DOI: 10.31617/1.2024(157)04
UDC 346.24:338.43=111

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PUBLIC-PRIVATE PARTNERSHIPS IN THE AGRICULTURAL SECTOR

The levels of management in the field of agriculture were systematized, a comparative analysis of the international experience of management in the agrarian sphere was carried out (on the example of Germany and Italy). The current trends in digitalization of agricultural management in the world, as well as tasks and challenges of digitalization in Ukraine were described. The hypothesis of the research is that the implementation of digital solutions in the Ukrainian agricultural sector will increase the efficiency of management, especially in the conditions of military challenges. Methodologically, the research is based on the analysis of policies, strategic plans, scientific works and other sources related to management in the field of agriculture, taking into account the impact of digital technologies. The centralized management model in the development of the agricultural sector still dominates in European countries. However, the EU current policy in the field of regional development provides for the transfer of as many management functions as possible to the regionnal level. This approach is also characteristic of the national model of agricultural development policy.

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ДЕРЖАВНО-ПРИВАТНЕ ПАРТНЕРСТВО В АГРОПРОМИСЛОВОМУ КОМПЛЕКСІ

Систематизовано рівні управління в галузі сільського господарства, проведено порівняльний аналіз міжнародного досвіду управління в аграрній сфері (на прикладі Німеччини та Італії). Описано сучасні тенденції цифровізації управління сільського господарства у світі, а також завдання та виклики цифровізації в Україні. Гіпотезою дослідження є те, що впровадження цифрових рішень в українському аграрному секторі підвищить ефективність управління, особливо в умовах воєнних викликів. Методологічно дослідження ґрунтується на аналізі політик, стратегічних планів, наукових праць та інших джерел, пов'язаних з управлінням у галузі сільського господарства з урахуванням впливу цифрових технологій. Централізована модель управління у розвитку аграрного сектору все ще домінує в європейських країнах. Проте сучасна політика ЄС у сфері регіонального розвитку передбачає передачу якомога більшої кількості управлінських функцій на регіональний рівень. Цей підхід також характерний для вітчизняної моделі політики розвитку сільського господарства.

The most important and effective tool for the modernization of any of the known management systems in the modern world is their digitalization. Digitization of management in the agricultural industry at all levels, from the state to small agribusiness entities, is no exception. The further digital transformation of management in national agriculture represents a higher level of digital integration, which affects the most complex organizational changes in the structures of state administration and agribusiness. The results of the implementation of these tasks can significantly affect the growth of profits in the agricultural business and the competitiveness of products, which will allow the agricultural industry to reach modern global technological boundaries.

Keywords: digitalization, management functions, regional development, agriculture, technologies, and competitiveness.

Найважливішим та ефективним інструментом модернізації будь-якої з відомих систем управління у сучасному світі є їх цифровізація. Цифровізація управління у сільськогосподарській галузі на всіх рівнях, від державного до суб'єктів малого агробізнесу, не є винятком. Подальша цифрова трансформація управління у вітчизняному сільському господарстві представляє вищий рівень цифрової інтеграції, що впливає на найскладніші організаційні зміни у структурах державного управління й агробізнесу. Результати реалізації цих завдань можуть суттєво вплинути на зростання прибутків у сільськогосподарському бізнесі та конкурентоспроможність продукції, що дозволить сільськогосподарській галузі досягти сучасних світових технологічних рубежів.

Ключові слова: цифровізація, управлінські функції, регіональний розвиток, сільське господарство, технології та конкурентоспроможність.

JEL Classification: Q12, N50, O32, O33.

Introduction

A detailed study of foreign and domestic management experience in the field of agriculture clearly indicates that most developed countries are characterized by a multi-level nature of management. This involves the distribution of various powers and functions between different levels of government, but not in a hierarchical, but in a logical order, based on the dependence between different levels and subjects of relations, in which each participant contributes his share of specific resources and knowledge.

The broadest long-term experience of management in the field of agriculture in different countries definitely shows that there are numerous difficulties and obstacles in creating concrete and optimally effective multi-level coordination (Mantino, 2018). For a clear and deep understanding of multi-level management, it is first important to define the involved levels, as well as outline the circle of key participants (subjects) directly involved in these management processes.

