base for livestock production, to develop organic production, to structure a crop produce market.

To achieve these goals it is necessary to solve the issue of soil fertility improvement by taking a set of organizational-technological measures, namely: to use scientifically-grounded crop rotation in crop production; to focus on organic fertilization systems; to increase the efficiency by using mineral fertilizers via optimization of their doses, terms and methods of application into the soil; to introduce soil-protective technologies; to reduce a negative impact of chemicals on a plant itself and on useful microflora of the soil.

To provide arable farming with adapted cultivars and hybrids of agricultural crops which have higher productivity and ecological resistance to the environmental conditions, it is required to organize seed breeding system of agricultural crops in Ukraine. And yet, the varieties and hybrids adapted to weather and environmental conditions cannot always guarantee the high productivity of agricultural crops because of the process of global warming on our planet.

The application of post-industrial models of crop production development envisages the creation and implementation of: resource-saving bioadaptive technologies of agricultural crop cultivation, integrated pest management, optimization methods of the processes of growth and development of plants, taking into consideration climate changes and principles of precision farming.

In the conditions of the aggravation of the situation in the country which concerns the supply of energy carriers at affordable prices, it is expedient to speed up the production of alternative fuels, in particular those produced from crop output. The manufacture and use of biofuels will accelerate the solution of such strategic goals for the development of Ukraine and agriculture in particular as lesser dependence of the producers on imported fuel and satisfaction of demand for these products at a lower price. Therefore it is necessary to ensure appropriate raw material base for bioenergy development, i.e., to optimize rape sown areas to produce biodiesel and those under sugar beet to manufacture bioethanol. The production and use of bioethanol and biodiesel will make it possible to manufacture ecologically-friendly alternative fuel, to create new jobs, to increase companies' revenues, and to reduce Ukraine's dependence on fuel import.

To improve the structure of crop production it is necessary to manufacture the produce which is in great demand in the world market – wheat, corn, barley, and to optimize the sown areas of sunflower (not more than 15% in crop rotation) – to manufacture oil for domestic consumption and for export, rapeseed – to produce biodiesel, sugar beet – to produce bioethanol, corn for silage, soybean and perennial grasses – to meet the needs of livestock production in proper fodder supplies.

2. Ways of increasing sugar beet productivity

Sugar beet productivity depends on both soil-climate conditions of their cultivation and agro-technological conditions, and first of all, the introduction of highly-productive hybrids, the use of quality seeds, updated machinery and technologies, fertilizers, reliable pest management, highly-technological processing at sugar-mills.

Sugar beet productivity is a function of a complicated interaction of natural and agro-economical factors. The researches done in Germany (Glevaskiy, Kravchenko & Poechalov), prove that among the factors which influence sugar beet productivity over 50% do not depend on people, 34% depend on the year conditions, 17% depend on the location of growing. The effect of agrotechnological measures (plant density, nitrogen fertilization, sowing and harvesting terms) constitutes 35%, and that of the variety is 14%.

If to consider separately a variety (genetic potential) and seeds (their quality), the effect of these factors on sugar beet productivity is equal (50% – a variety, 50% – seed quality), according to the research results of the Institute of bio-energetic crops and sugar beets. When agro-climatic conditions are favorable, advanced cultivation technologies of sugar beets ensure high and stable yields, and seed quality plays an important role. Due to quality pre-sowing seed preparation, using protective-stimulating substances, it is possible to receive additional 10-20% of sugar beet yield (Yunusov, 2000).

Some indicators of crop productivity are known to have genetic basis. The degree of variety or hybrid potential identification is determined by genetic information, which is in a cell, and environmental conditions where plants grow (Ovcharov, 1973).

It is possible to form a large mass of organic substance, including sugar, when vegetation period is long enough, light and temperature regimes are good, soil moisture content and seed quality are high (Helemsky, 1967).

Intensive mass increase of leaves and roots as well as sugar content of biological forms of sugar beets together with soil-climate conditions made it possible to receive the best maximal crop. To estimate climatic conditions according to air temperature and moisture supply, hydrothermal coefficient, which characterizes weather conditions taking into account air temperature and the amount of precipitation for a particular period, is used (HTC). It was established, when moisture content was too high ($HTC = 1.2$) sugar beet yield and sugar content of both biological forms of sugar beets decreased considerably (Table 5).

Table 5. Sugar beet biological form productivity depending on hydrothermal conditions

Year	GTK	Biological forms					
		Diploids			Triploids		
		Yield, t/ha	Sugar content, %	Yield of sugar, t/ha	Yield, t/ha	Sugar content, %	Yield of sugar, t/ha
2010	1.0	62.7	15.1	9.5	60.9	14.9	9.1
2011	1.0	57.8	15.8	9.1	58.1	15.6	9.1
2012	1.2	53.1	15.0	8.0	55.7	15.2	8.5
Average		57.9	15.3	8.9	58.2	15.2	8.9
LSD _{05 year conditions}		0.98	0.15	0.16	0.98	0.15	0.16
LSD _{05 biological forms}		0.76	0.12	0.13	0.76	0.12	0.13

Source: own research.

A significant difference in biological forms of sugar beets was not seen. The difference in the yield of diploid and triploid forms of sugar beets was 0.40 t/ha ($HIP_{05 \text{ biological forms}} = 0.76$). The effect share of biological forms on root yield was small – only 6%, that of the year conditions was higher – 13%.

Summing up meteorological conditions occurred in the years of the research it may be stated that the deviation of several indicators (temperature, precipitation amount, air relative humidity) from long-term average ones did not come close to critical indicators, which in general facilitated to receive high yields of sugar beets. The reserves of productive moisture together with precipitation during the vegetative period, provided they are used rationally, can guarantee root yield equal to 51.1–55.7 t/ha.

The important way to increase sugar beet productivity is to create optimal plant density. It is very important to form steady plant density because both sugar beet yield and sugar yield depend on it. When plants are evenly located in the rows and plant density is optimal, roots of the same size and with smaller deviations from the axe line of a row and soil surface are formed; this in turn allows better mechanized harvesting.

It is worth mentioning that within four years on the average the variations of actual plant density from a planned one were not significant (*Table 6*).

Table 6. Sugar beet productivity depending on plant density, 2010–2014

Variant – plants density, thousand / ha		Yield, t/ha	Sugar content, %	Yield of sugar, t/ha
Accordint to scheme	actual			
80–90	82.7	51.1	14,7	7,5
91–100 – control	94.7	51.9	14,9	7,7
101–110	104.8	55.7	15,1	8,4
111–120	114.0	50.1	15,3	7,7
121–135	126.8	44.3	15,5	6,9
136–145	139.4	41.8	15,8	6,6
LSD _{05 year conditions}	1.32	1.41	0,18	0,23
LSD _{05 density}	1.62	1.72	0,22	0,29
LSD _{05 year conditions/density}	3.24	3.45	0,44	0,57

Source: own research.

According to the research results, the highest indicator of pure productivity was in the variant with plant density 101–110 th/ha – 5.0 g of dry matter/m² of leaf surface per 24 hours, which made it possible to receive the highest sugar beet yield – 55.7 t/ha and sugar yield – 8.4 t/ha.

This is due to the fact that this plant density is close to an optimal one which ensures the formation of proper amount of leaf mass; a leaf area increases, photosynthetic plan-ting potential grows, which results in organic substance accumulation and the outflow of photosynthesis products to the roots.

As the plant density increased to 136–145 th/ha, root yield decreased considerably – 10.1 th/ha, compared with the control, and on the contrary, sugar content increased from 14.9 % (control) to 15.8 % in the variant with density 136–145 th/ha. However, the increase of sugar content with such yield decrease did not give serious sugar yield increase per hectare, both compared with the control and the variant with plant density 101–110 th/ha. For instance, when plant density before harvest was 91–100 th/ha, sugar yield was 7.7 t/ha, when it was 136–145 th/ha, then sugar yield was 6.6 t/ha. Sugar content depended on rather the year conditions than the plant density. Precise estimation of the efficiency of various plant densities can be done using cluster analysis (*Fig. 2*).

To make it, we used such economic-valuable signs as root yield, sugar content, sugar yield, pre-harvest density. Based on the received data of Euclid distances we built a tree of hierarchic clustering.

In the Fig. 2 we can classify two groups of clusters, namely: I – 101-110, 111-120 th/ha, and II – 121-135, 136-145 th/ha. The combination of the studied density variants in these very groups of clusters proves that sugar beets are better adapted to dense plantations than to thin ones. Thus, higher plant density in the sugar beet fields can provide proper productivity level, but plantations with density 80-100 th/ha cannot guarantee stable productivity. In such fields plants depend more on the effect of unfavorable environmental factors, and weeds affect them immensely, all this explains the difference in main productivity elements and the location of nutrition areas 80-90 and 91-100 th/ha beyond clusters.

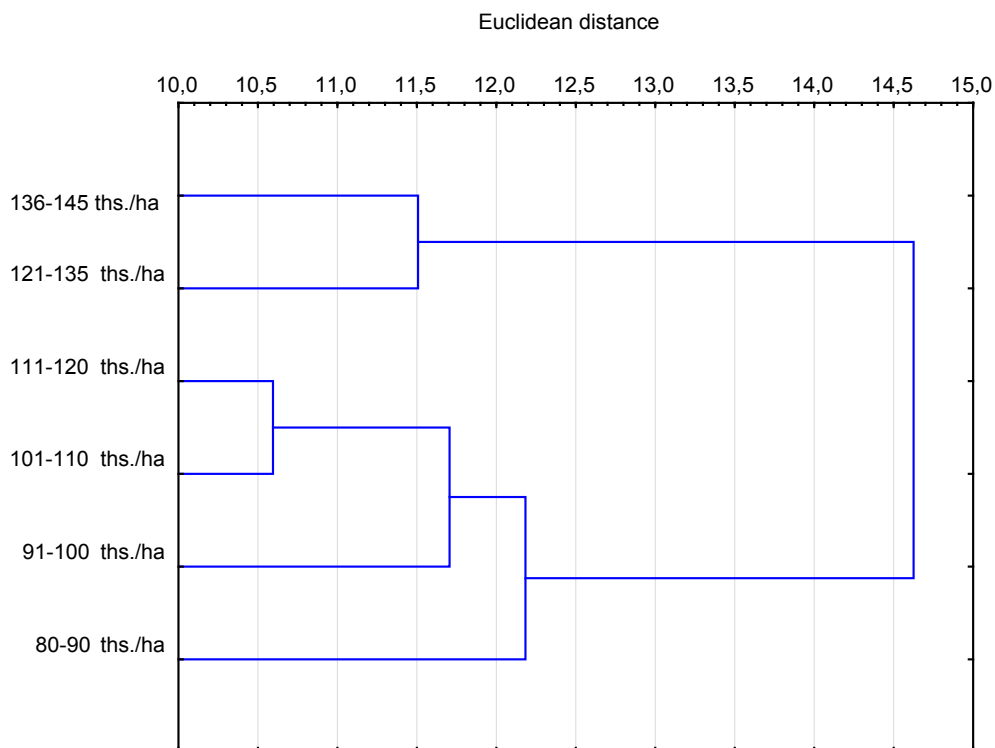


Fig. 2. Cluster analysis for complex agronomic signs depending on plant density [Umanskyi ChS 97 hybrid]

Source: own research.

The next important step in increasing the crop productivity is the indicator which characterizes the efficiency of microelement use in the production technology of sugar beets, namely the yield level (Sabluk et al., 2011; Ivaschenko, 1994).

Foliar application with various micro-fertilizers (helaty) is efficient both when spraying is done at the stage of leaf closing in the rows and when leaves close in the inter-rows.

A significant increase of yield and sugar content resulted from the use of microelements is due to the fact that plants need more nutritious elements which are in macro- and micro

fertilizers. Hence, foliar application with microelements favors intensification of growth processes, intensive absorption of mobile compounds of macro- and microelements from the soil and fertilizers, which eventually leads to a considerable increase of sugar beet productivity.

It has been found out that the formation of the sugar beet yield, sugar content and sugar yield depend on foliar application at corresponding stages of their vegetation, forms of microelements and their application rates (*Table 7*).

Table 7. Sugar beet productivity depending on terms, types and norms of microelements application in feeding, 2010–2012

Variant – species of microelements (Factor B)	Application rate, l/ha (Factor C)	Plants density before harvesting, thousand/ha	Yield, t/ha	Sugar content, %	Yield of sugar, t/ha
I term: closing leaves in a row phase (Factor A)					
Without feeding (control)	–	97.8	46.3	15.3	7.1
Reacom-R-beet (standard)	5.0	102.5	51.8	14.8	7.7
Reastim-humus-beet	3.0	102.4	49.5	14.4	7.1
	5.0	102.4	52.3	14.5	7.6
	7.0	102.5	56.5	14.5	8.2
Reacom-plus-beet	3.0	101.9	48.5	14.2	6.9
	5.0	102.2	53.2	14.4	7.7
	7.0	103.4	58.0	14.3	8.3
II term: closing leaves between rows phase (136 days from sowing) (Factor A)					
Without feeding (control)	–	98.7	47.4	15.4	7.3
Reacom-R-beet (standard)	5.0	102.9	52.6	14.7	7.7
Reastim-humus-beet	3.0	102.5	49.7	14.3	7.1
	5.0	103.4	56.3	14.5	8.2
	7.0	104.4	64.6	14.2	9.2
Reacom-plus-beet	3.0	104.9	54.4	14.7	8.0
	5.0	105.6	63.9	14.4	9.2
	7.0	107.3	71.2	14.4	10.3
LSD _{05 year conditions}		0.61	1.28	0.11	0.20
LSD _{05 introduction term (factor A)}		0.50	1.04	0.09	0.17
LSD _{05 type of fertilizer (factor B)}		0.50	1.04	0.09	0.17
LSD _{05 application rate (factor C)}		0.61	1.28	0.11	0.20
LSD _{05 interaction of factors (1*2*3*4)}		2.21	4.42	0.37	0.71

Source: own research.

The types of micro fertilizers influenced sugar beet yield.

Thus, with foliar application at the stage of leaf closing in the row, micro fertilizer Reacom-plus-beet ensured real yield increase compared with both the control and other micro fertilizers. When micro fertilizers were applied at the stage of leaf closing in the inter-row (136 days after sowing), significant yield increase was received with the use of Reacom-plus-beet and Reastim-humus-beet compared with the control and the standard. The highest yield increase was recorded when micro fertilizer Reacom-plus-beet was used at both foliar application terms. At the stage of leaf closing in the inter-rows (136 days after sowing) and the application rate 7 l/ha, this micro fertilizer gave the highest root yield 71.2 t/ha, sugar content 14.4% and sugar yield 10.3 t/ha with the same density of evenly located plants in the row and on the main fertilizer background.

The use of new micro fertilizers Reacom-plus-beet and Reastim-humus-beet on the background of main fertilizer resulted in a considerable increase of sugar beet productivity not only comparing to the control, but also to the application of micro fertilizer Reacom-plus-beet (the standard). This can be explained by the composition of microelements which have a positive impact on plant growth and development and organic mass accumulation.

Sugar beet yield along with other agrotechnical measures depends on the introduction of highly productive hybrids to a great extent.

Based on the research results of the productivity of triploid hybrids of local selection Umanskyi ChS 97 and foreign selection Oriks, pre-harvest plant density of both hybrids was optimal for this area, namely, hybrid Umanskyi CHS 97 – from 96.6 (the control) to 107.67 th/ha (microelements were applied twice), Oriks – from 96.5 th/ha on the control to 107.6 th/ha (micro fertilizers were applied twice).

Table 8. Sugar beet hybrid productivity depending on terms of microelement application in feeding, 2010–2014

Variant – term of microelements introduction (factor B)	Yield, t/ha	Sugar content, %	Yield of sugar, t/ha
Umanskyi ChS 97 (Factor A)			
Without feeding – control	43.4	15.3	6.6
Closing leaves in a row phase	47.1	15.1	7.1
Closing leaves between rows phase (136 days from sowing)	49.3	15.3	7.5
Closing leaves in a row phase + closing leaves between rows phase (136 days from sowing)	59.4	15.4	9.1
Oriks (Factor A)			
Without feeding – control	46.2	15.1	7.0
Closing leaves in a row phase	48.6	15.2	7.4
Closing leaves between rows phase (136 days from sowing)	50.1	15.3	7.7
Closing leaves in a row phase + closing leaves between rows phase (136 days from sowing)	61.5	15.4	9.4
LSD _{05 year conditions}	1.47	0.10	0.22
LSD _{05 hybrid (factor A)}	1.04	0.07	0.16
LSD _{05 feeding (factor B)}	1.47	0.10	0.22
LSD _{05 interaction of factors (1*2*3)}	4.15	0.29	0.63

Source: own research.

The optimal plant density and their steady location along with soil-climate conditions and farm practices helped receive good sugar beet yield – 43.4-61.5 t/ha depending on foliar application terms of triploid hybrids of local and foreign selection (Table 8).

In the trials the productivity was associated with genotype expression.

A significant sugar beet yield increase of triploid hybrids with foliar application was recorded regardless of their origin, compared with the control. Thus, when microelements were applied at a leaf closing stage in the inter-rows (136 days after sowing), sugar beet yield of hybrid Umanskyi CHS 97 was 48.9 t/ha and that of Oriks – 49.5 t/ha.

The yield increase of both sugar beet hybrids ranged from 3.9 to 6.4 t/ha ($HIP_{05} = 3.9$ t/ha), compared with the control. Hybrid Oriks showed the highest yield – 62.8 t/ha when foliar application was done twice, the increase amounted to 17.2 t/ha, compared with the control.

The share of foliar application effect on the root yield was the highest – 53%. The year conditions had a serious effect on the yield – 16%, the effect share of the interaction of the factors “year conditions and foliar application” was equal to 17%. The effect of other factors was not significant.

The results of a cluster analysis proved that trial variants with two-time foliar application of sugar beets (7 and 8) of both hybrids were combined in one cluster (Fig. 3).

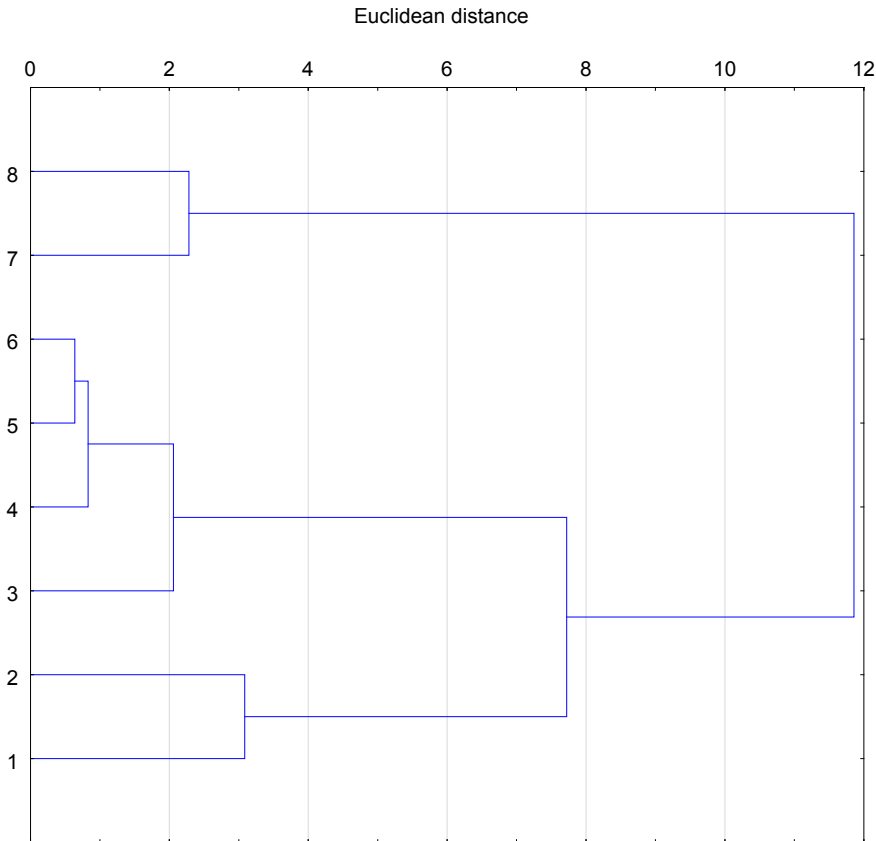


Fig. 3. Cluster analysis for complex agronomic signs depending on microelement application and varietal composition

Source: own research.

This combination of variants in one cluster confirms the conclusion that it is expedient to do two-time foliar application which facilitates the highest beet yield of both hybrids. Control variants (1 and 2) of both hybrids with the lowest yield were combined in another cluster, and still another cluster contained variants of both hybrids with one-time foliar application. This proves the fact that despite the origin of hybrids only foliar application influences the yield.

No significant increase of root sugar content in correlation with the terms of microelement application of both hybrids was recorded.

In the experimental years, sugar content ranged from 15.1% to 15.4% on the average. No significant variation of this indicator depending on the varietal composition was recorded.

As the most intensive sugar accumulation in roots occurs in July-September, it is better to do microelement foliar application at leaf closing stages in the rows and in the inter-rows (136 days after sowing), this will favor the outflow of nutrients from leaves to roots, and the increase of root and sugar yield per 1 ha.

