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THE VALUE ADDED CHAIN IN THE MECHANISM OF PUBLIC-PRIVATE PARTNERSHIP FOR THE DEVELOPMENT OF THE LAND USE ECONOMY OF RURAL TERRITORIES

Purpose. *The aims of this paper are (i) to explore public-private partnerships as a tool for economic development of rural economies in developing countries and countries with economies in transition in order to ensure sustainable use of nature and increase public welfare of rural communities through the added value chain; (ii) to develop proposals for the implementation of public-private partnerships on land management and land use in Ukraine.*

Methodology / approach. *The methodological approach involves study of the world's PPP practice in land management and land use (including the use of land in forestry), study of the connections between PPP projects and scientific approaches to the concept of sustainable development and the added value chain, as well as analysis of domestic scientific bibliography, which relate to the subject of this study.*

Results. *The authors found that the declared priorities of the Agenda for Sustainable Development until 2030 require the application of integrated approaches. In particular, the programme in the mechanism of sustainable development management in the form of PPP to ensure sustainable use of nature and increase the social welfare of rural communities. Because the programme approach here involves investing in natural resources and environmental protection and should cover the entire value chain, which directly or indirectly affects the efficiency of natural rural assets, as well as the use and application of innovative technologies.*

Originality / scientific novelty. *It is substantiated that progress in achieving the declared priorities, in particular in the field of environmental protection, growth of public rural welfare, etc. is possible only in a combination of strengths of all PPP partners, which will eliminate the shortcomings and weaknesses of rural communities. In contrast to existing approaches to the development of the land use economy of rural territories, the basis of the synergy of the parties to PPP is a special natural resource – land, which performs environmental, economic, legal and socio-cultural functions, and determines the form and content, which actually builds sustainable development, including rural. A wide range of PPP forms has been further developed, varying in the degree of involvement and risk taken by the private party in relation to the development of the land use economy of rural territories. The approach to the value chains organization in the development of PPP projects on land management and land use and providing security of land use in terms of taking into account the land use of farmers, formed on different rights, has been improved. The author's project PPP in the production of pellets a private investor in lumber logging waste provided by some state-owned enterprise both subject to the extension of the moratorium and without its effect is developed.*

Practical value / implications. *The authors' research shows that the introduction of the value chain in the mechanism of public-private partnership will lead to significant effective changes in*

the development of the land use economy, in particular of rural territories. Namely, with the use of appropriate policies it will ensure the provision of sustainable use of natural resources and growth of public welfare, in particular rural communities. This approach allows to involve all stakeholders (government, community, business) for effective management of natural assets in general and agriculture in particular and will increase their level of capitalization and investment attractiveness.

Key words: *sustainable development, public welfare, program approach, value chain, rural territories, land use.*

Introduction and review of literature. Today, the world's experience shows that developing countries with economies in transition experience the need for additional investment to ensure sustainable development of the country as a whole, and especially in rural areas. Because the modernization and development of infrastructure, which is critical for ensuring the proper quality of life of the rural population, the state of the environment, and the general well-being of society, requires significant amounts of funding, which is impossible solely from public budgets.

Agricultural abandonment is an important land use process in many world regions and one of the dominant land use change processes in Europe (van der Zanden, Verburg, Schulp and Verkerk, 2017). Threats and vulnerabilities, in particular environmental degradation and climate change, as well as the risks which exist in the international financial system, have become more pronounced. The need for additional investment in climate-friendly and sustainable development scenarios is estimated at several trillion USD per year, and the annual additional funding for infrastructure development is between 5 trillion and 7 trillion USD. To meet these needs it would be enough to have global savings of around 22 trillion USD per year, however, there is an improper allocation of resources (United Nations, 2015), including agricultural land. At the same time, the slowdown in the world's economy complicates the task of attracting long-term investment needed to achieve the Sustainable Development Goals (United Nations, 2016). But the conceptual space of sustainable agriculture is congested with many different ideas existing through which to achieve sustainability (Rose et al., 2019).

Successful implementation of sustainable development projects in any area of public relations is possible with the participation of business, subject to appropriate commitments from the authorities and a fair sharing of potential risks by public and private parties. We agree that partners can achieve better progress by combining their strengths rather than on their own (Frone and Frone, 2013). In world's practice, such relations are realized on the terms of public-private partnership (hereinafter – PPP), which, depending on the method of payment for PPP services are divided into two groups (Farquharson et al., 2010; International Bank for Reconstruction and Development, World Bank, Asian Development Bank and Inter-American Development Bank, 2014):

- «User pays», when the compensation of investments made by a private partner is compensated mainly by the payments of the service consumers for services

provided by the private partner using the created (modernized) infrastructure object (completely or partly);

- «Government pays», when the public partner (state or municipality) reimburses the costs of the private partner for the project in the form of «infrastructure availability fees» (availability payment).

Thus, through PPP the private investments can be attracted to rural areas, municipalities where the financial risks are too high to make it attractive, for example when their areas of investment are included in EU action priorities such as environmental protection or climate change (United Nations Economic Commission for Europe, 2008).

In general, the PPP is more often used as a mechanism for the implementation of individual projects and very rarely as part of comprehensive, well thought-out development plan for the region, community, etc. Hermans, Geerling-Eiff, Potters and Klerkx (2019) defined PPPs as an especially suitable systemic policy instruments within agricultural innovation systems in the early phases of the development of an emerging technological innovation system, because they stimulate innovation system functions such as knowledge development, network building, diffusion and guidance of search, that play an important role in these early phases. However, the situation is changing dramatically in the context of the General Assembly Resolution of 25 September 2015 «Transforming our world: the 2030 Agenda for Sustainable Development», where the vast majority of the goals set under the Sustainable Development Goals and focused on human well-being and ensuring the high life quality and has a comprehensive and thus, partnership nature. In addition, the spread of PPP is stimulated if EU provides the opportunity to finance PPP projects through the Structural Funds or through innovative financial instruments (Zaharioaie, 2012).

An in-depth multifaceted study of chain theories is presented in the monograph (Cui and Liu, 2018). Trade and agrifood Global Value Chains (GVCs), its structure, governance, their impacts on farmers, in particular the issue of land ownership, land management, land-use, and land-use displacement analyzed by Raschio (2017). As noted Hamulczuk, Makarchuk and Sica (2019), according to the Heckscher-Ohlin model, land-abundant countries like Ukraine should export land-intensive goods, therefore, the international integration of commodity markets should lead to the integration of factor markets, land markets among them, but adjustments to the long-run equilibrium relationship are asymmetric and seasonal. Malek, Tieskens and Verburg (2019) in explaining the global spatial distribution of organic crop producers shows that less-favorable socio-economic conditions can indeed pose a higher risk for establishing a steady and successful supply of organic products due to a potentially higher rate of certification failures and problems in establishing value chains.

According to Rogito et al. (2020) youth involvement across the agricultural value chain is low. This study shows that there is a strong correlation between access to finance and youth involvement in agricultural value chains. The findings Ho et al. (2018, 2019) indicate that customer orientation and inter-functional coordination are antecedents to innovativeness, while competitor orientation has no significant

relationship with innovation. The studies provide, that development policies should encourage smallholders to engage in the coordinating supply and increase their capacity to access information on customers, competitors, and contact with other actors across the chain. Mishra and Dey (2018) concluded that governance of agricultural value chains other than those that are export oriented is often riddled with overlapping and contradictory roles of actors. However, a shift towards a buyer-driven market is expected in the future, which requires the protection of the interests of smallholder producers by policy-makers.

