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PROBLEMS OF INNOVATIVE DEVELOPMENT OF THE AGRICULTURAL SECTOR
ПРОБЛЕМИ ІННОВАЦІЙНОГО РОЗВИТКУ АГРАРНОЇ СФЕРИ

Summary. *Introduction. Innovative development of the agricultural sector, within the framework of sustainable development, involves the implementation of environmentally friendly innovations, the economical use of natural resources, as well as the development of intellectual capital and rural areas, compliant with social and environmental standards.*

The innovative development of the agricultural sector has its own characteristics, which are primarily due to the peculiarities of rural area development, the seasonality of production, and the influence of climatic conditions on the results of activity. Within the sustainable development theory, sustainable innovative development of the agricultural sector involves a combination of economic efficiency with environmental and social responsibility.

Purpose. The purpose of this article is to study the problems of innovative development of the agricultural sector, including innovation infrastructure,

commercialization of scientific developments, and intellectual capital, as well as to identify ways to solve existing problems in this area based on sustainable development standards.

Materials and methods. The research materials are scientific works of domestic and foreign scientists dedicated to issues of innovative development, including the agricultural sector, within the sustainable development theory.

The conducted research used methods of theoretical generalization, analysis, and synthesis, a comparative method, as well as statistical methods for analyzing indicators of innovative development of the agricultural sector.

Results. The article examines the main factors that influence innovative development, including organizational factors of the scientific research commercialization process in the agricultural sector, in particular, innovation infrastructure and intellectual capital. It also studies the process of scientific developments transfer as an important direction of state innovation policy.

Based on the results of the study of theoretical, methodological, and practical aspects of the functioning of intellectual capital in the agricultural sector, a model of its development is offered, taking into account institutional conditions and the effectiveness of innovative activity in the specified sector of the economy, taking into consideration the principles of sustainable development.

It is noted that the mechanism for the development of intellectual property in the agricultural sector should be based on environmental and social standards and include three components: economic, regulatory, and organizational.

Prospects. In order to solve the problems of innovative development of the agricultural sector, the state should support and stimulate the further development of those scientific, design and technological organizations, the activities of which are aimed at the transition from traditional production technologies to the development and implementation of fundamentally new ecological technological processes, as well as complex technological systems that

are created on the basis of the latest scientific achievements and contribute to the economical use of natural resources of Ukraine.

The goal of innovative development should be to ensure sustainable growth in the competitiveness of domestic producers based on ecological and technological modernization of the economy, to increase their innovative activity and to introduce new products (plant varieties, animal breeds), eco-technologies, as well as methods of organizing and managing economic activities to boost the greening of production and the well-being of the population in addition to stable economic growth, based on defined national priorities for sustainable development.

The obtained results can be used in further scientific explorations for in-depth study and proposals for solving accumulated problems.

Key words: *sustainable development, innovative development, innovation infrastructure, intellectual capital, technology transfer, innovative development model.*

Анотація*. Вступ. Інноваційний розвиток аграрної сфери, в межах концепції сталого розвитку, передбачає впровадження екологічно безпечних інновацій, ощадне використання природних ресурсів, розвиток інтелектуального капіталу і сільських територій з забезпеченням соціальних та екологічних стандартів.*

Інноваційний розвиток аграрної сфери має свої особливості, що зумовлені, передусім, особливістю розвитку сільських територій, сезонністю виробництва і впливом кліматичних умов на результати діяльності. В межах теорії сталого розвитку сталий інноваційний розвиток аграрної сфери передбачає поєднання економічної ефективності з екологічною і соціальною відповідальністю.

Мета. Метою статті є дослідження проблем інноваційного розвитку аграрної сфери, у тому числі інноваційної інфраструктури,

комерціалізації наукових розробок, інтелектуального капіталу та визначення шляхів вирішення наявних проблем у цій сфері виходячи з стандартів сталого розвитку.

Матеріали і методи. Матеріалами дослідження є наукові праці вітчизняних та зарубіжних учених, присвячені питанням інноваційного розвитку, у тому числі аграрної сфери, в межах теорії сталого розвитку.

У процесі здійснення дослідження було використано методи теоретичного узагальнення, аналізу та синтезу, порівняльний метод, а також статистичні методи аналізу.

Результати. У статті розглянуто основні чинники, які впливають на інноваційний розвиток, у тому числі організаційні чинники процесу комерціалізації наукових досліджень в аграрній сфері, зокрема інноваційну інфраструктуру і інтелектуальний капітал. Розглянуто процес трансферу наукових розробок як важливий напрямок державної інноваційної політики.