Due to the increase of the root yield, and in particular, two-time foliar application with microelements at leaf closing stages in the rows (136 days after sowing) and in the inter-rows (136 days after sowing), sugar yield of both hybrids increased considerably. As the yield of hybrid Oriks, compared with hybrid Umanskyi ChS 97 was higher, the sugar yield per hectare was also higher. The sugar yield per hectare of hybrid Umanskyi CHS 97 was 6.6-9.0 t/ha, whereas that of hybrid Oriks was 7.0 to 9.4 t/ha. In addition, the highest sugar yield of both hybrids was received with two-time foliar application with microelements. Foliar application had the most significant effect which amounted to 56%. The effect of year conditions was 14%, and the interaction of these two factors was 17%. The effect of other factors was irrelevant.

Besides, agro technological measures, an important way of increasing sugar beet productivity, have to be aimed at the creation of favorable conditions for plant growth and development to receive maximal possible genetic potential of hybrid; this, first of all, can be achieved by using high-quality seeds of new hybrids, which, in combination with other factors, ensures high field germination, optimal density, steady plant location in the row, and finally – the increase of crop productivity.

The level of sugar beet yield and technological properties depends on numerous factors, which in turn enable complete disclosure of the potential of their genetic characteristics. When proper sugar beet quality is developed in the process of their vegetation, it is important to use various agro technological measures which lead to better yield and quality of sugar beets, as the processing of low quality raw material gives no economic effect.

It is not possible to enhance the processes of plant growth and development and a simultaneous formation of sugar beet productivity without the external factor effect. Among the most efficient factors which enhance the potential of sugar beet productivity are complex use of highly productive hybrids, the creation of optimal plant density, high agrochemical background and foliar application with micro fertilizers.

According to the data of A.S. Zarishniak and I.M. Zherdetskyi (2008), it is advisable to do foliar application of sugar beets three times during vegetation. The first foliar application should be done when there are four-eight leaves on the plants, the second one – before leaf closing in the inter-rows (15-18 leaves), the third top dressing – during the period of intensive root growth and sugar accumulation (July-August, 32-42 leaves), as

sugar content in the roots is the major indicator of their quality (Sabluk et al., 2011).

In the trial foliar application was done twice – at a stage of leaf closing in the row and at a stage of leaf closing in the inter-row (136 days after sowing).

It was important to determine the effect of foliar application on pre-harvest plant density and sugar beet productivity in general.

In the experimental years pre-harvest plant density, on the average, was optimal for the area, namely, for hybrid Ukrayinskyi CHS 72 it ranged 101.9-104.8 th/ha, for hybrid Leopard – 101.9-104.4 th/ha. No significant variation in the correlation between plant density and varietal composition was recorded.

Plant density before harvesting together with soil-climate conditions and agro technological measures had an impact on sugar beet yield.

A substantial increase of root yield of both diploid hybrids of sugar beets was recorded when foliar application with microelements was done twice – at a stage of leaf closing in the rows and at a stage of leaf closing in the inter-rows (136 days after sowing).

With plant density 101-104 th/ha and microelement application rate calculated for root yield 70 t/ha in the area of unstable moistening, the yield of hybrid Ukrayinskyi CHS 72 was 57.1 tt/ha and that of hybrid Leopard – 58.9 t/ha (Table 9).

Table 9. Sugar beet hybrid productivity depending on agrotechnological measures of growing, 2011-2014

Variant		Yield of roots, t/ha	Sugar content, %	Yield of sugar, t/ha
hybrid	term of microelements introduction			
Ukrainian ChS 72	Without application	52.1	15.2	8.0
	closing leaves in a row phase + closing leaves between rows phase (136 days from sowing)	57.1	15.9	9.1
Leopard	Without application	53.2	15.3	8.1
	closing leaves in a row phase + closing leaves between rows phase (136 days from sowing)	58.9	15.9	9.4
LSD _{05 year conditions}		1.20	0.18	0.25
LSD _{05 hybrid (factor A)}		1.22	0.15	0.21
LSD _{05 feeding (factor B)}		0.98	0.15	0.21
LSD _{05 interaction of factors (1*2*3)}		2.40	0.37	0.51

Source: own research.

The yield increase of both sugar beet hybrids ranged from 5.0 (hybrid Ukrayinskyi CHS 72) to 5.7 t/ha (hybrid Leopard), compared with the control (HIP_{05 hybrid} = 1.22 t/ha). No significant variation in sugar beet productivity depending on the studied hybrids was recorded.

Within a four-year period, on the average, sugar beet productivity was mostly influenced by year conditions, which effect share was 70%, and top dressing – 15%. Varietal characteristics were insignificant; their effect share was only 5%.

Top dressing of sugar beets resulted in the increase of beet sugar content, in particular: hybrid Ukrayinskyi CHS 72 by 0.7%, hybrid Leopard by 0.6% (HIP_{05 top dressing} = 0.15 %).

In the experimental years, on the average, root sugar content of the control was 15.4-

15.5 %, and with two-time foliar application it was 15.8-15.9 %. No significant variation in root sugar content depending on varietal characteristics was recorded.

Due to the increase of root yield and sugar content, when foliar application with microelements was done twice, sugar yield increased considerably, compared with the control without foliar application. In the experimental years, on the average, with foliar application, sugar yield of hybrid Ukrayinskyi CHS 72 was 9.1 t/ha, that of hybrid Leopard – 9.4 t/ha; sugar yield increase was 1.1 and 1.3 t/ha, correspondingly. No significant variation in sugar yield and its increase depending on hybrids was recorded.

The results of field trials are confirmed by testing the implementation of complex measures taken in farm businesses – ALLC “Agrosvit”, Myronivka district, Kyiv region and LLC “Zemlia Tomylivska”, Kyiv region: highly productive diploid and triploid hybrids with 96-98% of deed germination, 107–109 th/ha plant density, on the background of main fertilizer, foliar application with microelements at a stage of leaf closing in the row + at a stage of leaf closing in the inter-rows, root harvesting at the end of October –the first decade of November; the aim was to determine sugar beet productivity. In agricultural limited liability company “Agrosvit” (ALLC) on the area of 200 ha sugar beet productivity of hybrid Ukrayinskyi CHS 72 was 52.3 t/ha, sugar content was 16.5 %, sugar yield was 8.6 t/ha. The yield increase was 0.3 t/ha, and sugar yield – 0.5 t/ha, compared with the complex trial which was carried out in ERC of BNAU. In limited liability company “Zenlia Tomylivska” (LLC) on the area of 200 ha the increase of sugar beet productivity with complex application of agro technological measures was 1.1 t/ha, that of sugar content was 0.7 %, and sugar yield was 0.5 t/ha.

There are several important conclusions, that have to be mentioned, such as:

1. According to a complex effect of hydro-meteorological conditions it was established that precipitation, which occurred in June, had the largest impact on sugar beet yield in the area of their cultivation. However, in the experimental years little connection ($r = 0.29$) was found between biological form yield (from 53.1 to 62.7 t/ha) and precipitation amount in June (from 61.7 to 137.4 mm). It was determined that there was no significant variation between biological sugar beet forms as to their yield, sugar content and sugar yield. The share of biological form effect on root yield was irrelevant, only 6%.
2. In the zone of unstable moistening plant density can be increased as much as to 101-110 th/ha. Its further increase ensured the decrease of sugar beet productivity rather than its increase. Plant density had a significant effect on root yield and sugar yield, but sugar content depended more on year conditions.
3. It was proved that terms of microelement application, types of micro fertilizers and their application rates had effect on sugar beet productivity. The use of new micro fertilizers Reacom-plus-beet and Reastim-humus-beet on the background of main fertilizer guaranteed a considerable increase of sugar beet productivity when compared not only with the control (without foliar application) but also with the use of micro fertilizer Reacom-R-beet (the standard). Foliar application with different micro fertilizers (3.0 to 7.0 l/ha) at a stage of leaf closing in the row and at a stage of leaf closing in the inter-rows (136 days after sowing) favored better assimilation of microelements from the soil, which in turn influenced final sugar beet productivity. Top dressing with helatic micro fertilizer Reacom-plus-beet done in the second application term (7 l/ha) was the most efficient measure, which resulted in root yield increase by 18.6 t/ha and sugar yield by 2.6 t/ha, if compared with top dressing with micro fertilizer Reacom-R-beet (the standard).

4. In the trials the productivity was associated with genotype expression. It was found out that regardless of their origin triploid hybrids responded to top dressing positively. The increase of sugar beet yield ranged from 3.9 to 6.4 t/ha ($HIP_{05} = 3.9$ t/ha), compared with the control. The highest yield – 62.8 t/ha – was received on hybrid Oriks with two-time foliar application, its increase was equal to 17.2 t/ha, compared with the control.
5. A complex experiment proved that in the area of unstable moistening of the Right-Bank Forest Steppe zone of Ukraine, to supply plants with moisture is a limiting factor. The calculations of moisture consumption showed that in the experimental years the amount of moisture was enough to reach the yield of 60 t/ha, that is, the yield indicator which was received in this trial.

3. Improving the marketing of products of the sugar industry

Current state of sugar beet production and sugar branch of Ukraine explains the necessity to create conditions to ensure efficient sugar beet production and their processing for sugar. However, the factors of the efficiency enhancement of the branch businesses are not coordinated well or they are not used to due extent, which makes economic situation at sugar market more complicated due to its over- or under-production and a low level of producers' efficiency does not provide extended reproduction.

Marketing is an important part of enterprise management system operation and provides future opportunities for its effective development in the changing conditions of the market environment. Decisive is the role of marketing in the sugar sector enterprises, particularly as a prerequisite for the implementation of productive activities, the management of goods movement in the process of pricing and product evaluation possible volume of demand and supply and the main by-products of sugar production.

The importance of the output of sugar and sugar beet production consists not only in the source of the production of the important foodstuff – sugar. A market of alternative fuel kinds based on the use of sugar and starch-bearing agricultural crops and processed products is created across the world. As the problem of supplying our country with power-carriers becomes urgent, it is expedient to speed up and diversify the manufacture of alternative fuel kinds, in particular, bio ethanol and biogas. The challenges of the development of the sugar beet production should be clearly determined at a national level – the use of sugar beets and the products of their processing for the manufacture of alternative fuel.

At present sugar beet production and sugar branch of Ukraine are in a difficult situation. Due to the lack of circulating assets and proper logistics sugar-planting companies are not interested in growing sugar beets, and sugar-mills do not have enough sugar raw materials. The output of sugar production in Ukraine depends on the gross harvest of sugar beets, their yielding capacity and the sown area under this crop.

One of the ways to increase the efficiency of sugar beet production in Ukraine is to follow production technologies of growing sugar beets, their main elements are plant nutrition and pest management (pests, diseases and weeds); the latter together with soil-climatic conditions favor the yield increase and its harvest volume per hectare.

The yield increase of sugar beets resulted from the development of arable farming and better observance of the technologies. In 2001 producers applied 90 kg of acting substance (as) of mineral fertilizers per hectare, then in 2015 – 274 kg, i.e., three times more (State Statistics Committee of Ukraine, 2016). Close direct correlation between the amount of mineral fertilizers

applied and the root yield was determined. The correlation coefficient is 0.93. Recently special attention has been paid to the protection of sugar beets from pests and diseases which decrease their productivity considerably. In 2001, 8.9% of sugar beet area before harvesting was protected from diseases (mainly cercosporosis), in recent years all the field have been protected. Sugar beet fields were better protected from weeds as well. In 2001, 65.9% were treated with herbicides, and then in recent years every sugar beet field has been treated with herbicides three times.

As to soil potential, peculiarities of climatic conditions, a sugar belt was determined by the Institute of bio energetic crops and sugar beets of Ukraine's NAAS (Royik, 2001). The most favorable zone for sugar beet cultivation, where 55-60 t/ha can be harvested, is western regions of Ukraine – Volyn, Ivano-Frankivsk, Lviv, Rivne, Ternopil and Khmelnytsk. The less favorable zone, where 50-55 t/ha can be harvested, includes Vinnytsia, Zhytomyr, Kyiv, Poltava, Sumy, Kharkiv, Cherkasy and Chernihiv regions. The area where only 45-50 t/ha can be harvested is Kirovohrad and Chernivtsi regions. The rest of the regions, where sugar beets are grown and which are not included in a sugar beet belt, are unfavorable for sugar beet production because of their soil-climatic conditions.

Thus, Ukraine's agrarian policy has to take into account and to respond to the consequences, associated with the country's membership in WTO, and to support both the concentration of sugar beet cultivation in the proper regions and sugar beet farms.

Recently, integrated companies in the sugar branch have been created; they participated in the season of sugar beet processing of 2015-yield, as a result 75.7% of sugar was produced to the total production. Production concentration of sugar raw material in powerful specialized companies makes it possible to grow sugar beets using intensive technologies which in turn results in the increase of yield and gross output.

In Ukraine at the beginning of the 90ties there were 192 sugar-mills with total capacity 509.7 th t of sugar beet processing per day, in 2001 – 147 sugar-mills with total capacity 339.0 th t, and in 2012 – 63 sugar-mills with total capacity 255.4 th t. It is worth mentioning the years when 192 sugar-mills of Ukraine were built: before 1860 – 58 sugar-mills, 1860-1900 – 66 mills; 1901-1940 – 24 mills; 1941-1996 – 44 sugar-mills (The legislative provision, 2005).

In recent years the number of working sugar-mills for sugar beet processing has been reduced by four times. And the sugar output at Ukraine's sugar-mills increased from 11.4% in 2001 to 14.68% in 2015 (*Table 10*) (Yarchuk, 2015).

Within the year of 2015 sugar-mills of Ukraine received 9.91 mln t of sugar raw material or less by 34.6% compared with 2001, they processed 9.72 mln t of sugar beets and produced 1.43 mln t of sugar or 6.03 t/ha which does not satisfy the need of the internal market of Ukraine to its full scale. The difference between the duration of a technological process and that of sap extraction was 3.6 days per mill, i.e., that was idle time for each working mill. At some mills, stations of sap-extraction, defeco-saturation and product units work below their production capacity, which results in 1.73% of sugar in molasses (2001 – 2.24%).

However, automation level of some technological units has been improved which has positive impact on operation indicators of sugar mills. In Ukraine mill coefficient which characterizes the degree of sugar extraction from beets was 0.8172 (2001 – 0.723), and operation coefficient of the mill was 0.8506 (2001 – 0.7808), i.e., 85.06% of biological sugar from the received amount was extracted in the mill. Unfortunately, the difference between mill coefficient and operation coefficient – 0.0334 (2001 – 0.0578) – is high in the branch; and it confirms large losses of beets and sugar when rot beets are received, stored, transported to the sugar mill.

Table 10. Indicators of sugar beet processing and sugar production in Ukraine

Indicator	Year				2015 in % to	
	2001	2013	2014	2015	2001	2014
Procured beets at the mills, mln t	15.15	9.22	15.11	9.91	65.4	65.6
Processed beets, mln t	14.57	9.06	14.81	9.72	66.7	65.6
Beet loss in storage, %	3.8	1.70	2.02	1.85	-	-
Sugar produced from beets, mln t	1.33	1.26	2.05	1.43	107.5	69.8
Produced sugar, t/ha	1.56	4.66	6.22	6.03	386.5	96.9
Production coefficient	0.7230	0.8071	0.8071	0.8172	113.0	101.3
Duration of sap extraction, days	42.6	61.04	81.46	68.2	160.1	83.7
Number of working mills	147	38	48	36	24.5	75.0
Average daily amount of processed beets per 1 sugar mill, th t/day	2.71	3.62	3.75	3.75	138.4	100.0
Sugar output, %	11.40	13.35	14.04	14.68	-	-
Sugar content in molasses, %	2.24	1.76	1.73	1.73	-	-
Mill coefficient	0.7808	0.8364	0.8439	0.8506	108.9	100.8
Operation term of sugar mills, days	47.6	64.80	84.90	71.8	150.8	84.6

Source: own research.

It has to be mentioned that 25 sugar mills which operated in 2015-season consumed natural gas for their production needs. Total consumption at these mills was 214.4 mln m³ of natural gas, and natural gas consumption per 1 t of processed sugar beets was 34.07 m³ comparing to 34.4 in 2014. The share of fuel and power in processing production cost of 1 t of sugar beets is about 38%, and its share in sugar production cost is 27%. It encouraged sugar mills to look for alternative kinds of fuel to substitute natural gas.

According to the statistics of the National association of sugar producers of Ukraine “Ukrt-sukor”, at the beginning of operation season-2015 some renovation work concerning the preparation of the systems for using furnace fuel oil was carried out at several sugar mills; a number of sugar mills started their operation with total or partial substitution of natural gas. In 2015 sugar mills consumed 15.6 th t of pellet, 6.1 mln m³ of biogas, 13.2 th t of peat, 68.5 th t of bituminous coal for their operation needs. It made it possible to substitute 100 mln m³ of natural gas with alternative fuels during the operation season. As the average price of 1000 cubic meters of natural gas is UAH 6600, cost cutting is UAH 660 mln (The National Commission, 2015).

The power balance of a sugar mill shows that 85-90% of the total fuel consumption goes for the manufacture of heat energy for technological needs, and 10-15% – for the manufacture of electric power, lime and carbon dioxide. So, a significant way to reduce specific consumption of fuel-power resources is to reduce heat power consumption for sugar beet processing.

The necessity to diversify the supply of sugar mills is defined not only by high dependence of the country on power resource import, but also by the need to have reserve capacities to process the surplus of the produced output taking into account a cyclic and risky nature of sugar beet production.

In Ukraine the developed sugar beet production is a universal basis for the production of bioethanol. The greatest output of bioethanol per unit area at the appropriate level of yield can be obtained from the sugar beets. However, in the processing of sugar beet into sugar we get the molasses, and depending on its quality the output of bioethanol from 1t can be 0.222-0.237 t (*Table 11*).

Table 11. The calculation of the output of bioethanol from various types of raw materials by the different yields

Raw	The output of bioethanol from 1t of production, t	The output of bioethanol in calculating per 1 ha depending on the yields of culture, t	
		yield	output of bioethanol
Sugar beets (crude juice)	0.074-0.079	40.0	2.96-3.16
		50.0	3.70-3.95
		60.0	4.44-4.74
Molasses (processing of sugar beet into sugar)	0.222-0.237	1.56	0.35-0.37
		1.95	0.43-0.46
		2.34	0.52-0.55
Wheat	0.237-0.311	3.0	0.71-0.93
		4.0	0.95-1.24
		5.0	1.19-1.56
Corn	0.321-0.346	4.0	1.28-1.38
		5.0	1.61-1.73
		6.0	1.93-2.08

Source: own research.

Hence, the development of commodity policy and the extension of product range of sugar mills is one of the most promising and efficient ways which will facilitate the efficiency enhancement of sugar branch companies. The intensification of this trend is possible in the conditions of total and rational use of raw materials which come for sugar manufacture, and also in the conditions of complex processing of by-products of sugar production.

The importance of sugar beets is not limited to the manufacture of sugar. When sugar beet is processed, beet pulp and molasses are produced. Beet pulp is used to feed animals and to manufacture pectin glue, used in textile production. Molasses is widely used in animal feed manufacture. It is raw material for spirit/alcohol production as well as glycerin, good yeast for bakery industry (Sabluk, Kodenska, & Vlasov, 2007).

Taking into consideration the world experience as to the use of sugar raw material to produce alternative fuel, it would be expedient to use it at sugar mills of Ukraine. It is possible to set up the production of bio ethanol from sugar beet processed products, and that of biogas – from beet pulp. The use of sugar beets and their processed products to manufacture other items in addition to sugar makes them competitive compared with other agricultural crops.

Table 12. Diversification trends of sugar mill output

Processed output of sugar beets	Consumption
Sugar	- technical purposes
	- consumption by population
	- consumption in food industry
Beet pulp	- to feed animals with fresh, sour, granulated beet pulp
	- silage
	- manufacture of pectin glue
	- manufacture of biogas (electric power, organic fertilizers)
Molasses	- processing for spirit, glycerin, dry yeast
	- manufacture of animal feed, cleaning of dry beet pulp
	- separation to get sugar
	- animal feed enrichment
	- manufacture of bio ethanol
Defecate	- manufacture of fertilizers, building material
Bioethanol	- admixture to gasoline

Source: own research.

The production of bio ethanol is possible by using several schemes. The first option is to set up the workshop for bio ethanol manufacture at the sugar mill. The mill produces sugar with help of traditional technologies, and bio ethanol – from molasses. The second option is to produce bio ethanol from syrup. This practice can be used at alcohol-producing plants situated near sugar-mills. Another way to manufacture bio ethanol envisages the manufacture of sugar and bio ethanol from molasses and syrup. In this case two processes are combined at the mill, and correspondingly, its productivity increases and production cost of the output decreases. The optimal practice is the construction of combined workshops at sugar-mills and alcohol-producing plants; during sugar beet harvesting season they will manufacture bio ethanol from processed products, and in-between season (shoulder period) – from grain wastes of headed grain crops or corn.

At present processing, storage and utilization of beet pulp present a problem for the majority of sugar mills in Ukraine. The economic conditions of running business in the regions of sugar beet processing and the availability of sugar beet processing companies affect the solution of this problem. The main promising trends in the consumption and utilization of beet pulp are: valuable fodder for cattle, pectin concentrate and pectin glue, biogas with further manufacture of electric power. One of the potential ways to create demand for beet pulp is its use as valuable fodder for cattle.

Alongside with this, a considerable amount of biogas will be consumed by sugar mills for their own needs, however, if proper equipment is used, then the remaining power can be sold to other consumers according to “green tariff”. It is possible to use units for simultaneous manufacture of electric power and heat, and also special equipment for biogas cleaning and using it as traditional fuel for vehicles and other agricultural machinery.

