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*Articles*

- [To The Question Of Increasing The Investment Potential Of Non-State Pension Funds](#)  
Sherzod Umurzoqovich Rajabov 01 - 05
- [From The Analytical Procedure At The Initial Stage Of The Audit Use Issues](#)  
Choriev Isroil Hamzaevich 06 - 10
- [Budget Organizations Formation and Improving Accounting for Out-of-Budget Budgets](#)  
Ostonokulov Azamat Abdukarimovich, 11 - 16
- [Financial Resources Of Insurance Companies](#)  
N. Babayeva 17 - 24
- [Estimation of Thrombocyte Concentrate \(TC\) and Whole Blood \(WB\) using Unscented Kalman Filter](#)  
Abdul Muhith, Teguh Herlambang, Irhamah, Dinita Rahmalia 25 - 32
- [The Influence Of Servicescape, Brand Image And Customer Relationship Management On Customer Satisfaction And Customer Loyalty At Fast Food In Medan City](#)  
Yeni Absah, Endang Sulistya Rini, Ahmad Azmi, Chairul Arif 33 - 45
- [Determinants of Perceived Usefulness and End-User Accounting Information System in SMEs](#)  
Mardiana Andarwati, Diana Zuhroh, and Fikri Amrullah 46 - 61
- [Directions Of Development Of The Pension Provision System Of Citizens In The Republic Of Uzbekistan](#)  
Mamatov Bahadir Safaralievich 62 - 78
- [High Efficiency Video Coding and Deblocking In Operating Systems With Applications](#)  
Vikram Sindhu S, S V Achuta Rao, P. Santosh Kumar Patra 79 - 87
- [Introducing a Model of Student Critical Thinking Skills in History Education](#)  
Nurzengky Ibrahim, Desy Safitri, Sri Nuraini, Taufik Rihatno, Edwita, Arita Marini,  
Apri Wahyudi 88 - 96

- [Character Building Model in Extracurricular Activities using Simulation Games for Elementary School Students](#)

Sri Nuraini, Desy Safitri, Taufik Rihatno, Arita Marini, ZE. Ferdi Fauzan Putra,  
Apri Wahyudi 97 - 102
- [The Development of Character Education Model using Stop Motion Animation for Elementary School Students in Indonesia](#)

Taufik Rihatno, Desy Safitri, Sri Nuraini , Arita Marini, ZE. Ferdi Fauzan Putra,  
Apri Wahyudi 103 - 109
- [Model of Musical Intelligence for Elementary School Students](#)

Waluyo Hadi, Yufiarti, Mohamad Syarif Sumantri, Arita Marini, Apri Wahyudi 110 - 115
- [Process of Ethereum and Hyper ledger Fabric with Blockchain Technology](#)

Niveditha N M , Niranjanamurthy M , Shifa muskan , Umme hani 116 - 125
- [The Examination of Consumer's Perceptions of Perceived Benefits towards the Intention to Continue Seeking the Online Advertising](#)

Mohammed Ghanim Zangnaa, Hosam Alden Riyadh, Salsabila Aisyah Alfaiza,  
and Radyan Dananjoyo 126 - 139
- [Green-Blue World Of Uzbek Dastan "Alpamysh»](#)

Dr. Turaev Bahadir Khotamovich, Mustaev Kamol Turonovich 140 - 145
- [Modeling of a State and Development Market of Tourist Services of the Republic Of Uzbekistan](#)

Turaev B.X. 146 - 154
- [What missing the Internet means in digital era: A case study of longest ever Internet blackout in Jammu & Kashmir](#)

Ravia Gupta and Dr Kushal Kumar 155 - 171
- [From Tradition to Modernization in Morphological Process of Indigenous Settlement Patterns in Bali, Indonesia](#)

Ngakan Ketut Acwin Dwijendra 172 - 184
- [Detour Global Domination Number of Some Standard And Special Graphs](#)

Dr. A. Punitha Tharani , A.Ferdina 185 - 189

- [–Improving Student Learning Outcomes through Reciprocal Learning in Environmental Education Course](#)

