

# DEVELOPMENT OF THE INNOVATIVE ENVIRONMENTAL AND ECONOMIC SYSTEM IN UKRAINE

MONOGRAPH Prague, 2019

### PRIVATE HIGHER EDUCATIONAL INSTITUTION «ACADEMICIAN YURIY BUGAY INTERNATIONAL SCIENTIFIC AND TECHNICAL UNIVERSITY»

# DEVELOPMENT OF THE INNOVATIVE ENVIRONMENTAL AND ECONOMIC SYSTEM IN UKRAINE

## Collective monograph

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OKTAN PRINT s.r.o. Prague, 2019 Recommended for publication by the Academic Council of PHEI «Academician Yuriy Bugay International Scientific and Technical University» (Minutes № 05/1819 from 21.05.2019).

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The monograph is designed for a wide range of readers, including students of economic specialties, scientists, civil servants and representatives of the real economy sector who are interested in transforming the economic system of Ukraine in accordance with global trends and development drivers.

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#### **PREFACE**

The issue of developing an innovative environmental and economic system in Ukraine today is relevant to the applied-science discourse. I believe that it is precisely this kind of work that reveals the theoretical and methodological basis of the problem of strategic management of the innovative development of the economic system of Ukraine in the context of the deployment of the fourth industrial revolution and the transition of the global economy to the sixth technological paradigm and the knowledge economy, meets the requirements of the time.

The monograph investigates the theoretical foundations of the formation of innovative components of scientific - technological and industrial security of the economic system at the state and regional levels, management of the innovative basis for financial and investment components of competitiveness, development and validation of new methods for assessing global and local challenges of the present in the system of ensuring environmental security.

The monograph consists of five sections. The first section is devoted to the theory and methodology of strategies for innovative economic development and enhancement of competitiveness. The scientific developments of the authors concerning the modern paradigm of strategic management in macroeconomic dimensions are presented. The microeconomic aspects of strategic management and competitiveness management are revealed. The second section is devoted to the latest conception of the formation of innovative factors of public administration of economic growth. The approaches to institutional and technological design of innovative models in the field of public administration, the mechanism of implementation of the principles of the concept of compliance of all components of public administration with economic growth are proposed. The third section deals with the issues of the innovative basis of financial management and monetarycredit policy. The scientific-methodical principles and practical tools for improving the system of public finance management - optimization of the taxation system, public sector debt, the latest principles of the budget and monetary-credit policy, FinTech development, are worked out. Innovative financial technologies and investment security tools are offered. The fourth section focuses on the determinants of national economic security. The globalization factors of foreign economic security are investigated. Innovative drivers of social security of regions of Ukraine are determined. The mechanism of implementation of the integrated territorial management of environmental security in the conditions of transition to sustainable development is formed. The fifth section addresses to the principles of

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# MAIN ELEMENTS OF MANAGING THE QUALITY OF AGRICULTURAL PRODUCTION

Abstract: The emergence of a market for quality and safe food is the most important strategic task of the national economy. Practical actions on this issue are conditioned by the objective necessity of a civilized approach to the organization of environmentally safe agricultural and industrial production, preservation of the health and gene pool of the nation, formation of state measures for the integration of environmental constraints into the legal basis of international foreign trade relations. The indicators of quality of agrarian products and their significance and essence are presented. The methods of assessing the quality level of agrarian products and the role of standards are highlighted in the most effective promotion of the active introduction of new technology and technologies, the economical use of raw materials and the extension of the shelf life of products and the preservation of nutrients in it. The quality standards of agrarian products ensure its safety for the life and health of people, animals, plants and the protection of the natural environment. The main directions of quality management of agrarian products are analyzed through promotion of demand satisfaction, improvement of the material base of production, provision of expanded reproduction of agrarian production, etc. Improving the quality of agricultural products affects the level of productivity and the structure of production; ensures increased efficiency of agrarian enterprises, improvement of material incentives and social development.

**Key words:** quality, agrarian products, consumer, indicators, standard, standardization, management.

Relevance. In a market economy, the quality of agricultural products plays an extremely important role in increasing its competitiveness and in creating an attractive business environment for agrarian production. Economic competition of agrarian enterprises, their struggle for markets is concentrated not only on the price, but also on non-price factors. Among these factors is advertising, creation of favorable conditions for the implementation of agrarian products and a special place takes its quality. At the same price, higher quality products are in demand. Significant improvement of the quality of agrarian products by the company compared to similar products of competitors gives him the opportunity to raise the price for it without losing their consumers, and in some cases even increasing sales.

