

# 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**





MANAGEMENT OF  
AGRARIAN PRODUCTION  
STRUCTURES  
IN THE CONDITIONS OF  
GLOBALIZATION PROCESSES



ODESSA I.I. MECHNIKOV NATIONAL UNIVERSITY [UKRAINE]  
NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE [UKRAINE]  
UNIVERSITI TEKNOLOGI MALAYSIA [MALAYSIA]

# 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**

Odessa - Kyiv - Skudai-Johor - Olsztyn

**2019**

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.

#### **OFFICIAL REVIEWERS OF THE MONOGRAPH:**

Prof. Dr. Katarzyna **Glabicka-Auleytner** (PhD, DSc, ProfTit), *Kazimierz Pulaski University of Technology and Humanities in Radom, Poland*

Prof. Dr. Alvydas **Baležentis** (PhD, DSc, ProfTit), *Mykolas Romeris University, Vilnius, Lithuania*

Prof. Dr. Svitlana **Gutkevych** (PhD, DSc, ProfTit), *European University, Ukraine*

Prof. Dr. Mykola **Parchomets** (PhD, DSc, ProfTit), *Temopil National Economic University, Ukraine*

Dr. Olena **Dragan** (PhD, DSc), *National University of Food Technologies, Ukraine*

#### **SCIENTIFIC EDITORS OF THE MONOGRAPH:**

Prof. Dr. Vitalii **Nitsenko** (PhD, DSc, ProfTit), *Odessa I.I. Mechnikov National University, Ukraine*

Prof. Dr. Tatyana **Mostenska** (PhD, DSc, ProfTit), *National University of Life and Environmental Sciences of Ukraine*

Dr. Abbas **Mardani** (PhD), *Universiti Teknologi Malaysia, Skudai, Johor, Malaysia*

#### **TECHNICAL EDITOR OF THE MONOGRAPH:**

Dr. Kamil **Sygidus** (PhD)

#### **GRAPHIC DESIGN AND TYPOGRAPHY:**

Dr. Kamil **Sygidus** (PhD)

#### **COVER DESIGN:**

Dr. Kamil **Sygidus** (PhD), *Photo Aerial Shot of Green Milling Tractor by Tom Fisk from Pexels*

#### **PRINTING HOUSE:**

**Bookmarked Publishing & Editing**

*Vitalii Nitsenko, Tatyana Mostenska, Abbas Mardani (scientific editors). Management of agrarian production structures in the conditions of globalization processes. A monograph. -Odessa - Kyiv - Skudai-Johor - Olsztyn: Bookmarked Publishing & Editing, 2019. -Bibliogr. -Ilustr. - 218 p.*

All rights reserved. No part of this book may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of the publisher.



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA



© 2019 Odessa I.I. Mechnikov National University

© 2019 National University of Life and Environmental Sciences of Ukraine

© 2019 Universiti Teknologi Malaysia

© 2019 Bookmarked Publishing & Editing

**ISBN 978-83-952465-3-1**

# List of Contents

<b>INTRODUCTION</b> .....	<b>7</b>
<b>PART 1.</b>	
<b>THEORETIC-METHODOLOGICAL APPROACHES TO MANAGEMENT IN THE AGRARIAN SPHERE</b> .....	<b>13</b>
<b>Chapter 1.1.</b>	
<i>THEORETIC-CONCEPTUAL BASES OF MANAGEMENT OF MODERN AGRARIAN PRODUCTION STRUCTURES</i>	
Y. Ushkarenko, A. Solovyov, N. Kusyk, A. Mardani.....	15
<b>Chapter 1.2.</b>	
<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
<b>Chapter 1.3.</b>	
<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
<b>PART 2.</b>	
<b>MODERN CONCEPTIONS OF DEVELOPMENT OF AGRICULTURAL PRODUCTION</b> .....	<b>53</b>
<b>Chapter 2.1.</b>	
<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
<b>Chapter 2.2.</b>	
<i>ASSURING APPROPRIATE ENVIRONMENTAL STATUS OF THE MAIN AGRICULTURAL INPUTS: EUROPEAN EXPERIENCE AND OUTLOOK FOR UKRAINE</i>	
L. Udova, V. Nitsenko, O. Yevdokimova.....	67
<b>Chapter 2.3.</b>	
<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
<b>PART 3.</b>	
<b>THE ROLE OF MARKETING IN MANAGEMENT BY MANUFACTURING STRUCTURES OF THE AGROINDUSTRIAL SECTOR</b> .....	<b>125</b>
<b>Chapter 3.1.</b>	
<i>MARKETING OF SUGAR INDUSTRY IN UKRAINE</i>	
A. Doronin, L. Karpuk, O. Zakharchenko, N.Z. Md Salleh.....	127
<b>Chapter 3.2.</b>	
<i>VOLATILITY OF WORLD PRICES AND ITS IMPACT ON AGRICULTURAL PRODUCTION</i>	
K. Prokopenko, N. Mamontenko, N. Loganathan.....	151
<b>Chapter 3.3.</b>	
<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.**