Desy Safitri, Sri Nuraini, Taufik Rihatno, Sehati Kaban, Arita Marini,

Apri Wahyudi 190 - 193
- [lant Leaf Disease Detection and Classification using Texture Feature based Back Propagated Artificial Neural Network Classifier](#)

E. Samatha Sree Chaturved1, Ch. Shailaja 194 - 203
- [World Experience Of Industrialization And Diversification Of The National Economy And Possibilities Of Using It In Uzbekistan](#)

Nargiza Azamkhanovna Rakhmatova 204 - 214
- [International Experience Of Passing The “Middle-Income Trap” Through Urbanization.](#)

Mirzaeva A.Sh. 215 - 222
- [Opportunities Of Getting Demographic Dividends In Uzbekistan](#)

Mirzakarimova Muyassar Muminovna, Khajiyev Baktiyor 223 - 235
- [Empirical Research on Perceived Popularity of TikTok In India](#)

Dr. Deepti Kiran, Miss Itisha Sharma 236 - 241
- [A Methodological Analysis for the Impact Assessment of the Digitalisation of Economy on Agricultural Growth](#)

Andrii Sakhno, Iryna Salkova, Antonina Broyaka, Nataliia Priamukhina 242 - 249
- [An Analysis of Modelling of the Consumption of Organic Products and Strategic For Increasing Its Production in Ukraine](#)

Eleonora Kadebska, Hanna Kharchenko, Volodymyr Kharchenko,

Svitlana Tereshchenko, Hanna Doroshenko 250 - 257
- [A Comparative Study on Performance of Breast Tissues Classification Using Support Vector Machine and Regression](#)

Meenakshi Srivastava 258 - 263
- [A Moderated Mediation Model of Dark Triad and Organizational Citizenship Behavior: Roles of Workplace Incivility and Islamic Work Ethics](#)

Muhammad Salman Chughtai, Maenuddin, Ayesha Shafique, Muhammad Hafeez,

Altaf Hussain , Dr. Naveed Wahid 264 - 278

## A Methodological Analysis for the Impact Assessment of the Digitalisation of Economy on Agricultural Growth

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### Abstract

*The study substantiates theoretical and methodological provisions, conceptual, scientific, methodological and practical approaches to the formation of tools for organizational and economic regulation of sustainable development of agricultural production in the conditions of digitalization. The economic content of the category “sustainable development of agricultural production” has been determined. The theoretical foundations for ensuring the sustainable development of agricultural production are generalized. The conceptual categorical apparatus has been improved. The essence and peculiarities of the functioning of the sustainable development management system in interaction with the elements of the external environment are outlined and the foreign experience of regulating the sustainable development of agricultural production is generalized. Methodological bases of formation of the economic mechanism of sustainable development of agrarian production in conditions of digitalization are developed. The state and tendencies of development of agrarian production in Ukraine, its socio-economic conditions, peculiarities of innovative investment support and regional aspects of sustainable development are identified. A conceptual model of agro-digital cooperation platform and balancing of agricultural production has been developed. The potential for implementation of the agro-digital cooperation platform for the convergence of regions in the process of sustainable development has been evaluated. Scenario modelling of sustainable development of agrarian production with the implementation of the relevant economic mechanism in strategic documents is carried out.*

**Keywords:** *agriculture, digital economy, sustainable development of agricultural production economic activity efficiency, personnel costs, sales volume, agro-digital cooperation platform.*

### INTRODUCTION

Ukraine, by its soil and climate potential, has significant advantages among all European and countries of the world for the development of intensive agriculture and the creation of its export potential. Against this background, she chose the European vector of development, emphasizing the unity of agricultural production and rural areas. Also, the strength of links between agricultural production and rural territories of Ukraine is increasing due to the development and acceleration of globalization processes and the emergence of related trends, changes in the ratio in the structure of institutions influence on ensuring a balanced economic, social and environmental development of this complex systemic formation.

The need to shape the digital economy and society in Ukraine is recognized at the state level, and digital technologies are considered as one of the key drivers for sustainable development of all spheres of production. The development of the digital economy addresses many public policy issues that need to be addressed not only clearly but also systematically addressed. One such issue is understanding the implications of the digital transition for sustainable agricultural development and agrarian production. The phenomenon of spatial differences, which is one of the priorities for solving acute problems of uneven development of agricultural production, deserves more and more attention.

