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ВЕСТНИК

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NAS RK is pleased to announce that Bulletin of NAS RK scientific journal has been accepted for indexing in the Emerging Sources Citation Index, a new edition of Web of Science. Content in this index is under consideration by Clarivate Analytics to be accepted in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts & Humanities Citation Index. The quality and depth of content Web of Science offers to researchers, authors, publishers, and institutions sets it apart from other research databases. The inclusion of Bulletin of NAS RK in the Emerging Sources Citation Index demonstrates our dedication to providing the most relevant and influential multidiscipline content to our community.

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SMART-SPECIALIZATION DEVELOPMENT OF FARMS

Abstract. Looking for ways to increasing efficiency of farms is an important national economic problem. At the same time, priorities should be given to endogenous factors of economic development. Moreover, the experience of the most successful farmers has shown that smart-specialization as a concept of sustainable, innovative and niche agricultural production has a high potential for improving management efficiency now. The aim of the research is to form the scientific bases for farms smart-specialization development. The conceptual fundamentals of development the smart-specialization of Ukrainian farms are outlined, which are based on the principles of innovativeness and competence of farmers, entrepreneurial search, rational production specialization, economic, environmental and social efficiency of land use, intensification of inter-farm interaction. It has been substantiated that transition to the smart-specialization makes it possible to reorient farms to a model of innovatively-oriented strategic specialized diversification of agricultural production, intensive, integrated growth in niche segments of the agrarian market under the conditions of the optimal realization of their land and resource potential, limited effect of economies of scale in farms and competitive pressure. It has been shown, that the system of managerial decisions in the conditions of smart-specialization of farms should be based on the balance of ensuring maximum efficiency or sensitivity of production to changes in market conditions. In the first case, a production should be more flexible, but less specialized. In the second case, a specialization will be narrow with the maximum full utilization of production capacities of the economy. Focusing on the product it is necessary to determine the optimal volume of production, based on market demand, taking into account seasonality. Two-way communication with production shows the interdependence of these factors on the level and chosen direction of the smart-specialization of a farm, causing a wide or narrow range of production, as well as the dynamics of the level of finished goods inventories. In order to increasing efficiency of farms in the transition to the smart-specialization model, the creation of the national information center (hub) for farming development on the basis of the National Academy of Agricultural Sciences of Ukraine have been promised.

Key words: smart-specialization, farm, strategy, efficiency, agribusiness.

Introduction. Agriculture is characterized by specific features related to the biological nature of production processes and the compulsory availability of land resources for their implementation. Considering the problem of improving agricultural productivity requires identifying and maximizing the use of business reserves as potential opportunities for improving the outcomes. One of these strategic aspects of improving the farm efficiency, the use of land resources is the smart-specialization management.

In addition, the development of agricultural specialization in farms is stimulated by the availability of land resources and their quality; availability of tangible assets and labor resources in the countryside; availability of roads and transport infrastructure; placement of industrial processing and warehouses; remote product markets; innovative processes in agro-industrial production; production intensification; internal and external agrarian policy of the state; level of state support for small businesses, stable market demand for certain products. In turn, the limiting factors in the development of specialization should include the need for crop rotation and soil conservation; production diversification as a risk mitigation tool; lack of certain resources; barriers to entry into the markets; green and bio-production.

Such an approach is now fully consistent with the UN Development Strategy "The Future We Want", the EU development strategy "Europe 2020: A strategy for smart, sustainable and inclusive growth", the sustainable development strategy "Ukraine –

2020", and the agrarian sector development strategy of Ukraine. "3 + 5".

The urgency of the farms smart-specialization management problem, its strategic importance determined the choice of research topic, the purpose statement and tasks of scientific search.

The oretical basis. According to S. Kolesnev, the specialization of production is the result of labor social division [1]. Therefore, it characterizes the qualitative side of the labor division, showing what is produced on the farm or in a particular territory, being organically dependent on the location of productive forces. Thus, the specialization of production is the process of separation resulted in labor social division of industries that produce homogeneous products and are characterized by special equipment, technology and qualification of staff [2].

