

THE EVOLUTION OF LAND RESOURCES AS A PRODUCTION FACTOR

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UDC 334.758.4:338
JEL Classification: Q13; R52

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The Evolution of Land Resources as a Production Factor

The aim of the article is to study the specifics of the evolution of land resources as a factor of production. It is proved that the main idea underlying modern approaches to the use of land resources is that economic subjects involved in the production process are guided by their own interests, which is caused by the maximization of utility of or profit from the available land plots. Thus, production decisions regarding allocation or use of land as a production factor are made in order to maximize profits, taking into account the state of technological development (society, industry), available resources, and government policies. Land resources throughout the entire existence of mankind have played a key role in the life of society, which is determined by national, social, economic, and natural features of the realization of the function of land as a natural object necessary for the functioning of all sectors of the economy, the main means of production and subject of labor in agriculture. The multifunctionality of land resources determines a significant number of theoretical and methodological approaches to their study. Investigating the evolution of land resources as a factor of production from the position of various economics allows distinguishing different views on this economic category. Systematizing the theoretical foundations of the evolution of land resources as a production factor in classical economics made it possible to identify the main theories of development of land relations.

Keywords: agricultural lands, economic theory, evolution, schools of thought, production factor.

DOI: <https://doi.org/10.32983/2222-0712-2019-1-121-127>

Bibl.: 28.

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УДК 334.758.4:338
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Данкевич В. Є., Пивовар П. В., Пивовар А. М.
Еволюція земельних ресурсів як фактора виробництва

Метою статті є вивчення специфіки еволюції земельних ресурсів як фактора виробництва. Обґрунтовано, що основна ідея, яка лежить в основі сучасних підходів до використання земельних ресурсів, полягає в тому, що суб'єкти економіки, які задіяні в процесі виробництва, керуються власними інтересами, що обумовлено максимізацією користності або прибутку з площі наявних земель. Тобто виробничі рішення щодо розподілу або задіяння землі як фактора виробництва приймаються з метою максимізації прибутку з урахуванням стану технологічного розвитку (суспільства, галузі, підприємства), наявних ресурсів і політики держави. Земельні ресурси впродовж усього існування люд-

УДК 334.758.4:338
JEL Classification: Q13; R52

Данкевич В. Е., Пивовар П. В., Пивовар А. Н.
Эволюция земельных ресурсов как фактора производства

Целью статьи является изучение специфики эволюции земельных ресурсов как фактора производства. Обосновано, что основная идея, лежащая в основе современных подходов к использованию земельных ресурсов, заключается в том, что субъекты экономики, которые задействованы в процессе производства, руководствуются собственными интересами, что обусловлено максимизацией полезности или прибыли с площади имеющихся земель. То есть производственные решения по распределению или задействованию земли как фактора производства принимаются с целью максимизации прибыли с учетом состояния технологического развития (общества, отрасли, пред-

ства відігравали ключову роль у житті суспільства, яка визначається національними, соціальними, економічними та природними особливостями реалізації функції землі як природного об'єкта, необхідного для функціонування всіх галузей економіки, основного засобу виробництва та предмета праці у сільському господарстві. Багатофункціональність земельних ресурсів обумовлює значну кількість теоретико-методичних підходів до їх дослідження. Дослідження еволюції розвитку земельних ресурсів як фактора виробництва з позиції різних економічних течій дозволяє виокремити різні погляди на цю економічну категорію. Систематизація теоретичних основ еволюції земельних ресурсів як фактора виробництва у класичних економічних течіях дозволила виокремити основні теорії розвитку земельних відносин.

Ключові слова: сільськогосподарські землі, економічна теорія, еволюція, наукові школи, фактор виробництва.

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приятія), існуючих ресурсів і політики державства. Земельні ресурси в течение всего существования человечества играли ключевую роль в жизни общества, которая определяется национальными, социальными, экономическими и природными особенностями реализации функции земли как природного объекта, необходимого для функционирования всех отраслей экономики, основного средства производства и предмета труда в сельском хозяйстве. Многофункциональность земельных ресурсов обуславливает значительное количество теоретико-методических подходов к их исследованию. Исследование эволюции развития земельных ресурсов как фактора производства с позиции различных экономических течений позволяет выделить разные взгляды на эту экономическую категорию. Систематизация теоретических основ эволюции земельных ресурсов как фактора производства в классических экономических течениях позволила выделить основные теории развития земельных отношений.

Ключевые слова: сельскохозяйственные земли, экономическая теория, эволюция, научные школы, фактор производства.

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From the socioeconomic point of view, land is one of the most important natural resources; therefore, economically and environmentally sound farming which takes into account preservation and reproduction of land fertility requires a theoretical and methodological justification of land relations. The issues of studying the development of land relations under the modern transformational conditions of forming the domestic agricultural land market call for a special theoretical actualization. In this case, a detailed investigation into the evolution of theoretical views on land resources as a production factor as well as analysis of the relevant ideas of various economics is necessary.

The theoretical and methodological basis of the research is the dialectical method of cognition of economic processes, the fundamental principles of modern economic theory, scientific works of domestic and foreign scientists on the evolution of land resources as a production factor. The research methods

applied are scientific methods of cognition based on a systems approach. To achieve the goal set in the article, a number of general and special research methods are used: systems analysis – when describing the theoretical and methodological foundations of land use; abstract and logical method – for clarifying the essence of the basic concepts, definitions, and categories of land use, ownership, and allocation; the method of analogies – when comparing relevant world processes, phenomena, and trends.