Among other kinds of alternative fuel sources for the companies of the sugar branch and sugar mills in particular, the use of biogas is the most economically advisable and acceptable one. However, producers face some difficulties in introducing biogas units, namely, large initial investment expenses (it costs UAH 200 mln to build and put into operation a biogas unit with power capacity equal to 2.25 MVt); low credit activity in the sugar industry; the necessity to get a license to produce biogas; the lack of standard documentation for design, construction and operation of biogas units, etc. The lack of building code for biogas reactors is a legal problem.

Conclusions

Marketing of sugar industry companies – an activity that is associated with a complex sugar market research in order to expand product range, pricing, sales and meet the needs of enterprises of the sugar industry and consumers.

The increase of operation efficiency of sugar beets and sugar is possible through the output diversification of sugar mills of Ukraine. Besides, sugar beet production should be concentrated in the most favorable regions for this crop, whose soil-climatic conditions ensure high indicators of the yield and quality of the root beets. The increase of sugar beet productivity will satisfy the needs of sugar in the internal/domestic market, and it will result in the output diversification of sugar mills as well. In addition to sugar, it is expedient to produce heat and electric power, bio ethanol and biogas at the sugar mills.

Supply diversification of the sugar mills will allow:

- to set up the manufacture of ecologically clean alternative fuel – bio ethanol, biogas, and also that of electric power according to “green tariff”;
- to create jobs;
- to increase business profits;
- to get additional fodder for livestock production;
- to decrease the dependence on fuel import and to guarantee food security of Ukraine.

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Chapter 3.2.

VOLATILITY OF WORLD PRICES AND ITS IMPACT ON AGRICULTURAL PRODUCTION

Kateryna Prokopenko, Nataliia Mamontenko, Nanthakumar Loganathan

1. The stability of agricultural prices as a factor of food security

Most countries felt the effects of the food prices growth and fluctuation during recent years. As a result of growing food shortages population of the least developed countries (that are net importers of food and represent about 19% of the world population) suffered the most. It is usually the poorest rural population, dependent on food supply that is under the threat.

The report “The Future of Food and Farming: Challenges and opportunities for global sustainable development” (Foresight, 2011) states that in the next forty years the global system of food safety is undergoing serious structural changes concerning the level of supply and demand. The population growth impacts the demand, with total population increased from 8 billion in 2030 to 9 billion in 2050. It is likely that many people can afford a larger range of products for consumption, the production of which requires increasing resource costs. The following factors may affect the food supply: increased competition for land, water, energy resources and negative factors related to climate change. Thus, there is the problem of world capacity production system to provide the necessary food production of agricultural commodities in the long term and ensure global food security.

Measures to ensure food security should be taken at the micro and macro levels. Factors that contribute to the formation of food security at the macro level, include actions aimed at stabilization of agricultural production and reducing the likelihood of natural disasters which affect food security; reducing the dependence on energy resources; decrease the dependence of national food security from foreign sources in the conditions of instability in world markets and foreign exchange earnings from imports, price stability; reduce trade barriers and elimination of trade embargo.

Changes in the price level contribute to volatility in the market when these changes are the significant and risks of these changes cannot be predicted in advance. Thus, the fluctuations cause a high level of uncertainty, which increases the risks for agricultural producers, including those related to the change in commodity prices, consumers and governments, and promote the non-optimal decisions of investors on the allocation of investment in agriculture. Over the past fifty years barriers to agricultural trade were formed, which caused a slowdown in growth in agricultural trade, and reducing the rate of development of the poorest countries, increased growth and adverse effects of volatility in global food prices.

Market is the center of economic activity and the most important economic issues related to the functioning of the market. The mechanism is based on the functioning of the market supply and demand, with the central element of the market mechanism in favor price. Pricing in the agricultural sector differs significantly from other sectors of the economy. First, this is due to the specific agricultural production. The main features of pricing for agricultural commodities include: rental pricing principle; objectivity seasonal fluctuations; the possibility of active regulation; instability and high amplitude.

The main features of the formation of agricultural commodities prices include: rental pricing principle; objectivity of seasonal fluctuations; the possibility of active regulation; instability and high amplitude.

Prices formation on the agricultural market is determined by the dynamics of supply and demand. The proposal depends on the following factors:

- weather conditions
- prices of inputs,
- fuel prices,
- level of coverage,
- State trade policy,
- level of agricultural support.

Demand is impacted by the number, dynamics and structure of the population, changes in consumer preferences, and therefore consumption patterns, changes in household income.

Fluctuations in prices – a common feature inherent even to established agricultural markets. But when these trends become large-scale and unpredictable, they can have a negative impact on food security of consumers, farmers, and countries.

The rapid increase in food prices and their fluctuations from 2008 troubled the world and forced it to actively discuss and explore the problem of price changes in agricultural markets. Since 1960, a significant increase in food prices was observed twice. Since 1982 the world market was quite stable for over 20 years and prices were lower than the baseline of 2000.

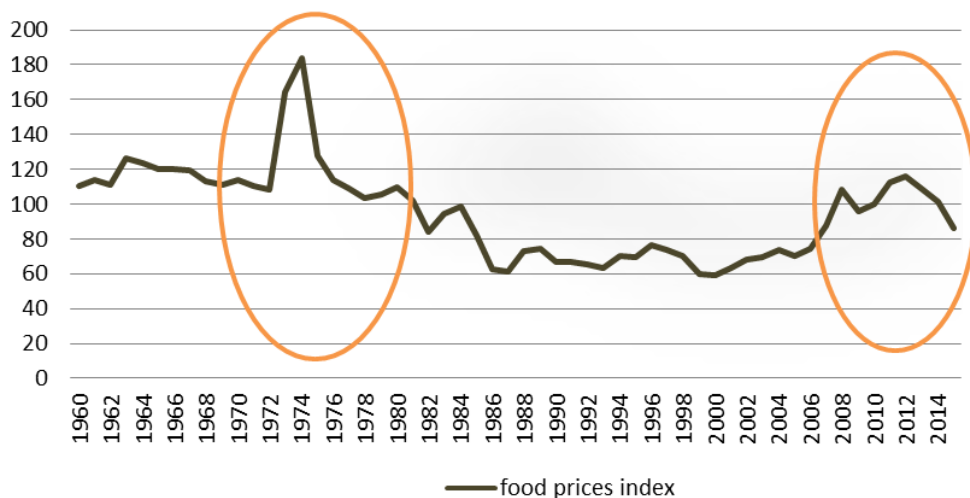


Fig. 1. The dynamics of the food prices index, % (2000 year = 100%)

Source: Created by author based on the data (World Bank, 2016).

Today food prices in the world are consistently high, although there is a gradual trend to their reduction. Therefore, we can say that the second wave of growth ended and prices have stabilized (Fig. 1). According to the latest forecasts of economists Food and Agriculture Organization of the United Nations (FAO) food market will be more stable and less volatile as compared to the last few years, due to improved supply and the recovery of world grain stocks.

In particular, the dynamics of grain prices indicates that despite the periods of prices decrease, they are now on average 1.5 times higher than similar indicators in early 2000 (Fig. 2). In 2012, they peaked during the last decade and now tend to decrease.

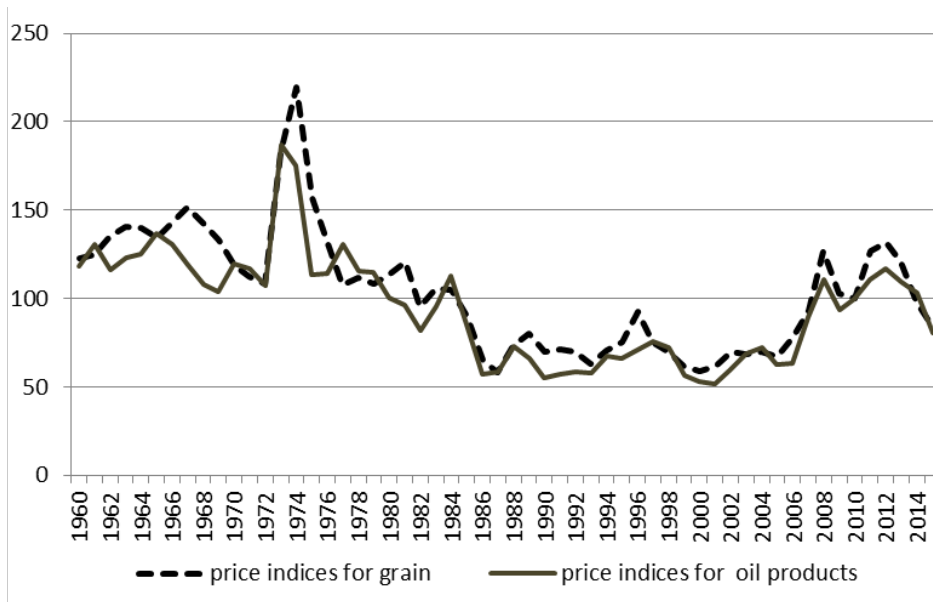


Fig. 2. The dynamics of price indices for grain and oil products, % (2010 = 100%)

Source: Created by author based on the data (World Bank, 2016).

Analysis of the last two periods of rising prices for corn (1973-1975 and 2011-2013). These periods were chosen due to the fact that both are characterized by high values of grain prices that have persisted for two more years.

It should be noted that the features of the recent price increases on the world food market were:

- protracted nature (long period of rising prices);
- the scale of the phenomenon (covered not only the developing countries but also developed countries);
- significant fluctuations and volatility in prices (volatility associated not only fundamental but environmental changes).

At the same time price fluctuations were not due to a certain single reason, there was a layering of several driving forces as factors of the demand and internal factors of the supply.

2. Price volatility and its reasons

During the studying of food prices, it is necessary to distinguish between some similar but unequal concept. One of them is the difference between average prices for the period and price volatility over time (The State, 2011). Average prices may change at constant fluctuation. Thus, between price levels and price volatility there is a connection – they are both determined by demand. In addition, there is a correlation between high prices and high volatility. First, high prices entails the use of reserves that can mitigate the impact of shocks on prices on the supply side or demand. However, after the stocks have been exhausted, the system becomes vulnerable to a new shock from the supply side or demand, in the absence of the compensator price volatility is usually higher than the availability of stocks. Despite this connection, it is important to consider the difference between the two concepts. First, the prices can be high, but stable. Secondly, the risks and benefits of high prices is largely different from the risks and benefits of volatile prices.

Another important difference is the one between the volatility and unpredictability of prices. Variability is inherent to property prices for many reasons, but some price changes may be largely predictable. A classic example of predictable food price changes – seasons when prices are lowest during the gathering the new harvest and immediately after, a maximum just before the new harvest. Although seasonal changes vary somewhat for years, they are generally similar. But weather disasters are usually unpredictable and, therefore, may lead to unpredictable price changes. Therefore, some price changes are relatively easy to predict, others – more difficult. Estimated price changes have different risks and benefits than unpredictable.

The main causes of modern growth and volatility of agricultural prices include (Abbot, 2008):

- increasing food needs of the developing countries and countries with transition economies, caused by their rapid economic growth;
- High energy prices, which increase the cost of agricultural production;
- rising prices for fertilizers;
- increased demand for corn for biofuel production;
- weakening of US currency;
- instability of production associated with climate change;
- a significant reduction in grain stocks;
- policies of exporters and importers of food;
- increased pressure on land and water resources;
- increase in world grain trade on futures, and, thus, the inflow of speculative capital.

Mostly dynamics of food prices depends on the dynamics of grain prices. Although grains are not the most significant part of the global food market (about 10%), prices for products such as meat and milk are included in the calculation of the price index of food is largely dependent on grain prices, since it is the basis animal feed.

The analysis showed that during the last ten years there have been large changes in the real price index for all food commodity groups. The maximum index of food prices, calculated according to the FAO methodology, over the period, was recorded in February 2011, and grain – in June 2008 (if you take average indicators, the maximum value of the index of food prices was recorded in 2011, and index of grain prices in 2008) (FAO, 2016).

At the end of 2016 food prices remain stable in the world high and likely to remain volatile

As previously indicated in economic theory volatility is connected to two main concepts: variability and uncertainty. The first describes the movement as a whole, and the second indicates the movement, which can be unpredictable.

As already noted, price fluctuation is a common feature inherent in many well-developed agricultural and other commodity markets, as well as a necessary condition for the functioning of a competitive market. But when changes are large-scale, continuing and unpredictable, they can have a negative impact on food security of consumers, farmers and even entire countries.

Among the main manifestations of volatility in global markets, the following should be noted:

- volatility of agricultural prices associated with the frequency of occurrence of international food crises (70 years of XX century, 2000 years of the XXI century);
- the volatility associated with the shortage of goods in the markets of agricultural products due to significant pressure on natural resources due to agricultural production (water, soil, oil).

In general, volatility of prices is the price movement up or down over time. This movement might be close to zero (low volatility) or up to a large scale (high volatility). The time period is also important because volatility is measured in a relatively short period of time. For economists price volatility is the main component of the normal functioning of markets. The essence of the price system is that when there is a shortage of any commodity, its price increases, which leads to lower consumption and demonstrates the need to invest in the production of this product (Prakash, 2011). Thus, a certain level of volatility is needed for the markets functioning. Most papers distinguish normal and excessive volatility, which can be characterized as both good and bad volatility. However, the difference is not so simple. The excessive volatility in relation to vulnerability means that its discovery there is no universal standard or reference point. During the assessment of market volatility as a normal, fluctuations are determined by the relationship between prices and the so-called fundamentals of a market economy and its impact on the population and the country. Sometimes the concept of excessive volatility is used for qualitative assessment of price changes that can not be easily explained by changes in demand or supply. Defining a starting point for measuring normal and excessive volatility levels is quite complex. In practice, many authors have used different methods to assess whether volatility in food prices increased over time (Gilbert, 2010; Huchet-Bourdon, 2010; Abbot, 2008). They nearly unanimously concluded that over the last 50 years (1960 to present) a tendency to increase volatility in prices was observed. They emphasize that the current price volatility on the international markets of agricultural commodities is higher than it was in the nineties of the last century in the two thousand years of this century, but higher than in the seventies of the last century.

In the current environment it is very difficult and probably impossible to analyze the volatility of prices in isolation from price growth in order to understand what is happening on the world food markets. And on the world food markets there is a new phenomenon of the existence of strong upward trends, i.e. simultaneous increase in prices and increase of their volatility. The best illustration of the existence of this trend is the fact that the markets had to endure during the deepest depression since the Second World War (when the growth rate of world production declined from 5.4 percent in 2007 to 2.9 percent in 2008 and to -0.5 percent in 2009) that food prices have started to decline, and the fact that even with the depressed

food prices have not fallen to the level that was recorded in 2006 when the world started to grow again, it was accompanied by a repeated increase in food prices. This, however, does not mean that prices can not go down again in response to a repetition of the depression of the global economy, as occurred in 2009. Since 2013 food prices started a gradual decline.

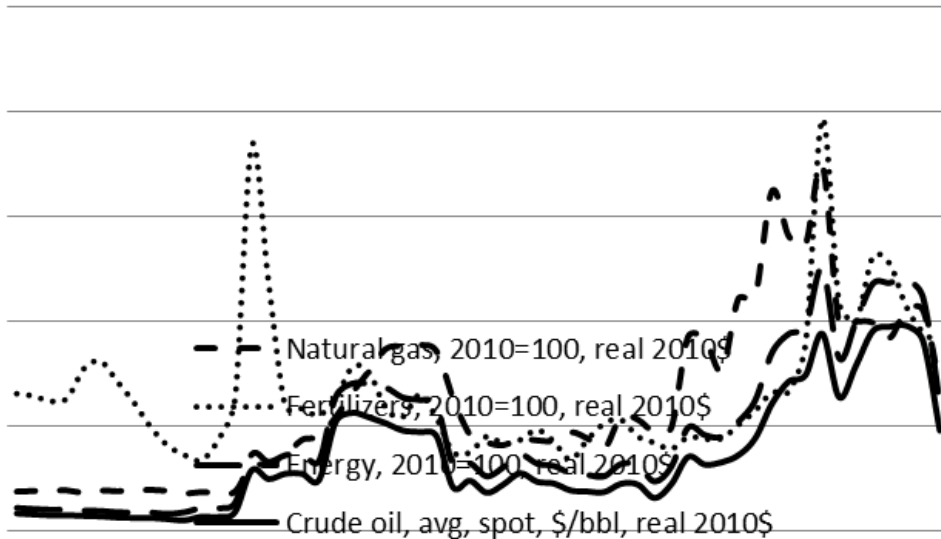


Fig. 3. Dynamics of prices for the resources that affect agricultural production

Source: Created by author based on the data (World Bank, 2016).

In the long term, another wave of investment in agriculture could lead to a substantial increase of production and the return relatively low and stable prices. But while the trend to higher prices has a chance to save, then prices decrease, which is observed is fragile. The second reason is that people and governments are more concerned about high prices, not their volatility. Even if someone pays attention to the volatility, it is because it increases during periods of rising prices. The impact of volatility in the prices of food security and human well-being depends on the price level. The impact of price volatility is felt much more at high prices.

The main causes of the food crisis of 2007–2008 were: decline in production, poor infrastructure and, consequently, losses during storage and transportation of food products, the volatility of food prices. The main factors affecting the volatility of prices are: droughts, floods, hurricanes and other weather conditions associated with climate change in countries such as China, Bangladesh, Australia, Pakistan; increased demand for certain products such as meat, cereals, dairy products; rising oil prices, which caused a rise in transport and production of certain products; increase in speculative investments in the mining sector and the agricultural sector. Discovered by OECD and FAO link between rising energy prices and the cost of agricultural food products (OECD/FAO, 2010) gave reasons to believe that oil prices had not increased in the pre-crisis period of 2005–2007, it is likely that prices for agricultural food products would not have risen to such an extent. Moreover, changes in oil prices has both short and long term effects. For example, in the short term rise in oil prices affect the costs associated with the operation of irrigation systems, food processing and transportation. Thus, cost of each stage of value added increases. In the long term rise in fuel prices affects the decision-making manufacturer on production volumes.

Another cause of price volatility was the gap between the amount of supply and demand for food products. Thus, the gradual reduction of export crops in China and India and a parallel increase in consumption rates caused the growth of world prices for cereals in the period 2007-2008.

The exchange rate of the national currency of the exporting country food as a financial instrument, is also a factor that affects the price volatility. Increasing exchange rate against the US dollar substantially reduces the competitiveness of the export price. To compensate and preserve the share on the international market, domestic prices should be reduced, which in the long term, respectively, reduces the impact on production volumes. Prices reduction by importing countries stimulates demand. Thus, high demand along with a decrease in production are major factors in the overall increase in world food prices, *ceteris paribus*. The gap between the amount of supply and demand for food products contributes to the escalation of prices.

Deeper reasons for the growth of food prices include factors such as structural changes in trade and agricultural production, support and subsidies in agriculture in developing countries, speculation on the food market and the problem of climate change.

3. Volatility in agricultural prices: impact on producers and measures to ensure price stability

Given all of the above it should be recognized that in order to meet the demand for food from a growing world population, which is estimated to reach 9.2 billion people in 2050, agricultural production is projected to grow by around 70%. An important component of achieving this goal is to maintain profitability for agricultural producers. High prices of agricultural products would not only benefit countries that are efficient producers and exporters, but also becomes an incentive for countries which currently act as net importers of food, with a high potential in agricultural production (the development of which is constrained by the high level of subsidies to production of developed countries), to further the political goals of food self-sufficiency.

Macroeconomic effects of commodity prices for the country are important because they affect the level of income per capita, which is the key determinant of living standards. In general, high world food prices benefit countries that export these products, while low prices benefit importing countries. Abstracting from the moment of volatility, it can be argued that in the short to medium term price fluctuations are generally changes with a zero-sum: exporters are benefiting at the expense of importers, and vice versa. However, in the long term, high food prices may force some importing countries to increase investment in agriculture and reduce imports, or even become exporters. Such investments are crucial for the development of the agricultural sector, sustainable poverty reduction and prevention of food safety risks.

The impact on the balance of payments and the exchange rate would be the most significant in those countries where the food sale is part of export or import. Countries, which export much of their production, receive the greatest benefit at high prices. Countries that import a significant portion of food for consumption, are affected at high prices the most. However, consequences generated by the “terms of trade” are important too. For example, a country that exports oil or metals, may not need to increase their production to compensate for rising food prices if the price of its exported products increased more than prices for imported food.

In the short term benefits of high prices are realized primarily by farmers with high commodity surpluses, and it should be noted that these producers do not relate to the poorest. In addition, the poorest tend to buy more food than sell. Thus, high food prices tend to lead to increase poverty, food insecurity and malnutrition.

In the long run the best way to reduce food prices is the investment in agriculture. It will lead to a sustainable yields increase, lower production costs, increased productivity and reduced loss and waste of food. These investments can make food more affordable for consumers and more profitable for manufacturers and act as an important mechanism to influence food prices for everybody to receive the benefit. In this sense high prices may be the safeguard against high prices, provided that high prices encourage the introduction of improved technologies in agriculture and encourage the government and international donors to increase the amount of financial resources for investment in agriculture. So while high prices intensify the problem of food security and poverty in the short term, they also empower investment and economic growth that reduce these negative risks in the long term.

Nevertheless, high prices can encourage long-term investment in agriculture that will contribute to sustainable food security in the long term.

For farmers volatility of commodity products prices (either their increase or decrease) leads to uncertainty. It affects decisions on investment in agriculture and, thus, has the long-term affect on World Food Security.

Export-oriented agricultural products prices on the domestic market of Ukraine depend on the prices prevailing on the world market. In the last few years one of the main export crops was corn. Therefore, *Fig. 4* compares the dynamics of moving average values (for occasional fluctuations smoothing) and average monthly selling price of corn on domestic and global markets. The dynamics shows that the trend of prices on the domestic market with a small time lag almost completely repeats the one on the world market.