It should be noted that, despite the study of the institutional support of PPP in Ukraine, the development of proposals for amendments to the legislation to promote sustainable land use (Levochkin, 2016; Popov, 2016; Zaloznova, Petrova and Trushkina, 2016; Șargo and Timofti, 2017; Bondar, 2018; Zapatrina, 2018; Hreshchuk, 2019; Kruhlov and Tereshchenko, 2019; Savchuk and Liubchych, 2019; Mazur and Tomashuk, 2020), the problem of PPP in the field of land use remains not well understood.

Given all the above, we believe that the solution of this issue in developing countries and countries with economies in transition is possible only if the implementation of a programme approach in the mechanism of sustainable land use management of their territories with an emphasis on added value chains. Because this integrated approach, in addition to economic, political and social challenges, will also solve the problem with investments, namely – the expansion of sources of funding for the development of a country or region or community. This led to the choice of the direction of our study, the results of which are presented in the study.

The purpose of the article. The aims of this paper are (i) to explore public-private partnerships as a tool for economic development of rural economies in developing countries and countries with economies in transition in order to ensure sustainable use of nature and increase public welfare of rural communities through the added value chain; (ii) to develop proposals for the implementation of public-private partnerships on land management and land use in Ukraine.

Materials and methods. The research was performed using materials and documents of national and world importance, as well as domestic scientific publications related to solving the most important global problems and integral needs of sustainable development, namely – the rational and efficient use of land and other natural resources, including agricultural lands with use of the PPP mechanism.

The information and statistical base of the study consisted of decisions, reports and materials of the State Statistics Service of Ukraine, the United Nations, the World Bank, data from the online resource AgroPortal and the work of domestic and foreign scientists.

The methodological approach involves study of the world's PPP practice, study of the connections between PPP projects and scientific approaches to the concept of sustainable development and the added value chain, as well as analysis of domestic scientific bibliography, which relate to the subject of this study.

Results and discussion. Land is the basis of sustainable development of any

country and performs a number of functions in society, including environmental (plays an important role in the strategy of reproduction and survival of various species), economic (the basis on which is built the welfare of the population), legal (abstract set of property rights) and socio-cultural (Tretiak, 2013).

In the scientific literature there are two concepts: «land – as a matter» and «land – as a capital». In the first case, the land should be understood as land resources (along with water, subsoil and forests, as they belong to the land), which arose and exists against the will and consciousness of human; land, which is the basis of food, the arsenal of human resources, as well as the place of its settlement. The combination of «land – as a matter» with human labor and its capitalization, turns it into «land – as a capital» (land + property rights = land use as land capital). That is to say, the existence and development of human society are inextricably linked with it and its use can be considered from many points of view: the subject of labor and means of production in agriculture and forestry; the spatial basis of the whole set of forms and types of social activity; territorial basis of statehood and national self-determination; natural resource and carrier of minerals (Tretiak, 2013). However, in a market-driven economy, land use (land with other natural resources that are inseparable from it and property rights) functions as land capital. And it is this function that promotes the involvement of land and other natural resources, inseparable from the land, in the PPP as an economic asset.

In general, in the world practice, the PPP has proven to be an effective mechanism for managing the sustainable development, where the participation of the public and private sector through PPP projects is a key component of complex systems, including land management and global land security. The use of PPP is a more effective means of project implementation than the involvement of private business in public procurement, especially in a volatile political situation, as we now see in Ukraine. The process of PPP implementation in terms of land management and global security of land use is quite specific because all relations are formed around a special natural resource – the land, because the land can be in different forms of ownership, and has a close relationship with other natural resources, acts as an object of placement of productive forces and a means and object of labor in agriculture and forestry.

The expected results from the improvement of the institutional framework for the development of PPP in the field of land use can be assessed by:

environmental effect – reduction of negative impact on the environment through the use of PPP mechanisms: environmental measures financed within the relevant projects, environmental investments, rationalization of use of natural resources. In the long run, the greening of activities in rural areas helps to improve the living conditions of the population, reduce morbidity rate, treatment costs, increase of longevity;

social effect – first of all infrastructure development (construction of highways, electric, gas, heat, water supply and drainage systems, waste disposal). The transfer to the private sector of the right to provide public services (management of medical,

educational, cultural and sports institutions, etc.) not only improves their quality, but also contributes to the growth of employment and income of the rural population;

economic effect – the ability of PPP mechanisms to promote rapid and high-quality modernization of the rural economy, intensify investment activities, reduce expenditures from the state budget, use the experience and skills of individuals while maintaining state control over assets. PPP allows to increase the efficiency of management of state resources and infrastructure through the involvement of private enterprises, optimal risk sharing between the state and the private sector, the development of project financing skills, the establishment of a constructive dialogue between business and government.

An interesting example is the conclusion of a joint agreement in Vancouver, Canada (United Nations Economic Commission for Europe, 2008), the study of which gave us the opportunity to formulate certain conclusions on the implementation of the PPP in Ukraine, based on the results of SWOT-analysis of this agreement. For example, the City of Vancouver decided to enter into a joint agreement with the private sector to upgrade the handling of industrial waste, which served both the commercial goal of making profit and the goal of reducing the negative impact on the environment. The private partner has incurred the obligations for the designing, financing and construction of the thermal power plant. Such a power plant uses gas obtained from organic waste as an alternative energy source, and also sells its surplus for the needs of local industry. The heat released during electricity production is used for water heating and is sold by a private partner to a large greenhouse complex to fulfil his heating needs.

The main participants in concluding the above joint PPP agreement are:

- Vancouver City Administration, which acts as a public partner because the city owns the land where the waste is being dumped and manages the city-owned landfill;
- the electricity generation company is a private partner that designs, finances, builds and manages combined heat and power projects, and specializes in their sale;
- Company BC Hydro, the British Columbia Crown Corporation, accountable to the Ministry of Energy and Natural Resources of Canada, is the buyer and distributor of electricity generated by cogeneration units;
- the agro-industrial sector is another private partner that buys hot water for use in the greenhouse.

Distribution of PPP risks. Note that the city administration does not make any payments to private partners involved in the PPP project, but guarantees the supply of gas from organic waste for 20 years under the contract. In this way, the city accepts the risk of supply constraints under the project, but at the same time, minimizes this risk by maintaining responsibility for the management of the gas collection system. Revenues from the sale of electricity go to a private partner with the exception of 10 % payment to the city. At the same time, the total investment in the project by private partners amounted to about 10 million USD.

Socio-economic benefits:

- the project contributed to the creation of additional jobs (about 300);

- Vancouver began to receive a profit of about 300 thousand USD a year from the project, which will cover current operating costs;

- The PPP project turned a rather expensive environmental program into a more efficient economic program and created an additional source of income for the city.

Environmental benefits:

- the project helped to reduce greenhouse gas emissions by approximately 200 thousand tons per year, which corresponds to carbon dioxide emissions of about 40 thousand vehicles;

- the project contributes to the production of about 500 thousand GJ of energy per year, which meets the electricity needs of 3 to 4 thousand households;

- the project helps to reduce the consumption of natural gas by the agricultural complex by 20 %.

The conclusion of the given example of the PPP project is that it is a model of effective management of urban land use and optimal use of organic waste, which provides economic and environmental benefits for society through the interaction between public and private sectors.

On the example of land use in forestry, PPP is considered, in particular with regard to the development of infrastructure projects (Zverev, 2009). This is due to the fact that the developed infrastructure provides economic growth, but the implementation of these projects requires large costs, which often exceed the capacity of local budgets. Therefore, the state attracts private business to solve problems, and cooperation can take various forms of PPP. For entrepreneurs, such a partnership means reducing the risks of doing business, certain tax benefits, joint activities with the authorities regarding the use of land in forestry.