The state of scientific development. The analysis of recent researches and publications shows that such domestic scientists have made a significant contribution to the study of the problems of the quality management of agricultural products and its importance on life and health of the population: Andriychuk V.G., Gorbonos V.F., Dementiev V.V., Garmashov V.V., Golubeva U.R., Zagorodniy A.E., Ivanov Yu.B., Kapshtik M.V., Kovalchuk S.Ya., Likhopiy V.I., Overkovskaya T.K., Semeniuk E.O., Tunytsia Yu.T., Shpyl'ovyj V.A., and others like that. Despite a significant number of studies, problems in the field of management and effective standardization of quality of agricultural products and its approximation to international standards are relevant and require further study especially in terms of innovative development.

The aim of the work is to study the peculiarities of quality management of agrarian products and its impact on the life, health of people and on the efficiency of the national economy. To highlight the quality indicators of the main types of agricultural products and methods for determining its level.

**Main part.** The quality of products is a set of its properties that characterize the extent of the capacity of this product to meet the needs of consumers in accordance with its intended purpose. World experience convinces that the quality of products is a function of the level of development of scientific and technological

progress and the degree of implementation of its results in production. The higher the quality of products, the more fully satisfied the needs of consumers and more effectively solve socio-economic problems of society. Raising the quality of agricultural products is regarded as a decisive condition for its competitiveness on the domestic and foreign markets. The competitiveness of agrarian products determines the prestige of the country and is a decisive factor in increasing its national wealth [1, p. 3].

The consumer demands certain agrarian products to meet his own needs. The most important of them are its quality, trademark, style, size, service, warranty, etc. Each type of agrarian product should be a carrier of various specific properties, which reflect its usefulness and meet certain requirements of the person. Its usefulness is characterized by consumer value, and consumer value must be determined by the appropriate quality. The consumer value and quality of these products are directly related. Consumer cost may not be useful to the same extent, and the quality of products characterizes the extent of its suitability for consumption, that is, the quantitative side of consumer value. Each type of agrarian products has its own quality indicators. Under the indicator of quality, understand the quantitative expression of one or several homogeneous properties of products that meet certain consumer needs in relation to its intended purpose and conditions of use.

The quality indicator of agricultural products quantifies the degree of its suitability and can be expressed in terms of class, grade, in percentage points, etc. The following requirements, such as suitability for fast cooking, proper storage, good taste, high starch content, etc., can be put forward on the potato. The value of sunflower is estimated by its content of fat, which varies within 42-53%; wheat on the content of gluten (within 23-40%). Milk can be extra class, first, second grade and unsorted. Meanwhile, the protein content and fat content, which is equal to 2.8-5.2%, is determined. Qualitative indicators of flax fiber are estimated on the varietal dimension scale from the second to the 28th, but the production quality index is fiber flax - from 18-25%. Some types of agrarian products have specific

quality indicators. All Quality Scores are divided into unit and complex. Units characterize someone property of products (the content of starch in potatoes), while complex represent several properties of the product - varietal dimension fiber flax fiber [2, p. 84].

We characterize the main quality indicators agricultural products:

- 1. Biological indicators characterize the suitability of agrarian products for consumption in food. They depend on the biological and physiological characteristics of plants and animals, in the process of cultivation and care of which these products are obtained. Among these indicators, the content of macroand microelements, protein, vitamins, sugar, starch, fat, and the like is of paramount importance. For many types of products, its appearance is also important. Biological indicators of the quality of agrarian products are dynamic, very dependent on weather and soil conditions, may improve or deteriorate under the influence of man. In compliance with all agrotechnical requirements in the growing and harvesting of winter wheat and the cultivation of grain, the protein content in it may increase, under other identical conditions, by more than 6 percent. The biological quality indices are significantly influenced by the natural and economic conditions, the observance of agrotechnical requirements, the technology of growing and harvesting crops, methods of keeping animals, etc.
- 2. Performance indicators characterize the following properties of agrarian products that are necessary and important for its efficient industrial processing or for industrial use in subsequent cycles of agrarian production. According to these indicators, the quality of intermediate products and agrarian raw materials is estimated. Seeds of cereals must have the appropriate similarity, varietal purity, moisture content, do not exceed the marginal depth of litter, etc. Sugar beet entering the processing of sugar factories should not contain impurities of the hinges or be contaminated above the established norms, their shrinkage is not allowed. The feeds must have a certain level of nutrition, digestible protein, macroand microelements. Indicators of production directly affect the productivity of agrarian production in its subsequent stages: seeds on the level of productivity of

crops, feed - on the productivity of animals; agrarian raw material - on the productivity and efficiency of processing enterprises and the quantity and quality of final products.