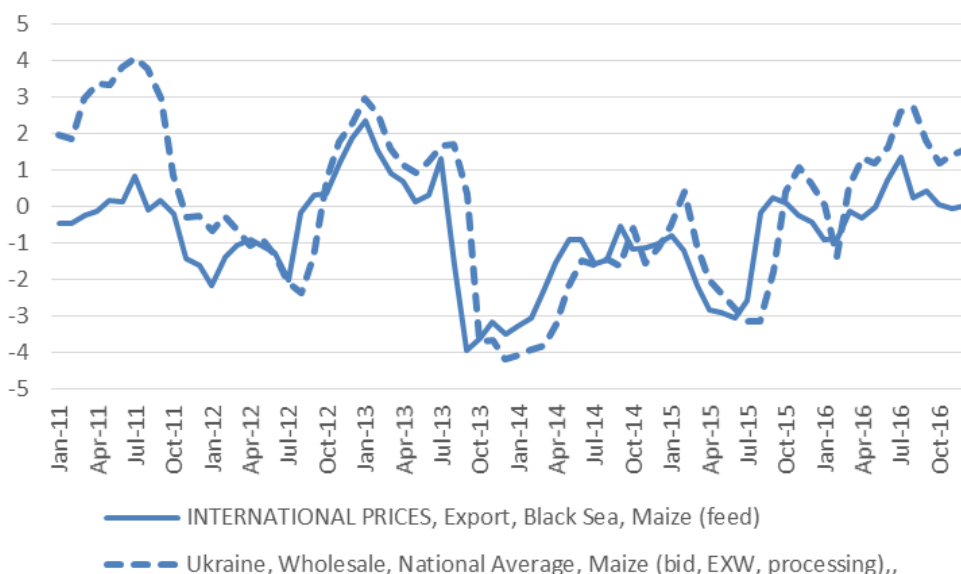


Fig. 4. Dynamics of 12 months moving average of monthly corn selling prices, %

Source: Created by author based on the data (GIEWS FPMA Tool, 2016).

Comparing levels of volatility of corn global and domestic prices indicates that domestic corn prices trend in Ukraine (except for the marketing year 2012/2013) was characterized by higher volatility compared to world prices. It should be noted that the last six months of 2016 the volatility of world and domestic corn prices were rather close, but it tends to rise and this situation creates additional risks for domestic producers and requires certain measures to mitigate the impact of volatility on their activities.

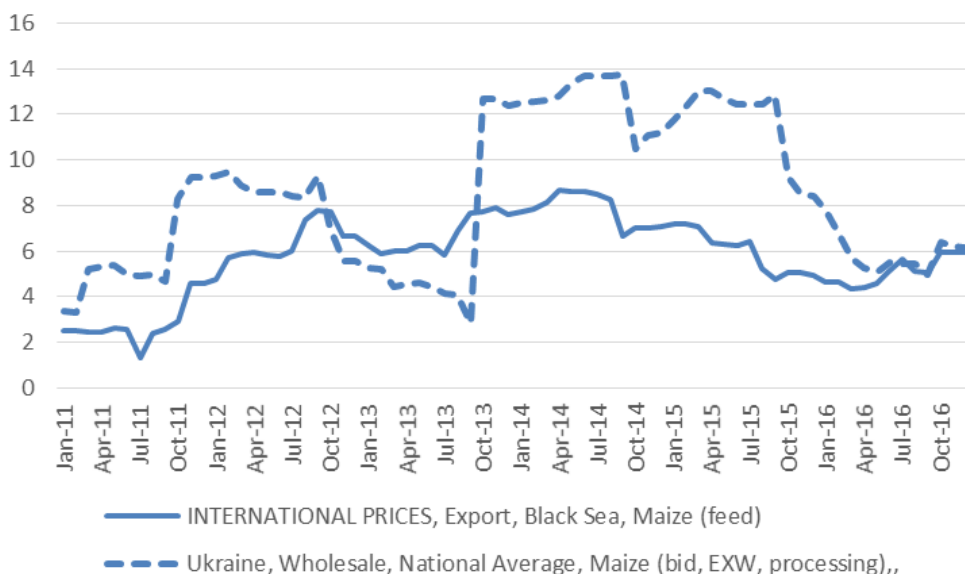


Fig. 5. The dynamics of corn selling prices volatility, %

Source: Created by author based on the data (GIEWS FPMA Tool, 2016).

Profitability of Ukrainian producers is very dependent on the world prices, which is particularly clear on the corn market (Bodnar, 2014).

Over the past 15 years, the major discussed issues of the policy on food prices were management tools to prevent this risk, thus, volatility is a risk that must be managed. Overall it is expected that prices will rise because of growing population and economic growth that will put upward pressure on demand, as expected increased use of biofuels (depending on biofuel policies and the price of oil). As for the proposal, if oil prices continue to rise, agricultural production costs will increase, which will cause increasing food prices. Restrictions related to natural resources, particularly climate change and the lack of fertile land and water in some regions, create serious problems for the food production at reasonable prices. On the other hand, it is optimistical that there is still significant potential for increasing crop yields through new technologies, and reducing losses throughout the chain of production and marketing. However, this potential will not be realized without increased investment.

The tools to address price volatility and provide income to farmers could include private initiatives, government policies, or a combination of both.

First of all, there are several methods for individual farmers to address these issues in particular, they can try to reduce the likelihood of these risks. For example, the use of appropriate

te production technology (through the introduction of drought-resistant crop varieties or irrigation investment), farmers can reduce the risk of crop losses due to weather conditions.

The risks associated with fluctuations in prices also can be reduced through the use of insurance. However, these tools are quite expensive. So farmers, in order to protect against these risks, mainly apply simple financial approaches, such as saving money during periods when they obtain high income, using these reserves when income decreases (European Parliament, 2014).

In addition, there are tools of protection against price fluctuations such as diversifying crop rotations, membership in farmer cooperatives and the construction and use of facilities for their production.

Governments can empower farmers by creating a political and legal framework that will expand their ability to manage these risks (Tangermann, 2011). Such measures include training farmers to provide accurate information about the market situation, support the social security system during natural disasters or serious disturbances on the market.

For example Common Agricultural Policy (CAP), of EU is composed of several policy tools to help farmers to deal with price volatility and income. These tools have developed over a long period.

CAP uses the following three tools for the period 2014-2020:

- financial support for farmers in the form of insurance premiums for crops and livestock from losses caused by adverse climatic events and disease;
- financial support of mutual funds to compensate farmers for production losses associated with climatic and environmental events;
- financial support to farmers who experience a serious loss of income (over 30% of the average annual income) (Swinnen, 2013).

US farm policy uses a completely different set of tools and instruments to deal with the volatility of prices and incomes for farmers than those used by CAP. While EU provides direct payments to support farmers' incomes by marketing their products, the USA stopped direct payments and focused on the market income, reducing risk by encouraging farmers to use insurance. These differences are reflected in the balance of various tools in the US and EU, while the agricultural policy of the USA comprises at least 60% of insurance tools and no direct payments, CAP comprises less than 1% of insurance instruments and around 60% of income support through direct payments (European Parliament, 2014).

The main aim of measures of preventing and reduction of the prices volatility is to reduce food insecurity and promote productivity, particularly among small producers in developing countries. Doing so increases the degree of stability in relation to external shocks, and increases the supply in local markets at affordable rates. Measures to deal with the price volatility should ensure the volatility reduction in the short and long run and reduce the impact of price volatility on food production, income and nutrition in the poorest developing countries. Tools to achieve these goals include: demand regulation, trade policy, providing investments for financing agricultural markets, ensuring transparency and predictability and the prevention of speculation on agricultural commodity markets, forecasting the information on agricultural output.

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Chapter 3.3.

THE USE OF MODERN MARKETING CONCEPTS IN ENSURING THE SOCIAL ORIENTATION OF THE ENTERPRISES OF THE FOOD INDUSTRY

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The theory of marketing is the subject of research of many scholars, as foreign as domestic. Among them, the most well-known are: Assel G., Lamben J., M. Baker, F. Kotler, J. Bowen, J. Meikens, K. L. Keller, F. Kredis, E. Saveliev, A. Starostina and others.

Marketing, having undergone a long evolutionary path, is constantly evolving. The question of the evolution of marketing is relevant in many studies, as domestic as foreign scientists. This question is considered by many scholars through the development of marketing concepts that are characterized by certain features (principles, functions, approaches) that allow them to be identified. Among the main characteristics of marketing concepts, scientists define: market orientation (production or consumer); the purpose of the enterprise; tools for meeting the needs of consumers; the main factors of market satisfaction, etc.

F. Kotler (2006) states that marketing, as one of the areas of scientific research, is characterized by a large selection of theoretical concepts and techniques that help marketers make decisions.

For a long time the view of F. Kotler dominated. It says that marketing development is a coherent development of five concepts: improving production, product improvement, intensification of commercial efforts, integrated marketing, social and ethical marketing. The most common approach to defining concepts that characterize the evolution of marketing, was considered to be set out in F. Kotler's work «Marketing Management» (Kotler, 2006). In his opinion, the development of marketing concepts took place in accordance with the degree of maturity of the market (*Table 1*).

F. Kotler notes that marketing concepts embody different periods in the history of the American economy and the main social, economic and political changes over the past 50 years. The general trend of development is shifting the focus from production and goods to commercial efforts, towards a consumer with an increasing focus on consumer issues and social ethics (Kotler, 2006).

The socialization of enterprise activity can be realized through the socialization of marketing activities. F. Kotler's approach to defining the basic concepts of marketing has given an impetus to the development of the theory of social and ethical marketing.

F. Kotler's views became the basis of the formulation of modern approaches to the definition of social and ethical marketing as the main concept of the late 20's – the beginning of the 21 century.

Kredisov A. and Naumova B. (1999) note that at the end of the twentieth century, the change in consumer behavior by the market reaction was the development of new marketing concepts and strategies based on the principles of social and ethical marketing.

Table 1. Evolution of marketing concepts

Period years	Concept	Leading idea	Main goal	Ability to use
1860-1920	Improvement of production	Production of what can be produced, philosophy «do and sell»	Improving production, achieving of high production efficiency, reducing production costs, increasing sales, maximizing profits, mass distribution of products	Demand for goods exceeds supply; the cost of the product is too high and needs to be reduced, which requires increased productivity
1920-1930	Improvement of the product	Production of quality goods, the philosophy of «make and sell»	Improvement of consumer properties of goods, improving the quality of goods, the focus on the seller's needs	There was a quantitative saturation of the market
1930-1950	Intensification of commercial efforts	Development of distribution network, distribution channels	Intensification of sales of goods at the expense of marketing efforts for the promotion and sale of goods	Goods of passive demand and goods-attributes; sphere of noncommercial activity
1950-1980	Integrated marketing	Production of what the consumer needs, «understand and respond» philosophy	Satisfy the needs of target markets, focus on the needs of customers, marketing orientation, ahead of the market	For consumer goods; use by large enterprises
1980-1995	Social and ethical marketing	Production of what is necessary for the consumer, taking into account the requirements of society	Satisfying the needs of consumers of target markets, according to preserving human, material, energy resources and environmental protection	Providing long-term prosperity of consumers and society

Source: compiled by the author for (Kotler, 2006).

There are many definitions of social and ethical marketing in the scientific literature. However, they are united by the fact that, when implementing approaches based on social and ethical marketing, the activity of enterprises is oriented towards social orientation.

Social and ethical marketing is based not only on individual needs of consumers, but also on preserving and improving the quality of the standard of living of society (Belyavtseva, & Vorobyov, 2006).

Increasing of interdependence between economic results and the social orientation of enterprises, taking into account environmental and social problems in implementing strategic plans creates preconditions for the socialization of marketing activities. It means the

greater maturity of society and the growth of consumer demands not only to the quality of products and services, but also to business, increase its environmental, safety, etc. The reaction of enterprises to the problems characterizing the modern external environment of organizations is the orientation of modern marketing to sociological concepts.

Socialization – a characteristic of the process of assimilating members of society of a certain system of knowledge, norms and values that ensure the existence of a reliable social system (Saveliev, Chebotar & Shtefanich, 2008).

Social responsibility in any manifestation, whether it is corporate social responsibility, or socially responsible marketing, embodies human values that can benefit society as a whole and its individual members.

The introduction of social responsibility companies is possible under certain conditions. And the first step here may be the use of elements of socially responsible marketing, which manifests itself in the socialization of interaction with consumers, suppliers, channels of sales.

So, defining the preconditions for the introduction of socially responsible business, A.Sh. Galimova and O.A. Poluyanov (2014) defines three main groups of factors that influence the possibility of introducing social responsibility:

- loyalty of the authorities to companies that carry out social policy tasks together with the state;
- economic benefits – the desire of the businessman to guarantee his own stability, to protect himself from unnecessary problems;
- moral and ethical reasons, which are guided by management and owners, taking part in voluntary social and responsible activities.

The motivation of business to carry out socially responsible activities is determined, first of all, by the attitude of owners towards consumers and the social role of the enterprise. We are increasingly inclined to believe that under current conditions, social responsibility can be considered as one of the competitive advantages of doing business and as a strategic benchmark for market development.

According to N.V. Kuznetsova (2013), the business must take care not only of the profit and payment of taxes distributed by the state to solve socially significant problems, but also must be motivated by the need to share with society the responsibility for social injustice, economic inequality, taking part in the economic adaptation of socially vulnerable groups of population, in the protection of the environment.

Based on the Code of Conduct, socially responsible corporations are expected to implement the guidelines in the so-called sensitive areas that are enforced by following management procedures such as:

- creating conditions for the preservation of health and environment, ensuring safe working conditions;
- ensuring a fair working environment;
- prevention of bribery, restriction of the value or inadmissibility of gifts and entertainment;
- observance of human rights and participation in society;
- management of third parties (interested persons);
- management of differentiated pricing;
- management of «soft» permissions;
- knowledge management (Leisinger, 2011).

In order to achieve a larger effect, an enterprise should choose its own areas of influence that are most consistent with its strategic objectives and strategic intentions, such as:

- protection of life, health and property of consumers of enterprise products;
- prevention or reduction of harmful effects on the environment;
- use of materials and energy-saving technologies for the purpose of economical spending of non-renewable resources;
- assistance to low-income groups of the population.

All these areas of influence belong to the food industry enterprises. Since the actual production of enterprises for quality characteristics must meet the standards that guarantee the safe consumption of food products.

Most food industry enterprises have a harmful effect on the environment, so it is necessary to minimize this impact. The solution to this problem is the certification of enterprises under the International Environmental Standard ISO14000. This standard is focused on the environmental management system (CEM).

The production of food products relates to materials and energy-intensive industries. In the cost of production a high proportion have the cost of raw materials and energy resources occupy. Therefore, the introduction of technologies aimed at the complex use of raw materials and the use of related products will reduce the cost of production. For example, the use of molasses, whey, beer pellets, and others.

In addition, one of the priorities of the socially-oriented policy of food industry enterprises in current conditions may be the production of social-oriented products for the population with low purchasing power. According to statistics, Ukrainians spend more than 50% of their income on food, but the consumption of basic products is below the rationale. This is especially true talking about livestock products.

Enterprises that implement socially responsible business conduct tactical goals such as: observance of labor and social rights of personnel; the introduction of standards to eliminate accidents in production, which is no less important when implementing the principles of social responsibility.

Socially responsible marketing uses the principles of corporate social responsibility, promoting social standards and ethical standards of business in interaction with consumers and stakeholders.

Marketing concepts evolved, their formation took place in parallel with the development of market relations and need to form new approaches to interaction with consumers and society as a whole. The concept of socially responsible marketing has transformed from the concept of social and ethical marketing, becoming part of the concept of socially responsible marketing.

Developing the theory of socially responsible marketing, scientists identified its features, tasks, principles, functions, orientation.

The concept of social and ethical marketing aims solving problems related to meeting the needs of consumers, while respecting the interests of society and enterprises, ie, social and ethical marketing is aimed at balancing three factors: company profits, purchasing needs and interests of society (Kotler, 2006); (Baker, 2002).

One can conclude that the purpose of the concept of social and ethical marketing is to increase profits by meeting the needs of target consumers, without detriment to society

as a whole. The rules of social and ethical marketing limit in a certain sense the entrepreneurial initiative and production activity. They place them in dependence on the areas of social development and the imperative of improving their place of residence (Bulakh, Kakunina, & Chernykh, 2010).

Here are some definitions of social and ethical marketing (*Table 2*).

Table 2. Generalization of points of view on the definition of social and ethical marketing

Author, Source	Definition
1	2
F. Kotler (1991)	Setting the needs and interests of the target markets and ensuring the desired satisfaction more efficient and more productive than competitors, while simultaneously maintaining or strengthening the well-being of the consumer and society as a whole
G. Assel (1999)	Social-ethical (socially oriented) marketing is aimed not only at identifying the needs, needs and interests of target markets, their satisfaction more efficient and more productive than competitors, but also with the requirement of preservation and / or strengthening the well-being of the consumer and society as a whole
O.P. Pankrukhin (2005)	Marketing activity in conjunction with the ethical, environmental components of the business, the state of the environment and the attempt to maximize profits in the production of goods and services.
N.M. Moskvitina (2011)	The concept of social and ethical marketing, as well as the concept of clean marketing, suggests that the company's primary objective is to identify the needs of individual groups of consumers and to use more efficient and productive ways than competitors. The firm must ensure the preservation and strengthening of the well-being of the consumer and society as a whole
I.V. Bulakh, G.A. Kakunina, O.O. Black (2010)	The socio-ethical concept of marketing is characteristic of the modern stage of development of human civilization. It is based on a new philosophy of entrepreneurship, focused on satisfying the reasonable, healthy consumer needs.
O.I. Vikcharchuk (2015)	Social and ethical marketing is the responsibility of marketing activities to society. The rules of this kind of marketing allow us to keep the economic activity under control, in a limited amount allow for entrepreneurial initiative and production, thus placing the enterprise in dependence on the norms and rules of society and its needs and guidelines.

Source: Summarized by the author.

The presence in the definition of social and ethical marketing of the direction of the activities of enterprises to meet the reasonable and healthy needs of consumers does not seem appropriate to us, since in this case it is difficult to explain within the defined concept the production of status goods, that do not meet the healthy needs of consumers whose production is aimed at activities enterprises of the whole industries (alcoholic beverages, tobacco, etc.). The question also arises as to how to evaluate the production of the brewing industry, the fast-food industry, etc. from these positions.

Even if production is aimed at satisfying needs that are difficult to call healthy and reasonable, the arguments for the existence of enterprises that provide such products can be:

- firstly, the existence of the needs for which production is directed;
- secondly, the creation of jobs for employees who work to meet these needs, which can be considered as an internal social focus of the business.

Characterizing social and ethical marketing, determine the main objectives of marketing within this concept, among which:

- comprehensive substantiation on the basis of knowledge of economic and biological laws of optimal interaction of enterprise, society and nature;
- introduction of such forms and methods of production, based on the rational use, protection and reproduction of natural resources, taking into account the ethical component of the entrepreneur's behavior (Pisarenko, 2000).

Social and ethical marketing has become a concept aimed at solving issues related to the pressing problems of society. In this context, within the framework of this concept, enterprises must find ways to achieve a balance between the profit of the enterprise and the satisfaction of the needs of consumers. That is, the achievement of a balance of interests in production and consumption, if necessary, minimize the negative impact of production on the environment.

The concept of social and ethical marketing, which was formed on the basis of strategic marketing, considers marketing activity in tight connection with the new global problems of humanity – ecological, ethical, educational, – generated by postindustrial society, information civilization. The deterioration of the quality of the environment and the problems of bioethics make it difficult to solve the equation, where, on the one hand, the profits of the firm, and on the other – not only current needs, but also long-term well-being, increase the value of human life in general (Pankrukhin, 2005).

Pankrukhin (2005) notes that in implementing the concept of social and ethical marketing, the company's profits are strictly dependent on satisfaction of the higher perspective needs of man and society, on their long-term well-being.

One of the main features of ethical marketing is that enterprises, within the framework of clearly defined ethical rules, operate in the formulation of marketing strategies. To operate effectively on the market, the company must adhere to these rules in conjunction with market players: consumers, suppliers, competitors, distribution channels, etc.

The basic concepts on which the concept of ethical marketing is constructed are:

- the need for change for enterprises, which should be based on the welfare of consumers;
- determination and observance of rules of internal ethical behavior;
- the likelihood of loss of profits while respecting the principles of ethical marketing.

To realize the concept of social and ethical marketing, the main emphasis is put on the responsibility of the company to society in the marketing activities.

Thus, the essence of the concept of social and ethical marketing can be expressed through a phased solution of problems: identifying the needs and interests of target markets, providing higher consumer value through tools that support or improve the welfare of clients and society (Moskvitina, 2011). In addition, the author emphasizes that this concept is the most progressive of the five, presented in the works of F. Kotler (2006).

The development of the theory of social and ethical marketing implies the need to formulate its basic principles and functions.

So, S.M. Osadcha (2013) identified the following basic principles of social and ethical marketing:

- the principle of consumer sovereignty; concentration of effort;
- focus on the future;

- continuity; social and ethical marketing;
- adequacy;
- flexibility and adaptability;
- economic feasibility; complexity;
- variability and optimality;
- situational approach.