PPP is a promising mechanism for managing the sustainable development of rural areas, given the role of forests as an operational resource and at the same time a provider of public goods. This requires a balance between the goals of forest conservation, their ability to provide ecosystem services, the economic need for lumber logging and the right of communities to profit from forest exploitation. Accordingly, various forms of governance are developing, based on the cooperation of public authorities and private structures at the international, national and local levels (Sturla, 2012).

Experience in concluding PPP agreements on land use in forestry is limited and mainly concerns the provision of lumber logging services by private partners. For example, in Finland and Germany, partnership agreements are the provision of lumber logging services by third parties. In these countries, 80 % of the volume of timber planned for logging is mainly harvested by mechanized means, and in the Czech Republic and Poland – 100 % (United Nations Economic Commission for Europe, 2008).

However, the long-standing experience of the PPP on land use in Italian forestry, in particular in the Liguria region, which is characterized by the highest forest cover in the country, is interesting (Sturla, 2012). Liguria's forest resources have been exploited irrationally for a long time, due to management difficulties and

the presence of a large number of small forest owners. Forestry was conducted without a comprehensive approach to the production of mainly wood products, partly – food, feed, and so on. The economic downturn of the 1960s led to the migration of the rural population and, as a consequence, a large-scale decline in forestry activities in the Apennines.

In 2008, six pilot projects were implemented, funded by the region to facilitate the implementation of this plan and economic valorization of forests (government measures to re-evaluate resources or goods) and aimed at improving the efficiency of lumber logging and wood processing activities. Pilot projects are implemented in the form of PPPs in areas where forests are of particular importance for local development (mainly in economically unattractive areas of the Apennines), given their multifunctional role and the economic integration of the region into forest supply chains.

The pilot projects implemented in the Liguria region are interesting in terms of the implementation of the classic forms of PPP. These are primarily joint ventures: private individuals (forestry consortia and private owners of forests and sawmills) and the state (usually territorial authorities – municipalities, communities), which distribute revenues and risks associated with the implementation of project tasks. Thus, an organizational structure is formed that adheres to the development strategy defined by the local authority, on the one hand, and the regional forestry plan, on the other.

A key factor in their successful implementation was consolidated state support for forest supply chains, as well as a clear plan for forestry and the governing body at a higher administrative level. The pilot projects also demonstrated that PPP funding is concentrated mainly in the locations of forestry consortia, which aim to build the capacity of a sustainable certified supply chain for local forest products. Instead, the mountainous areas of Western Liguria, where there are no large forestry enterprises, required funding mainly for small infrastructure, provided in particular by consortia through the forest products of the respective private forest owner where the project was implemented. Consortia are also suppliers of biomass to the local district heating system. In some cases, the goal of developing the timber supply chain has led to the resumption of management in highly degraded mountain forests, which were previously considered economically inaccessible and abandoned.

A successful example of a PPP is the Chesapeake Forest Conservation Project (Maryland, USA). The Chesapeake Bay is the widest delta in America and the main recreation and commercial fishing area of the state. The ecological condition of the bay is significantly disturbed as a result of intensification of wastewater discharge from nearby overcrowded cities and minimal control over the utilization of agricultural waste (livestock and fertilizers).

For said purpose, a Chesapeake Forest Conservation Project was developed, which included two phases:

- the first was to establish state cooperation with non-governmental organizations to raise the funds needed to acquire land and develop a plan for

sustainable forest management;

- the second is the participation of state authorities in a public-private partnership to manage all property in accordance with environmental standards, which are monitored by the public sector.

In turn, the private sector is allowed to carry out lumber logging on a permanent basis in specially designated areas, which provide the necessary level of income for all project participants.

For the initial purchase of the property, the state has committed 16.5 million USD to acquire half of the 58,000-acre lot of land put up for sale by a private lumber company, bordering the state-owned wooded area. The non-governmental organization, acting on behalf of the charity, purchased an additional 29,000 acres of land also for 16.5 million USD with the intention of handing it over to the state government free of charge. The private company has acted as a subcontractor that provides management of private property in accordance with the standards and mechanisms of environmental protection.

A unique feature of this PPP project is its self-financing. The Sustainable Forest Management Plan included identifying areas where lumber logging could take place without adversely affecting the environment. Lumber logging management was provided by a private company under a contract. Continuation of logging activities has reduced social tensions – reduced the fears of the local population about the possible negative economic consequences of the project.

Already in the first two years of implementation, the Chesapeake Forest Conservation PPP project proved to be cost-effective. Among its economic, social and environmental benefits are the following:

- ensuring economic activity and employment by supporting local businesses and the population;
- elimination of the possibility of using forest areas not for their intended purpose;
- improving water quality and water resources in Chesapeake Bay;
- protection of the habitat of rare and endangered species;
- creating favorable conditions for the reproduction of soils and forests;
- protection of picturesque places of special historical, cultural and ecological significance (United Nations Economic Commission for Europe, 2008).

The effectiveness of the project is due to the following factors:

- concluding agreements by state authorities with a private partner on the management of territories instead of hiring additional staff;
- avoiding the expenditure of state funds and obtaining additional revenues from the provision of sustainable and efficient management of forested areas;
- annual increase in profits, starting from the moment of project implementation.

The Chesapeake Forest Conservation PPP project is an example of a transparent model of cooperation where NGOs, local authorities, the public and private sectors participate in the discussion of the project, its main stages, funding and management issues. The results of the annual financial audit of the project are fully open to the

public, independent monitoring is carried out.

Thus, the analysis of the world experience of PPP in forestry confirms the low efficiency of forestry development without the participation and support of the state, especially in sparsely forested areas. It is promising to create forestry enterprises that perform contractual work within the framework of state orders that meet the goals of the state as the owner of forest resources. The PPP model for the purpose of sustainable management of forest areas, management of logging under a contract with a private company can be applied where there is a need for certain services of the private sector. Thus, the use of natural resources can be a source of funding for PPP projects and plans.

The key to hampering the development of PPP projects in Ukraine in the field of forest land use is imperfect policy, including land policy, lack of market-oriented and environmentally sound management system of resources and land use, appropriate legal and economic mechanisms and tools, including land management and land management.

The outlined problematic issues are reflected in the SWOT-analysis of the current state of formation of the economic and institutional landscape of PPP projects in the field of forest resources use (Table 1), which identifies strengths and weaknesses, opportunities and threats.

As the analysis revealed, some characteristics of the institutionalization of public-private forms of management in the use of forest resources determine the features of financial and economic regulation. For example, the presence of positive experience in the use of approaches to financial and economic regulation and the institutional basis for the sale of timber at open auctions, which will facilitate the introduction of regulatory tools, and others.

Weaknesses include unsatisfactory methods of forest area assessment, lack of mechanisms to stimulate protective afforestation, insufficient sanctions by the state in case of violation of the established procedure for the use of forest resources, etc.

Opportunities are concretized by such positions as deeper involvement of forest resources in the sphere of market processes through transformation of institutional environment, development of mechanism of special use of non-timber forest products, useful properties of forests, institutional preconditions of development of system of measures on means of financial and economic regulation.