Over the last seventy years, domestic and world agro-economic science and practice have developed a large number of specialization varieties. The typology is based on the structure of labor social division and peculiarities of agriculture, which allowed us to classify specialization by level of implementation, form of realization and object [3]. For a long time, the theory of specialization has been hardly investigated, taking into account the already existing achievements of scientists and components of sustainable development [4]. In 2009, economists D. Forey, P. David, and B. Hall developed the concept of "smart-specialization" [5]. In general, smart-specialization means smart, intensive specialization based on innovative production and spatial development technologies. In 2010, the European Commission approved the document "Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth". Thus, the main strategic goals defined are as follows [6]: "smart" intensive growth of the economy based on knowledge and innovation; sustainable growth based on resource conservation, environmental security and competitiveness; inclusive growth to stimulate high levels of employment in the economy and ensure social and territorial cohesion in society. In addition, at the national level, Member States must transform their national and regional business systems for the above strategic objectives so that they contribute to the implementation of best practices and smart specialization. Consequently, the concept of "smart"-specialization has gained official status in the EU.

It should be outlined that the basis of market smart-specialization was laid by A. Smith. In his fundamental work, he noted that the possibility of exchange always leads to labor division. Therefore, the labor division and its specialization should be determined by the size of the market [7]. Specialization is also immanent in economic benefits, which is manifested in the form of cost savings for the producer and in reducing the price of goods for the consumer.

According to the authors of the national report "Innovative Ukraine 2020", "smart"-specialization is a new concept of regional development that combines industrial and innovation policy and aims to promote the effective and efficient use of public investment by focusing on the strengths of the region, which constitute its own specialization of the region [8]. According to J. Brzyski and J. Pika, "smart"-specialization is to identify the unique functions and assets of each country and region, to emphasize the competitive advantages of each region and to focus the attention of regional partners on the vision of future achievements [9]. According to M. Fedyaeva, smart-specialization is an industrial and innovative system for regional economies, which aims to demonstrate how state policy, market conditions, as well as policies in the field of research, development and investment in innovation processes can influence the economic, scientific and technological specialization of the region, and hence its productivity, competitiveness and economic growth [10]. It is a good idea that smart-specialization indicates the ability of the region to generate new activities by identifying the priorities of local concentration and agglomeration of resources [11]. Also it should be mentioned, that the "smart"-specialization concept is extended to the theory of smart-cities, smart-universities [12], smart-societies, etc.

The aim of the article is to form the scientific bases for farms smart-specialization development.

Research methodology. To achieve this purpose, we use general scientific and special research methods, in particular, monographic, historical, abstract-logical, deductive ones, synthesis, generalization and abstraction.

The theoretical basis of the research is the scientific works of domestic and foreign scientists on economic theory, agricultural economics, management of land and resource potential, problems of farms development based on smart specialization.

The methodological basis of the research is the dialectical method of cognition and the systematic approach to the study of phenomena and processes in the agricultural economy and the organization of production in farms.

Results. Unlike conventional specialization, smart-specialization implies a systematic action, because it involves the process of selecting the most attractive sectors and types of economic activity, the selection of innovative technological solutions to ensure development in the medium term.

Based on the recommendations for developing smart-specialization development strategies in EU [13], we have developed the concept of developing "smart" intensive specialization of farms.

Smart-specialization of farms is fully consistent with the hierarchy of economic development strategies. Thus, the strategic challenges of today have exacerbated the problems of guaranteeing food security in the world, ensuring the quality of food, supporting employment in rural areas, increasing the efficiency of use of all components of the resource

potential, preserving the environment, etc. Small and medium-sized farmers play a leading role in solving these problems globally.

The transition to a model of "smart"-specialization implies understanding the market mechanism by farmers. Therefore, public policy should be aimed at supporting innovative farmers, stimulating rural entrepreneurship in order to use the available resources in the most efficient way, developing the rural economy at the regional level on the basis of realizing the competencies of people and innovative information technologies of production and marketing of finished products.