Another approach to defining the principles of social and ethical marketing is presented in (Osadchaya, 2013), where the basic principles of social and ethical marketing are defined as follows:

- responsibility to the environment. The use of environmentally friendly products and the availability of environmental production;
- social responsibility. The company must understand that it not only produces and sells goods but also affects the society through this product;
- responsibility for employees. The company must be sure that the people who work there work on the right roles and positions for the better functioning of the company's social and ethical processes;
- responsibility for the information. Every firm should understand that information is an influential factor in human life, so you need to speak, write and report only true and truthful information.
- strategic responsibility. Each company should have its own social and ethical marketing strategy from the very beginning of its implementation in order to preserve strength, time and resources.

D.V. Kislov (2013) defines the principles of social and ethical marketing through three groups: general, structural and specialized. To each group of principles it includes the following: a) general ones, among which: the principle of objectivity; principle of adequacy; principle of ordering; the principle of social balance; the principle of social responsibility; the principle of moral responsibility; principle of publicity; b) structural, among which: the principle of coherence; the principle of conformity (methods, forms, etc.); the principle of concretization; c) specialized (specific), among which: the principle of information; the principle of personalization; principle of decision-making.

As can be seen from the presented points of view, each author in his own way defines the principles on which the concept of social and ethical marketing is built. However, the principle of social responsibility is common to all points of view.

In our opinion, the principles of social and ethical marketing can include the principle of systemicity, since it allows to orient the enterprise management system to target the achievement of the goals of social and ethical marketing, which will ensure more effective interaction of the enterprise with the environment and increase the adaptability of the enterprise to its changes without violations the ethics of doing business altogether.

There is also no single approach to the definition of the functions of social and ethical marketing in scientific and educational literature. Describing the functions of social and ethical marketing in terms of the process approach, it is appropriate to divide them into general and specific. General characterize the performance of any marketing activity, while specific determines the use of the concept of social and ethical marketing in the enterprise.

Thus, in works (Hirchenko, & Dubovik, 2007) to the functions of social-ethical marketing include both specific and general (classical) functions: analytical, production, pricing, marketing, communicative, management, social, reproductive. However, according to the authors, such a list of functions is limited and they are not structured.

A wider classification is presented by another author (Osadchaya, 2013), where classical marketing functions (market research, assortment, pricing, marketing and communication policies, management and control) and specific functions (regulatory, social security and system-transforming) are considered (Table 3).

Table 3. Specific functions of social and ethical marketing

Functions of social and ethical marketing		
Regulatory functions	Social security functions	System-transforming
1. Ensuring of the legal basis for the functioning of the organization 2. Ensuring of social stability 3. Provision of health and safety conditions 4. Ensuring the rights of workers	1. Ensuring the growth of the educational and cultural level of employees 2. Improvement of the professional qualification structure of the collective of the workers of the organization 3. Increase of labor discipline, reduction of losses of working time 4. Improve the working conditions of employees 5. Development of organizational culture 6. Adaptive function 7. Distribution of social benefits and services 8. Development of social and domestic infrastructure (living conditions of workers, medical and health services, cultural and educational programs, sports sections)	1. Research function 2. Positioning the social idea, the social goals of the organization 3. Promotion of social ideas 4. Formation of the desired image of social processes, ideas, organization as a whole 5. Strategic management

Source: Summarized by the author on the basis of Osadchaya (2013).

However, this approach seems limited to us, because it closes only on the internal environment of the organization, which is mainly for the social component of human management.

Despite the broad list of socio-ethical marketing functions, in our view, social security functions should not be limited to focusing on the organization, but mainly on staff.

Outside the attention of the authors have left the actual functions remained for interaction with the market and interested persons, such components of the internal environment as technology. Goals as one of the components of the internal environment in the proposed approach are considered only through strategic management. At the same time, it is precisely on the formulation of the goals of the activities from the point of view of social and ethical marketing should be directed to identify and perform the functions of marketing activities.

The development of economic relations and the transformation of the market required new solutions for the development of relations between the market and the consumer, the definition of new values of marketing activity, new incentives in the production and sales activities of enterprises.

The reaction to changing business conditions was the transformation of F. Kotler's (2006) views on the definition of marketing concepts that have undergone changes. In his book, he notes that the organization can take as one of the six competing marketing

concepts: production, marketing, traditional marketing, the concept of individual and socially responsible marketing.

Thus, F. Kotler introduces clarifications on the use of traditional marketing concepts and introduces into the scientific circle the concept of individual and socially responsible marketing.

In defining the traditional marketing concept, F. Kotler states that it is based on four pillars: target market, consumer needs, integrated marketing and profitability (Kotler, 2006).

As in the previous definition of a marketing concept, the main direction of marketing efforts is directed at target markets. However, this direction is more differentiated, since it is based on the difference in types of needs. This approach allows you to distinguish between marketing feedback, marketing foresight, and creative marketing.

Feedback marketing suggests that the company finds out the formulated needs and strives to satisfy them, while in the marketing of predictions, the manufacturer looks forward and tries to determine what the consumer will need in the near future. Unlike them, creative marketing identifies needs that are not formulated by consumers and offers solutions that consumers with enthusiasm answer (Kotler, 2006).

To expand the characteristics of above mentioned marketing concepts can be for the concepts of individual and socially responsible marketing (*Table 4*).

Table 4. Characteristics of the concepts of individual marketing and socially responsible marketing

Concept	Leading idea	Main goal	Ability to use
Individual marketing	Taking into account the needs of individual clients	Increasing of profitability and stable growth by conquering more share of expenses of each client, a high degree of consumer loyalty, compared with competitors and the principle recognition of the value of the client throughout life	Custom-made products; Direct marketing; Internet sales; Sale of expensive (status) goods
Socially responsible marketing	Leading interests of society and its members	Smoothing potential conflicts between needs and interests of consumers and public welfare	Consideration of social and ethical aspects of business activities; Manifestation of a corporate civil position

Source: Summarized by the authors on the basis of Kotler (2006).

Formulated by F. Kotler's approach to defining the concept of socially responsible marketing allowed to include in the composition of socially responsible marketing theoretical approaches that characterize socio-ethical marketing. This point of view is followed by other authors.

Therefore, S.G. Bozhuk and T.D. Maslova (2012) consider socio-ethical marketing as a component of socially responsible marketing, noting that, in terms of terminology, it is advisable to talk about socially responsible marketing, because ethics of behavior is considered only as a part of social responsibility.

The same view of the relation between social and ethical is presented in (Gladka, 2013), which emphasizes that ethical correlates with social as a part of the whole, therefore, social and ethical marketing should be considered as one of the directions of socially responsible marketing.

In Work (Hellriegel, Jackson, Slocum, etc, 2008) authors describe ethics as a code of moral principles and values that guide the behavior of an individual or group in terms of what is right or wrong. From these positions ethics should be considered as a set of values and norms that allow to determine the correct and wrong behavior, affecting both individuals and commercial organizations.

Based on these points of view, we can conclude that the concept of socially responsible marketing is wider than socio-ethical.

Under socially responsible marketing, F. Kotler examines the concept of marketing, according to which the organization's mission is to identify the needs and interests of target markets and to meet users more efficient and productive than competitors, while maintaining or improving the welfare of not only consumers but also of society in general. The concept of socially responsible marketing requires that marketing takes into account the social and ethical aspects of business activities (Kotler, 2006).

A similar view of F. Kotler's approach to defining the concepts of marketing that determined its development is adhered to G. Assel (1999), J. Lamben (1996). In these works, they also consider the five concepts of marketing development. However, if the four concepts have names identical to the list proposed by F. Kotler, then the fifth concept, which is considered by Henry Assel and Jean-Jacques Lamben, is called the concept of social-oriented marketing.

Thus, in the opinion of G. Assel, J. Lamben, marketing in its formation in the process of evolution focused on the following concepts: production, product (commodity), marketing, marketing, social-oriented marketing.

Table 5. Comparison of marketing concepts

The name of marketing concept in the evolution process	Landmarks	The purpose of the company's existence	Satisfying the needs of consumers	Ehe main factor of market satisfaction	The degree of maturity of the market
Production marketing concept	Orientation on production	Growth of production at reduced costs	Reducing prices, causing sales growth	Volume of production	Demand is bigger than supply
Product (Commodity) marketing Concept	Orientation on production	Growth in sales through improvement of quality	Improving goods and creating new	Quality	Demand is equal to supply
Sales marketing concept	Orientation on production	Sales growth through active promotion of manufactured goods	Improvement of distribution and promotion system	Sales system	Supply is bigger than demand
Marketing concept	Consumer orientation	Sales growth by understanding consumer needs	Research of consumer preferences	Customer needs	Supply is bigger than demand
Concept of socially oriented marketing	Consumer orientation	Satisfaction of consumer needs taking into account the interests of the society	Balance of interests of the enterprise and society	Reducing the load on the environment	Supply is bigger than demand

Source: Systematized by the author on the basis of G. Assel (1999), J. Lamben (1996).

The role of marketing has changed along with changes in the degree of maturity of the market, respectively, there were changes in the purpose of the existence of the enterprise, both in ways to meet the needs of consumers, and in the main (prevailing) factors of market satisfaction. It is for these variables that we can characterize each of the marketing concepts discussed above.

Comparison of marketing concepts by G. Assel (1999) and J. Lamben (1996) is given below (Table 5).

Schematic look at the concept of social-oriented marketing G. Assel represents in this way Fig. 1.

Social-oriented marketing is considered as a process of interaction with consumers and stakeholders from the standpoint of socialization activities.

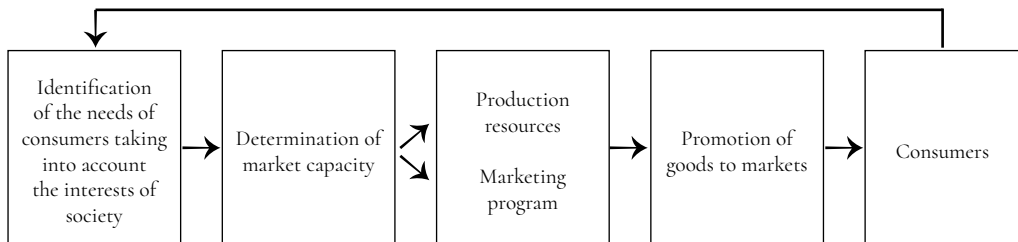


Fig. 1. Scheme of the concept of social-oriented marketing

Source: G. Assel (1999).

Thus, M. Baker, from the point of view of social-oriented marketing, justifies the attitude to marketing as a process of interaction in the social context, which is based on the building of a system of partnership relations (Baker, 2002).

The peculiarity of the modern market is the sharp and difficult predicted changes, which requires appropriate changes in the theoretical substantiation of marketing activities and the formation of new approaches in practice. These changes caused the need for rapid changes in ensuring the interaction of enterprises with the marketing environment.

Taking into account the changes that led to a change in approach in marketing theory, F. Kotler (2008) deals with five marketing concepts: production concept, product concept, marketing concept, marketing concept and holistic marketing concept, emphasizing that changes in the external environment require new approaches in marketing practice and business in general.

Therefore, on the basis of all the above concepts, a new holistic marketing concept was formed. And the concept of socio-ethical and socially responsible marketing, which in the mid 90-ies of the 20 century and in the early 21st century were considered as new areas of marketing development, included as part of the concept of holistic marketing.

Thus, it may be noted that the concept of holistic marketing is a logical continuation of the development of previous marketing concepts. The new concept of marketing is based on the implementation of various marketing programs, taking into account their interdependence. The hallmark of holistic marketing is the recognition of an integrated approach in marketing activities. This concept does not address a set of individual elements, but all components as a whole. Holistic marketing is an attempt to balance individual components and integrate them into a single entity (Kotler, & Keller, 2012).

Holistic marketing – a holistic concept that focuses on individual consumer needs. At the same time, the main feature of holistic marketing is the need to integrate all the business management plans. In addition, the use of this concept contributes to increasing the attractiveness of businesses for consumers. As a result, such an approach should increase the efficiency of the activity by taking into account changes in the needs of consumers – the target segment of the enterprise.

The evolution of F. Kotler's approaches to the definition of marketing concepts is given below (Table 6).

Table 6. Concepts of marketing, defined in the writings of F. Kotler

Author, publication	The list of marketing concepts presented in the publication
F.Kotler (1991)	improvement of production; product improvement; intensification of commercial efforts; integrated marketing; social and ethical marketing
F.Kotler (2006)	production concept; commodity concept; sales concept; marketing traditional concept; concept of individual marketing; the concept of socially responsible marketing
F.Kotler, K. Keller (2008)	production concept; commodity concept; sales concept; marketing concept; the concept of holistic marketing

Source: Summarized by the author on the basis of Kotler (2006); Kredisov & Naumova (1999); Lamben (1996).

The concept of holistic marketing is based on the planning, development and implementation of marketing programs, processes and activities, taking into account their latitude and interdependence, and includes four components: internal marketing, marketing relationships, integrated marketing and socially responsible marketing (Fig. 2).

According to (Grebnyov, 2003) holistic marketing allows to take full advantage of the value and technology of the concepts that have taken place and marketing tools as an integral part of the structure.

Thus, F. Kotler and K. Keller sees socially responsible marketing as a component of holistic marketing. At the same time, socially responsible marketing is defined as one that is based on the orientation towards society, law, ecology and ethics. In this case, it is useful to say that one of the priorities of socially responsible marketing is the orientation of enterprises to society and solving its problems.

In the academic and scientific literature, the definition of social and ethical marketing is considered as the principle of informed marketing, according to which the company must make marketing decisions, taking into account the wishes of consumers, the requirements of the company, long-term interests of consumers and the long-term interests of society as a whole (Grebnyov, 2003). This definition includes as separate elements of holi-

stic marketing, namely: internal marketing (requirements of the company), marketing of relations (consumer's desire), and socially responsible marketing (long-term interests of society as a whole).

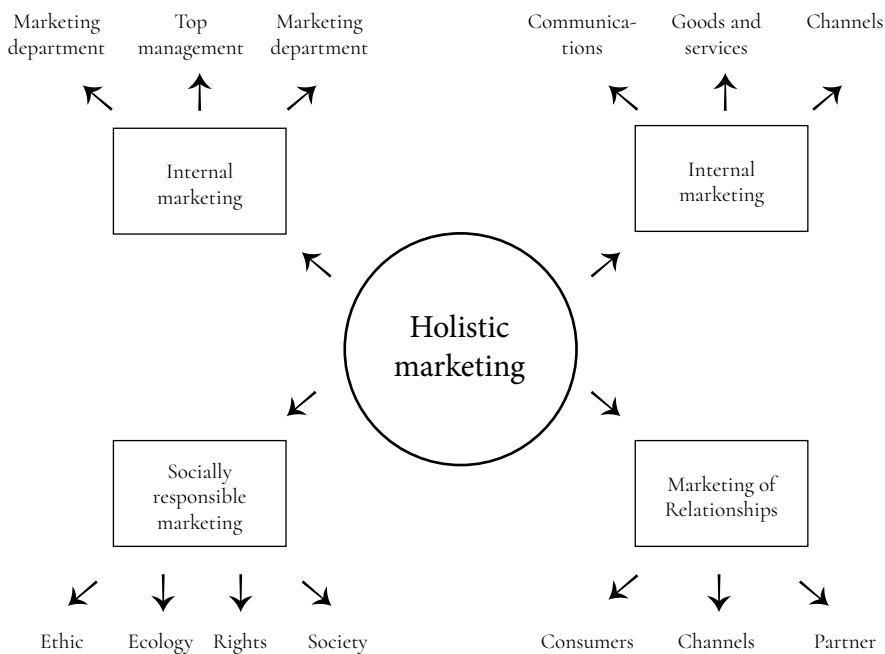


Fig. 2. Components of holistic marketing

Source: Kotler & Keller (2008).

A number of authors, characterizing the modern concept of marketing, define it as a concept of socially responsible marketing (Bulakh, Kakunina, & Chernykh, 2010; Cherchik, & Miskovets, 2008; Froter, 2011). At the same time, the views of authors on socially responsible marketing varies.

I.V. Bulakh, G.A. Kakunina and O.O. Black distinguish socially responsible and socio-ethical marketing concepts (Bulakh, Kakunina, & Chernykh, 2010).

The same point of view is observed by I.L. Reshetnikova, who notes that almost always the term “ethical” is used in the phrase social and ethical marketing, and sometimes even replaced by terms of social or socially responsible marketing. However, these concepts can not be considered synonymous (Reshetnikova, 2012).

In (Bulakh, Kakunina, & Chernykh, 2010) presents the point of view where socially responsible marketing is defined as the concept of marketing management, based on the following principles: customer orientation, responsibility to the consumer (satisfaction of consumer's moderate needs), responsibility to employees in terms of work and existence, and compliance with existing social goals and standards.

From the above mentioned we can conclude that in socially responsible marketing authors include elements of holistic marketing, identified by F. Kotler and K.L. Keller: internal marketing (responsibility to employees in terms of work and existence), marketing

of relationships (customer orientation), socially responsible marketing (responsibility to the consumer and compliance with existing social goals and standards).

L.M. Cherchik suggests that the emergence of the concept of socio-conscientious marketing is a consequence of changing priorities: getting quick profits – social welfare, satisfying the reasonable, healthy needs of consumers in accordance with the humanitarian interests of society, solving environmental problems and rational use of limited natural resources (Cherchik, & Miskovets, 2008).

O.S. Froter considers the concept of socially responsible marketing, bearing in mind that socially responsible marketing involves providing consumers with high-quality, environmentally friendly food products, introducing into the production of modern scientific and practical achievements, using resource-saving technologies, and promoting the growth of welfare of enterprise workers and the preservation of the environment (Froter, 2011).

In the definition of socially responsible marketing in this case also includes some elements of the components of holistic marketing (socially responsible, marketing relations, integrated marketing).

F. Kotler, J. Bowen, J. Meekens (1998), emphasizing the growing role of the social component of marketing, point out that the social marketing concept should be regarded as the latest achievement of the business philosophy, according to which an enterprise must determine the needs, desires and interests of its target market and satisfy them more effectively than competitors, and in such a way as to maintain or enhance the welfare of the consumer and society as a whole.

The concept of social-oriented marketing is a market-oriented marketing concept, in which ethical norms formalized in the form of social standards are included in the management system.

S.O. Yezhov-Marayev (2011) emphasizes the necessity to achieve the correspondence between the needs and desires of consumers and social well-being, considering marketing in terms of its importance to society, taking into account the need for integration, social responsibility and ethics. At the same time, the direction of the marketing system should be to predict, service and meet the needs of consumers, which will improve their quality of life.

Thus, we can conclude that socially responsible marketing is based on the concept of corporate social responsibility of business. Given the weakening of social protection of the population and the need for socially-oriented solutions by enterprises, the leadership and owners of the need to maintain or increase the level of profitability of enterprises in compliance with social standards (Fig. 3).

The significance of the introduction of socially responsible marketing in the enterprise as a whole is determined by an increase in the level of socio-economic development of the enterprise and ensuring the implementation of the state social policy. This is especially true for industrial enterprises, which, on the one hand, provide the largest share of the gross product in the country, and on the other hand, they are characterized by a considerable number of negative social results of their functioning (Bulakh, Kakunina, & Chernykh, 2010).

The change in socio-economic relations caused the further development of marketing concepts, in the center of which is a person. That is why logically appeared socially responsible marketing as a component of holistic marketing in the development of marketing concepts.

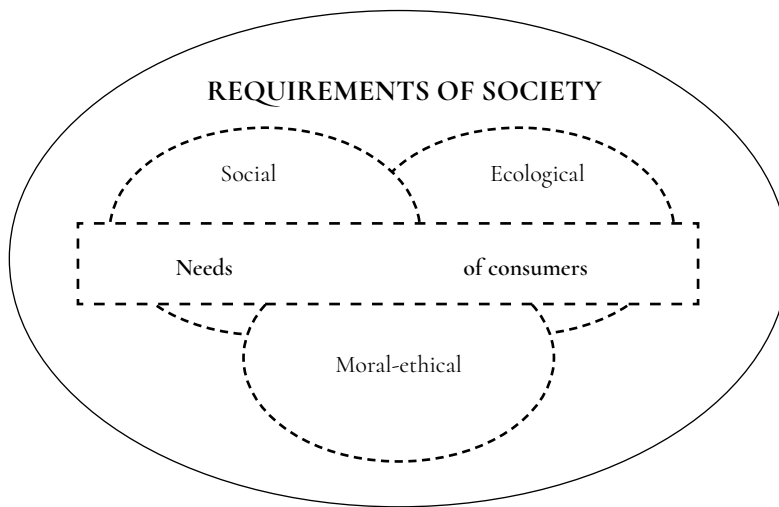


Fig. 3. Components of socially responsible marketing and their relationship with the needs of consumers and the requirements of society

Source: Gladka (2013).

Socially responsible marketing – is a kind of administrative activity, in the course of which the conscious and systematic satisfaction of the needs of consumers takes place according to social, ecological and moral-ethical requirements of society (Gladka, 2013).

Ohio Richard Steckel notes that for companies that want to engage only in the production and marketing of their products, social responsibility is seen as a difficult task. Companies that try to solve this task through strategic partnership with non-profit organizations, will acquire a powerful tool to ensure the profitability and viability of their business in the long run (Stekel, Simons, Simons, & Tanen, 1999).

Socially responsible marketing should be considered as one of the components of a modern marketing concept – the concept of holistic marketing. In addressing issues of food security, socially responsible marketing, as part of holistic marketing, plays a leading role. The concept of holistic marketing in the form presented in the theory of F. Kotler and K.L. Keller, through socially responsible marketing, solves issues of ethical, environmental, legal and social standards of doing business, focusing on increasing the responsibility of business to society.