PPP projects is one of the economic instruments for the formation of sustainable development of land use in both rural and agricultural areas, to address global food security challenges and serve to expand access to advanced technologies and new markets. Based on the conceptual idea of food security and the Sustainable Development Goals approved in 2015 at the UN Summit on Sustainable Development, in particular Goal 2 «Fight hunger, improve access and quality of food, and promote sustainable agriculture», which provides for 2030 ensuring that everyone on the planet has access to safe, nutritious food in sufficient quantities to meet their needs, as well as doubling the productivity and income of small food producers, including through ensuring equal access to land and other natural

resources, finance, knowledge and markets, it is expedient to take into account the role of small and medium-sized agricultural producers for stimulating PPP projects in Ukraine, and developing measures to improve the investment climate and justifying new investment opportunities and recommendations for foreign investors. There is also the task of increasing the employment of the rural population.

Table 1

SWOT-analysis of modern institutional support of public-private forms of management in the field of forest land use

Strengths	***Weaknesses***
Economic factors	
•approval of forest sector development programs; •the basis of institutional support is formed, which creates conditions for the growth of the total land area of the forest fund, the total and average stock of plantations, production volumes and sales; •positive experience in using approaches to financial and economic regulation; •development of public-private partnership projects in the forest sector of the economy; •positive institutional preconditions for the introduction of electronic circulation of wood; •institutional basis for timber sales at open auctions; •carbon market development	•unfavorable processes based on institutional gaps; •imperfect system and tools for regulating forest relations and forest use; •formation of institutional traps that significantly hamper both the overall development of the forest resources sector and its reform; •imperfect functioning of formal and informal institutions; •conservative management methods and lack of modern management; •unregulated property relations; •unsatisfactory methods of forest area assessment; •lack of necessary and qualitative data on forests and their use as a result of unregulated mechanism of information support for the development of the industry
Environmental factors	
•availability of legal acts in the field of ecology – the Law of Ukraine «On Environmental Protection», the Forest Code of Ukraine, etc.; •providing support to the mechanisms of regulation of processes in the field of forest use of ecological processes (as evidenced by the increase in the share of forests with limited forest use, expansion of afforestation, increasing the area of certified forests, etc.); •implementation of a system of measures for forest protection and conservation	•irrational structure of forest use, which leads to an increase in the share of artificial plantations and low-value derived stands; •lack of mechanisms to stimulate protective afforestation; •the need for systematization in the process of environmental monitoring; •weak sanctions by the state in case of violation of the established procedure for the use of forest resources
Social factors	
•mechanisms for the use of forest resources by citizens have been developed; •significant public influence on forest use processes at the local level; •favorable conditions for access of local communities to forest resources, conducting tourist activities, grazing cattle near forest areas	•consumer's attitude of the population to forests located on the territory of Ukraine; •significant influence of informal institutions on the processes of resource use; •irrational use of resources by the population, one of the reasons for which is weak and ineffective sanctions by the state; •numerous restrictions on local residents' access to forests by the local elite

Continuation of the table 1

Opportunities	***Threats***
Economic factors	
•improvement of the legal framework, regulation of the mechanism of the decision-making process on forest exploitation; •qualitative correction of institutional support, which will lead to the growth of additional volumes of wood as the age and breed structure of plantations approach the optimal and increase the average stock of plantations; •increasing market demand for environmentally friendly products; •wider involvement of forest resources in the sphere of market processes through the transformation of the institutional environment; •development of a mechanism for special use of non-wood forest products, useful properties of forests; •attracting innovative technologies and investments in the development of the industry	•prolongation of the use of raw material properties of forest resources, mass export of unprocessed wood abroad due to the preservation of the institutional base; •risk of deterioration of forest use due to low quality characteristics of institutional support, non-compliance with norms and standards of forest resources use; •financial risks of forest certification; •imperfect institutional support that does not stimulate sustainable forest use in the tax aspect; •the presence of the shadow sector in the field of forest resources; •lack of state support for research and innovation; •low investment prospects for attracting free funds for the development of the forest complex
Environmental factors	
•making changes to the procedure of forest certification, increasing their area and certified wood products; •development of a mechanism for the development of recreational forest services; •improving the legal provision of protection and preservation of forest areas; •institutional preconditions for the development of a system of measures aimed at the use of financial and economic regulation to preserve the ecological functions of forests	•increasing environmental pressure on forest resources; •intensification of unfavorable processes regarding the environmental priorities of the industry development in the context of their lobbying; •significant risks of passivity of response of protective mechanisms of observance of ecological priorities in forest use; •the predominance of economic priorities over environmental requirements (as an example, the development of tourist infrastructure in the immediate vicinity of forests)
Social factors	
•strengthening public control over forest resources; •implementation of special educational programs on forest conservation, maintenance of their useful functions and protection of biodiversity; •increasing the transparency of the forest sector, improving public awareness	•low ecological and legal culture of the population; •violation of the requirements of legislative and regulatory acts on labor protection and industrial safety; •low rates of real implementation of European norms in the field of forest resources use by local communities

Source: supplemented by the authors according to the data (Khvesyk et al., 2013).

In Ukraine, a significant part of the private sector is involved in agricultural activities and a large part of the rural population exists through family farming and small farming (Table 2).

Table 2

The structure of agricultural production by types of agricultural holdings in Ukraine, %

Agricultural products	Agricultural enterprises			Small farms			Households		
	2000	2014	2018	2000	2014	2018	2000	2014	2018
The structure of crop production									
Grain and leguminous crops	81.6	78.1	80.1	5.1	12.0	14.4	18.4	21.9	19.9
Factory sugar beet	87.8	92.8	95.3	5.7	6.9	6.9	12.2	7.2	4.7
Sunflower	87.5	85.7	86.1	10.0	19.3	19.8	12.5	14.3	13.9
Potato	1.4	3.2	1.9	0.3	0.9	0.5	98.6	96.8	98.1
Vegetable crops	16.9	13.9	14.4	1.4	3.4	2.7	83.1	86.1	85.6
Fruit and berry crops	18.2	16.6	21.6	0.3	2.8	5.3	81.8	83.4	78.4
The structure of livestock production									
Meat	26.3	61.5	65.1	0.5	2.4	2.5	73.7	38.5	34.9
Milk	29.0	23.8	27.4	0.5	1.5	2.0	71.0	76.2	72.6
Eggs	33.8	64.0	55.2	0.1	0.4	0.7	66.2	36.0	44.8
Wool	38.6	14.6	12.4	0.3	3.2	3.0	61.4	85.4	87.6
Honey	6.8	1.5	1.2	0.2	0.2	0.2	93.2	98.5	98.8

Source: State Statistics Service of Ukraine, 2019.

The dynamics of the structure of agricultural production by types of agricultural holdings in Ukraine during 2000, 2014 and 2018 in general indicates an increase in the role of farms in crop production, as well as increasing the role of agricultural enterprises in meat and egg production, and concentration of milk production in households against the background of an increase in the share of farms in such productions, and some shift in the production of wool and honey from agricultural enterprises to households and farms.

In general, the PPP has a wide range of forms, varying in the degree of involvement and risk taken by the private party. The terms are usually set out in the contract in order to outline the responsibilities of each party and clearly allocate the risks. The graph below shows the range of PPP agreements (Fig. 1).