The main development directions of farms smart-specialization are:

• development of strengths and competitive advantages of farms, which are formed due to regional characteristics and conditions of agriculture;

• state support, depending on the strategic priorities for the development of the agro-food sector at the national and / or regional levels;

• state support for innovative entrepreneurship in rural areas;

• promotion of rural investment activity;

• stimulating the involvement of stakeholders in innovation and investment processes in agricultural production.

The implementation of these tasks has its own peculiarities at each level of the hierarchy of the economic system.

At the farm level, they are mostly reduced to the analysis of strengths and weaknesses, the search for free market niches, the introduction of innovative production technologies.

At the regional level, it is necessary to assess the potential of innovative agricultural development, to formulate a general vision of the development of the regional and agrarian sector's economy in particular, to identify priorities for which state support will be provided, as well as to form a circle of stakeholders, managers and decision-makers and monitor the achievement of strategies.

At the state level, smart-specialization involves strategic specialized diversification. The leitmotif is the entrepreneurial skills. Its result is a kind of innovation designed to shape the strengths of the farm. In other words, the farmer must be clearly aware that in order to ensure the highest economic result, his products must be characterized by unique selling points due to his own talent, regional characteristics or a set of production factors under information asymmetry conditions. Therefore, "smart"-specialization contributes to the intensification of production, and unlike traditional state planning, interactively forms the poles of regional development. The task of public authorities is to provide the conditions for implementation and coordination of the smart-specialization choice, monitoring of cluster development from the view point of the specialization chosen at the regional level, identification of needs for state support and objects of state regulation [14]. For example, the agrarian sector development strategy of Ukraine. "3 + 5" provides stimulating organic production, subsidizing small farmers and other programs to stimulate the development of particular production areas that can create value-added products and jobs, increase land value and market intellectual capacity, impetus for the development of small farms by expanding leasehold rights, intensifying production in southern Ukraine through the development of irrigation and land reclamation systems, etc. In order to fulfill these tasks, it is necessary to ensure the quality functioning of an innovative system based on the integration of science, production, education, government and civil society.

Under free market conditions and unbalanced public policies, farms develop in conditions of fierce, often imperfect competition. The criterion for the optimization of the sectoral structure is the maximum profit, which leads to monocultural agro-production, often irrational, environmentally unbalanced land and nature management. Manufactured products are typical, and the economic effect is formed by the price mechanism, cost optimization and tax payments.

In the conditions of transition to smart-specialization, the farming becomes innovative-oriented, and the state promotes innovation-investment activity, the transfer of innovations in agricultural production, stimulates the sale of niche agricultural products. Compared to traditional farms, "smart"-specialized ones have extra benefits due to less competitive pressure, which also has a higher economic effect on land, labor and capital.

The development of farms specialization should be based on the following principles: rational use of available land, labor and logistical resources; creation and realization of core competencies of the economy depending on the available potential; economically, socially and environmentally efficient production of those products that are in demand in the market. This specialization has an inherent property of inertia. It's due to the fact that there is no possibility of substantial and rapid re-profiling, and therefore the specialization is determined by the actually chosen type of economic activity, as well as the resource provision. At the same time, non-compliance of scientifically substantiated levels of specialization leads to a significant decrease in soil fertility, environmental pollution [15] and other damages.

In addition, the development of farms smart-specialization should be based on several other principles, which also vary depending on the level of management. Thus, the basis of smart-specialization at the farm level is the specialization of agricultural production, which aims at maximum efficiency of the available resources used and achieve competitive advantages in the market due to the effect of scale. At the same time, farmers search for new methods of

production and marketing, actively cooperating with research institutions, higher education institutions, consulting agencies and advisory services. In addition, they produce innovative solutions based on new knowledge and entrepreneurial skills. All of these innovations should be directed at rational management, avoiding «predatory» use of land, other natural resources and labor resources.

At the branch, regional and national levels, the transition to smart-specialization involves finding a relatively unique specialization for each region by identifying a rational mix of resources and market opportunities. In addition, public policy should aim at selective support for innovative entrepreneurship, favoring only those rationalization solutions that do not harm the economy, the environment and the society. For this purpose, the principle of openness and publicity of the decisions made is applied. Specialized regions should be involved in active interregional interaction through the closed added-value chains. Taking into account that agriculture, unlike industry, is significantly limited in the range of products, and the distribution of resource potential occurs across natural and economic zones, the boundaries of which do not coincide with the administrative-territorial division of Ukraine, it is advisable to cluster farms by products.