In turn, this requires a scientific and methodological approach to assessing the level of sustainable development of agricultural production, monitoring the dynamics, development and implementation of effective measures aimed at increasing it in modern conditions of digitalization and confirms the relevance of this research.

### **REVIEW OF LITERATURE**

Issues of information and analytical support for sustainable development are the subjects of scientific research by S. Bandur, S. Bobilev, O. Veklic, V. Lebed, M. Shapochka, V. Andrushchenko, O. Bezugly, O. Gorban, V. Kremen, K. Losev, V. Tregobchuk and others. Problems of communication of the authorities are considered in the works of G. Pocheptsov, E. Makarenko, V. Golub, N. Gritsyak, A. Zverintsev, N. Alyushina, T. Dzhiga, A. Barovskaya, O. Poprotsky, S. Solovyov, Olena & others, N. P. Reznik & others, Sedigheh & others, S.K. Gupta & others and other scientists. However, despite considerable theoretical and methodological work and numerous researches of these problems, further study of the improvement of the mechanism of organizational and economic regulation, methodological and resource base for making effective decisions on sustainable development of agricultural production in the context of digitalization, development of its strategies and scenarios in today's market conditions, determining the directions of increasing the competitiveness of the industry, which led to the choice of the topic of our article.

### **RESEARCH METHODOLOGY**

The purpose of the study is to substantiate theoretical and methodological foundations and conceptual approaches to improve the organizational and economic regulation of sustainable development of agricultural production of Ukraine to increase its competitiveness in terms of digitalization, taking into account the peculiarities associated with the integration of Ukraine into the European and world economic space.

Theoretical provisions are based on the works of domestic and foreign scientists who develop the theory of sustainable development of agricultural production, substantiate its dependence on macro- and microeconomic factors and features of agriculture. The methodological basis is the systematic approach to the study of the phenomena and processes under study and the dialectical method of cognition, which made it possible to comprehensively consider the processes related to the sustainable development of agricultural production in the context of digitalization.

### **RESULTS**

On the way to the sustainable development of the agrarian sector, based on three components (economic, environmental and social), there is a need to strike a balance between social and environmental costs in economically viable economic activity. Social expenditures, in turn, are aimed at achieving certain tangible and intangible benefits. Environmental costs are intended to prevent pollution of the environment and require the transition from non-renewable to renewable resources, the introduction of technological processes that would have a minimal impact on the environment. The main criteria for the sustainable development of the agrarian sector are the increase in the production of safe food for human nutrition to meet the needs of the population, ensure the economic efficiency of production, which will stimulate widespread reproduction. The social component of sustainable development includes improving the level and quality of life of peasants, stabilizing demographic and migration processes.

Internal factors depend to a large extent on the management factor, namely: availability of highly qualified executives, modern technologies, placement, specialization and concentration of agricultural production; the potential of economic and intellectual resources; internal infrastructure; product competitiveness; organizational and economic forms of enterprises; production and management organization; investment and innovation activity; accounting for and respond to fluctuations in demand, availability of capacity reserves, resources, agricultural raw materials; work motivation.

Taking into account the current state of the socio-economic sphere of the village and the situation with the use of natural resources (the main tool of work in the countryside), for a successful sustainable development of agricultural production in Ukraine it is necessary to build such a system of public administration that would optimally combine state regulation of the economy with market



regulators, priority should be given to the state, and all levers of such management should be closely interconnected with the elements of the environment.

To stabilize agricultural production and increase the efficiency of functioning of the agricultural market in the countries of the world, a system of direct and indirect levers of state influence is used: regulation of prices and farm incomes, budget financing, crediting, taxation, stabilization of the agricultural market, etc. At the same time, virtually all Western countries in the relations of agriculture with other industries, in the issues of export and import of agricultural raw materials adhere to the principle of agrarian protectionism, which we consider appropriate to implement in Ukrainian realities. Developed countries are actively stimulating national agriculture, in which the cost of producing a unit of output is usually higher than in the world. In this case, the import-export capabilities of the commodity producers are taken into account, and the features of the mechanism of support of the agrarian sector in each country depending on the natural, economic, geographical and foreign economic conditions.