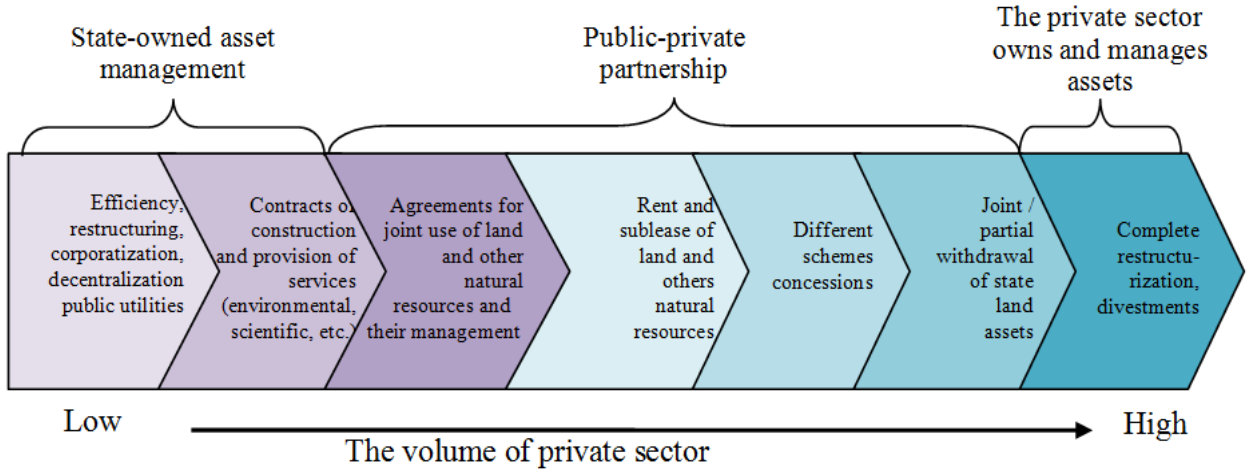

Fig. 1. The range of forms of PPP involvement and the degree of risk taken by the private party

Source: supplemented by the authors using sources (Delmon, 2010).

That is why when using land as a multifunctional resource that is limited in space and generally non-renewable, we believe that we need a comprehensive approach, which we see in the implementation of a programme approach to investing and increasing the role of the added value chain in the PPP mechanism, characterized by significant potential for sustainable development of land use in a region or a separate municipality or rural area. The peculiarity of PPP projects in terms of land management and land use security is that, for example, for rural areas the basis for sustainable development is an efficient agro-industrial complex, the programme approach to investment should cover the entire added value chain in agriculture, starting from the efficient use of natural assets (land, water, forest), to innovative materials and equipment and to wholesale and retail networks. At the same time, PPP projects should be implemented on the basis of strategic planning of sustainable development in the context of ensuring the rational use of natural resources and effective environmental modernization.

An important aspect of the added value chain efficiency in the PPP mechanism for the development of land use economy of rural areas is the appropriate level of information support for sustainable environmental management, to assess using the satellite data the impact of economic activities on ecosystems, identificate the risks associated with global climate change, desertification, loss of landscape and biotic diversity (Tarariko et al., 2019).

In implementing this comprehensive approach, the main requirement should be that programme investment is aimed at achieving environmental and economic goals of public policy. Therefore, PPP projects should use the best forms of economic retionships of land ownership and other natural resources, as well as available technological solutions, or technologies and innovations that meet global standards and priorities for sustainable development.

For example, the EU's financial institution, the European Investment Bank (EIB), which supports various areas of PPP, finances the development of underdeveloped European regions in the form of long-term loans. The EIB supports the rural economy by creating benefits for both private enterprises and society as a whole through long-term financing and the provision of technical advice and assistance. Funding is provided to those PPP projects which make a significant contribution to: more resource-intensive agriculture and food security; improvement or restoration of ecosystems; innovative solutions for current and future challenges in the sector and productive or sustainable use of by-products of agricultural and food production. The main requirement for PPP projects is innovation. Another important fact is that the EIB credits mainly small agricultural enterprises (with less than 3,000 employees) and with an average level of profitability (European Investment Bank, 2018). In addition, the EIB's approach to investing is to cover the entire added value chain, from the supply of materials and equipment to the wholesale and retail chains (Fig. 2).

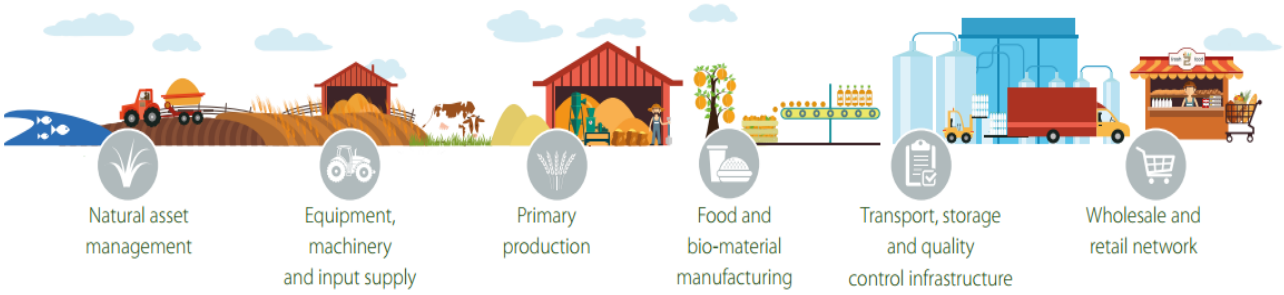

Fig. 2. Value added chain in the agro-industrial complex

Source: European Investment Bank, 2018.

When developing PPP projects on land management and land use and providing security of land use in terms of added value chain organization, it is necessary to assess the relationship between all the participants – executives and supporting organizations: to identify as much as possible economic, environmental and social benefits and losses for all chain participants (Fig. 3).