The issue of electronic management in the agricultural sector is relevant for every developed country. Among foreign experts who are actively developing forecasts and researching technological trends in e-government are Pal (2019), Panganiban (2019) and Uddin et al. (2010). They emphasize the need for strategic planning and adaptation to local conditions and note that initiatives often fail due to limited funding and insufficient infrastructure.

Domestic scientists emphasize the importance of transparent administrative services and increasing the digital literacy of the population. Andrieieva (2019), Babenko et al. (2022), Zastrozhnikova (2019), Kulyk and Kravchuk (2011) study the development of agricultural startups that use information technologies to increase productivity, note the need to

implement a new agrarian policy in Ukraine and the importance of engaging experts to create a digital transformation strategy.

The aim of the research is to systematize and organize the foreign and domestic management experience in the field of agriculture, in particular, the study of historical aspects, the current state and the impact of digital technologies.

It is hypothesized that the implementation of digital solutions in the Ukrainian agricultural sector will increase the efficiency of management, especially in the conditions of military challenges.

The methodological basis of the research is the description and analysis of policies, strategic plans, scientific works and other sources related to management in the field of agriculture, taking into account the impact of digital technologies.

The main part of the research is based on several key aspects that systematically reveal the scientific issues and research results. First, the theoretical foundations of multi-level management and its features in the context of the agricultural sector are considered. Further research is focused on foreign experiences of digitization, which makes it possible to compare different approaches to the implementation of e-governance in the industry. Particular attention is focused on the implementation of the State Agrarian Register in Ukraine, where the historical prerequisites, current state and evaluation of the effectiveness of this tool are highlighted. The final part of the research is devoted to the analysis of the challenges associated with the digitalization of the agricultural sector and the prospects for further improvement of the system in the conditions of modern crisis realities.

1. Management levels in the field of agriculture

There are two main levels of state administration: *national* (state) and local. However, for a more accurate organization of management in the agricultural sector, it is proposed to supplement this system with two additional levels: *regional* and *subregional* (*Table; Figure*). This approach is based on the needs of agriculture, where interaction between national politicians and local initiatives requires clear coordination at intermediate levels.

Table

Management levels

Level	Brief concept description
National (state)	Coincide with the concept of the state level
Regional	The concept of governance as well as the scale (size) of a region (region, state, canton, etc.) may differ in international comparison, resulting in serious problems for international comparison
Subregional or intermediate	Often play a significant role in those systems where the degree of decentralization is very high and/or in large regions. In fact, it is about the level between the regional (land, canton, region, etc.) and the local level, which can be very important for those countries where there can be diversity in the territorial division
Local	It is most suitable for local self-government, subjects of public and private forms, civil society, in fact for everyone who promotes such development projects at the local level

Source: compiled by the authors.

The sub-regional level is often associated with a certain administrative division established in the territory in question. However, the local level is not necessarily associated with an administrative unit. The term "local" level rather means "of a local, limited nature or effect on something". In fact, "local" becomes practically synonymous with such administrative units as "provincial, district, village". If we depart from the logic of administrative division, these are, as a rule, territories limited in size, within which specific, special and even unique agencies (associations, organizations, institutions, representative offices, etc.) operate, interested in cooperation. These are also agencies that are already implementing various projects for the development of rural areas, environmental projects and other initiatives, plans and programs related to the development of the agricultural sector. In this context, the term "local" can refer to a certain set of private and public actors to promote different types of partnerships.