It is essential to include the tools of farms smart specialization: digitalization of agribusiness, innovative agro-technologies, organic industry, state interventions of innovative products, training for agriculture.

Organizational forms of smart-specialization policy implementation are clusters in the agro-food sector, closed added-value chains, network forms of farms cooperation, product integration, involvement of farmers in agricultural technology parks, national technology platforms, startups, etc.

Providing a national and regional strategy for the development of agriculture based on smart-specialization should be done in five stages. In the first stage, they analyze the innovative potential of agricultural production in the regions, assess the level of asymmetry in the development of productive forces, the availability of market infrastructure and market barriers. In the second stage, they formulate an overall strategic vision for agricultural development in the region, determining the place and role of the farms. In the third stage, the goals of smart-specialization development are determined, based on the strengths of the natural resource and entrepreneurial potential of the region. The fourth stage involves defining clear indicators for assessing the level of smart-specialization development and achieving the goals set. In the fifth stage, they develop a specific action plan, align regional strategies with the national one.

It is obvious that small and medium-sized farms are not in a position to compete with large agricultural enterprises or agroholdings. Therefore, the competing main strategies of a leader, a challenger, or a follower are not available to them. Instead, niche marketing is their smart marketing strategy. Thus, the main strategy of the farms is focusing, the purpose of which is to specialize in the production of several types of agricultural products to generate competitive advantages in price and cost. At the same time, farmers need to apply a strategy of intensive growth, which involves the intensification of production, improving the efficiency of land and resource potential use.

The use of "smart" intensive specialization enables the farmer to focus on the market segment that has been left behind the attention of leaders or found / created by the farmer himself. The presence in a niche is justified if it satisfies these conditions [16]: growth potential, profitability, low attractiveness to competitors, compliance with economic opportunities, ability to defend their market positions. Obviously, when a farm has occupied a niche, a strategy to maintain a position or fight for leadership in it should be applied; otherwise, they have to go beyond the niche or apply integration strategies. With regard to integrative growth strategies, farmers can use them in quite a limited way due to lack of funds. Therefore, horizontal and vertical cooperative integration (creation of cooperative farms), non-cooperative vertical integration (production contracting) and corporate horizontal and vertical integration in the case of large integrated business entities are most likely.

Smart-specialization of farms gives opportunities for their integration with research institutes and educational institutions. Forms of organization of such relations are realization of spin-outs and spin-offs based on farms. Thus, an integrated entity can create or contract a spin-out business by financing its innovative startup and/or providing part of its tangible and intangible assets while maintaining intellectual property rights. According to P. Tsibulev and V. Korsun, domestic scientific institutions may establish or contractually cooperate with a spin-off company that develops new technology and/or develops production of innovative products based on the results of their scientific research [17]. The spin-off enterprise sells innovative products on its own or through intermediaries, and the scientific institution receives royalties, in accordance with a pre-contract. We think that in order to increasing efficiency of farming in the conditions of transition to the model of smart-specialization, the urgent need is to create an information center based on the National Academy of Agrarian Sciences of Ukraine.

Establishment of a national information center (hub) for the development of agriculture in Ukraine will also allow to solve the following tasks: to substantiate the strategic direction of competitive farming development; to purchase a necessary resources and innovative technologies; to introduce a system of rational and environmentally friendly land

use and bioethical livestock management; to ensure the development of e-commerce in agricultural and knowledge-intensive products; to monitor of agrarian markets for detection free market niches; to ensure cooperation of farmers with financial institutions for facilitate loans they receive; to integrate a farming sector to international agrarian markets, etc. In addition, the information hub will help to increase the investment attractiveness of agricultural production in Ukraine, to ensure transparency in the selection of contractors, in concluding treaties of land leases (shares). It will create conditions for selection of the most effective and conscientious land users, reducing the motives for opportunistic behavior of all parties involved to the farmer's value chain. In order to ensure the effective functioning of the national information center (hub) for the development of farming, it is necessary to adhere to the following basic principles: to ensure transparency, honesty and ethics of doing business; to support of perfect economic competition; to ensure a high quality and safety of work over other production tasks; to give a freedom and democracy during farmers' decision-making; to make continuous improvement of the farm value chain management mechanisms; to secure an ecological safety of economy; to failure a harm for rural areas; to preserve a soil fertility.