Виходячи з результатів дослідження теоретико-методологічних і практичних аспектів функціонування інтелектуального капіталу в аграрній сфері запропоновано модель його розвитку з урахуванням інституціональних умов та результативності інноваційної діяльності в зазначеному секторі економіки з урахуванням принципів сталого розвитку.

Зазначено, що механізм розвитку інтелектуальної власності в аграрній сфері має базуватись на екологічних на соціальних стандартах і включати три складові: економічну, нормативно-правову, організаційну.

Перспективи. Для вирішення проблем інноваційного розвитку аграрної сфери, держава має підтримувати та стимулювати подальший розвиток тих наукових і проектно-технологічних організацій, діяльність яких спрямована на перехід від традиційних технологій виробництва до розробки і впровадження принципово нових екологічних технологічних процесів, комплексних технологічних систем, що створюються на основі

новітніх досягнень науки і сприяють ощадливому використанню природних ресурсів України.

Метою інноваційного розвитку повинно стати забезпечення стійкого зростання конкурентоспроможності вітчизняних товаровиробників на основі екологічної технологічної модернізації економіки, підвищення їх інноваційної активності та впровадження нових продуктів (сортів рослин, порід тварин), еко-технологій, а також методів організації та управління господарською діяльністю для підвищення екологізації виробництва і зростання добробуту населення та стабільного економічного зростання, базуючись на визначених національних пріоритетах сталого розвитку.

Отримані результати можуть бути використані у подальших наукових розвідках поглибленого вивчення і пропозицій щодо розв'язання накопичених проблем.

***Ключові слова**: сталий розвиток, інноваційний розвиток, інноваційна інфраструктура, інтелектуальний капітал, трансфер технологій, інноваційна модель розвитку.*

Statement of the problem. In the context of today's deepening economic and social crises and environmental problems of natural resource use, innovative development of the agricultural sector should provide solutions to many issues related to ecological production, improving the quality of life of the rural population, and preserving the environment.

The most significant issues include the construction of an innovative model for the industry development within the framework of sustainable development, intellectualization of economic relations, development of innovative infrastructure, commercialization of scientific developments, and formation of prospective competitiveness on the basis of ensuring economical use of natural resources and high living standards of people in rural areas.

Analysis of recent research and publications. It should be noted that the problems of innovation activity and infrastructure were studied by many foreign and domestic scientists, including Yu. Bazhal, O. Butnik-Siversky, P. Druker, V. Geyets, O. Datsiy, O. Kendyukhov, V. Mamchur, P. Sabluk, H. Studinska, L. Fedulova, O. Shpykuliak, J. Schumpeter, and others.

V. Mamchur and H. Studinska consider two aspects of innovative development of the agricultural sector: increasing the efficiency of agricultural production and improving the socio-economic living conditions of the population in rural areas [1].

The works of P. Sabluk highlight the main modern problems of the development of the agricultural sector and their solution through the prism of improving the reform of agricultural science: the creation of interregional scientific centers of the National Academy of Agrarian Sciences of Ukraine, [2,3]. However, many issues regarding the commercialization of scientific developments and innovation infrastructure require further in-depth study and proposals for solving the accumulated problems.

The purpose of the article is to study the problems of innovative development of the agricultural sector, including innovation infrastructure, commercialization of scientific developments, intellectual capital, and effective ways to solve existing problems in this area based on the sustainable development principles.

Materials and methods. The theoretical basis of the article included the works of foreign scientists (P. Drucker, J. Schumpeter) and domestic scientists who are agricultural economists (P. Sabluk, O. Shpykuliak, etc.), and the analytical and informational basis consisted of the reports of the National Academy of Agrarian Sciences of Ukraine, as well as statistical publications on a topic of the innovative activity of the agricultural enterprises of Ukraine.

Presentation of the main material. Sustainable development of the economy of Ukraine is impossible without a highly effective, scientifically based

strategy of innovation activity, including the agricultural sector, capable of ensuring the competitiveness of agricultural enterprises in domestic and global markets while adhering to environmental and social standards.

The innovative activity should result in high-tech competitive products that will strengthen the position of the national producer in the global market and ensure an increase in the competitiveness of the country's economy in global rankings.

An important link that connects the science, the production, and the consumer is the commercialization of scientific research. The organizational factors of this process include innovation infrastructure and regulatory and legal support for commercialization entities, and the economic ones include venture entrepreneurship. As for innovation infrastructure, Ukraine has built only some of its elements.

The organizational forms that ensure the development of innovative activities include technology parks, technopolises, business incubators, innovation centers, venture firms, consulting and analytical firms, etc.