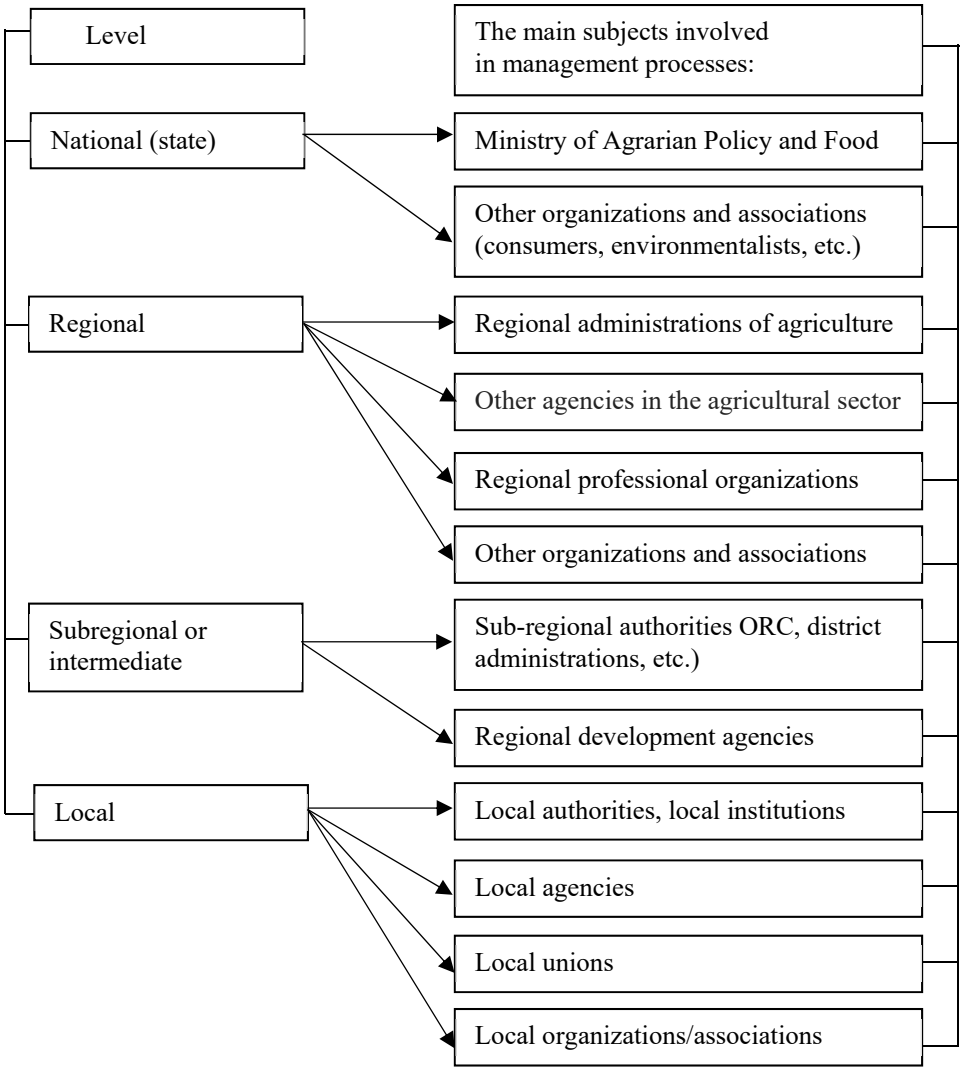

Figure. Structure of multi-level governance of the agricultural sector

Source: compiled by the authors.

Each of the four levels of management presented in the figure has its own rather specific participants (subjects), not only institutional (state and regional management bodies, etc.), but also others, such as various associations, social and economic representations, non-profit and volunteer organizations, etc. The specifics and significance of each of the levels of management may change depending on the institutional order (structure) of an individual country. In those states where the national level clearly dominates, there is a powerful centralized management system, and vice versa, as a rule, states with predominantly decentralized management are countries with regional and subregional (intermediate) levels.

2. International management experience in the agricultural sector

Today, the centralized management model that still dominates Europe in terms of rural development and agribusiness is becoming more popular in some new development programs of the European Union and individual countries. At the same time, even 20–30 years ago, interest in the centralized model in Western European initiatives and programs for the development of rural areas was quite low.

Instead, the current general policy approach of the EU and other European countries outside the EU in the development of regions consists mostly in transferring as many management functions as possible to the regional level. Currently, in the countries of Western Europe, the development policy of rural areas and their management models are very different. In particular, the management models of agricultural development in Italy and Germany have the most difficult points and features compared to other countries of Western and Eastern Europe, as they are characterized by a rather strong territorial division of functions and management powers.