Sustainability of agricultural production depends on the purposeful and complex interaction of the components of the economic mechanism and implies the ability of the economic entity to dynamically maintain proportions in the organization of activities oriented to innovative development; increase social and economic efficiency; to continually increase the pace of development, carrying out expanded reproduction, which aims to provide the population with quality food, food security of the state without harming the environment.

In market conditions, the main factors influencing the sustainable development of agricultural production are costs, price, and the profit of producers. The lack of regulation of relations in the agro-food market, the outpacing of the growth rate of food inflation relative to the general level of inflation cause a decrease in the real resources of the population. At the same time, the prices of agricultural producers' sales are much lower than the retail prices for agricultural products and food, which makes it necessary to ensure the stabilization of the agricultural commodity market, which can be achieved by forming market stocks during periods of increasing demand for agricultural products. Of particular importance are the state instruments of regulation through commodity purchasing interventions in the market to ensure stable prices and conditions for sustainable development of agricultural production.

Strategic interests of sustainable development of agrarian production of any country are precise to ensure stable socio-economic growth, taking into account the favourable state of the environment and the rational use, protection and reproduction of natural resource potential. Based on the relevant prerequisites, the concept of sustainable development of agrarian production of Ukraine should be ensured through a targeted policy that should include the state, regional and local levels. The key tasks of sustainable development of agrarian production in Ukraine should be the pursuit of a fundamentally new structural policy, increasing its food potential, overcoming the energy crisis, and shaping an effective environmental and economic policy of the state. Ukraine's transition to sustainable development envisages three stages: 1) overcoming the ecological and economic crisis, macroeconomic stabilization, forming prerequisites for improving the standard of living of the population, balancing production and consumption (transitional); 2) solving the problems of structural restructuring of the state economy, solving the fuel and energy problem, the democratization of society, ensuring a high quality of life, balanced use of natural resource potential; 3) ensuring sustainable development based on new sectors of the economy, creation of environmentally friendly industries, as well as a global environmental security system and the foundation for no sphere development. The analysis of the economic situation in the country, in particular in agriculture, shows that Ukraine is at the first stage of the path to sustainable development.

Methodical approach for the assessment of sustainable development of agricultural production involves the calculation of the integral index. The components of the proposed integral indicator of sustainable development of agricultural production are a set of constants that determine the economic parameters of its functioning and a set of indicators that characterize the improvement of technology of functioning of individual components. It is a systematic and integrated approach to solving the problem of economic assessment of sustainable development of agricultural production in Ukraine in the context of globalization will contribute to the modernization of the mechanism of state regulation and financial and economic instruments in the context of balancing economic, social and environmental development of the agricultural sector to ensure food and resource-environmental security of the state.

In the system of public administration sustainable development of agricultural production, such components of the financial mechanism as the tax mechanism, the credit mechanism, the insurance protection mechanism and investment support. Another deterrent to the sustainable development of agricultural production is the system of crediting agricultural producers, whose problems are the imperfection of mechanisms for attracting financial resources, the incompleteness of the construction of credit system, improper legal regulation of its functioning, low level of profitability of agricultural production, as well as the qualifications of managers of farms. When reforming the agrarian sector, commercial banks began to engage in lending, and the state shied away from regulating this process, with the interest rate on the loan significantly exceeding the level of profitability, and therefore the absolute majority of agricultural producers did not receive credit. At present, the main goal of a government in the agricultural sector is to solve the problem of the insolvency of the Ukrainian village, to create the right conditions for attracting bank loans and investments.

Digitization of agricultural production, by its consequences, is consistent with the goals and principles of sustainable development, as it not only provides operational information in the form of big data on the state of the environment but also directly optimizes the use of non-renewable natural resources. The most advanced and capitalized existing digital platforms bring users together primarily based on cost-effectiveness, while social and environmental components are not even secondary but subordinate. It is worth noting that the potential of further digitization is not limited. By deepening and expanding communications through digital platforms, a more flexible and effective balancing of the interests of the social, economic and natural environment is possible. It is on digital platforms that opportunities are created for the common implementation of environmental standards in the management of agricultural production and the use of its results.