The legal basis for the formation and implementation of priority areas of innovative activity includes the Constitution of Ukraine, the laws of Ukraine "On Scientific and Scientific-Technical Activities", "On Priority Directions of Innovation Activity in Ukraine", "On State Forecasting and Elaboration of Ukraine's Economic and Social Development Programs", "On Innovation Activity", "On Scientific and Scientific Technical Expertise", "On Priority Branches of Science and Technology Development", "On a Special Regime of Investment and Innovation Activity of Technological Parks", "On Scientific Parks" and other normative legal acts regulating relations in the scientific, technical and innovation spheres.

The most successful form of organizing the rapid implementation of scientific developments is technoparks. The creation of technoparks is based on the coordination of activities and cooperation of such aspects as science, higher

education, production, public and private sectors, and government bodies. The necessary conditions for their creation include the presence of high-class scientific and research institutions in the region, the availability of highly qualified specialists in the production sphere, the possibility of preferential lease or purchase of production premises or land, and the availability of technological infrastructure and venture capital [4].

At the same time, Ukraine's technoparks have not yet become regional centers for the development of innovative activities. And the problems here lie not only in the lack of finance.

The main reason for this situation is the failure to implement the Law of Ukraine "On a Special Regime of Innovation Activity of Technological Parks" and its amendments. The failure of the legislative and executive branches of government to implement the provisions of the laws aimed at creating favorable conditions for innovation entities, as well as their frequent amendments, have suspended the rapid dynamics of the development and expansion of this innovation network in Ukraine.

An updated legal framework for regulating the activities of these innovative structures is necessary. Another urgent step to take would be the development of a draft law "On the Activities of Technoparks, Technopark Structures and Technopolises" since the Law "On a Special Regime of Investment and Innovation Activity of Technological Parks" regulates a preferential regime for implementers of technoparks innovative and investment projects, and there is a need to support and create new small and medium-sized innovative enterprises in the region in addition to benefits, incentives and other forms of state support.

Measures of state support for the functioning of technoparks include exemption from income tax and value-added tax, exemption from import duty, application of the accelerated depreciation system, full or partial (up to 50%) interest-free lending, and full or partial compensation of interest. The last measures mentioned on the list are not in effect. In many countries of the world,

the state provides stimulating support for the effective operation of technoparks: from direct budget financing, especially during their creation, to various types of customs and tax benefits applied in the process of their operation. If Ukraine does not take radical measures to normalize the operation of technoparks and to implement legislative regulation of their activities in the near future, then such innovative structures, which have been successfully operating until recently, will cease to exist [5].

Technology transfer is no less important a direction of state innovation policy than infrastructure development (Fig. 1).