Therefore, managing the smart specialization of farms involves a strategic focus on producing those products that are more efficient or higher in value added.

Conclusions. Improving the efficiency of farms is a strategic objective of agro-economic science and practice. The benefits of specializing in agricultural production include: improving the efficiency of farming, the use of tools and labor; productivity growth; improving the skills of workers, focusing them on the performance of typical tasks; simplifying business management, accounting and budgeting; opportunities for introduction of advanced production technologies of certain types of agricultural products; gradual accumulation of necessary means of production, updating the machine-tractor park; increasing production intensity, development of customer base for acquisition of current assets and sale of finished products.

One of the most modern and most effective tools for improving the efficiency of farms is the transition of farms to the model of smart-specialization. Under the farms smart-specialization we mean an innovation-oriented system of spatial, systematic development of socially and environmentally-balanced agricultural production of competitive products, which also covers the purposeful process of separation as a result of the labor social division by industries and types of economic activity, which are characterized by a homogeneous production, technical and technological support and qualification of staff, and is accompanied by increased efficiency land-use potential in the long term. In order to reorient Ukrainian agriculture to innovation, we have developed the concept of providing farms smart specialization, based on the principles of farmers' innovation and competence, entrepreneurial search, rational specialization of production, economic, environmental and social efficiency of land use and intensification of interaction, allows to refocus the farms on the model of innovative-oriented strategic specialized diversification of agricultural production, intensive, integrated growth in niche segments of the agrarian market with the condition of optimal realization of their land-resource potential, limited effect of scale economy in terms of the competition. Organizational forms of realization of the smart-specialization policy are clusters in agrofood sphere, closed value-added chains, networks of farms cooperatives, involvement of farmers into agroscience and technology parks, national technological platforms and startups.

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ФЕРМЕРЛІК ШАРУАШЫЛЫҚТАРДЫҢ SMART-МАМАНДАНДЫРЫЛУЫН ДАМЫТУ

Аннотация. Шаруа қожалықтарының тиімділігін арттыру жолдарын іздеу маңызды экономикалық мәселе болып табылады. Бұл ретте басымдықтар экономикалық дамудың эндогендік факторларына берілуге тиіс. Сондай-ақ, табысты фермерлердің тәжірибесі, қазіргі уақытта шаруашылық жүргізудің тиімділігін көтеру үшін тұрақты, инновациялық және тауашалық аграрлық өндірістің концепті ретінде smart-мамандандыру жоғары әлеуетке ие екенін көрсетті.

Мақаланың мақсаты - фермерлік шаруашылықтарындағы smart- мамандануын дамытудың ғылыми негіздерін қалыптастыру болып табылады.

Фермерлердің біліктілігі мен жаңашылдығы, кәсіпкерлік ізденіс, өндірісті оңтайлы мамандау, жер ресурстарын қолданудың экономикалық, экологиялық және әлеуметтік тиімділігі, шаруааралық әрекеттесуді қарқындау қағидаларына негізделетін, Украинаның фермерлік шаруашылықтарын smart-мамандандыруды дамытудың концептуалды бастамасы кескінделген. Smart-мамандандыруға өту фермерлік шаруашылықтарда ауыл шаруашылығы өндірісін инновациялық-бағдарлы стратегиялық мамандандырылған әртараптандыру үлгісіне қайта бағдарлау, жер-ресурстық әлеуетінің оңтайлы іске асырылуы жағдайында аграрлық нарықтың тауашалық сегменттерінде қарқынды, интеграцияланған өсу, фермерлік шаруашылықтарда ауқымдылық әсер мен бәсекелестер тарапынан қысымның шектелу мүмкіндіктерін береді.