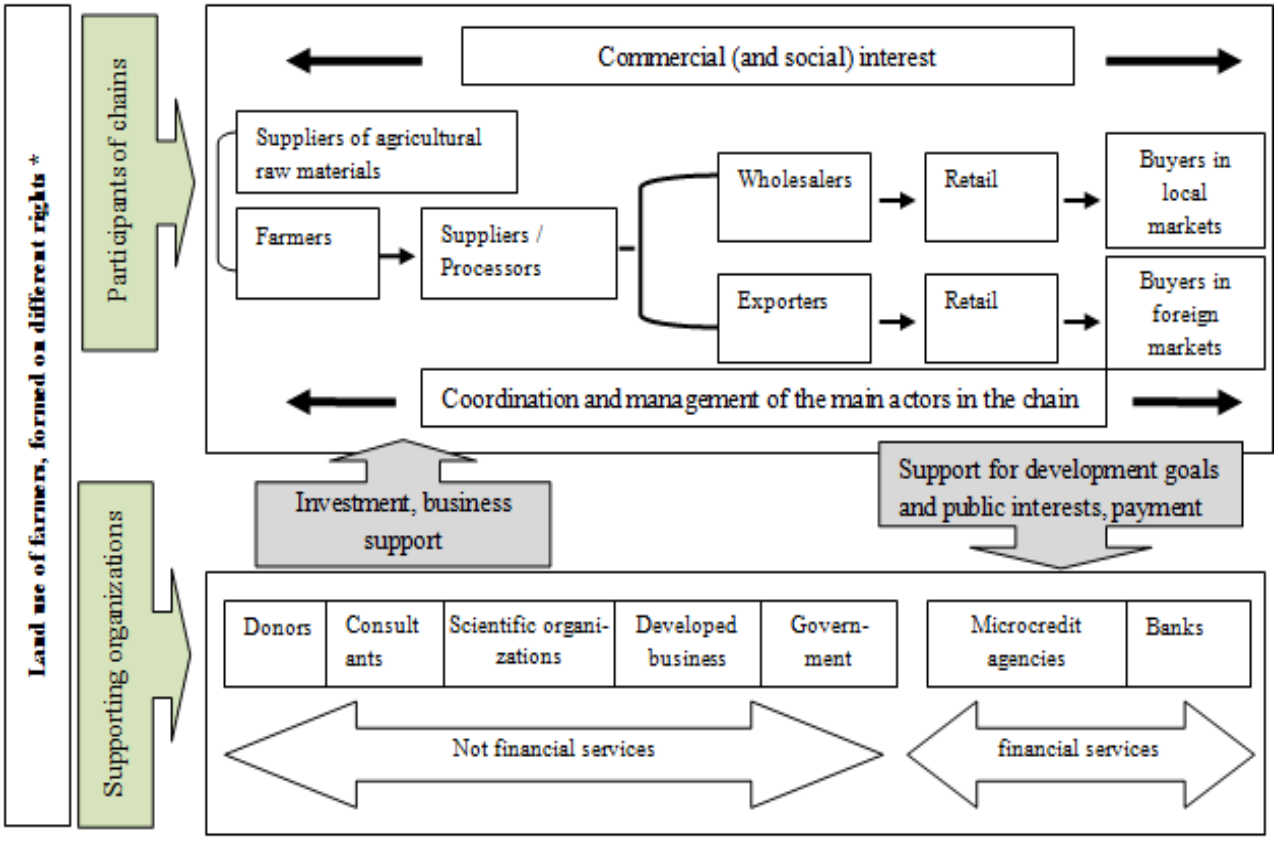

Fig. 3. The main added value chains in the agricultural sector

Note. *author's supplement.

Source: Arndt et al., 2005.

The analysis of the agri-food added value chain shows where the greatest added value is formed accumulated and realized, which allows to identify the roles of different participants in this process inside the chain and outside. If farming land use includes different natural resources (forest, waters, common subsoil assets) and formed with different rights (private property rights, lease rights of land plots of private, state and communal property), the additional value increases the added value

from land use and other natural resources (Fig. 4).

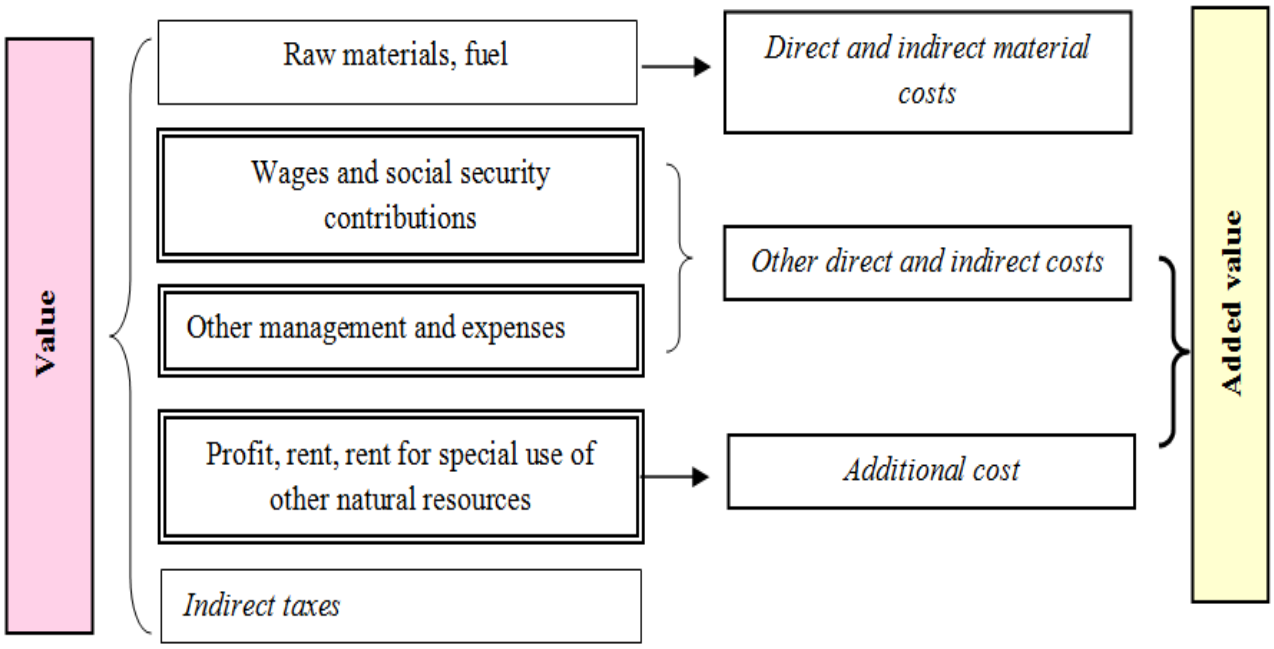

Fig. 4. Logical-and-meaningful scheme of the structure of value added in the process of agricultural land use

Source: developed by the authors.

This approach contributes to the development of strategies to achieve rural development goals, when the poorest farmers are involved in the process of obtaining a part of the added value. The implementation of added value chains in the PPP allows a fair distribution of risks and provides socio-economic and environmental benefits.

Given that the legislation of Ukraine (Verkhovna Rada of Ukraine, 2005) temporarily, for a period of 10 years, it is prohibited to export out of the customs territory of Ukraine under the customs regime for the export of unprocessed timber (code 4403 UKTZED): wood species, except pine, – from November 1, 2015; pine trees – from January 1, 2017. There is also a ban on the export of timber and lumber of valuable and rare species of trees – *acacia*, *sorbus torminalis*, *cherry*, *pear*, *walnut*, *chestnut*, *common yew*, *sweet cherry*, *sycamore maple*, *juniper*, our calculations indicate the investment attractiveness of value-added projects in the production of pellets a private investor in lumber logging waste provided by some state-owned enterprise both subject to the extension of the moratorium and without its effect (Tables 3–6).

Taking these results of the PPP project in the production of pellets into account, in order to the development of the land use economy of rural territories, it is important to create conditions for the formation of communal ownership of forest lands and forest plantations. The latter can be created with the active participation of territorial communities on the allocated land areas. Such development of forest use will contribute to the concentration of resources in a certain area, especially in regions that do not have the necessary funds and material support for such activities.

Table 3

Main forecast indicators of the project development scenario, when there is no moratorium on the export of conifer round timber

Indicators	Years of project implementation				
	1	2	3	4	5
The volume of logging waste, m^3	25167	26596	27675	28135	31587
The volume of wood processing waste, m^3	136578	137285	139578	142639	155657
Total waste, m^3	161745	163881	167253	170774	187244
Available wood waste for the production of pellets, m^3	133815	134811	136128	136664	150919
The cost of wood waste, UAH/m^3	60.00	66.00	72.60	79.86	87.85
Raw materials, thsd. UAH	8028.90	8897.53	9882.89	10913.99	13257.63
The volume of pellet production, t	19116.43	19258.71	19446.86	19523.43	21559.86
Sales volume, t	19116.43	19258.71	19446.86	19523.43	21559.86
in the domestic market (60 %)	11469.86	11555.23	11668.11	11714.06	12935.91
in foreign markets (40 %)	7646.57	7703.49	7778.74	7809.37	8623.94
Price of 1 t of pellets, UAH: in the domestic market	1700.00	1870.00	2057.00	2262.70	2488.97
in foreign markets	2500.00	2750.00	3025.00	3327.50	3660.25
Revenue from sales of pellets, thsd. UAH	38615.19	42792.87	47532.01	52491.08	63762.89
in the domestic market	19498.76	21608.28	24001.31	26505.40	32197.10
in foreign markets	19116.43	21184.59	23530.70	25985.68	31565.79

Source: author's calculation based on the results of search and analysis of forest and forest products statistics.