<b>MAIN DIRECTIONS OF IMPLEMENTATION OF INNOVATION-INVESTMENT ACTIVITIES OF ENTERPRISES .....</b>	<b>185</b>
<b>Chapter 4.1.</b>	
<i>MANAGEMENT OF INNOVATIVE-INVESTMENT ACTIVITY OF ENTERPRISES</i> V. Ilin, O. Ilina, V. Ilin, I. Hanzhurenko.....	187
<b>Chapter 4.2.</b>	
<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
<b>ABOUT THE EDITORS.....</b>	<b>213</b>
<b>ABOUT THE AUTHORS.....</b>	<b>215</b>



## 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 on 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.

Vitalii **Nitsenko**

*Odessa I.I.Mechnikov National University, Ukraine*

Tatyana **Mostenska**

*National University of Life and Environmental Sciences of Ukraine, Ukraine*

Abbas **Mardani**

*Universiti Teknologi Malaysia, Malaysia*



# 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 Kusyk, 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 20<sup>th</sup> 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 epy 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 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 to 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 hydrographical 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.

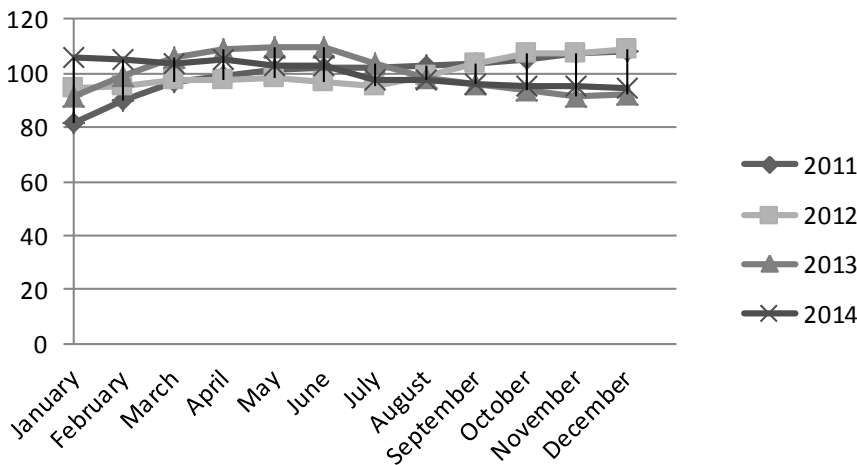
Agrarian production structures are characterized by certain features related to the processes of sales of products and, accordingly, to pricing process. In agriculture, the basis of market prices is the cost of production at the worst fertility soils. Of course, we are talking about the fact that production 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.

## **References:**

- Andriychuk, V.G. (2013). *The economy of agricultural enterprises*. Kyiv, Ukraine: KNEU.
- Food and agriculture organization of the United Nations (2016, September). Retrieved from <http://aims.fao.org>
- Gvershiani, D.M. (1970). *Organization and management. Sociological analysis of bourgeois theories*. Moscow, USSR: Nauka.
- Laurent, R. (2014). *Agrarian system*. Hypergeo, Liberg'eo. Retrieved from <https://hal.archives-ouvertes.fr/hal-00922131/document>
- Norenkov, I.P., Kuzmik, P.K. (2002). *Information support of science-intensive products. CALS – technology*. Moscow, Russia: Publishing house of the Bauman MSTU.
- Pogribniyi, O.O. (2007). *Agrarian Law of Ukraine*. Kyiv, Ukraine: Truth.
- Sadler G.J., Barnsley M.J., Barr S.L. (1991). *Information extraction from remotely sensed images for urban land Brussels, Belgium*. EGIS '91.
- White, F.E. (1989). A Model for Data Fusion 1st National Symposium on Sensor. *Fusion*, 2, 20–26.
- Wosserman, F. (1992). *Neuro-computer technology*. Moscow, Russia: Mir.
- Verkhovna Rada of Ukraine. (2005, February 4). *Economic Code of Ukraine*. Retrieved from <http://zakon2.rada.gov.ua/laws/show/436-15>