F. Kotler notes that the concept of socially responsible marketing declares targeting on markets, defining the organization's tasks in identifying needs, desires and interests of consumers and meeting the needs of more efficient and productive ways than competitors. At the same time it is necessary to maintain or increase the welfare of both the consumer and society as a whole (Kotler, & Keller, 2012).

The most difficult task of marketers in this case is to find a balance between the three most controversial criteria: the profit of the company, the satisfaction of consumers and the public interest.

Orlov (2010), characterizing the role of socially responsible marketing in the development of modern society, notes that social orientation is ideal for the development of our society. However, there is a major disadvantage of a market economy – the pursuit of high

profits. This prompts capital owners will not stop even before the most serious crimes.

In the most general form, socially responsible marketing should ensure compliance with quality standards in the production of products, to ensure the preservation of the environment, to form a positive image of the consumer.

This point of view is adhered to (Vashchenko, & Belkin, 2010; Zelenko, 2009), defining that the main activity of socially responsible marketing should be aimed at: the production of quality and safe goods; promotion of environmental protection; sponsorship and charity activities, participation in the resolution of crisis situations in the community; cooperation with local authorities and non-governmental organizations.

Thus, socially responsible marketing does not focus only on interaction with consumer products. The use of the concept of socially responsible marketing involves social responsibility to employees and society.

Socially responsible marketing is the concept of marketing management, based on the principles of responsibility to consumers, customer orientation, responsibility to employees in accordance with existing social goals and standards. It is important to consider social responsibility in the context of the company's strategy formation, since, by focusing on long-term prospects, an enterprise is trying to meet the expectations of society in relation to its products or services and at the same time forms high social standards, contributing to improving the quality of life and living standards in the country (Leonova, & Shevtsiv, 2015).

Social responsibility in the implementation of the concept of socially responsible marketing should be built on the basis of respect for its clients and all stakeholders; responsibility in the supply chain; the introduction of social and environmental standards.

R. Rendenbach and P. Robin (1991) identified the five stages of the formation of socially responsible marketing, placing them in the form of a pyramid. Each stage is given a name based on the types of behavior that characterize this stage.

The basis of the pyramid is stage 1 – Amoral behavior. At this stage, profit maximization serves the dominant purpose. This stage is characterized by an increase in psychological pressure on the consumer through advertising measures, the ability to maintain a high level of profitability through cartels.

Stage 2 – Legitimate Behavior (Legal Organization). At this stage, the company takes over the fulfillment of obligations of a legal nature (observance of laws and standards). At this stage, the voluntary inclusion of the company in complying with laws and standards, controlling the role of the state should be gradually reduced.

Stage 3 – Cheerful behavior. At this stage, companies begin to embody ethics in their activities. However, all measures of ethical conduct are associated with the owners and management of the company only with an orientation to the internal environment. Social standards of the organization are more focused on staff and internal business processes.

Stage 4 – Beginning ethical behavior. At this stage, companies adopt the company's code of ethics and review ethical standards, and they come to understand the need to focus their activities on social standards, including even when the profitability of the company is reduced as a result of the measures taken.

Stage 5 – Developed ethical behavior. At this stage, companies demonstrate socially responsible behavior that is consistent with declared values, and is adhered to at all hierarchical levels of government.

R. Rendenbach and P. Robin pointed out that such an approach to creating a model

of socially responsible marketing was inspired by the work on individual moral development of Kolberg (1964, 1976). However, the direct application of Kolberga's work, according to the authors, is impossible, since organizations simply do not develop the same way and under the same circumstances as the individual.

If in developed countries most of the enterprises are in 3-4 stages, for Ukraine characteristic behavior is mostly immoral or law-abiding behavior. Food industry companies are also no exception, based on a large number of publications on product falsification.

Thus, the public organization «Public control over consumer rights protection» (Ukraine: falsification of dairy products, 2016; Milk is no longer true), during 9 months of 2016 conducted 120 studies in Kiev, Odesa, Lviv, and Poltava concerning the quality of dairy products. The falsification of butter on the composition of non-dairy fats is established. Falsification in 74% of selected samples is established. The content of non-dairy fats is from 5 to 100%. For soup, falsification is found in 22% of samples. The content of non-dairy fats is within the same range as on cream butter. In the sweet cottage cheese masses, all sampled samples had non-dairy fats.

The reasons for the falsification of dairy products are the lack of sufficient quantities of raw milk, the decrease in the purchasing power of the population, which orientates the producers to cheaper products, and consumers to buy cheap products, the reorganization and merger of controlling bodies, the lack of effective tools to stop the issue of counterfeit products from public organizations, moratorium on inspection of enterprises.

According to experts (May 2017), 50% of dairy products are rigged in Ukraine, if we take a segment of butter, then the falsification will be up to 80%. With such an amount of counterfeit products it is difficult to talk about the transition of dairy enterprises to the second stage (law-abiding behavior) of the introduction of socially responsible marketing. Rather, such behavior is an exception among dairy enterprises.

P. Orlov (2011) notes that in Ukraine there is an inadequate quality control and social orientation of legislative and regulatory acts, there are no clear mechanisms for controlling compliance with the legislation in a high level of corruption.

At the same time, according to the author, the most important function of the state administration bodies should be creation of favorable conditions for the production of competitive products by Ukrainian enterprises, and, on the other hand, the introduction of effective control and high responsibility for the production of low-quality products.

The transition of enterprises of the food industry to stage 2 (law-abiding behavior) can be achieved through the introduction of enterprises of socially responsible marketing.

However, a more effective mechanism for establishing a socially responsible business in the first stages can be the control of the state for compliance with norms and standards, especially in the issue of food products. The existing system of penalties for the release of counterfeit products does not carry a real threat to enterprises.

Therefore, in modern conditions, only enterprises can take over the performance of production functions that meet the quality standards. And control can be provided by public organizations with increasing funding for laboratory studies. In 2016, the state allocated 2.5 million UAH for sampling and research, which is clearly not enough.

In Ukraine, low social responsibility of business entities and their marketing is a consequence of insufficiently high quality of the country's economic system, insufficient social orientation of the economy, high corruption, and ineffective state regulation (Orlov, 2016).

A. Andreason's work «Ethics in Social Marketing» (Andreasen, 2001) presents the ethical limits for the practice of social marketing (Fig. 4). We characterize the components of the ethical constraints of social marketing.

Participants (enterprises and organizations) should be motivated to introduce socially responsible marketing. There are no restrictions for organizations that implement socially responsible marketing. Participants in socially responsible marketing can be typical organizations – both profitable and non-profit, private organizations and government agencies.

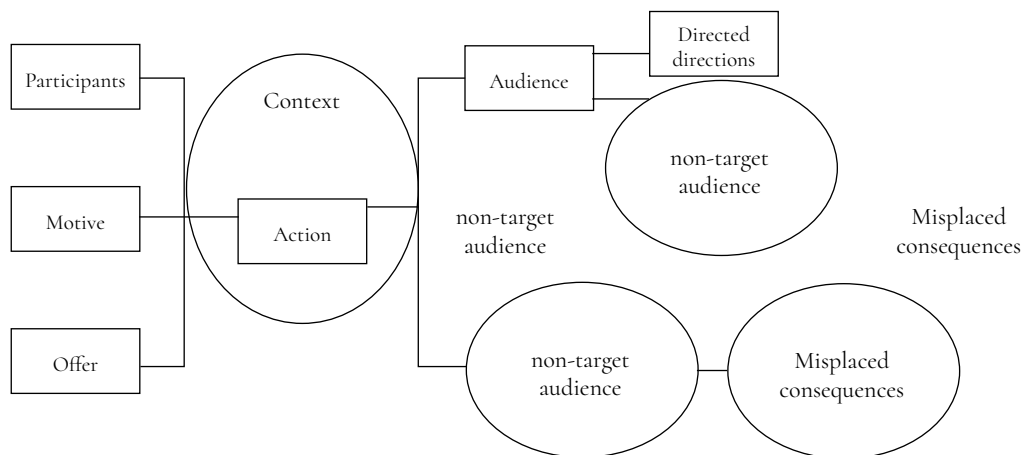


Fig. 4. Ethical limitations of social marketing

Source: Andreasen (2001).

Participants must be motivated and prepared to implement socially responsible marketing through changes in social, political, economic or cultural activities. In addition, one of the main requirements is that participants in the process of socially responsible marketing should be truthful and consistent in the implementation of the program of socially responsible marketing.

The impact of the nature of the product offered by enterprise is an ethical dilemma, since enterprises offer both status goods and goods of everyday demand. And for these products, the meaning that embeds in the concept of social responsibility will be different. So, with regard to food products, then the basic requirements of social responsibility should be affordability, quality and safety. In view of this we can conclude that the implementation of the concept of socially responsible marketing for each enterprise will be affected by a large set of factors that will determine the individual way of implementing the principles of socially responsible marketing by individual enterprises.

However, among the set of factors that determine the willingness of enterprises to implement the concept of socially responsible marketing, the motive is the main one. It is often said that motives are determined from personal interest in altruism. At the same time, one company may have a more socially-oriented marketing program than the other, but both will be successful. The activity of the enterprise may prevail the motive of a desire to receive more profit without focusing on social needs of society, or a genuine desire to become socially responsible. Thus, in the area of attitude of owners and management of the enterprise there is a desire to implement the concept of socially responsible marketing activities.

About the activities of the organization within the framework of socially responsible marketing you can get impressed by many criteria. They include communications that must be truthful and aimed at promise of what can be accomplished. When it comes to socially responsible marketing, information for the consumer should not be partly false. It can only be honest. The consumer should not create a false impression about the company and its products or services.

The context of actions concerns issues when and how the social responsibility program will be implemented in the activities of enterprises

The audience may be targeted and non-targeted in terms of ethical assessment. The task of enterprises to intensify interaction with the non-targeted audience, to build the appeal in such a way that they are interested in each of these audiences.

Important are the implications of socially responsible marketing for both target and non-target audiences.

In this case, the key terms are the consequences as a result of impact on the target and non-target audience – interaction with them.

Based on the above framework of socially responsible marketing, its main tools can be called: market research; definition of social and environmental consequences of activities in the production of goods and services; research of the influence of consumption of goods and services on the environment and consumers themselves. Thus, the main objective of socially responsible marketing can be determined by satisfying the needs of target consumers, but the production and provision of services should be subject to the effective use of human, material, energy and other resources, their preservation while ensuring the environmental friendliness of the production and the environment.

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PART 4.

MAIN DIRECTIONS OF
IMPLEMENTATION OF
INNOVATION-INVESTMENT
ACTIVITIES OF ENTERPRISES

Chapter 4.1.

MANAGEMENT OF INNOVATIVE- INVESTMENT ACTIVITY OF ENTERPRISES

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1. The features of the formation of mechanism of management of innovative-investment activity of enterprises

First of all, the modern social development is determined by the following factors: 1) the increase in the number and the needs of the population; 2) the development of globalization processes and the exacerbation of global economic problems; 3) the regulation of the world economies via combination of market mechanisms and methods of state regulation; 4) the militarization of the economy; 5) the scientific and technological progress (STP).

Under the conditions of the globalization spreading, the position of the country in global economy increasingly depends on the competitiveness. Moreover, among the factors that determine the competitiveness, the biggest importance is given to the quality of innovative systems generated by the development of STP. Thus, as M. Zubets and S. Tyvonchuk noted, in most of the countries one of the priorities of social development is STP (Zubets & Tivonchuk, 2004, p. 45). Therefore, nowadays the problem of activation of innovative modernization of the economy and its technological recovery, stimulation of investment inflows in order to finance innovations in the context of competitiveness improvement is in the center of economic theory.

Thus, currently, the effective functioning of enterprises of Ukraine depends on the level of its investment and innovative support. By the support, we mean the process of implementing innovations into the production through the tools of innovative infrastructure, financed by attraction of investment resources. And the main criterion of this process is the best possible result at the lowest cost.

We should note that current economic and social development of Ukraine's economy is characterized by an obsolete technological base, low productivity, high resource and energy consumption of production. This is the result of extremely low investment and innovative activity of economic entities of Ukraine.

Unfortunately, today in Ukraine already low indicators of innovative activity of industrial sector are rapidly falling. The innovative activity of Ukrainian enterprises has decreased by 6% during last five years, the level of implementation of scientific and technological research into the production reduced even more: in 2000 it was 15% and in 2015 – only 8.2%. By comparison, Japan's corporate sector's innovative activity equals 70-80%, in the EU it is 50-70% (State Statistics Service of Ukraine, 2015).

Scientific researches of scientists-economists say that the main obstacle to innovation development of Ukraine's economy is the lack of a systematic approach in the support of innovative activity. Nowadays, there are only few elements of innovation structure in our economy: there are several regional innovative centers. Thus, the concept of sustainable development of Ukraine supposes the formation and the goal-oriented development of a civilized market of scientific and technical innovative products.

One of the main factors of this market formation is a proper investment support. However, V. Yatsenko says that, despite some recovery in the investment process in Ukraine, the positive tendencies in the investment sphere are not yet sustainable. In terms of transformation of economic relations some factors continue to operate that hinder the development of investment and innovative activity (Yatsenko, 2004, p. 71):

1. low level of demand for scientific and technical developments from the side of the real sector of economy;
2. the failure of economic entities to accept innovative technologies due to significant physical deterioration and obsolescence of their material base;
3. the imperfect tax system;
4. the significant risk attributed to innovative activities.

However, the greatest barrier to innovation is a lack of funds associated with the deterioration of the overall situation in the field of investment activity. For example, investment into fixed capital of agriculture in comparable prices of 1996 decreased from 11.8 bln UAH to 880 mln UAH during 1990-2002, or about by 13 times, and their share in total investment in national economy decreased from 21.3% in 1990 to 4.8% in 2002, thus, more than by 4 times. Regarding the investments during 2003-2009, the significant changes in the structure of fixed capital investment did not take place. In 2015 fixed capital investments in agriculture accounted only for 6.1% of the total investment in fixed assets in country (State Statistics Service of Ukraine, 2016).

These data confirm the conclusion of V. Trehobchuka, that investment process continues to deteriorate despite some recovery during last years. In our opinion, it speaks about the fact that here the investment policy was aimed at overcoming of the existing crisis and did not take into account the real state of the productive forces, which is currently characterized as catastrophic (Trehobchuk, 2006, p. 11-12).

The primary task of the investment policy is the improvement of the investment climate, which is overseen by different state agencies. However, these researches are conducted in the absence of state theoretical and methodological approaches regarding the problems of investment climate studying, including:

- theoretically unfounded factors of foreign investment attraction;
- absence of accepted common methodology of the evaluation of investment attractiveness of individual economic entities and associations;
- absence of complex approach towards the monitoring of the investment climate;
- current problems of the reliability of statistical information concerning investment in the domestic economy.

Such native researchers as V. Geyets (1999), B. Kvasnyuk (1997), I. Lukinov (1997), looking at the problems of investment activity, especially pay attention to the state of the investment process, which also depends on the character of the investment climate. The-

se ideas are also being investigated in the works of foreign scientists, such as: V. Kulikov (1996), K. Redham (1996), Y. Urinson (1997) and others. The issue of the necessity of that thesis argumentation is described by M.S. Gerasimchuk (1998), K. Guseva (1997), V. Shevchuk and P.S. Rogozhin (1997), M.G. Chumachenko (1999). At the same time, from a methodological point of view, the problem of disclosure of the character of the investment climate is open and should be interpreted.

The investment climate can be considered as a system of purpose-driven national and regional measures within a specific area (region), which is determined by many factors related to investments' attraction (political, social, economic, technical, technological, resource and so on).

According to the current factors, the investment climate is a number of its structural elements, which all together form a synergistic effect. The last state can be written in a formal way as:

$$IK = \sum_{i=1}^n IE_i, \quad (1)$$

where IK – investment climate;

IE_i – i -st element of the investment

The improvement of the investment climate of a specific area (region) has the leading role in a crisis economy, the real alternative to investing in the development of the territory is the placement of funds into the liquid securities at the financial market. The effectiveness of the investment climate for a particular territory is manifested in two aspects: economic and social. The economic aspect is shown by the growth (fall) of macroeconomic indicators, especially GDP per capita and export capacity. As for the social one, it is shown by the reduction of social risks, the increase in wages, and thereafter in consumer purchasing power.

The investment climate also provides a multiplier effect when investing into the development of one sector of the economy in a particular area leads, via an increase in its profitability, to the involvement of other sectors (enterprises) and generally to the possibilities of increasing investments into them.

As V.S. Lokshin says, the investment climate of a territory is also characterized by the principle of competitiveness (Lokshin, 2006, p. 7). Objectively, the investor *ceteris paribus* will invest funds into the territory with the relatively higher competitiveness features, meaning, where the potential return on investment will be faster.

It's possible to consider the investment climate both for the state and for the region. This division is advisable to perform in relation to additional regional capabilities for the creation of certain favorable conditions, benefits related to particular investor. In this case even the investment risk factors will not be an obstacle for the investing into the development of a territory (region).

Investing into the areas (regions) with not quite perfect investment climate is also accompanied by significant unexpected economic development prospects of the regions, such as the opening of strategic resources' deposits.

The level of investment climate is also determined by the type of economic system, that is the character of economic relations which were formed within a society. First of all, this is property relations. It defines the specifics of implementation of the state investment process in general and investment opportunities specifically.

The investment climate of the territory is also influenced by the following factors, which form a list of so-called economic freedoms according to the international classification: 1) trade and tax policies; 2) the role of the state; 3) monetary policy; 4) foreign investment; 5) banking policy; 6) wages; 7) proprietorship rights; 8) market regulations; 9) „black” (shadow) market. Each of the mentioned factors is evaluated on a 5-point scale. Ukraine occupies 135th place in the International rating system. Traditionally high ratings belong to industrialized countries, such as: USA, UK, Switzerland, New Zealand and others.

According to the International Classification all world countries can be divided into four groups according to the degree of providing of mentioned economic freedoms: free, partly free, almost non-free and non-free. Unfortunately, Ukraine is in a third group and this factor influences the image of the State with respect to the favorable investment climate in face of the potential investors.

It's necessary to provide the following measures to improve the investment climate of Ukraine's economy:

- to improve Ukrainian investment legislation, both at the national and at the regional level; to conduct the legislative activity to insure the investment legislation consistency with other legal documents; to assign Code status for the investment legislation („Investment Code”); a special attention in „Investment Code” should be given to the support of domestic and foreign investors;
- to consider the possibilities of tax advantages to the investors of strategically important sectors and activities;
- to renew and to review the operation of the legal framework related to the decisions regarding the formation and functioning of special economic zones and territories of priority development;
- to help reducing and preventing investment risks through the mechanisms of state economic regulation;
- to reduce energy consumption and consumption of materials per unit of output, improving its competitiveness by providing quality characteristics.

The realization of these measures could be done with the help of relevant state program. The centre of it should be an idea of creation of a favorable investment climate in Ukraine in order to improve a socio-economic development of both regions and the country in general, to raise the economic security of the country and to allow Ukraine competing on a global scale as well.

The development of agro-industrial complex should be chosen as the priority of the economic investment policy of our country, in general. Such a decision is also based on the historical background, the definite conditions and reasons. Turning to the history of our country, we can see that this is the history of agrarian state. There are favorable natural conditions for the agricultural production within our country. Finally, the agricultural sector, especially agriculture, has a significant economic potential and facilitates the development not only of the agricultural production, but also of many areas of industrial production.

Currently, the especially important problem is the recognition of AIC as a priority sector of the economy that is under the conditions of the aggravation of the crisis in the economic sphere and in the social life of our country in general. The crisis allowed us to immediately identify the most vulnerable spheres of our economy (metallurgy, chemical industry), and, indeed, the most stable sector is AIC both at the regional and at the national level. For example, under the conditions of crisis, agro-industrial complex is the only branch of the

Lugansk region economy that planned at least a small increase in gross output.

Moreover, the investments should be innovative, that means they should be made in modern technologies and innovative production. In our opinion, the incentives of innovation oriented investment process from the government side will ensure the sustainable development of the national economy under the conditions of accelerating globalization and integration processes. The mentioned government regulation of investment and innovation process based on a systematic and complex approach will allow creating the effective system of conditions for building up an investment climate at such level that will stimulate a new, innovative development.

Nowadays, developed countries of the world actively explore an innovative investment path of economic development. Many researchers have positioned such countries as the economic systems of mixed type, and the economic model of these countries is called social-market. We consider that, despite the formal recognition of Ukraine as a market economy, its economic development at the current stage has largely transitional character. That is why the economy of most developed countries, i.e. the creation of a system of social-market economy, serves as a guidemark for our country (Vorobyov, 2002, p. 29). So, the question of forming mechanism of regulation of innovation and investment has the great interest for our research.

As M. Zubets and S. Tyvonchuk (2004, p. 11) note that the competitive pressures certainly have a decisive importance for the rapid development of scientific and technological progress in developed countries with market economies

The current state of the market in developed countries is marked by the mix of competition and monopoly.

The competition takes on the character of the so-called imperfect competition and is limited by the scopes of oligopolistic dominance structures, which are typical for most industrial markets (Borisov, 1998, p. 154; Mocherny et al., 2000, p. 203). Thus, a spontaneous start – the mechanism of market self-regulation – is one side of the mechanism of innovation regulation under the market conditions. This mechanism is formed by influence of two factors: the regulatory monopoly powers and competitive powers.

Regulatory monopoly powers within the oligopoly are based on the concentration of a significant or majority of the industry production and of the capital in the hands of a limited number of leading producers. Moreover, not only big companies but also small firms operating in specialized production or on local-regional markets, where they are leaders, are referred to them (Zubets & Tyvonchuk, 2004, p. 12).