If in Germany its federal structure is manifested through the federal system of the entire state structure of the country and indeed there is a high level of independence of all 16 states, then Italy is primarily a unitary state, where separate but defining elements of federalism are clearly present. This form of state territorial structure is often called "regional". There are only 20 regions in the country, which are divided into provinces. At the same time, 5 regions of Italy have a special status as wide autonomy.

It is possible to identify common points in the management of Germany and Italy (Mantino, 2006). In both countries, deep decentralization was carried out, based on the transfer of important management functions to the regional level, both administrative and legislative (in Italy in 20 regions, especially in 5 of them with wide autonomy; in Germany – in all 16 Lands). The main impetus for reforms and decentralization of management in these states, as is believed today, was the influence of certain results obtained in the world order after the end of the Second World War. Decentralization reforms proceeded in several stages and became particularly active in

Germany and Italy between the 1970s and 1990s, namely before the unification of the Federal Republic of Germany and the German Democratic Republic. All interconnections and relations between different levels of government in these countries are based precisely on the principles of comprehensive and broad cooperation, that is, on the multipolar system of government.

It is important to emphasize the distinctive features characteristic of such a model:

• all management functions in this cooperative model are divided in such a way that for the solution of the same problem, whether it is state aid or participation (grants, programs, works, quotas, etc.), social services, a number of environmental problems and other issues, all participants have different levels, and organs perform specific functions. Any movements and actions in the development of the agrarian sphere begin and continue to be implemented only with mandatory observance of territorial interests, which are represented and formed with the direct participation of several levels of management in these territories;

• on the basis of the previous undisputed condition in the cooperative model of management, it is quite possible to duplicate some management functions and use certain tools that can solve various problems that naturally arise from this duplication. In such circumstances, the most important mechanism in solving such problems will be careful coordination between the state and regions to coordinate the main steps to solve them, as well as mandatory work with local authorities. For example, in the United States, the Department of Agriculture (USDA) plays the main role at the level of the federal body, which is the main guide of the state agricultural policy at all levels of management of the country's agricultural sector. USDA also plays an important role in coordinating the interests of agricultural producers (farmers) with the interests of other agribusiness actors, as well as considering the interests of end users of agricultural products and other agricultural services with the national interest.

An important role in realizing the mutual interests of all participants in this process is played by partnerships between the state and the private sector (Public-Private Partnerships, PPPs), which, accumulating the efforts and scientific and technical potential of the private and public sectors of the economy in close cooperation, as a result provide a huge synergistic effect in development.

Ukraine should also follow European trends and continue decentralization reforms, transferring more and more powers from the central and regional to the sub-regional and local levels, leaving only the functions of control and strategic management to the central bodies. It is expedient to use the American experience to establish better coordination between different levels of government and further form state policy in the field of rural development based on democratic and constructive agreements between different levels of government.

3. World trends in digitalization of agriculture

Regarding the global processes taking place in the world agricultural sector, many authoritative world experts today define and reduce to a single concept, which has received the general name Agriculture 4.0 or Farming 4.0.

The European Association of Agricultural Technology, which defines in detail the essence of the Agriculture 4.0 concept, currently, distinguishes two main directions of further development (Bobbio, 2002): precision farming (Precision Farming) and digital agriculture (Digital Agriculture).

Regarding the first direction, the following definition can often be found: "Precision agriculture is a complex agricultural management system that includes global positioning technologies (GPS), geographic information systems (GIS), yield monitoring technologies, variable application rate technologies, and remote sensing technologies" (Gacar et al., 2017).

Digital agriculture actively uses intelligent networks and data management tools. Its purpose is to use all available information and accumulated experience to automate agricultural production processes, that is, digital agriculture means going beyond simple access to data and creating truly effective artificial intelligence and significant added value of such data (Matiushko & Fishchuk, 2019, 14 June).