Table 4

Main forecast indicators of the project development scenario under the conditions of the moratorium on the export of a conifer round timber

Indicators	Years of project implementation				
	1	2	3	4	5
The volume of logging waste, m^3	25167	26596	27675	28135	31587
The volume of wood processing waste, m^3	198734	215413	237118	276177	315197
Total waste, m^3	223901	242009	264793	304312	346784
Available wood waste for the production of pellets, m^3	195971	212939	233668	270202	310459
The cost of wood waste, UAH/m^3	60.00	66.00	72.60	79.86	87.85
Raw materials, thsd. UAH	11758.26	14053.97	16964.30	21578.33	27272.58
The volume of pellet production, t	27995.86	30419.86	33381.14	38600.29	44351.29
Sales volume, t	27995.86	30419.86	33381.14	38600.29	44351.29
in the domestic market (60 %)	16797.51	18251.91	20028.69	23160.17	26610.77
in foreign markets (40 %)	11198.34	12167.94	13352.46	15440.11	17740.51
Price of 1 t of pellets, UAH: in the domestic market	1700.00	1870.00	2057.00	2262.70	2488.97
in foreign markets	2500.00	2750.00	3025.00	3327.50	3660.25
Revenue from sales of pellets, thsd. UAH	56551.64	67592.92	81590.19	103781.50	131168.13
in the domestic market	28555.78	34131.08	41199.01	52404.52	66233.41
in foreign markets	27995.86	33461.84	40391.18	51376.98	64934.72

Source: author's calculation based on the results of search and analysis of forest and forest products statistics.

Table 5

Main forecast financial indicators of the project development scenario, when there is no moratorium on the export of a conifer round timber, thsd. UAH

Indicators	Years of project implementation				
	1	2	3	4	5
Revenue from the sale of pellets	38615.19	42792.86	47532.00	52491.08	63762.89
Net income from the sale of pellets	32179.32	35660.72	39610.01	43742.57	53135.74
Total costs	78743.75	23884.10	25068.09	26284.26	29401.00
Financial result before tax	-46564.43	11776.62	14541.92	17458.31	23734.74
Income tax	-	2119.79	2617.55	3142.50	4272.25
Net profit (loss)	-46564.43	9656.83	11924.37	14315.82	19462.48
NPV = 7731.99 thsd. UAH					
IRR = 0.06					

Source: author's calculation based on the results of search and analysis of forest and forest products statistics.

Table 6

Main forecast financial indicators of the project development scenario under the moratorium on the export of a conifer round timber, thsd. UAH

Indicators	Years of project implementation				
	1	2	3	4	5
Revenue from the sale of pellets	56551.63	67592.92	81590.19	103781.50	131168.13
Net income from the sale of pellets	47126.36	56327.44	67991.82	86484.58	109306.77
Total costs	84937.26	32005.79	35957.99	42323.04	50047.67
Financial result before tax	-37810.90	24321.65	32033.84	44161.54	59259.11
Income tax	-	4377.90	5766.09	7949.08	10666.64
Net profit (loss)	-37810.90	19943.75	26267.75	36212.46	48592.47
NPV = 53108.82 thsd. UAH					
IRR = 0.62					

Source: author's calculation based on the results of search and analysis of forest and forest products statistics.

The development of PPP on land use in forestry will be essential for the development of the country as a whole, individual region, as well as territorial communities – both rural and large cities and towns. The conceptual principle of participation of territorial communities in this process is the rational use and reproduction of forest resources (as a raw material base and provider of ecosystem services). Another principle is a clear territorial and legal delimitation of the land fund of local territorial communities and the state forest fund.

Conclusions. The use of a comprehensive programme approach and investment in added value chains to ensure sustainable development of rural land use in Ukraine, through the application of the PPP mechanism will contribute to public welfare, food security, rural development, and rational use of natural, and first of all land resources. This is ensured by the fact that PPP projects use market-oriented economic relations of ownership of land and other natural resources, the best available technologies and innovations that meet global standards and priorities of sustainable development.

The authors' calculations show that the role of small agricultural producers,

including households, should be taken into account for stimulating PPP projects in Ukraine, and developing measures to improve the investment climate and justifying new investment opportunities and recommendations for foreign investors. Whereas in Ukraine a significant part of households is involved in agricultural activities and a large part of the rural population works in the family farm. In particular, according to 2018, in the structure of agricultural crop production 98.1 % of potatoes, 85.6 % of vegetables, 78.4 % of fruits and berries are grown by households. In the structure of livestock production 72.6 % of milk, 87.6 % of wool, 98.8 % of honey is produced by households. At the same time, in the production of agricultural crop there are trends in the ratio of production by types of agricultural holdings in 2000, while in the production of livestock products there was a shift in the concentration of meat and egg production from households to agricultural enterprises.

Successful implementation, in particular, of the agri-food value chain in the PPP, will help reducing governmental spendings by attracting private and other capitals, while equitably sharing risks between all parties involved, and effective management of land and other natural resources and ensuring land security in the interests of local rural land users, and on a more global scale, given the versatility of land.

The author's project PPP in the production of pellets a private investor in lumber logging waste provided by some state-owned enterprise both subject to the extension of the moratorium and without its effect is developed. The results of the calculations indicate the investment attractiveness of this project under the established restrictions.

Prospects for further research are the development of proposals for improving institutional support PPP projects on land management and land use and providing security of land use (including the use of land in forestry) in terms of taking into account the land use of farmers.

References

1. Arndt, K., Kormier, K. and Ryazanov, E. (2005), Value added chain management and rural poverty reduction: project experience in Kyrgyzstan. Project «Local Market Development». Kyrgyzstan, available at: https://docplayer.ru/31229891-Upravlenie-cepochkoy-dobavlennoy-stoimosti-i-preodolenie-bednosti-v-selskoy-mestnosti-opyt-proekta-v-kyrgyzstane.html.

2. Bondar, O. (2018), Public administration in the field of land use and protection and state land policy in Ukraine: problems of correlation. *Baltic Journal of Economic Studies,* vol. 4, is. 3, pp. 22–27. https://doi.org/10.30525/2256-0742/2018-4-3-22-27.

3. Cui, F. and Liu, G. (2018), Global value chains and production networks: case studies of Siemens and Huawei. Academic Press, London, United Kingdom.

4. Delmon, J. J. (2010), Understanding options for public-private partnerships in infrastructure: sorting out the forest from the trees: BOT, DBFO, DCMF, concession, lease ... Policy Research working paper; no. WPS 5173, World Bank Washington, DC, available at: http://documents.worldbank.org/curated/en/999661468323693635/Understanding-

options-for-public-private-partnerships-in-infrastructure-sorting-out-the-forest-from-the-trees-BOT-DBFO-DCMF-concession-lease.

5. European Investment Bank (2018), Agriculture and Bioeconomy Programme Loan, available at: http://www.eib.org/attachments/thematic/agriculture_and_bioeconomy_factsheet_en.pdf.

6. Farquharson, E., Torres de Mästle, C., and Yescombe, E. R. (2010), How to engage the private sector in public-private partnerships in emerging markets. The World Bank, Washington DC, USA.

7. Frone, S. and Frone, D. F. (2013), Public-Private Partnerships as Mechanisms for Risk Management in the Water Sector. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development*, vol. 13, no. 3, pp. 103–110.

8. Hamulczuk, M., Makarchuk, O. and Sica, E. (2019), Searching for Market Integration: Evidence from Ukrainian and European Union rapeseed markets. *Land Use Policy*, vol. 87, 104078. https://doi.org/10.1016/j.landusepol.2019.104078.