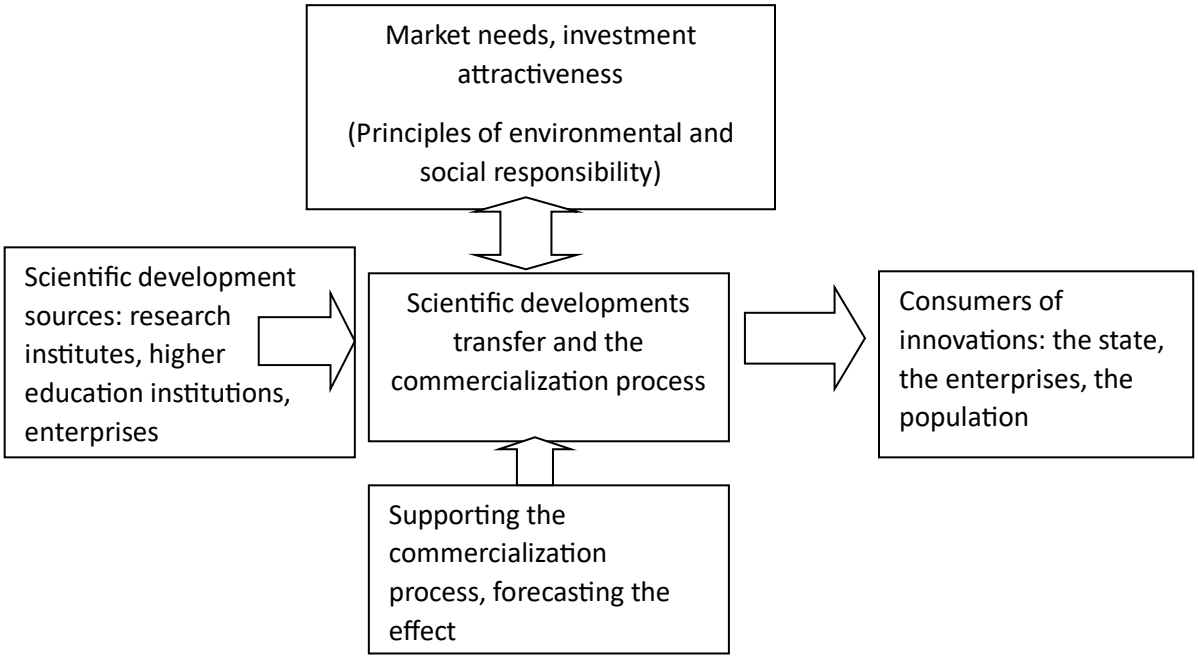

Fig. 1. A model of scientific developments transfer

Source: author's own development

In 2024, scientific institutions of the National Academy of Agrarian Sciences of Ukraine carried out the research covered by 43 scientific and technical programs, with the aim of scientific support of the agricultural sector. They conducted more than 2,200 studies, 1,391 of which were recognized as fundamental (1,384 were performed at the expense of the state budget), and 832

tasks were recognized as applied, including 789 performed at the expense of the state budget. Due to the commercialization of scientific and science-intensive products, in 2024, scientific institutions of the Academy received 26,759.4 thousand UAH under 620 contracts [6].

A necessary condition for innovative development is the conscious formation of balanced actions of the state, regions, and the public. The national innovation system will provide a favorable innovation climate and conditions for all links of the innovation mechanism, as well as compliance with environmental and social standards.

The role of the state in the innovative development model is to design and implement state incentives as well as to support innovations. One of the main means of state support for scientific and scientific and technical activities is a state order for the development of innovative products.

State support for scientific, technical and innovative activities should also involve designing regional programs for innovative development, which will include orders for scientific, technical and innovative products, financing scientific, technical or innovative projects at the regional and state levels, facilitating obtaining credit resources from international organizations for leading scientific institutions, developing and adopting normative legal acts for the purpose of accelerated development of scientific, technical and innovative activities as well as bringing the intellectual products to the market. And all the above points should be based on the principles of sustainable development.

In the context of limited budget resources, it is necessary to create an extra-budgetary fund for the development of innovations. For enterprises and organizations in the scientific and innovative sphere, it entails reducing the interest rate at the expense of the regional budget, developing centers to support enterprises that introduce innovative products, and subsidizing part of the costs for developing small innovative entrepreneurship (at the regional and district levels).

Based on the results of the study of theoretical, methodological, and practical aspects of the functioning of intellectual capital in the agricultural sector (Fig. 2), a model of its development is proposed, taking into account the institutional conditions of innovative activity in the specified sector of the national economy and the principles of sustainable development [7].

The mechanism for the development of intellectual property in the agricultural sector should be based on environmental and social standards and include three components: economic, regulatory, and organizational.

The economic component should be provided by the state through determining the priority areas of science and technology development, creating orders for intellectual property objects aimed at environmental protection, ensuring rational use of nature and the introduction of "green" technologies at the expense of state funds, as well as stimulating and supporting inventive activity.

The regulatory component should be aimed at harmonizing domestic legislation with international one, improving the legal regulation of the economic component of intellectual property law, which implies a system of payment of duties and fees related to the protection of intellectual property rights, reinforcing the legal protection of intellectual property rights, in particular, through strengthening legal liability for copyright infringement (criminal, administrative, civil), enhancing patent and information support related to the acquisition of rights to intellectual property and implementing measures to increase Ukraine's participation in the activities of the World Intellectual Property Organization and improve the state's image in international processes related to the intellectual property protection.

The organizational component should ensure the commercialization of rights to intellectual property objects (eco-technologies, new plant varieties, animal breeds, innovative proposals for greening production) based on the principles of environmental and social responsibility.