New high technological trends make it possible to establish clear connections in the innovation chain of the US agricultural sector: agronomy – new agricultural technologies – activity of the extension service or service system – development of the latest technologies by agricultural producers (farms) and other agribusiness subjects. At the same time, the broad possibilities of integration through the system of public-private partnership are actively used in the implementation of modern models of development of rural areas and, in particular, precision agriculture and digital agriculture. Thus, issues and problems related to management in the agricultural sector come to the fore.

In particular, Perga (2020) notes that the nationwide cooperative system or extension service in US agriculture was created in accordance with the Smith-Liver Act of May 8, 1914. The extension service unites various US agricultural organizations and institutions and is a kind of basis for the strategy of economic and environmentally sustainable functioning of the country’s modern agricultural sector. The created extension service system is actually the central link in solving all questions, tasks and problems that arise in the agriculture of the United States. Over the years, this system made it possible to form and develop a truly effective mechanism, where basic research is clearly coordinated, scientific developments are transformed into practical solutions, implemented into specific agricultural technologies, tested in practice, and information about innovations and effective technologies used in rural areas is disseminated. economy

Studying the experience of various foreign agricultural advisory services, in particular the American extension service, as well as the practical application and implementation of some elements of foreign agricultural advisory services will be extremely useful for the agro-industrial complex of

Ukraine, especially in the context of preparation for the active phase of a serious digital transformation in the agricultural sector.

Today, highly integrated agro-industrial production of an intersectoral type with a balance of all its constituent elements has been clearly and accurately formed in the USA, in conditions of sufficiently high development of industrial and economic ties and the necessary infrastructure. At the same time, the mechanisms of public-private partnership, venture financing are used together with the program-targeted stimulation of science and research by federal and state departments, which creates a special favorable regime for knowledge of capacious directions, which, when implemented, give a really high result.

4. Management digitization in agriculture of Ukraine

Currently, one of the most effective means of updating any modern management systems is their digitalization. This also applies to management in the agricultural sector at all levels – from state institutions to small agribusinesses, which is also subject to the digitalization process.

Shandryk (2020) singles out the following key tasks of modern management, which are based on the development and implementation of new technologies in the management processes of the agricultural sector of Ukraine:

a) rejection of paper documents and transition to full electronic document circulation and transfer after thorough and high-quality reengineering of many processes to digital form;

b) maximum reduction of the negative impact of the human factor through the active implementation of automated decision-making technologies at various levels of management;

c) achieving a high speed of making changes in management processes;

d) creation of a digital ecosystem that enables citizens and businesses to quickly and effectively interact with state bodies in a multimedia mode using various devices;

e) continuous improvement of the processes of the digital ecosystem based on the implementation of a feedback system regarding the degree of user satisfaction with the quality of the services provided;

f) increasing the level of transparency of decision-making in the public administration system through the maximum permissible disclosure of data and the introduction of automated technologies and decision-making systems.

It is important to note that today the comprehensive large-scale digitization of domestic agriculture is the need of the hour and the most important condition necessary to increase its competitiveness and achieve acceptable profitability both for the processing of agricultural products with subsequent sale, and initially for agricultural production itself, the profitability of which remains low (Bezpartochnyi & Britchenko, 2022).

During the war, the agricultural sector of Ukraine faced many new challenges and problems. However, even under constant fire from the enemy,

Ukrainian farmers continue to work, protecting the food security not only of Ukraine, but also of the whole world. The Ministry of Agrarian Policy and Food of Ukraine has launched the State Agrarian Register (SAR) to ensure the functioning of state support for the agricultural sector and create financing opportunities for agrarians. This tool is designed to provide assistance to small and medium-sized agricultural companies, for which access to budget support funds was complicated due to the imperfection of program administration procedures.

The State Agrarian Register is a universal centralized platform for the distribution of all types of state and international support. The law provides that third parties, including international donors and banks, have access to the register, which contributes to more efficient use of the provided resources. The main goal of the system is to provide financial and humanitarian assistance to farmers, providing a simple and convenient process of receiving support. In addition, the automated system makes it possible to collect and store information on the characteristics of agricultural producers and financial assistance for further analysis of the effectiveness of the use of public funds.