- 3. Indicators of transportability are important for all three types of agrarian products end-use, intermediate, raw materials, they characterize the degree of its suitability for transportation and to loading and unloading by appropriate means and methods. The most important indicators of transportability are the class and dimensions of products, time and money for the preparation of products for transportation, the cost of packaging and packaging, the cost of loading and unloading, the cost of transportation.
- 4. Reliability indicators are important at all stages of the movement of products to consumption personal or industrial. They indicate the suitability of products for the preservation of biological and a number of technological indicators of quality in its storage and transportation. Quantitatively, reliability indicators are measured by the shelf life of products for different methods of its implementation and the distance of its transportation on roads of different classes.
- 5. Environmental indicators characterize the environmental purity of products and their suitability for consumption by human beings or for feeding animals. These indicators include the content of products of radionuclides, nitrates, nitrites, residues of pesticides and other life-threatening elements and substances that must be carefully monitored in order to prevent excess of their concentration beyond the maximum permissible standards.
- 6. Safety indicators are presented by those features or properties of agrarian raw materials, characterizing the degree of safety of workers in the process of its production and production use. These indicators, as well as environmental indicators, are tightly controlled in order to take appropriate precautionary measures. In the post-Chornobyl period, the indicator of the content of radionuclides in the dust, which is formed during the processing of linseed or chips in flax mills, is carefully monitored.

- 7. Economic indicators characterize the degree of economic benefits of production of agrarian products of the corresponding quality. The most important of these are the price and profit per unit of output; price competitiveness of it; the share of agrarian products for which a quality certificate has been obtained; the share of exported products in the total volume of its sale.
- 8. Aesthetic indicators are of particular importance for final products consumed fresh and for consumer goods. They characterize the product's appearance (turgor, size, color, and for consumer goods, and the integrity of the composition, the perfection of the production performance of products, the rationality of the form, etc.).
- 9. Patent-legal indicators are inherent in those types of products that are protected by a patent. They describe the quality of new inventions that are embodied in agrarian products, their weight. Patent-legal indicators characterize the patent purity of agrarian products, its potential for unhindered realization on the domestic and foreign markets [3, 4].

To fully understand the quality of agrarian products, it is necessary to quantitatively express its properties. Finding specific ways to improve the quality level can only be done by counting unit and group quality indicators and comparing them with standards. Three methods are used to assess the quality level of agricultural products:

- 1. The differential method is based on the direct use of individual indicators, it is simple and allows you to detect a lag or advance on each property. However, it does not give an unequivocal answer to the benefits of a particular agricultural product. An unambiguous answer can only be obtained if all the indicators that are evaluated are better or worse than the standards. In other cases, further study of the quality level of other methods is necessary.
- 2. The complex method is based on the calculation of the complex indicator, represented by the main weighted average or integral indicators. Complex indicator aggregates all or partly individual indicators, it characterizes the real quality and reflects the main technical and operational properties of agricultural products and

gives the most important assessment of its quality. However, it does not always reflect all the properties that make up the quality of this product. The main advantage of the complex method is to ensure the widespread use of simultaneous accounting of any and in any number of individual indicators. However, this method has significant disadvantages, reduces the accuracy and reliability of the evaluation due to subjectivity in determining the weighting factors and due to the interdependence of individual indicators, which leads to multiple accounting of the same property in the complex indicator.

3. Integral quality index provides the most complete assessment of the quality of agricultural products, takes into account the entire set of costs for its creation and determines the economic efficiency of production. An integral indicator provides an unambiguous economic assessment of quality. Such an approach corresponds to the role of improving the quality of agrarian products as one of the most effective directions of direct increase of the efficiency of agrarian production. The integral indicator of the quality of agrarian products is the most important for measuring its level of efficiency [5, p. 142].

In the market conditions of mass production, it is necessary to treat the quality in a special way, as to the economic category. In assessing the quality of products, its main properties are checked: reliability; compliance with technological requirements; compliance with hygienic and physiological norms; economy; environmental friendliness; transportability and so on.