Фермерлік шаруашылықтарды smart-мамандандыру жағдайындағы басқару шешімдерінің жүйесі өндірістің нарықтық жағдайдың өзгеруіне сезімталдығын қамтамасыз ету балансына негізделуі тиіс екендігі көрсетті. Бірінші жағдайда, өндіріс икемдірек, алайда, азырақ мамандандырылған болуы тиіс. Екінші жағдайда, мамандандыру шаруашылықтың өндірістік қуатын максималды толық жүктеумен тар болады. Тауарға шоғырлану мезгілді ескерумен нарықтық сұранысқа негізделіп, өндірістің оңтайлы көлемдерін анықтау үшін қажет. Өндіріспен екі жақты байланыс өндірістің кең немесе тар номенклатурасын, сонымен қатар дайын өнім қоры деңгейінің серпінін шарттап, фермерлік-шаруашылықтың smart-мамандануының деңгейі мен таңдалған бағытына осы факторлардың өзара байланысын көрсетеді.

Smart-мамандану үлгісіне өткен кезде фермерлік шаруашылықтардың тиімділігін көтеру мақсатында Украинаның аграрлық ғылымдарының ұлттық академиясы базасында фермерлікті дамытудың ұлттық ақпараттық орталығын (хабын) құру келешекті болып табылады..

Түйін сөздер: smart-мамандандыру, фермерлік шаруашылық, стратегия, тиімділік, аграрлық бизнес.

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РАЗВИТИЕ SMART-СПЕЦИАЛИЗАЦИИ ФЕРМЕРСКИХ ХОЗЯЙСТВ

Аннотация. В процессе аграрной реформы в Украине, целью которой было становление крестьянина как полноправного собственника и пользователя земли, значительное развитие получили фермерские хозяйства. Сравнительно с сельскохозяйственными предприятиями эффективность деятельности фермерских хозяйствах остаётся низкой, а землепользование является экологически несбалансированным, что приводит не только к ухудшению качественного состояния земель и экологическим убыткам, но и к снижению конкурентоспособности их продукции на товарном рынке. Поэтому поиск путей повышения эффективности деятельности фермерских хозяйств является важной народнохозяйственной проблемой. При этом приоритеты должны отдаваться эндогенным факторам экономического развития. Более того, опыт наиболее успешных фермеров показал, что ныне высокий потенциал для повышения эффективности хозяйствования имеет smart-специализация как концепт устойчивого, инновационного и нишевого агропроизводства.

Целью статьи является формирование научных основ развития smart-специализации фермерских хозяйств.

В результате исследования доказано, что под smart-специализацией фермерских хозяйств следует понимать инновационно-ориентированную систему пространственного планомерного развития социально- и экологически-сбалансированного сельскохозяйственного производства конкурентоспособной продукции, которая при этом охватывает целенаправленный процесс выделения в результате деления общественно-распределённого труда отраслей и видов экономической деятельности, которые характеризуются однородным выпуском, технико-технологическим обеспечением и квалификацией персонала, а также сопровождается повышением эффективности использование земельно-ресурсного потенциала в долгосрочной перспективе.

Очерчены концептуальные начала развития smart-специализации фермерских хозяйств Украины, которые базируются на принципах инновационности и компетентности фермеров, предпринимательского поиска, рациональной специализации производства, экономической,

экологической и социальной эффективности использования земельных ресурсов, интенсификации межхозяйственного взаимодействия. Обосновано, что переход к smart-специализации даёт возможность переориентировать фермерские хозяйства на модель инновационно-ориентированной стратегической специализированной диверсификации сельскохозяйственного производства, интенсивного, интегрированного роста в нишевых сегментах аграрного рынка при условиях оптимальной реализации их земельно-ресурсного потенциала, ограниченности действия эффекта масштаба в фермерских хозяйствах и давления со стороны конкурентов.

Ключевые слова: smart-специализация, фермерское хозяйство, стратегия, эффективность, агробизнес.

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