“Agro-digital business ecosystem” is an interdependent body of legal and natural persons representing the agrarian sector or related to its activities and using standardized digital platforms to create value for external and internal customers in the form of a product or service. The core of the agro-digital business ecosystem is the digital platform or its totality. Historically, the main purpose of digital platforms is to create economic value. The environmental and social components are of secondary importance.

In the agrarian sector, in Ukraine, instead of the platform and ecosystem business, vertically integrated agro holdings dominate. This creates opportunities for the creation of digital platforms and business ecosystems based on cooperative logic, where domestic agro holdings will be only one of many users of the platform and one of many participants in the agro-digital business ecosystem. The creation of domestic agro-digital cooperation platforms will allow us to start a competitive business ecosystem on the national and later on the global market. Given the initially collective nature of the creation of agro-digital cooperation platforms, as an economic mechanism for ensuring sustainable development, there is the possibility of comprehensive discussion and implementation of the principles, requirements, standards and goals of sustainable development in the platform architecture. Unlike the basic economic criterion, which is dominated by the presence of one private owner of a digital platform, balancing mechanisms between the economic, social and environmental interests of agricultural producers, rural residents, investors, environmentalists start to take effect.

Delays in the deployment of digitization processes at national, regional, sectoral and individual levels can have extremely negative consequences. Countries, industries, companies and entities that are late in digital adoption may be digitally dependent on foreign countries, digital platforms and ecosystems that have already become digital.

In the last decade, the agrarian sector has become one of the leading sectors of the Ukrainian economy, accounting for 11.6% of total output at actual prices in 2017 and 13.8% of total value-added. At present, there is a clear trend of declining production in households.

Overall, GDP growth rates have been quite high since 2011. In 2017, the gross agricultural output of the country at constant prices in 2010 amounted to UAH 249.2 billion, there was a rapid increase in output in agricultural enterprises – by 127.8% in 2017 compared to 2010 in the agricultural sectors the largest increase was recorded in the crop production of agricultural enterprises. The share of gross livestock production in 2017 in agricultural enterprises was 22.7%, and in households – 34.8%, which is significantly reduced compared to 2000. The cited indicators indicate that livestock production is concentrated in households, but they also reduce its volume.

The Ukrainian agrarian sector with a production potential far exceeding the needs of the internal market is a link that, on the one hand, can become a locomotive for the development of the national economy and its effective integration into the world economic space, and on the other – the growth of incomes involved in the agrarian economy of the rural population more than a third of the country's population can have a multiplier effect on the development of other sectors of the national economy.

A detailed study of regional features of ensuring sustainable development of agricultural production was carried out, which was based on four groups of indicators (resource support; production activity; social development; environmental status), which included more than 42 different indicators. The biggest problems lie in the sustainable development resource, which clearly shows regional differences and the highest average, close to the negative maximum. The smallest regional differences are observed in social development, where the set of regions is the most homogeneous in this respect. An important issue is an interdependence between resource provision, productive activity, social development and environmental status. The constructed correlation matrix indicated that the resource provision is most closely related to the performance indicators (correlation coefficient 0.61) and environmental condition (correlation coefficient 0.68). While social development and resource provision are virtually independent of one another (correlation coefficient - 0.02). The correlation between productive activity and social development is quite moderate (correlation coefficient 0.33). The situation is similar to production activity and environmental status (correlation coefficient 0.3). Social development and environmental status are weakly correlated with a correlation coefficient of 0.3. For the clustering of regions by the level of sustainable development of agricultural production, the algorithm of intragroup averages and the Euclidean distance was chosen.