Since the launch of SAR, farmers have had the opportunity to apply for two state support programs for a total amount of over UAH 1.5 billion (State Agrarian Register, 2022). This includes payments per hectare of land and subsidies for keeping cows. Such a system allows you to track all aspects of the farmer's activity in one service, which greatly simplifies the process of receiving assistance. It is important to note that the Food and Agricultural Organization of the United Nations joined the support of Ukrainian farmers, which together with the Ministry of Agrarian Policy and Food of Ukraine announced a new support program.

A SWOT analysis of the State Agrarian Register shows that the creation of this system has significant advantages for the Ukrainian agricultural sector (Negrey, 2023). Among the strengths, it is possible to highlight the simplification of the process of obtaining support, increasing transparency and reducing administrative costs. At the same time, there are certain threats and opportunities that must be taken into account in order to achieve the main goal – improving the efficiency of the use of public funds and supporting farmers in a difficult economic situation.

To ensure the successful functioning of the State Agrarian Register and its contribution to the stabilization of the agrarian sector in the conditions of war, it is necessary to focus on several key aspects. First, it is important to create a favorable environment for small and medium-sized agricultural companies, which often face financial difficulties and logistical obstacles due to limited access to resources. Secondly, it is necessary to integrate innovative technologies and automate processes. This will not only reduce time spent on administration, but also increase transparency and control over the distribution of state aid. Automation will also help reduce the influence of the human factor on decision-making, which can contribute to a more equitable distribution of funds and increase trust in the system on the part of agrarians.

In addition, it is worth considering the possibility of expanding the functionality of SAR for integration with other national and international support systems. This may include cooperation with international financial organizations, which will allow to expand access to additional sources of financing. One of the ways to develop this direction can be the creation of partnerships with international donor organizations already working in Ukraine to coordinate actions and avoid duplication of efforts.

It is also advisable to focus on the development of feedback mechanisms with farmers for continuous improvement of the system. Farmers can provide valuable information on the use of funds and the effecttiveness of the support received, which will allow optimization of assistance programs and ensure maximum cost effectiveness. In addition, the analytics obtained on the basis of SAR data can become the basis for the development of new support strategies focused on the actual problems of the agricultural sector in war conditions.

The proposal is to create a more flexible system of distribution of public funds that would allow adaptation to the changing conditions of wartime. This can include mobile apps for quick support ticket submissions, as well as forecasting modules for better resource planning. It is also important to ensure uninterrupted access to the system in emergency situations, in particular through the implementation of backup servers and distributed cloud technologies.

In general, SAR has already demonstrated its effectiveness, but its potential can be greatly expanded. The main goal should be the creation of an effective, transparent and stable support system for the agricultural sector, which would take into account the peculiarities of wartime and contribute to the recovery of the economy of Ukraine after the end of hostilities.

Conclusions

The further digital transformation of management in the agricultural sector of Ukraine's economy represents a higher level of digital integration, which will affect the most complex organizational changes in state management structures. The results of the implementation of these tasks will have a significant impact on the growth of profitability and competitiveness of agricultural products, which will enable the agricultural industry to reach modern world technological frontiers.

The analysis of the introduction of digital technologies confirms the proposed hypothesis that their integration into the management of the agricultural sector will increase the efficiency of management, especially in the conditions of military challenges. New technologies, such as robotic systems, increase agricultural productivity and contribute to the rational use of resources. They help manufacturers ensure reliable monitoring and management of natural resources, improve control over processing, distribution and storage of raw materials. This can lead to optimization of labor costs, reduction of prices and improvement of food safety.

Thanks to transparency, accessibility and optimization of processes, the implementation of digital solutions in the agricultural industry will really increase the efficiency of management. This is especially important in the context of modern security challenges, where the speed and accuracy of decision-making become critically important.

Prospects for further research include the development of new data analysis methods for yield forecasting, logistics optimization, and the use of artificial intelligence to automate resource management processes. It is also important to study the impact of digital technologies on the environmental sustainability of agriculture and develop strategies to minimize the negative impact on the environment. This will make it possible not only to achieve economic goals, but also to ensure environmental responsibility of the agricultural sector.