The improvement of the mechanism for the formation of a quality management system in the agro-industrial complex, which serves as the guarantor of the ability, organization and management of the stable production and supply of products of a certain quality, takes on a priority character. The development, implementation, certification and maintenance of a quality management system in the capacity state is one of the strategic directions of activity of agrarian enterprises, which greatly increases their efficiency, economic efficiency and competitiveness in the world market [1, p. 4].

The economic aspect of the quality problem is to increase the efficiency of the national economy, increase the profit of enterprises, increase the competitiveness of products both in the domestic and foreign markets, rational use of material and energy resources. All issues in the field of quality, such as raising its level and managing it, are related to economic costs, which should result in a sound economic effect.

The modern innovative aspect of the problem is based on the interconnection of the process of improving the quality of products and the pace of the introduction of innovative technologies. Because of scientific and technological progress, information systems, transport communications, technological processes are being improved, thereby ensuring a higher level of product quality, which in turn leads to a new development in science and technology.

The quality and safety of agricultural products are subject to the rules of obligatory standardization and certification for compliance with product standards, which may endanger the life, health of citizens and the environment, established by the decree of the Cabinet of Ministers of Ukraine "On Standardization and Certification" from 10 May 1993. Depending on the type of agricultural products, the relevant standard sets requirements for the content of toxic elements, pesticides, mycotoxins, antibiotics, hormonal preparations, radionuclides, identification of microbiological parameters, sweeteners, nitrates, nitrites, synthetic dyes, sulfur dioxide, histamine, wormholes, erucic acid, etc. [6, p.235].

Rapid change and innovative technological development allowed chemicals that were not known before to be used for the production and storage of agrarian products. The Law of Ukraine "On Standardization" defines standardization as an activity, which consists in establishing the provisions for general and multiple application in relation to the existing tasks in order to achieve the optimal degree of ordering in a particular field, resulting in an increase in the degree of conformity of products, processes and services to their functional purpose, elimination barriers to trade and promotion of scientific and technological cooperation [7, p. 181].

The purpose of standardization specifies the main tasks, which are intended to ensure: the safety of agricultural products for the life and health of people, animals, plants and the protection of the natural environment; protection and preservation of agricultural products, in particular during transportation or storage; the quality of agricultural products in accordance with the level of development of science, technology and people's needs. As to the safety requirements, the content of harmful substances in wheat grain should not exceed the following maximum levels (mg / kg): lead - 0,5; cadmium - 0,1; arsenic - 0,2; mercury - 0.03; copper - 10.0; zinc - 50,0. The maximum levels of radionuclides are measured in Bq/kg: strontium-90 - 20; cesium-137 - 50 [8, p. 93].

Confirmation of compliance of agricultural products with the requirements of standards for its quality and safety is carried out through the certification procedure. This procedure is carried out by the authorized certification bodies - enterprises, institutions and organizations in order to prevent the sale of products dangerous to life, health and property of citizens and the environment, promoting the consumer in a competent choice of products, etc. The State certification system is created by State Consumer Standard of Ukraine, which conducts and coordinates the work on certification.

According to Art. 13 Decree of the Cabinet of Ministers of Ukraine "On Standardization and Certification" the certification of products in Ukraine is divided into mandatory and voluntary. The list of products subject to mandatory certification in Ukraine is determined by the order of the State Committee for Consumer Rights of Ukraine dated February 1, 2005 No. 28, registered with the Ministry of Justice of Ukraine on May 4, 2005, No. 466/10746. Section 26 of this legal act establishes a list of food products and food raw materials subject to compulsory certification [9].

In accordance with the requirements of the standard milk at procurement is divided into three varieties: higher, first and second. Milk should be obtained from healthy cows, cooled and filtered. The standard regulates the length of storage of milk from the manufacturer to the purchase. It should not exceed 24 hours at a

storage temperature not exceeding 4 ° C, 18 - 6 ° C and 12 hours - at a temperature not higher than 8 ° C. Milk is evaluated by such quality indices: density, acidity, total bacterial insemination, somatic cell content, purity (by the presence of mechanical impurities), fat and protein content.