A dominant market company uses the following instruments to realize its monopoly position: monopoly price manipulation, the artificial products deficit; the artificial creation of products surplus; containment of innovation process (via buying new patents and inventions and not allowing them to be introduced into production until the competition, which is continuously intensifying, does not make them introducing scientific and technological advances).

Some scientists point out non-price competition on the basis of technical superiority between market entities (Borisov, 1998, p. 154).

Under the conditions of favorable business environment, the leading commodity producers have the opportunity to use different types of the pricing policy, including the method of price competition as well, within the industries characterized by quite powerful structure. The pressure of competitive factors on defining the value of the product and conditions of its sale is crucial for the stimulation of investment process within private companies. However, at the same time, we should not forget that such an impact on the

investment process at the firm's level of competition is determined by the saturation of the market. If there is also a persistent deficit of a specific product, the stimulating effect of monopolistic competition on the products sale diminishes or disappears completely. In this case, there is a low receptiveness to scientific and technological progress.

However, under the conditions of a developed market phenomenon this situation usually has very short-term character: market competition factors quickly eliminate the deficit and the resulting monopoly power or direct dictation of the producer and again stimulate the investment process at the relevant production sites (Mocherny et al., 2000, p. 13). Thus, the combining of competitive and regulatory monopoly factors under market conditions ensures a quite favorable environment for the development of innovative-investment activity in general.

The economic development of the leading countries with market economy proves that it is impossible to rely only on market mechanisms in order to achieve the efficient functioning of the economy based on innovation process. It will be prevented, firstly, by especially endless cyclical nature of the market economy, as well as some other drawbacks of this model of economic development. The historical experience of these countries shows that it is necessary to have a powerful, purposeful government regulation. Its mechanism is widely used in all developed countries at a greater or lesser extent. The basis of such a mechanism is a reasonable combination of direct and indirect methods of government regulation (fiscal and monetary policy, taxes, subsidies, external events, etc.). It should be noted that Antitrust laws takes a special place in the mechanism of state regulation in many countries. It serves to provide the optimal combination of monopoly-regulating and competitive forces in commodity markets.

2. Foreign and domestic experience of public management of innovative-investment activity

The mechanism of state regulation of innovative-investment activity involves the use of the instruments of both direct and indirect effects. The choice of methods is determined by the regulation of specific economic conditions that are currently going on. The use of predominantly direct methods of influencing over the economy is generally implemented in times of instability, crisis etc. This concept of economic policy is based on the theory of John M. Keynes (1978). In more economically favorable conditions, the "monetarist" approach to the formation of a state policy of regulation of the economy is usually used.

We agree with the point of view of many scientists about the fact that effective operation of highly competitive investments is possible only on the basis of state regulation and support (Karakai, 2007, p. 14; Naryshkin, 2007, p. 57; Betehtina & Poysik, 1990, p. 4). The current state of Ukraine's economy is generally characterized by recession. That's why we consider that at this stage of its development, a policy of active state intervention into the regulation of innovative and investment activity should be used. Therefore, we paid a lot of attention to the study of foreign experience of state regulation of innovation in our research.

Depending on the degree of state intervention into the economy, in the economic literature countries of the world are conventionally divided into three groups:

- for example, the first group includes such countries as Japan and France. The state is actively managing the economy in these countries;
- the second group is characterized by a predominance of market relations (e.g. USA, UK);

- the third group of countries, as noted in the sources (Betehtina & Poysik, 1990; Santo, 1990; Abarenkov, 1988; Twis, 1989), follows the „intermediate option” in the economic, including innovation policy. The state uses both direct and indirect methods of regulation of economic processes.

The regulation in the market conditions with the use of direct methods involves such forms: direct subsidized financing of scientific research and development (R&D) of state scientific institutes and contractual program special-purpose funding of research and development.

According to S. Tyvonchuk and M. Zyber's (2004, p. 15-16) data, 50% of R&D expenditures is implemented by a direct subsidized funding with the aim to directly promote innovation. The contractual program special-purpose form of state regulation of innovations is in the provisioning of funds for research and development projects containing the description of the purposes of scientific research, the gradual implementation of research, calculations of material, technical, financial and labor costs. The funds are allocated not to the institutions, but to the teams of performers for the achievement of the goal provided by the project or program.

Among the indirect methods, tax liberalization and amortization legislation can be distinguished because predisposition to the entrepreneurship is regulated by the level of profit taxation. The use of these methods forms a favorable economic and political climate for innovative activity in sectors of the economy and for business innovation process in the society in whole.

The innovative policy in the developed countries is marked by systemic, complex effects on the whole innovation process, from the origin of the innovative ideas to the realization of the final innovation products; it aims to provide all conditions for the creation of innovation (formation of a favorable innovative climate, attraction of investments, etc.).

Transition countries, including Ukraine, should widely, but at the same time judiciously, use this experience of state regulation of innovative and investment activity. Therefore, we completely agree with S. Naryshkin's point of view about the main directions of state innovation policy of transition countries. He indicates the following ones:

- creating favorable economic and legislative environment for the participants of innovative activity, including intellectual property rights protection;
- forming the infrastructure of the national innovation system (NIS) to support the development of various forms of innovative-technological entrepreneurship, including small innovative companies;
- improving the system of state support for the commercialization of intellectual activity, pre-production and the market entry of innovative products (services), including training and retraining of personnel for innovative activity (Naryshkin, 2007, p. 57).

The concept of national innovation systems was manifested recently. V.S. Novikov said that the priority of state policy regarding the development of NIS brought many countries to the leaders of some essentially important directions for today. Considering the simplest model of interaction elements of NIS, which scheme is shown on *Fig. 1*, the role of the state is to promote the development of basic knowledge and the complex of character strategic technologies, and to create an infrastructure and favorable institutional environment for innovative activity of private companies. Thus, NIS combines scientific and business communities and the mechanism of their full-scale interactions (Novikov, 2007).

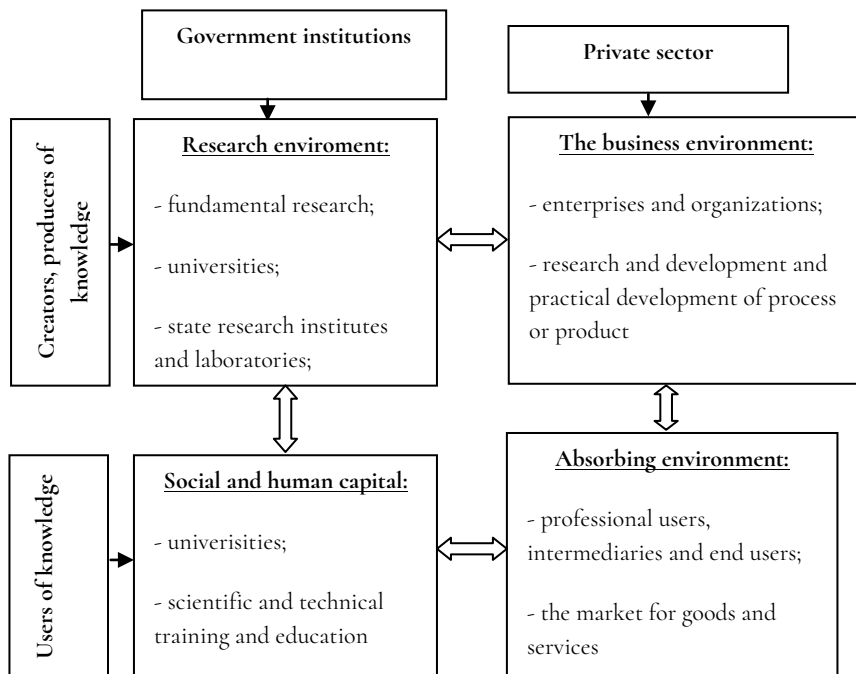


Fig. 1. The scheme of the national innovation system

Source: Development of the authors.

To compare the level of the development of innovation systems and of efforts coordination of countries related to a common approach to standardization of statistical science and innovation within the Organization for Economic Cooperation and Development a series of methodological manuals, so-called „Frascati Family”, including the „Oslo Guidelines” (1992) were developed. It was the main international standard in the sphere (Novikov, 2007).

The domestic researchers note that the mechanism of the development and the implementation of state innovation policy in Ukraine is still in its infancy, and the instruments of state regulation are constantly changing. Although the basic legislation concerning the functioning of innovative and investment activity is formed in a certain extent, but the practical use is constrained by underdeveloped innovative infrastructure, poor investment management and protection of intellectual property rights and, of course, by the lack of significant financial capacity to stimulate innovative activity (Laiko, Kulayets & Babiynenko, 2009, p. 27; Yushin & Brusenko, 2008, p. 42).

There are domestic scientists who are more pessimistic about the possibility of establishing NIS in Ukraine. For example, S. Romanenko (n.d.) indicates that there is a threat inability of establishing NIS in Ukraine due to the fact that over the past 17 years Ukraine has lost much of its innovation infrastructure due to:

1. the reduction of the internal market of innovations as a result of destruction of many enterprises, sub-sectors and sectors of machine building, especially electronic one, which is a major consumer of high-tech products;
2. the limitation and reduction of foreign markets of innovative products as a result of specialization of Ukraine as a supplier of raw materials and semi-finished products to the global market; deterior-

- ration of relations with Russia, which is the largest consumer of engineering products of Ukraine;
3. the preservation of management enterprise system based on manufacturing venture as the main unit, which does not comply with state-corporate model of innovation development;
 4. the factual absence of state policies directed to the support of high technology and system innovation.

In spite of these significant obstacles in Ukraine, State Agency of Ukraine for Investment and Development developed the Concept of National Innovation System of Ukraine in order to intensify the innovation process, the main goal of which is to provide conditions for improving productivity and competitiveness of domestic producers and, as a result, to improve well-being and ensure sustainable economic growth. The strategic directions of innovative development of Ukraine is also reflected in the Strategy of Innovational Development in Ukraine for 2010-2020 as well as in the Plan of measures concerning implementation of the Concept of National Innovation System (The Cabinet of Ministers of Ukraine, 2001; The Decree of the President of Ukraine, 2011).

These documents defined the main principles of the formation and implementation of balanced public policy to support the NIS development, aimed at improving the competitiveness of the national economy through the implementation of three innovation systems, including:

- market approach to the organization of innovative activity, which productivity is determined by the profit, not by the efforts applied;
- demand for the immediate transition from industry to functional principles in state administration of innovation sphere;
- capitalization of intellectual property as a mechanism for increasing the value of fixed assets of business entities and encouraging the society to the expanded reproduction of the intellectual capital of the nation.

Due to these innovations, it is expected to increase the efficiency of the entities that create, disseminate and implement commercial implementation of new knowledge and technologies that should provide an increase in the share of innovation factor in GDP growth of Ukraine by 2025 to at least 30% of the total GDP growth.

3. Development prospects of the mechanism of public management of innovative-investment support of agricultural enterprises activity

The analysis of investment and innovative activity allows us to make a conclusion that situation in this area in agriculture is unsatisfactory. One of the main reasons, in our opinion, is the imperfection of the mechanism of state regulation of the investment and innovative activity of agricultural enterprises.

The effective and continuous agriculture development depends directly on the level of scientific support and effectiveness of interaction with science. One of the factors that facilitates the development of scientific potential in Ukraine is quite strong network of scientific organizations which today accounts for over 1500 institutions. They are represented by the academic sector, industry, university and manufacturing science.

Agrarian science is based on the development of the National Academy of Agrarian Sciences of Ukraine (NAASU). The latest results of NAASU are the following:

- variety test of 170 new varieties and hybrids of agricultural crops;
- development of a number of resource-saving technologies of cultivation of grain, fodder and vegetable crops;

- 17 new technologies and process instructions, four types of processing equipment developed for the food processing industry;
- 709 tests of completed scientific developments and 957 implementations of completed scientific researches into 1072 agricultural farms.

However, the overall level of science impact and the use of scientific research in agro-industrial complex and Ukraine's economy in general has significantly decreased during the period of independence of Ukraine. The main reason for this negative trend is the reduction of the state's role in the processes of scientific support and maintenance of agricultural production. Moreover, this approach to the defining the role of the state in scientific activity is at odds with the international practice. The state plays a critical role in the scientific and technological activities and, accordingly, in implementing of innovative strategy in the developed countries and in many country-outsiders. These countries are characterized by high amounts of science financing (up to 2% of GDP).

The main objective factors of reduction in the role science plays in the domestic economy are:

- lack of budgetary financing (0.3% of GDP);
- dispersion of state financing of scientific-technical programs between several central executive bodies and the lack of efficient mechanism of coordination;
- lack of procurement of scientific production with its subsequent implementation mechanism;
- lack of state policies of the protection of national scientific production on the domestic market.

In addition, it should be pointed out the, that the subjective factor is the lack of interest of most researchers in any changes in the system of science because of the lack of active mechanisms of motivation. There are two main challenges: insufficient funding of science; complications for the commercialization of scientific research (because the system of organization of scientific works on the merits remained state, and production turned into a private basis).

The main directions of solving these problematic issues are set out in the Concept of reform and development of agricultural education and science in Ukraine, which is now being discussed in public. In particular, the development of science should have the following focus areas:

- establishment of an effective system of scientific production order, publicly funded by the Ministry of Agrarian Policy of Ukraine under the scientific coordination of the NAAS of Ukraine;
- transition to an innovative model of functioning and development that should ensure the competitiveness and commercial attractiveness of scientific and technical products in the market for science-intensive products;
- optimization of the system of agricultural science so to concentrate the logistics, personnel and financial resources in order to solve priority tasks of the agricultural production;
- formation of the system of planning and implementation of scientific and technical programs accordingly to the innovative models;
- creation of an effective innovation providing system;
- formation of the legislative mechanisms that would ensure the involvement of investments into research entities of the NAASU for their innovative development, the creation of sectoral holdings, the use a part of their profits in order to finance scientific fields.

The development of market relations also requires the development of infrastructure technology products that will provide effective measures to support innovative projects, providing consulting services. And of course we can not forget about personnel issues, the

motivation of labor forces for the production and the use of scientific products.

In our opinion, the implementation of the innovative development strategies requires the management not only at national level but also at the regional level. The system should incorporate all the enterprises and the research organizations in the region.

Based upon the analysis, we consider that one of the first measures aimed at the improvement of the state financial support should be an increase in the efficiency of state budgetary funds which are devoted to the support of agro-industrial complex.

For this purpose, first of all, some approaches concerning the current system of state financial support of AIC and the methodology of the implementation of the control for fiscal discipline related to its use should be reviewed. The attractiveness of this direction for improving the state support for agrarian production is due to its low financial burden. (Ilyin, Zos-Kior & Kuksa, 2016).

This area of improvement includes:

- improvement of the mechanisms of receipt and budgeting apportionment taking into account the size of enterprises and the results of their activities;
- organization of the timely financing based on clear, easy-to-use, transparent mechanisms;
- organization of equal access of agricultural producers to the state financial support through the establishment of an extensive system of regional consulting services, which purpose is to expand the professional knowledge and improvement of the skills of producers, increase of their efficiency and rural development;
- rigidity of the requirements to the internal control over the use of state budgetary funds to support AIC in the Ministry of Agrarian Policy of Ukraine as a key spending unit and the Ministry of Finance of Ukraine beginning from the cost planning stage;
- planning and, accordingly, use of budgetary funds to support the agricultural sector should be based on economically justified calculations which take into account standard costs;
- use of the international experience of state financial support available for the agricultural sector.

Regarding the international experience, we note that in developed countries the financial state support is primarily focused on highly-marketable enterprises because the rational nutrition of population is ensured by food production of these economies. We can conclude about the correctness of this approach to the financial disposition of state support (Ilyin, Kotsupatry & Ilyin, 2016).

Under conditions of continuous economic crisis there is a paradoxical situation in Ukraine, when the farms with the average area size, as on 1 January 2015, not more than 1.21 hectares produced 44.8% of gross agricultural output by the end of 2015. Additionally, the dwarf size of farms does not allow them such important forms of social labor division as specialization and concentration of production needed to improve the efficiency of economic activity.

During the research it was proved, that the mechanism of state support for agrarian sector of Ukraine's economy is imperfect and insufficient. Therefore, it is necessary to review the experience of developed countries in the sphere of state support provided to agricultural enterprises.

In these countries state regulation has a systemic character and is performed in different directions. One of the major priorities is the regulation of the prices for agricultural products, which is objectively proved by such a lack of a market economy as the inability of the market to ensure sustainable development of agriculture through the mechanism of market prices.

In the developed countries the scheme of state regulation of prices for agricultural products usually involves determination of upper and lower limits of price fluctuations and indicative or conditional prices, which the state is committed maintaining. That's why, in our opinion, in modern conditions (formation of market relations, economic openness, Ukraine's accession to the WTO) the primary task is to create conditions for the formation of an effective competitive agricultural production (Ilyin, 2015).

The basis of this production is:

- specialization and concentration of production;
- consolidation of material base via the accumulation of investment resources;
- use of the latest technology and equipment;
- increase in the labor productivity and decrease in the cost of production.

According to the mentioned characteristics of competitive production we can make a conclusion that production of that level could be organized only at large and medium sized agricultural enterprises. In our opinion, the state financial support and state agricultural policy in general should be focused on this area.

Among the most important documents on the regulation of the agricultural sector and agrarian relations the mentioned project Agrarian Code of Ukraine must be also noted. At first, it should organize and coordinate the current quite large legislative framework of the agrarian law.

Thus, in our opinion, the main goal of the state agricultural policy in Ukraine is to increase the competitiveness of agricultural production of Ukraine both in domestic and foreign markets, which is added up with the social protection of population and the development of rural areas based on the introduction of innovative-investment model of the agricultural sector development.

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Chapter 4.2.

THE IMPLEMENTATION OF INVESTMENT PROCESSES IN ORDER TO HARMONIZE LAND MANAGEMENT WITH THE EUROPEAN STANDARDS

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1. "Domino effect" from the implementation of investment processes in agriculture in order to harmonize land management with the European standards

The study of forecasts for the economic, social, environmental and integrated efficiency of land management (here in after LM) of agricultural sector allow a formalized transition to the advanced world models of land-use. The state should operate with available tools, taking into consideration not only the economic laws, but also the trends and patterns that have been established at the level of world agricultural relations, including land relations. Evolution of processes with limited predictability requires a particular purpose and context that implies the harmonization of LM efficiency in domestic agricultural sector with globalization prospects. This context makes the logic of this study.

As for the major world trends in the development of the agricultural sector, they are reduced to a significant increase in demand for agricultural products and foodstuffs with increasing volatility in their prices (*Table 1*).

These facts, on the one hand, lead to an increase in revenues of the national agents of land interests, and on the other hand (according to the effect of exports) to the growth of domestic prices for agricultural products and foodstuffs to the world level. At the same time, the limited range of exports is a negative factor for Ukraine whose agribusiness entities perceive volatility of world prices at the level of financial losses.

The way out of this situation could be to increase the range of agricultural and food products, expanding sales lines as well as circles of partner countries. The rate of production of agricultural raw materials outpace the growth of their processing and storage, therefore national agents of land interests receive less added value, as global competition is more significant at the market of finished products and warehouse logistics.

Against the background of the global problem of food production, in addition to increasing demand for production, the load on the land also increases because of the transition to biofuels. Among the most significant global trends, formation of a free trade zone between the US and the European Union (TTIR) should be highlighted; which will

also influence significantly the agricultural market situation, and accordingly, through a number of globalization impacts on LM, the relationship between a number of agents of land interests will transform from competing into complementary model.

The trends mentioned above will be for Ukraine generally positive consequences, provided that the national preventive and administrative adapters develop, including the system of agricultural insurance (Alaskerova, 2014), and there are restrictions on acquisition of agricultural land by foreigners, harmonization of national standardization and certification system with the world.

Table 1. Major global trends and their impact on land management in the agricultural sector in Ukraine

Global trends	Consequences for Ukraine
Significant growth in demand for agricultural products and food, especially for beef, pork, poultry, butter, cheese, powdered whole milk and skim milk	Increase in revenue from all national agents of land interests. A significant increase in domestic prices for agricultural products and foodstuffs
Volatility of world prices	Farmers' losses, the need for development of agricultural insurance
The rate of production of agricultural raw materials outpace the growth of their processing and storage	Shortfall in received added value for agents of land interests
The global problem of food production	Growth of land prices, the intensification of production
Conclusion of free trade agreements within the Transatlantic partnership in trade and investment between the US and the EU (TTIP)	Diversification of production, harmonization of national standardization and certification system with the world standards

Source: Systematized according to the materials (Andriychuk, p. 13; Golyan; 12, p. 21).

It should be noted that these trends also reflect both regional (EU) and national trends, which, incidentally, almost coincide (due to the effects of global deformation): the increased proportion of gross agricultural output in GDP; increased area of a farm; increased percentage of employees; strengthened vertical integration; increased capital intensity of production as well.

Besides the general trend, certain patterns of land use in the agricultural sector of Ukraine have recently been formed (Table 2), which are generally also coincide with the global situation.

These patterns suggest many unresolved issues in land use, such as: targeted use of suburban land; micro-credit for land-poor areas; cooperation, including cooperation within the framework of international cooperation; improving business culture among farmers; stimulating economic diversification and so on.