9. Hermans, F., Geerling-Eiff, F., Potters, J. and Klerkx, L. (2019), Public-Private Partnerships as Systemic Agricultural Innovation Policy Instruments – Assessing Their Contribution to Innovation System Function Dynamics. *NJAS-Wageningen Journal of Life Sciences*, vol. 88, pp. 76–95. https://doi.org/10.1016/j.njas.2018.10.001.

10. Ho, K. L. P., Nguyen, C. N., Adhikari, R., Miles, M. P., and Bonney, L. (2018), Exploring Market Orientation, Innovation, and Financial Performance in Agricultural Value Chains in Emerging Economies. *Journal of Innovation & Knowledge*, vol. 3, is. 3, pp. 154–163. https://doi.org/10.1016/j.jik.2017.03.008.

11. Ho, K. L. P., Nguyen, C. N., Adhikari, R., Miles, M. P., and Bonney, L. (2019), Leveraging innovation knowledge management to create positional advantage in agricultural value chains. *Journal of Innovation & Knowledge*, vol. 4, is. 2, pp. 115–123. https://doi.org/10.1016/j.jik.2017.08.001.

12. Hreshchuk, H. (2019), Efficiency of Land Management Provision of Sustainable Land Use of Agricultural. *Scientific Papers Series «Management, economic engineering in agriculture and rural development»*, vol. 19, is. 3, pp. 275–280.

13. International Bank for Reconstruction and Development, World Bank, Asian Development Bank, and Inter-American Development Bank (2014), Public-Private Partnership Reference Guide: version 2, available at: https://ppp.worldbank.org/public-private-partnership/library/public-private-partnerships-reference-guide-version-20.

14. Khvesyk, M. A. et al. (2013), *Formuvannia modeli upravlinnia pryrodnymy resursamy v rynkovykh umovakh hospodariuvannia* [Formation of a natural resource management model in a market economy conditions], PI IEESD NAS of Ukraine, Kyiv, Ukraine.

15. Kruhlov, V. V. and Tereshchenko, D. A. (2019), Public-private partnership

as tool for developing regional labor potential. *Science and Innovation*, vol. 15, is. 6, pp. 5–13. https://doi.org/10.15407/scin15.06.005.

16. Levochkin, M. (2016), Problems of public-private partnership in Ukraine and ways of solving them. *Baltic Journal of Economic Studies*, vol. 2, is. 2, pp. 85–91. https://doi.org/10.30525/2256-0742/2016-2-2-85-91.

17. Malek, Ž., Tieskens, K. F. and Verburg, P. H. (2019), Explaining the global spatial distribution of organic crop producers. *Agricultural systems*, vol. 176, 102680. https://doi.org/10.1016/j.agsy.2019.102680.

18. Mazur, K. and Tomashuk, I. (2020), Governance and regulation as an indispensable condition for developing the potential of rural areas. *Baltic Journal of Economic Studies*, vol. 5, is. 5, pp. 67–78. https://doi.org/10.30525/2256-0742/2019-5-5-67-78.

19. Mishra, P. K. and Dey, K. (2018), Governance of agricultural value chains: coordination, control and safeguarding. *Journal of Rural Studies*, vol. 64, pp. 135–147. https://doi.org/10.1016/j.jrurstud.2018.09.020.

20. Popov, A. (2016), The formation of institutional environment of agricultural land consolidation in Ukraine. *Baltic Journal of Economic Studies*, vol. 1, is. 2, pp. 128–134. https://doi.org/10.30525/2256-0742/2015-1-2-128-134.

21. Raschio, G. (2017), Land value chains. Global land outlook working paper, UNCCD, available at: https://knowledge.unccd.int/sites/default/files/2018-06/7.%20Land%2BValue%2BChains__G_Raschio.pdf.

22. Rogito, J. M., Makhanu, E., Mombinya, B. K. and Nyamota, G. (2020), Relationship between access to financial services and youth involvement in agricultural value chains in Kakamega county, Kenya. *Agricultural and Resource Economics*, vol. 6, no. 2, pp. 24–36, available at: https://are-journal.com.

23. Rose, D. C. et al. (2019), Integrated farm management for sustainable agriculture: lessons for knowledge exchange and policy. *Land Use Policy*, vol. 81, pp. 834–842. https://doi.org/10.1016/j.landusepol.2018.11.001.

24. Șargo, A. and Timofti, E. (2017), Public-private partnerships – financing instrument of the mechanism of economic growth and development of the agricultural sector. *Scientific Papers Series «Management, economic engineering in agriculture and rural development»*, vol. 17, is. 1, pp. 381–386.

25. Savchuk, O. O. and Liubchych, A. M. (2019), Legislative framework for the deveopment of innovative infrastructure of efficient use and protection of land under forest shelter belt plantations. *Science and Innovation*, vol. 15, is. 3, pp. 5–14. https://doi.org/10.15407/scin15.03.005.

26. State Statistics Service of Ukraine (2019), Statistical Yearbook Agriculture of Ukraine for 2018. Kyiv, available at: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2019/zb/09/Zb_sg_2018%20.pdf.

27. Sturla, A. (2012), Public-Private Partnership as a way to restore forest management. Some evidence from Liguria. *L'Italia Forestale e Montana*, vol. 67, is. 3, pp. 299–309. https://doi.org/10.4129/ifm.2012.3.08.

28. Tarariko, O. H., Ilienko, T. V., Kuchma, T. L. and Novakovska, I. O. (2019),

Satellite agroecological monitoring within the system of sustainable environmental management. *Agricultural science and practice*, vol. 6, no. 1, pp. 18–27. https://doi.org/10.15407/10.15407/agrisp6.01.018.

29. Tretiak, N. A. (2013), *Rozvytok systemy upravlinnia zemelnymy resursamy yak ekonomichnoi funktsii vlasnosti na zemliu* [Development of land management system as an economic function of land ownership], Grin D. S., Kherson, Ukraine.

30. United Nations (2015), Report of the intergovernmental committee of experts on sustainable development financing, available at: http://www.un.org/esa/ffd/wp-content/uploads/2015/03/ICESDF_Ru.pdf.

31. United Nations (2016), Tax cooperation platform: an important step towards strengthening international tax cooperation, available at: https://www.un.org/development/desa/ru/news/financing/collaboration-on-tax.html.

32. United Nations Economic Commission for Europe (2008), A Practical Guide to Good Governance in PPPs, UN, Geneva, Switzerland.

33. van der Zanden, E. H., Verburg, P. H., Schulp, C. J. and Verkerk, P. J. (2017), Trade-offs of European agricultural abandonment. *Land Use Policy*, vol. 62, pp. 290–301. https://doi.org/10.1016/j.landusepol.2017.01.003.

34. The Verkhovna Rada of Ukraine (2005), The Law of Ukraine «On peculiarities of state regulation of entrepreneurial activity related to the sale and export of timber», available at: https://zakon.rada.gov.ua/laws/show/2860-15#Text.

35. Zaharioaie, M. (2012), Appropriate financial instruments for public-private partnership in European union. *Procedia Economics and Finance*, no. 3, pp. 800–805.

36. Zaloznova, Y., Petrova, I. and Trushkina, N. (2016), The classification of forms of public-private partnership: synthesis foreign and domestic experience. *Agricultural and Resource Economics*, vol. 2, no. 3, pp. 88–105, available at: https://are-journal.com.

37. Zapatrina, I. (2018), State support under PPP: new challenges in the context of the un sustainable development goals. *European Procurement & Public Private Partnership Law Review*, vol. 13, is. 4, pp. 326–337. https://doi.org/10.21552/epppl/2018/4/10.

38. Zverev, A. A. (2009), Public-Private Partnership: ways to improve the legal framework. Collection of EBRD Articles, vol. 1, 244 p.

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