The milk density should not be less than 1027 kg/m3 at a temperature of 20 ° C or correspond to a freezing point -0,52 ° C. If the density indices are less than the indicated level, this indicates the presence of water in the milk. Acidity is an important indicator that characterizes the technological quality of milk, the ability to use it to produce such valuable products as cheeses. For the higher and first varieties of milk, the acidity should be within the limits respectively 16-17 and 19  $^{\circ}$  T (Turner), for the second grade - 20  $^{\circ}$  T. This standard increases the requirements for bacterial contamination of milk, although they are still inferior to the level of requirements that apply in EU countries. For the higher grade, this quality index should not be more than 300 thousand bacteria per cm3, for the first one - 500 and the second grade - 3000 thousand bacteria per cm3 (in the EU - not more than 100 000). To ensure this quality index, it should be kept in mind that bacteria, which are cooled to 10  $^{\circ}$  C, practically do not develop for 12 hours and when cooled immediately after milking to 4 ° C, 48 hours. The mass fraction of dry matter for higher grade milk should be not less than 11,8%, for the first one -11,5 and for the second grade - 10% [10, p. 6].

The purpose of standardization specifies the main tasks, which are intended to ensure: the safety of agricultural products for the life and health of people, animals, plants and the protection of the natural environment; protection and preservation of agricultural products, in particular during transportation or storage; the quality of agricultural products in accordance with the level of development of science, technology, technology and people's needs.

The objectives of agricultural standardization are achieved by developing, implementing and applying the relevant regulatory documents. Generally normative is a document that establishes rules, general principles or characteristics of various activities or their results. According to the levels of subjects of

standardization in Ukraine, the following normative documents are compared: national ones; organizations.

Standards for agrarian products, depending on its features, contain appropriate groups of provisions or requirements: classification; basic parameters and sizes; general technical requirements and safety and environmental protection; marking; packaging; transportation and storage rules; control methods; admission rules; rules of operation, repair, utilization, etc. [11].

Thanks to the improvement of quality and rational use of other non-price factors, the agrarian enterprise can receive not temporary advantages over competitors, as at a price reduction, but long lasting, since the latter need a lot of time to improve the product and make the necessary changes in the technology of its production.

The modern market economy puts forward fundamentally new requirements for the quality of agrarian products. The survival of any enterprise, its stable position in the agrarian market determines the level of competitiveness, which is characterized by two indicators - the price level and the level of product quality, and the quality of products becomes almost the most important factor in consumer behavior when it chooses a product.

The growth of product quality is the basis of the activities of all enterprises. It as a factor of competitiveness extends to the entire national economy. Reducing the quality of agricultural products leads to negative consequences. From an economic point of view - it is unjustified loss of material and labor resources associated with the production, transportation and storage of products. Application in the process of production of raw materials and materials of poor quality, as well as machines, equipment of doubtful qualitative characteristics leads to ineffective use of resource potential, the increase in prices of products and reduce its competitiveness, reducing the profitability of the enterprise.

Quality is a set of product properties that determine its ability to meet certain consumer needs in accordance with its purpose. This is one of the most important indicators of the enterprise. For quality products, there is always demand, it is realized at a higher price and, accordingly, the enterprise will receive more profit. It is the improvement of the quality of agrarian products that ensure the survival of the company in a market, because it is equivalent to an increase in its production, but with significantly lower costs, the economy of all types of resources [2, p. 85].

Modern innovative technologies open up great opportunities for increasing the well-being of people, if they are developed and used with the observance of appropriate environmental and human health measures. It takes into account the exceptional importance of centers of origin and centers for the genetic diversity of plants and animals for human nutrition. The limited capabilities of many developing countries to respond to the nature and extent of known and potential risks associated with living modified organisms should be taken into account in trade and environmental agreements that complement each other in achieving sustainable development.

The main directions of quality management of agrarian products: to promote full satisfaction of the needs of the consumer and the formation of the image of the enterprise; improve the use of labor resources and save on raw materials and materials; provide enhanced reproduction, improve the efficiency of the enterprise, improve material incentives and improve social development; influence the level of labor productivity and the structure of agrarian production [12].

Conclusions. Improvement of the quality of agrarian products is ensured through integrated, interrelated, permanent measures that control its quality. Application in agrarian enterprises of the quality management system of production is aimed at the establishment, maintenance and maintenance of its required level in the planning, production, sales and consumption. In the field of production of quality and safe agrarian products, standards most effectively promote the active introduction of new technology and technologies, economical use of raw materials and materials, extending the shelf life of products and preserving its nutrients This will ensure the prevention of the sale of products that is hazardous to life, health of citizens and the environment, will promote the consumer in a competent choice of products. Quality agricultural products provide

higher profitability of production and financial stability of the enterprise, increases its image, promotes the company's exit to the world market, more fully satisfies the needs of society in it, thanks to which a more favorable socio-psychological climate is formed in the state.

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