REFERENCE/СПИСОК ВИКОРИСТАНИХ ДЖЕРЕЛ

Andrieieva, O. (2019). E-Government of South Korea: A Strategy for Success. *Regional Studies*, (18), 67–72. https://doi.org/10.32782/2663-6170/2019.18.11	Андрєєва, О. (2019). Е-управління Південної Кореї: стратегія успіху, *Регіональні студії*, (18), 67–72. https://doi.org/10.32782/2663-6170/2019.18.11
Babenko, V., Zomchak, L., & Nehrey, M. (2022). Agritech startup ecosystem in Ukraine: ideas and realization. *Digital Transformation Technology: Proceedings of ITAF*, 311–322. https://doi.org/10.1007/978-981-16-2275-5_19	
Bezpartochnyi, M., & Britchenko, I. (2022). Digitalization for agriculture and rural development in Ukraine. Proceedings of the 2022. *International Conference "Economic science for rural development",* (56), 398–406, LLU ESAF. https://doi.org/10.22616/ESRD.2022.56.039	
Bobbio, L. (2002). *Local Governments in Contemporary Democracies*. Laterza Publishers.	Bobbio, L. (2002). *I governi locali nelle democrazie contemporanee*. Editori Laterza
Gacar, A., Aktas,H., & Ozdogan, B. (2017). *Digital agriculture practices in the context of agriculture 4.0. Pressacademia,* (4), 184–191.	
Kulyk, S. & Kravchuk, O. (2011). E-Government in Ukraine and Foreign Experience in This Field. *Scientific Bulletin of Lesya Ukrainka Volyn National University*, (20), 100–103.	Кулик, С., & Кравчук, О. (2011). Електронне управління в Україні та зарубіжний досвід у цій сфері. *Науковий вісник Волинського національного університету імені Лесі Українки*, (20), 100–103.
Mantino, F. (2006). Policies in Countries with Strong Decentralization: The Cases of Italy and Germany. *Paper presented at the INEA Seminar on Rural Development, Governance, and Programming* 2007–2013.	Mantino, F. (2006). Le politiche nei paesi a forte decentramento: i casi di Italia e Germania. *Paper presentato al Seminario INEA su Sviluppo rurale, Governance e Programmazione* 2007–2013.
Mantino, F. (2018). *Rural Development in Europe: Policies, Institutions, and Local Actors from the 1970s to Today*, 300.	Mantino, F. (2018). *Lo sviluppo rurale in Europa: politiche, istituzioni e attori locali dagli anni* '70 ad oggi, 300.
Matiushko, V., & Fishchuk, V. (2019, June 14). *Ukraine 2030E – the country with developed digital economics.* Khvylia. https://hvylya.net/uk/special-projects/177938-ukraina-2030e-kraina-z-rozvinutoju-cifrovoju-ekonomikoju	Матюшко, В., & Фіщук, В. (2019, 14 червня). *Україна 2030E – країна з розвинутою цифровою економікою*. Хвиля. https://hvylya.net/uk/special-projects/177938-ukraina-2030e-kraina-z-rozvinutoju-cifrovoju-ekonomikoju

Negrey, M. (2023). E-Government in Ukraine's Agricultural Sector: State Agrarian Register. Bulletin of Taras Shevchenko National University of Kyiv, *1*(222), 113–118. https://doi.org/10.17721/1728-2667.2023/222-1/14	Негрей, М. (2023). Е-управління аграрного сектору України: державний аграрний реєстр. Вісник Київського національного університету ім. Тараса Шевченка. *1*(222), 113–118. https://doi.org/10.17721/1728-2667.2023/222-1/14

Pal, S. (2019). Changing technological trends for E-governance in India. *Palgrave Macmillan*, 79–105. https://link.springer.com/chapter/10.1007/978-981-13-8852-1_5