In the global context, the problems should be resolved by the international community as well, as Ukraine will soon affect world prices to some extent, as predicted by the forecast estimates on the agricultural sector in Ukraine (according to the US Department of Agriculture (USDA), Food and Agriculture Organization (FAO) and the Organization of economic cooperation and development (OECD), in view of the tense situation with the prices for agricultural

products and food on world markets. Thus, the strategy of development of agriculture and rural area in Ukraine in 2015-2020, developed by the European Union, the European bank for reconstruction and development, USAID (United States Agency for international development), the World bank and FAO (global agents), has for a key position an increase for grain production to 100 million tons per year. During the implementation of this strategy it is necessary to consider the proposed methodological principles of forming economic, social and environmental effectiveness of LM, since the total yield can be achieved either through extensive way or intense way provided for a significant increase in anthropogenic pressure on land, or changes in the structure of sown areas with increased crop and deteriorating balance of humus in the soil.

Table 2. Patterns of land use in the agricultural sector of Ukraine

Condition	Use of land
Opportunities of land tenant Low provision for land	More intense
Low quality, no demand	On their own, beyond lease
Proximity to the city	Incomplete(part of territory)
Increased international trade	Increased land output
Larger share (land bank)	Increased rent
Higher competition for the lease	More responsibilities of land tenant
Lower provision for land	Higher land price
Large tracts of land	Mainly for plant-growing
Land-poor territories	Mainly for breeding

Source: Done using the source (Diesperov, 2014).

According to the strategy before 2020, it is planned to develop environmental standards and indicators of environmental problems of the agricultural sector. For the development of organic production it is suggested to develop and implement environmental legislation, harmonized with the EU legislation and create the relevant department in the Ministry of Agrarian Policy and Food of Ukraine on the development and marketing of organic production. In the agricultural management of regional administrations it is suggested to appoint at least one employee responsible for this direction. It is planned to give priority access for organic producers to tenders and to credit organic projects with interest of 4.6% in euros and 12.8% in UAH (Village and grants, 2015). At the same time the state is trying to optimize the structure of the agricultural use of the land resources in the framework of harmonizing land-use standards with the EU; and this concerns all regions of Ukraine (Table 3).

According to the forecast, there is a trend towards a significant reduction of agricultural land in all categories from 41,720.6 thousand ha to 35,490.0 thousand ha.

In particular, in future it is planned to restore agro-landscape balance of Ukraine before 2030. In the national distribution of agricultural land among users up to 2030 it is planned that all categories of farms have 86.7%, share in the amount and other land users – 13.3%, agricultural enterprises – 39%, collective farms – 10.5% individual farms – 36.6%.

Table 3. The optimal structure of agricultural use of land resources of Ukraine for 2030, thous. ha

Indicator	Steppe	Forest-steppe	Woodlands	Ukraine
Total	25019,8	20291,4	15043,6	60354,8
Agricultural land	19159,9	14580,2	8086,4	41826,5
of this arable land	15575,3	11961,6	6320,6	32857,5
Plow,%	81	82	66	79
Arable land used for natural grasslands and a forestation	4146,8	3090,5	1392,2	8630,9
of this eroded slopes 3 ° or more	1517,5	1715,6	461,0	3694,1
Unproductive lands	1165,4	584,2	430,2	2179,8
water protection zone	477,3	354,0	206,2	1037,4
salt	326,4	37,5	25,6	389,5
other	660,2	399,2	269,2	1328,6
Arable land remains in all categories	11428,5	8871,1	3928,4	24227,4
Plow,%	60	61	49	58

Source: *Strategic directions*, 2012.

These projections are impossible without improving LM system not only in quantitative but also in qualitative way, moreover, they have to fit into the current forecasts for the agribusiness of the world, including the European Union, taking into consideration the consequences for Ukraine (Table 4). According to current global forecasts up to 2020 global market volume of organic products will increase significantly and could be 200-250 billion \$, which will stimulate the development of organic farming in Ukraine.

Table 4. Current forecasts of agribusiness development and consequences of their implementation for LM in Ukraine

Expected factor	Source	Timing	Consequences for Ukraine
The volume of the world market for organic products may be 200-250 billion \$	FAO	before 2020	Development of organic farming
Ukraine's place in world exports	OECD and FAO	before 2023	Provision for 6.3% of world trade in wheat grain, feed grain – 12.1, vegetable oils – 6.0, poultry – 1.4, butter – 0.5, cheeses – 3.5%
The need for grain will increase by 50%	UN	before 2030	Ability to significantly influence world prices
The need for grain will increase by 100%	UN	before 2050	The opportunity to significantly influence world prices

Source: Compiled using (Andriychuk, 2015, p. 13; Artish, 2014, p. 96; Golyan, 2012; Hopko, 2011; Isakova, 2011, p. 64; Petrichenko et al., 2012, p. 35; Romashchenko, 2013; Village and grants, 2015, p. 54; Koeber, 2011, p. 28).

DP "AMPU" – State Enterprise "Administration of seaports of Ukraine"

By 2023 Ukraine will provide about 6.3% of world trade in wheat grain, feed grain – 12.1, vegetable oils – 6.0, poultry – 1.4, butter – 0.5, cheeses – 3.5%. By 2050 the need for grains will increase by 100%, which will significantly give the opportunity to affect world prices. If the port capacity of simultaneous storage of grain is doubled in Ukraine, logistics component of production will get cheaper; its role in international trade will be strengthened. Construction of irrigation networks and reconstruction of canals on the area of 520 thousand ha will improve the environmental, economic and social components of LM efficiency. If by 2021 grain exports from Ukraine (mainly wheat and maize) increase by 60% due to China, which, in turn, intends to significantly increase production and imports of pork, it will increase the revenues of all national agents of land interests. Biofuel production, which is projected by 2022 to grow by almost 70% (where will be used 28% of global sugar cane, 15% of vegetable oil and 12% of coarse grains) will also trigger an increase in revenues of all national agents of land interests. Worsening global problem of food security of entire regions of the world will cause the growth of prices for Ukrainian fertile land. Due to the introduction of new technologies in the agricultural sector, the profitability of agribusiness will increase to 75%.

These forecasts have a positive impact on the agricultural sector of Ukraine, again provided for the work of preventive and administrative adapters, configured primarily on the environmental component of the agricultural production.

2. Formation of perspective level of efficient lm through the globalization perspective and internal drivers

We offer some calculations concerning the change of the crop structure in the domestic agricultural sector in the context of the implementation of the statements of presented forecast (see. *Table 4*). For example, the impact of replacing 1 million ha of sowing winter wheat for maize calculated in 2014 (*Table 5*) shows that maize being more demanded on market is capable in the current conditions to bring 610 UAH/ha more profit; that will give additional 610 million USD from 1 million hectares.

Table 5. The impact of replacing 1 million hectares of sowing winter wheat for maize [estimated in 2014]

Performance	Winter wheat	Maize	Estimated output
Productivity, cwt/ha	40.1	61.6	21.5
Croppage, million tonnes	4.01	6.16	2.15
Total cost, billion UAH	5.86	8.63	2.77
Price realization, UAH / t	1872	1768	–104
Income, billion UAH	7.51	10.89	3.38
Profit, billion UAH	1.65	2.26	0.61

Source: Calculated on the basis (Petrichenko et al., 2012, p. 34; GSSU, 2015).

Replacing sunflower for maize gives an opportunity to get 270 UAH/ha more profit; that represents additional 270 million USD for 1 million hectares (*Table 6*). Similar calculations have been made by experts of the Association “Ukrainian Agribusiness Club” for the following crops:

- Flax (oil) – for the minimum selling price of \$ 300. \$/t for 1 hectare income is \$ 180/ha;
- Technical hemp – at a minimum selling price of \$ 890/t for seeds (or selling price of \$ 70 \$/t for fiber) profit per 1 hectare is 358 USD/ha;
- Walnut – with a minimum selling price of \$ 663/ t on 1 hectare profit is 495 USD/ha (Agrarian business, 2015).

Table 6. The impact of replacing 1 million hectares of sowing sunflower for maize [estimated in 2014]

Performance	Sunflower	Maize	Estimated output
Productivity, cwt / ha	19.4	61.6	-
Crop page, million tonnes	1.94	6.16	-
Total cost, billion UAH	5.47	8.63	3.16
Price realization, UAH / t	3847	1768	- 2079
Income, billion UAH	7.46	10.89	3.43
Profit, billion UAH	1.99	2.26	0.27

Source: Calculated on the basis (Petrichenko et al., p. 34; GSSU, 2015).

Environmental problems in LM need to be resolved because of the inability to fit into global trends and forecasts; and considered relatively to their causes (Table 7).

Table 7. Causes and recommendations for solving environmental problems in LM of the agricultural sector of Ukraine

Problem	Causes	Recommendations for solving
The ineffectiveness of the measures of land protection	Lack of owner's motivation to conserve depleted land	the state should provide an equal alternative for the period of restoration of fertility (e.g. equal land area).
Low quality of soils	irrational structure of sown areas, non-use of organic fertilizers	Livestock development; that will ensure the inclusion of annual and perennial grasses to crop rotation; green manure crops, maximum reduction of leaching organic mass from the field through eliminating the collection of by-products (straw), composting; financial cooperation, developed under the Kyoto Protocol, which provides funding for measures designed to bind carbon in soil; that is inextricably connected with increased humus.
Instability of prices for grain	Substantial dependence on external conditions for grain as raw material	Development of domestic manufacturing industry, the development of livestock

Source: Calculated based on (Mamontova, Kolpakova, 2009; Markov, 2009).

Thus, the problem of the ineffectiveness of the measures for the protection of land is explained by the lack of owner's motivation to conserve depleted land. In order to solve this problem successfully, we recommend that the state should provide an equal alternative for the period of restoration of fertility (e.g. equal land area). The problem of low quality of soils is explained by irrational structure of sown areas, non-use of organic fertilizers. In the given situation we can offer:

- Development of livestock; that will ensure the inclusion of annual and perennial grasses to crop rotation;
- Green manure crops, maximum reduction of leaching organic mass from the field through eliminating the collection of by-products (straw), composting;
- Financial cooperation, developed under the Kyoto Protocol, which provides funding for measures designed to bind carbon in soil; that is inextricably connected with increased humus.

The problem of volatility in grain prices caused by considerable dependence on external conditions for grain as raw material; can be solved through the development of domestic processing industry, livestock development.

In the context of the above forecast for 2010-2014, international projects for improving LM in Ukraine have been developed and partially implemented for agricultural purposes, the main of these are:

1. Pilot project to restore irrigation systems in Ukraine (modernization of irrigation systems on Kakhovka channel) – Export-Import Bank of China, EBRD, Export-Import Bank of the United States according to tender;
2. Pilot project to restore irrigation systems in Ukraine (restoration of irrigation system in the south) – Export-Import Bank of China;
3. Project “Support to fruit and vegetable industry in the southern regions of Ukraine” – Canada, Israel;
4. Project “Development of irrigation reclamation of Ukraine” – World Bank, Saudi Arabia, China;
5. Project “Support to development of Ukrainian agribusiness of small and medium size” – IFC (World Bank Group);
6. Project “Agricultural energy saving and financing of small producers” – private foreign investors Corp. USA (OPIC);
7. Project “Development of granaries and agricultural cooperatives” – Dnipropetrovsk Regional Council, the Department of Foreign Affairs, Trade and Development of Canada (DFATD);
8. Project “Integrated Land Use of the Eurasian Steppes” – EU;
9. Project “Revival of navigation on the Dnieper and the Southern Bug” – “NIBULON”;
10. Project “Start-up of grain technological and deep-water terminal in the port “Pivdennii” – State Enterprise “Seaports administration of Ukraine” (Table 8). An additional problem in the implementation of these forecasts of agribusiness development is undeveloped national joint agents. In the modern system of logistics infrastructure, in order to enter effectively the foreign market, such as grain, in Ukraine volume should be concentrated at the level of at least 1 million tons, which is possible to obtain from at least 100 thousand ha. This creates conditions for land overconcentration, as without having significant advantages in logistics software, in participation of joint agents and of the state in agricultural policy, including land relations, mini- and micro-agents are trying on their own to solve problems associated with globalization influences; and in accordance with the theory of global strains – to expand land banks and be vertically integrated. Since most private farms (mini-agents) for the quantitative measurement (land area) correspond to European standards of land use, it would be appropriate to harmonize their LM system with the European standards.

Table 8. International projects for improving LM of Ukraine of agricultural purposes [according to 2010-2014]

Project	Financing, mln \$.	Investor	Purpose of the project
A pilot project to restore irrigation systems in Ukraine (modernization of irrigation systems on Kakhovka channel)	1200	Export-Import Bank of China, EBRD, Export-Import Bank of the United States according to tender	Irrigation in the area of 250 thousand Ha (In Kherson and Zaporizhia regions)
Pilot project to restore irrigation systems in Ukraine (restoration of irrigation system in the south)	3000	Export-Import Bank of China	Irrigation in the area of 1200-1400 thousand Ha
Development of irrigation reclamation of Ukraine	1000	World Bank, Saudi Arabia, China	Development of land reclamation in all regions of Ukraine
Agricultural energy saving and financing of small producers	250	private foreign investors Corp. USA (OPIC)	Energy efficiency and financing of small producers

Source: Calculated according to (AgriNEWS, 2013; Ministry, 2015; AgriNEWS, 2015; Shulmeyster, 2015).

Based on this thesis, realization of investment projects in the agricultural sector shows a high probability of “domino effect”, i.e. when the implementation of a project or event with possible external influence will provoke transformational staged implications without external influences. For example, let’s consider two projects on the table 8. This effect is created under the action of globalization influences that form in this case consolidated unity of mini-, micro- and corporate agents.

Discussed economic priorities are the subject of this effect and in the financing of the projects pass through the following steps: clustering of small farmers, increasing their income; transition from survival level to average profit production; improving cost-effectiveness of land management; the transition from middle level to the high level of production profitability; improving the social effectiveness of land management; transition from high level to the stable high level of production profitability; improving the environmental performance of land management.

Finally, these transitions are the guarantor of harmonization of LM with the European standards.

In the process of harmonizing with European standards the three-level system of standardization should be overcome, which has developed and operates in Ukraine in recent years. In accordance with the principles of the Association Agreement with the EU, Ukraine should gradually introduce European standards (EN) as national ones. In the area of agriculture and food products, almost 300 international standards of Codex Alimentarius should be harmonized (Zinchuk, 2015, p. 83).

An additional problem in the implementation of international projects with Ukraine is to identify country of origin, which must have certain associations. Thus, according to the action plan issued by the Ministry of Agrarian Policy and Food of Ukraine and central executive bodies whose activities are directed and coordinated by the Cabinet of Ministers of Ukraine through the Minister of Agrarian Policy and Food of Ukraine, the Program of the Cabinet of Ministers of Ukraine and the Coalition Agreement in 2015;

the task number 6.29 is the creation and promotion of the brand “product of Ukraine”, the content of which is drawing up and adoption of a legal act on the concept of forming a high image of Ukrainian production on the world market.

In the view of the authors, other more creative options are possible. Ukrainian farmers in their dual development (intensification and organic production) have the opportunity both to significantly increase the volume of exports of agricultural products that are in demand and meet the standards of importing countries; and consolidate the positive image of the country as a producer of organic (useful, healthy, natural) agriculture and food by forming recognizable national brand, which should be formed on analytical and consulting platform of the Association “Ukrainian club of agrarian business”. Advancement of brand (e.g., similar to the «American Way» – «Amway», «Ukrainian Way» – «UkrWay») through, for example, migrant workers, Ukrainian diaspora abroad, advertising on the Ukrainian automobile, rail, water and air transport that travels abroad and high quality of products will create a positive agro-ecological image not only for a specific farming or specific national agricultural sector, but the whole country Ukraine as a food superpower.

It is advisable to form national brands on the basis of wholesale markets. For example, agri-food wholesale market in Lviv «Shuvar» can introduce TM «UPway» («Ukrainian-Polish way»), which means Ukrainian-Polish way.

The brand is formed not only by the activities of producers, but also includes social world of consumers – mediatized world of everyday existence of people in the form of fan clubs, societies and lifestyles. Brand is what determines and mediates the relationships between people. If a brand is defined as a cultural phenomenon, whose values are carried by people, namely citizens or members of one ethnicity/ company (in the form of a friendly attitude and corporate volunteering) and consumers, it is the relationship that is distributed between them that determines the presence of the brand of the country/ company or lack thereof. Modern forms of interaction between brand and consumer are the so-called brand communities that operate in real and virtual spaces, as well as a wide range of “creativity” (from the real advertising and personalization to co-design). Therefore, it is important to create meaningful social media and to involve autonomous creativity of consumers to obtain maximum economic benefit (value) along with the spread of moral values (values). Thus, consumers can independently perform certain operations: self-service when buying goods or obtaining services through special equipment, from product selection and finishing checkout (consumer as a quasi-employee); providing consumers with information on the quality of service of their staff through various forms of monitoring and evaluation (consumer as a quasi-observer); spreading information on the company by posting comments in social media, real advertising, wearing symbols and attributes of brands (consumer as a quasi-marketing specialist).

In the conditions of integration of agricultural production of Ukraine into the world economy, the importance is growing of forming its competitive advantage through the creation of organic product sold as an ecological brand, eco-brand. Domestic researchers define eco-brand as an intangible asset that is formed through bilateral process of value interaction (purity, healthy lifestyle) of organizations and consumers.

According to C. Koeber, agricultural producers find it important to identify and consider the value of this asset for assessing and forecasting their own economic performance. The value of eco-brand is defined as the total expenditure on the formation of semantic-symbo-

lic component of organic agricultural products, and not as the cost of production of valuable relationships that underlie the concept of “eco-brand.” Therefore, the problem is the integration of a meaningful core of brand in the methodology for assessing its value, namely identifying the sources of its formation (Braginets et al., 2015; Koeber, 2011, pp. 207–213). From among the latter efficient LM of the national agricultural sector plays an important role.

Summarizing the study, it should be noted that the actual effectiveness of LM corresponds to 17.3% of the potential for the current state of the external and internal influence factors of environment. Comparing its level to the European average, according to the author's methodology, it can be stated that it is equal to 10% of the level of Netherlands, or 20% of the level of Germany, or 53% of the level of France (given only a partial indicator “population, which is actually fed out of 1 ha of agricultural land”). Thus in the conditions of significant threats to national defense, Ukrainian business as a completely plastic institution almost instantly (only in 2014) moved the center of gravity from metallurgy, energy and chemical industries towards the agricultural sector. With the economic and political instability, this process can be amplified through great productive motivation and globalization influences.

In economies of countries dependent on import (for agricultural products and food-stuffs) global deformation resulted in reducing immediate dependence, i.e. the formation or increase of stocks of agricultural products and food on domestic area. This will slightly reduce the range of variation of seasonal price fluctuations primarily for grain, and will also attempt to increase the amount of reserve funds, that will increase the demand of spasmodic type for food against the background of its stable growth. The possibility of Ukraine in this background to increase significantly its own production is for domestic producers the most realistic and clear globalization perspective.

We emphasize the need of diversifying agricultural production and markets, deeper processing of products that will allow to export products with greater added value and, consequently, will permit to receive its larger elements – rent, depreciation, wages, interest, profits; i.e. to motivate the appropriate agents of Land interests.

In addition, for term of globalization in Ukraine related to land use, according to the authors, is marked by the influence of LM efficiency drivers, such as: the development of logistics infrastructure; security of private land ownership and other rights to it and added value from its use; the availability of cheap funds for business; the level of monopoly; ease of doing agribusiness; the level of corruption; the system of state quality standards; the development of public-private partnerships; decentralization of power; the system of state protectionism. These drivers, depending on the specific situation, may change places with each other, in other words they are mobile. The list of drivers is also temporary, e.g. the possibility exists of the appearance of new drivers or elimination of their effect due to the loss of sensitivity of land users on their change.

Regarding preventive and administrative adapters, today one of the largest of these is the moratorium on sale of agricultural land. The country's scope represents the general economic conditions, registered in the Commercial and Land Codes, as well as taxation, provisions of the Law of Ukraine “About Foreign Economic Activity” non-restriction of land banks, forming vertically integrated structures. Globalization prospects of national land users under the action of these drivers, preventive and administrative adapter with peculiarities enabled by the country's scope, are forming position of land users in the international system of division of labor, which ultimately determines the level of LM perspective.

The perspective level of land use should be considered in the process of harmonization of national LM of the agricultural sector of globalization prospects for sustainable development and food security. According to the authors, this process can be represented as a scheme of harmonization of economic interests of actors of land relations through financial and organizational capacities of these actors. The logic of the scheme is explained by the fact that the basis of actions of LM are economic interests of mini-agents, micro-agents, joint agents, the state, regional and global agents, which are oriented on a certain amount (share amount) of owning, using and handling objects of management (land, land rights or the added value from land-use), taking into account possible level of globalization impacts (social, economic, political, organizational, financial, information). Thus, a dynamic level of efficiency of LM is formed, as well as its tendency, to be perceived by agents of land interests as input for the new cycle of activity (operational, tactical or strategic planning).

As a result, we should note that the basic global trends and their impact on LM of the agricultural sector of Ukraine are reduced mainly to increased anthropogenic load on them. The author scheme of “domino effect” from the implementation of investment processes in agriculture, towards harmonization of LM with the European standards. We suggest creation of a network structure of organic products under the trademark «UkrWay» for analytical and advisory platform of Ukrainian club of agrarian business. We develop the scheme of harmonizing economic interests of land relations actors through of their capabilities. We design the scheme of forming perspective level of LM through globalization perspectives and internal drivers.

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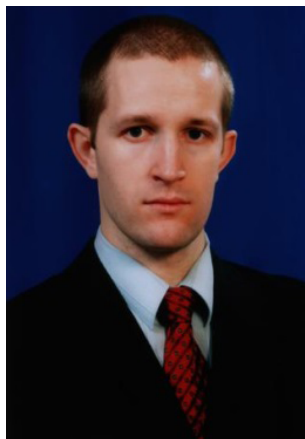
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