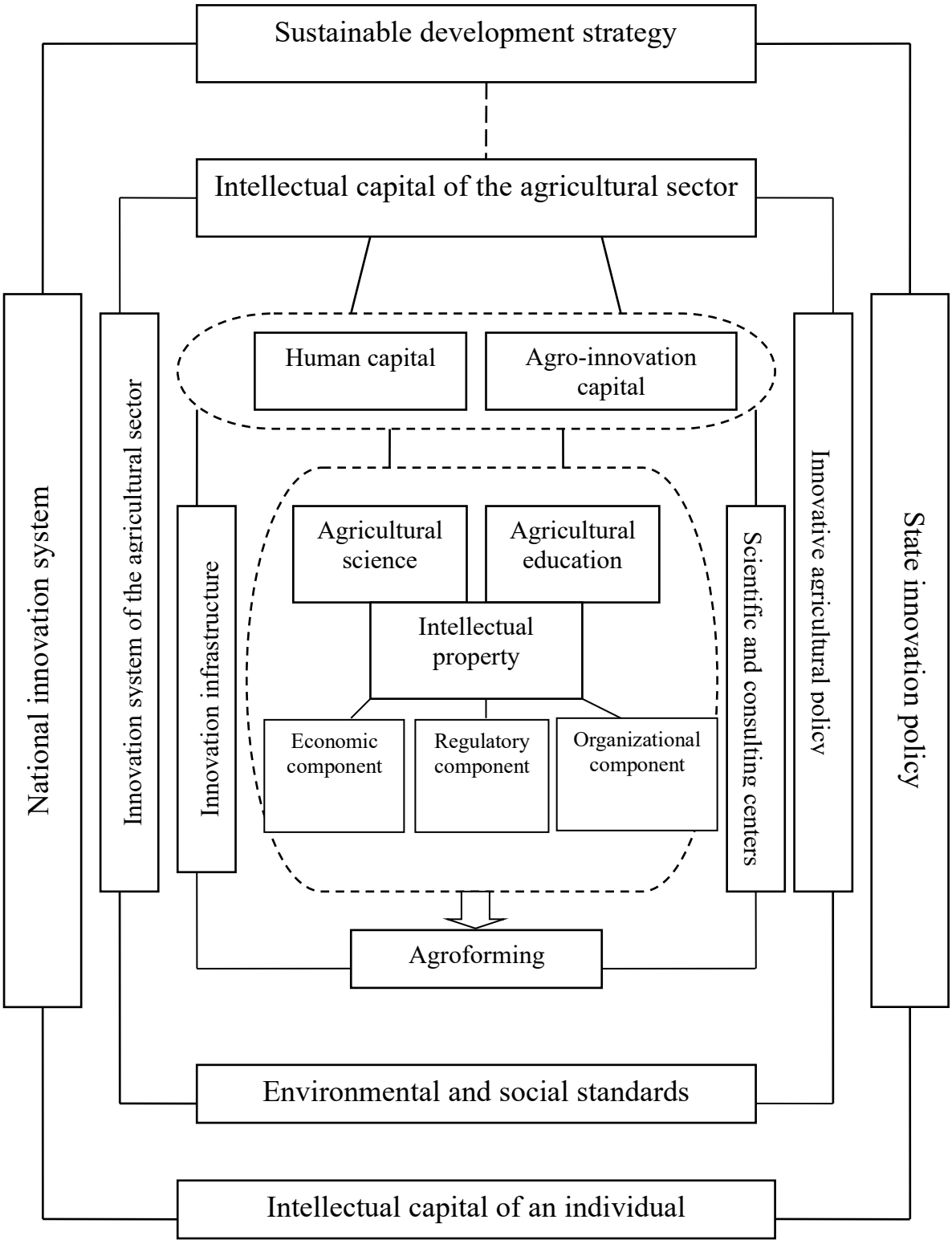

Fig. 2. The impact of intellectual capital on the national innovation system formation

Source: author's own development

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The state policy of Ukraine should be aimed at supporting its own innovative potential to the fullest, developing scientific and design centers, and ensuring world-class scientific and technical policy. Access to data from the World bank on the latest technologies will guide manufacturers towards the implementation of competitive developments.

The state should influence the development of both the public and private sectors of innovation activity. State regulation measures in this area should be aimed at encouraging entrepreneurship and private initiative on a comprehensive level. Creating structures that would take on the function of promoting intellectual products to manufacturers would eliminate the contradiction between scientific institutions and enterprises.

Conclusions. In order to solve the problems of innovative development of the agricultural sector, the state should support and stimulate the further development of the scientific, design and technological organizations, the activities of which are aimed at transitioning from traditional production technologies to the development and implementation of fundamentally new ecological technological processes and complex technological systems that are created on the basis of the latest scientific achievements and contribute to the economical use of natural resources of Ukraine. Constructing an innovation model is one of the main ways to ensure the competitiveness and sustainable development of the agricultural sector. This construction is based on the creation of a national innovation system that takes into account, in particular, the institutional factors of a possible effective combination of such components as science, education, knowledge-intensive ecological production, and innovative infrastructure. They catalyze the national model of innovative development of the economy and determine its competitiveness. There is a significant demand for effective structural reforms and the defined role of the state in regards to participating in the industry development and ensuring social standards for the development of rural areas.

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