An important strategic priority for the development of agricultural production in the context of digitalization is the introduction of digital agriculture as a new management strategy. Information technology will improve the quality, social standards and living conditions in rural areas. Digitalization will facilitate the development of infrastructure (social, engineering, access to high-speed Internet), increase the efficiency of agriculture, create new jobs, gradually eliminate digital inequalities between rural and urban areas, and halt migration processes in rural areas. However, digitization involves not only great opportunities but also significant problems and risks, which include: cybersecurity, data protection, monopolization of economic power, exacerbation of social problems (through reformatting labour demand); competition between digital business ecosystems, regulatory inconsistencies and current digital technologies; the discrepancy between educational attainment and professional skills in digital realities. Within the digitalization of agricultural production, it is possible to stratify the population of rural territories by income, which gives rise to the task of attracting the broadest categories of villagers to the processes of digitization, their inclusive entry into digital platforms and the acquisition of digital knowledge and skills. Accordingly, the role of the state and society and business in overcoming digital inequality will increase.

An exemplary tool for implementing sustainable development using modern digital capabilities is to create a platform for agro-digital cooperation. The logic and structural diagram of the agro-digital cooperative platform implies the availability of several blocks that provide the exchange of information, goods, services and cash between user groups, creating added value for them.

The target users of the platform will be agricultural producers, rural residents, landowners, consumers of agricultural products, suppliers of fertilizers and fuel and lubricants, manufacturers of agricultural equipment and related software, environmental organizations, portfolio investors, business associations, related representatives of state authorities and local self-government with agricultural production.

Based on the existing problems and challenges of economic, social and environmental development, the basic blocks of the platform have been developed: the block of joint investment projects (includes Initial coin offering (ICO), the joint procurement block, the block of agricultural education, the search for personnel and employment, the block eco-meteorological landscape, agribusiness sales unit, newsgroup and news unit, rulemaking activity unit, mutual lending unit, joint activity unit.

The following list of blocks is basic and can be supplemented with blocks with other functionality if necessary. The blocks under consideration are largely interdependent and

interconnected. The platform may also be an aggregator for other sites or platforms related to the agricultural sector. Additionally, the agro-digital cooperation platform can serve as a tool for the implementation of corporate social responsibility projects. For this purpose, it is possible to use the blocks of the platform “Joint Investment Projects” and “Joint Activities”. The platform provides support for investment agreements, purchase and sale agreements, land lease agreements, legal support for their implementation, and storage of information in a distributed database based on block chain technology.

The conceptual model of the agro-digital cooperation platform, from the standpoint of classical economic theory regarding the interdependent stages of reproduction of the public good, is internally consistent and harmonious since it is in some way consistent with each stage (production, distribution, exchange, consumption).

The digitalization of the agricultural sector occurs simultaneously in three environments: (1) real (offline), (2) virtual (online), (3) institutional. In a real environment, the priority is to develop ICT infrastructure in rural areas. Without full Internet access, creating a digital platform is meaningless. In a virtual environment, it is necessary to accumulate funds to invest in the creation of an integrated digital platform for the development of agricultural production. This platform must meet the challenges associated with cybersecurity. A digital platform is also a tool for combining real and virtual environments and is the basis for creating an appropriate business ecosystem of agricultural production. Without improving the institutional environment, it is impossible to ensure the full functioning of digital platforms. For example, the use of block chain technology and the distribution of proprietary rights are still unregulated. Adequate interaction of the virtual and the real environment requires not only the involvement of representatives of agricultural business and rural population but also investors and consumers of products from cities of Ukraine and from abroad. Ultimately, it will create a viable ecosystem that can compete in the global market. Within these environments - at their intersection - digital business ecosystems are created as a set of physical and virtual (digital) objects and entities, as well as normative rules for their interaction. Given the substantial scale of the necessary institutional changes, close cooperation between representatives of the executive and legislative branches, experts, civil society, local authorities and united territorial communities becomes important. This will align the interests of all stakeholders within a single strategic vision with further formalization at the legislative level. A changing institutional environment poses several risks and offers opportunities for rural stakeholders.