Panganiban, G. F. (2019). E-governance in agriculture. Digital tools enabling Filipino farmers. *J. of Asian Public Policy*, *12*(1), 51–70. https://www.tandfonline.com/doi/full/10.1080/17516234.2018.1499479

Perga, T. (2020). *The Environmental Policy of the USA. The Era of Formation.* Monograph, National Academy of Sciences of Ukraine, State Institution 'Institute of World History of the National Academy of Sciences of Ukraine'. Researchgate https://www.researchgate.net/profile/ etiana-Perga/publication/346524139_EKOLOGICNA_POLITIKA_SSA_EPOHA_STANOVLENNA_US_ENVIRONMENTAL_POLICY_THE_AGE_OF_EMERGING/links/5fc61b274585152e9be89fd2/EKOLOGICNA-POLITIKA-SSA-EPOHA-STANOVLENNA-US-ENVIRONMENTAL-POLICY-THE-AGE-OF-EMERGING.pdf	Перга, Т. (2020). *Екологічна політика США. Епоха становлення.* Монографія. НАН України, ДУ "Інститут всесвітньої історії НАН України". Researchgate. https://www.researchgate.net/profile/ Tetiana-Perga/publication/346524139_EKOLOGICNA_POLITIKA_SSA_EPOHA_STANOVLENNA_US_ENVIRONMENTAL_POLICY_THE_AGE_OF_EMERGING/links/5fc61b274585152e9be89fd2/EKOLOGICNA-POLITIKA-SSA-EPOHA-STANOVLENNA-US-ENVIRONMENTAL-POLICY-THE-AGE-OF-EMERGING.pdf
Shandryk, V. (2020). The Phenomenon of Digitalization and Its Impact on the Functioning of Global Public Administration Systems. Series "Public Administration in the Information Sphere". *Scientific Perspectives*, *6*(6), 416-428. https://doi.org/10.52058/2708-7530-2020-6(6)-416-428	Шандрик, В. (2020). Феномен цифровізації та його вплив на функціонування світових систем публічного управління. Серія: "Державне управління інформаційною сферою". *Наукові перспективи*, *6*(6), 416–428. https://doi.org/10.52058/2708-7530-2020-6(6)-416-428
State Agrarian Register. (2022, September 5). *Small agricultural producers can receive assistance through the SAR.* https://www.dar.gov.ua/news-list/mali-agro-virobniki-mozhut-otrimati-dopomogu-cherez-dar	Державний аграрний реєстр. (2022, 5 вересня). *Малі агровиробники можуть отримати допомогу через ДАР.* https://www.dar.gov.ua/news-list/mali-agroviro-bniki- mozhut-otrimati-dopomogu-cherez-dar

Uddin, M. N., Rahman, M. G., & Sarkar, M. S. (2010). Strategy for implementing e-governance in the agriculture sector in Bangladesh Internat. *J. Of Engineering and Technology*, *6*(4), 622–629. https://www.cabdirect.org/cabdirect/abstract/20103147759

Zastrozhnikova, I. (2019). Fundamentals of electronic governance in the agricultural sector of Ukraine's economy. *Digital Economy. Collection of materials of the II National Scientific and Methodological Conference* (pp. 222–226). https://ir.kneu.edu.ua/handle/2010/31552	Застрожнікова, І. (2019). Основи електронного управління в аграрному секторі економіки України. *Цифрова економіка. Збірник матеріалів II Національної. науково-методичної конференції* (с. 222–226). https://ir.kneu.edu.ua/handle/2010/31552

Conflict of interest. The authors certify that they have no financial or non-financial conflicts of interest in relation to this publication; they have no relationships with government agencies, commercial or non-commercial organizations that might have an interest in the subject matter of the research.

The authors received no direct funding for this research.

The authors' contribution is equal.

Chepil G., Panchenko A. Public-private partnerships in agriculture. *Scientia fructuosa*. 2024. № 5. P. 48–59. https://doi.org/10.31617/1.2024(157)04

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Received by the editorial office 07.09.2024.
Sent after revision 23.09.2024..
Accepted for printing 04.10.2024.
Published online 21.10.2024.