Ensuring compliance with the current digital realities of the regulatory field will increase the ability of rural populations to obtain administrative services online. This will have a positive impact on creating new, high-tech jobs and increasing wages. At the same time, conditions will be created for expanding the markets for selling their farm products. The process of learning and applying digital law will require some time to spend. For this purpose, it is necessary to involve social protection workers who possess (have already received) the necessary knowledge. For local authorities, implementing digital legislation that formalizes digitization processes is a tool to reduce management costs while improving quality administrative services that will increase business confidence and rural population. The main risks for the authorities are the lack of qualification of the managers, the lack of personnel of the corresponding qualification, which threatens to slow down the processes of digitalization and prevents the community from receiving digital dividends. In the context of increasing mobility of people and businesses, increasing competition with other territories, this threatens the migration of individuals and legal entities to other “digital” jurisdictions.

## CONCLUSIONS

It is justified that the general trend of digitalization provides a transformation of the value of an agrarian business, when the based value goes directly from agricultural land (as a physical substance owned or leased) to information on the state of these lands, their history of use, volumes of fertilization, etc. The agro-digital business ecosystem is defined as an interdependent set of legal entities and individuals representing the agricultural sector or related to its activities, and together using standardized digital platforms to create value for external and internal customers in the form of a product or service. The core of the agro-digital business ecosystem is the digital platform or set of digital platforms whose main purpose is to create economic value. The environmental and social components are of secondary importance.

Within the digitalization of agrarian production, significant risks are created regarding the stratification of the rural population by income, which gives rise to the task of involving the broadest categories of rural people in the processes of digitalization, their inclusive entry into digital platforms and the acquisition of digital knowledge and skills. The role of the state, society and business in overcoming digital inequality is increasing accordingly. Against the backdrop of rising digital inequality, it is extremely difficult to ensure sustainable development, especially in its social component, and therefore the only tool for sustainable development is digital platforms.

#### REFERENCES

1. Svitlichna V. Theoretical basis of a new paradigm of society - knowledge economy. *Economy: the realities of the time*. 2015. No. 3 (19). Pp. 184–193. URL: <http://economics.opu.ua/files/archive/2015/No3/184/193.pdf>.
2. Bowen R. & Morris W. (2019). The digital divide: Implications for agribusiness and entrepreneurship. *Lessons from Wales. Journal of Rural Studies*. [Online]. Available: <https://www.sciencedirect.com/science/article/abs/pii/S0743016718312105>
3. Ivanova V. Knowledge-based economy and the knowledge economy: the adequacy of the use of categories. *The mechanism of regulation of the economy*. 2011. № 3. Pp. 47–54. URL: <http://essuir.sumdu.edu.ua/bitstream/123456789/29633/1/Ivanova.pdf>.
4. Kundius V., Rushchitskaya O. A., Rushchitskaya O. E., & Kot E. (2019). Development prospects of agrarian science and education in the formation of digital economy. In *International Scientific and Practical Conference “Digital agriculture-development strategy” (ISPC 2019)*. Atlantis Press. [Online]. Available: <https://www.atlantispress.com/proceedings/ispc-19/125909498>
5. Dannikov O., Sichkarenko K. Conceptual bases of digitalization of economy of Ukraine. URL: [http://www.market-infr.od.ua/journals/2018/17\\_2018\\_eng/15.pdf](http://www.market-infr.od.ua/journals/2018/17_2018_eng/15.pdf).
6. Kolyadenko S. Digital economy: preconditions and stages of formation in Ukraine and in the world. *Economy. Finances. Management*. 2016. № 6. Pp. 106–107. URL: [www.irbis-nbuv.gov.ua](http://www.irbis-nbuv.gov.ua).
7. Kuznetsova I. G., Voronkova O. Y., Bakhvalov S. Y., Ruiga, I. R., Zhuruli, G. N., & Levichev, V. E. (2018). Formation of Human Capital as a Key Factor in Ensuring the National Security of Agriculture in the Digital Economy. *European Research Studies*, 21, Pp.73-83.
8. Veretyuk C., Pilinsky V. Determination of priority directions of digital economy development in Ukraine. *Financial space*. 2017. No. 3 (27). *Scientific notes of the Ukrainian Communication Research Institute*. 2016. № 2. Pp. 51–58.
9. Fedchenko, A. A., Kolesnikova, O. A., Dashkova, E. S., & Pozhidaeva, T. A. (2019, April). *Economic Analysis of Human Resources in the Digital Economy*. Institute of Scientific Communications Conference Springer, Cham, 2019. Pp. 599-605.
10. Events (2019). *World Economic Forum* [Online]. Available: <https://www.weforum.org/focus/davos-2019>
11. On approval of the Concept of development of the digital economy and society of Ukraine for 2018-2020 and approval of the plan of measures for its implementation, 2018. Retrieved from: <https://zakon.rada.gov.ua/laws/show/67-2018-%D1%80>.
12. Kondratiev N.D. Large cycles of conjuncture and prediction theory. *Selected works*. – Moscow: Economics, 2002. – 767 p.
13. Fischuk V. “Digitization is just the beginning”, 2018. Retrieved from: <https://day.kyiv.ua/en/article/ekonomika/didzhytalizaciya-ce-lyshe-pochatok>
14. Vasilenko V. Agriculture is becoming digital. URL: <https://www.ifarming.com.ua/agriculture-becomes-digital>.
15. Surdu D. Agrarian Business in the Digital Age – Ukrainian Realities. URL: <https://nachasi.com/2018/10/02/it-land>.
16. Deichmann, U., Goyal, A., & Mishra, D. (2016). Will digital technologies transform agriculture in developing countries?. *The World Bank*. [Online]. Available: <https://elibrary.worldbank.org/doi/abs/10.1596/1813-9450-7669>
17. Olena Yushkevych, Sandeep Kumar Gupta, Lesia Zaboranna, Anatoliy D. Ostapchuk and Reznik N.P.; Peculiarities of Trending Strategies: Its Implementation and Offers for Improvement

- of Effectiveness, *International Journal of Recent Technology and Engineering*, ISSN 2277-3878 ,Vol 8, Issue-3, 2019, Pp 4787-93.
18. Reznik N.P., DemyanYa. Yu., Tokar Ya .I., Sandeep Kumar Gupta and Anatoliy D. Ostapchuk; Mechanism of Investment Maintenance For The Sustainable Development of The Agricultural Sphere, *International Journal of Innovative Technology and Exploring Engineering*; ISSN: 2278-3075 ,Vol-8 Issue -11S, 2019, Pp 112-116.
  19. Reznik N. P., Sandeep Kumar Gupta , Olena M. Sakovska, Anatoliy D. Ostapchuk, Ruslana V. Levkina; Ukrainian World Exchange Market of Oilseeds: A Research of Challenges for Growth, *International Journal of Engineering and Advance Technology*, ISSN 2249-6958, Vol-8, Issue-6, , 2019, Pp 3823-3829
  20. Reznik N.P., DemyanYa. Yu., Tokar Ya .I., Sandeep Kumar Gupta and Anatoliy D. Ostapchuk; Mechanism of Investment Maintenance For The Sustainable Development of The Agricultural Sphere, *International Journal of Innovative Technology and Exploring Engineering*; ISSN: 2278-3075 ,Vol-8 Issue -11S, 2019, Pp 112-116.
  21. Sedigheh Asghari Baighout, Sandeep Kumar Gupta, Serdar Vural UYGUN and Rabi Kumar” Investigating the Factors Affecting the Selection of Grapevine top wire method in the Malekan - East Azarbaijan Gardens: Economic Growth, *International Journal of Scientific and Technology Research*, ISSN 2277-8616, Vol- 8, Issue-12, 2019, Pp 693-700,
  22. Sandeep Kumar Gupta, Rainu Gupta, Vivek Srivastava and Ram Gopal “The Digitalisation of The Monetary system in India: Challenges and Significance for Economic Development ” , *Journal of Emerging Technologies and Innovative Research*, March 2109,Vol 6, Issue 3, 2019, Page 01-04, ISSN: 2349-5162.
  24. Sandeep Kumar Gupta, Hoblyk V.V., *Shcherban T.D.* and Medvid L.I. and Reznik N.P; Transaction Costs for The Institutional and Customary Environment of The Transboundary Region; *Contemporary Dilemmas: Education, Politics and Values (Mexico)*, ISSN 2007-7890,Vol VII, Special Issue November 2019, Serial no 122, Pageno 1-15.