Issues of using land resources were studied by classical economists, including F. Quesnay, A. Smith, K. Marx, W. Petty, D. Ricardo, A. R. J. Turgot, J. B. Say, M. Tugan-Baranovsky, A. Chayanov, A. Engelhardt, and others. The theoretical, methodological, and applied justification of economic aspects of the formation and establishment of the market for agricultural land are considered by a wide range of domestic and foreign scientists, namely, V. G. Andreychuk, P. I. Haidutskyi, V. Y. Dankev-

ych, M. I. Malik, V. Ya. Mesel-Veselyak, P. T. Sabluk, M. M. Fedorov, O. M. Shpychak, A. A. Fesyina, V. V. Yurchyshyn, and others. The authors argue that analysis of the economic nature of land as a production factor is necessary to determine features of gaining profit from its economic realization [5, 6, 14, 15, 16, 20]. At the same time, approaches to using land resources in the context of contemporary global challenges remain debatable.

Evolution involves the process of irreversible changes in the structure and functions of a particular system during its historical development, which results in a better adaptation of the system to environmental conditions. In the philosophical sense, evolution is a form of development implying a continuous, gradual quantitative transformation that is a background for a qualitative transformation. Such evolutionary changes occurred in a number of economic spheres, including land relations.

For the first time, land was considered as an object of economic analysis in the theory of French physiocrats. In their opinion, land was the only productive resource, whereas agricultural labor – the only substance for the development and increase of social wealth [1]. These views can be explained by the fact that the development of the theory of physiocrats falls on the period (mid-18th century) when the feudal-agrarian system dominated in France. A characteristic feature of this period was the emergence of a new class of entrepreneurs who were interested in changing the feudal system which limited the development of the economy as well as in the formation of new land economic relations [26].

One of the central places in the formation of the conceptual theory of physiocrats is occupied by the teaching of F. Quesnay on the net product, which is set forth in his famous work the *Economic Table* (1758) [9]. By “net product” the author meant an additional product calculated as the difference between the gross national product and the material costs spent on its creation during the year. According to F. Quesnay, the wealth of nations or pure product was a gift of nature and was formed only in agriculture. The source of the net product was land and labor of people engaged in agricultural production. F. Quesnay, in fact, logically completed the views of W. Petty who believed that labor was the father of material wealth, the earth was its mother [2; 7].

The analysis of land as an object of economic relations was continued by A. Smith. In his work *An Inquiry into the Nature and Causes of the Wealth of Nations* [13], the author stated, “Whoever derives his revenue from a fund which is his own, must draw it either from his labor, from his stock, or from his land. The revenue derived from labor is called wages; that derived from stock, by the person who manages or employs it, is called profit; that derived from it by the person who does not employ it himself, but lends it to another, is called the interest or the use of money. It is the compensation which the borrower pays to the lender, for the profit which he has an opportunity of making by the use of the money. Part of that profit naturally belongs to the borrower, who runs the risk and takes the trouble of employing it, and part to the lender, who affords him the opportunity of making this profit. The revenue which proceeds altogether from land, is called rent, and belongs to the landlord” [13].

A. Smith in his scientific works also emphasized that land rent “enters into the composition of the price of com-

modities in a different way from wages and profit. High or low wages and profit are the causes of high or low price; high or low rent is the effect of it” [13]. For a deeper understanding of this thought, it is necessary to consider the opinion of an opponent of A. Smith – D. Ricardo, who stated that “bread is expensive not because of high rent, but high land rent is because bread is expensive”.

A great contribution to the development of these problems was made by D. Ricardo, who became the founder of the theory of rent. In his works, D. Ricardo defined the rent as “that portion of the produce of the earth which is paid to the landlord for the use of the original and indestructible powers of the soil”. It should be noticed that, according to the author, land rent was a payment for using only land and was different from contractual rent which includes the return on capital spent on increasing the fertility of the land, building support structures, etc. In the process of studying land rent, Ricardo justified its economic nature and revealed patterns of its development. The main idea of Ricardo was that rental relations arose with the establishment of private ownership of land, and it was paid only when two conditions were fulfilled simultaneously:

- 1) the amount of land is limited;
- 2) factors that affect the formation of rent include fertility of land (different natural potential) and different distances between the plots and the markets where the products grown on them can be sold;
- 3) the source of rent is not the bounty of nature but materialized human labor added to it.

The difference between Ricardo's thought and that of Smith is that Ricardo considered rent as an excess of value over the average profit received from land, while Smith considered rent as one of sources of value [4].

A number of new ideas about the role of land as a production factor were presented by J.S. Mill in his work *Principles of Political Economy* [7]. Mill continued the theory developed by D. Ricardo taking into account the competing uses of land for the purposes of agricultural production, extraction, and location of means for processing agricultural products and applying the concept of rent to production as a whole. He singled out components characterizing the best lands: soil quality, location, proximity to water bodies, etc. The combination of all these factors, in his opinion, formed additional income, which was essentially similar to land rent. Moreover, he believed that rent could never enter into the production process as a cost factor. Mill considered land and labor as the main production factors. But later he began to notice the fact that the efficiency of the production process also depended on the stock of goods and the value added that was formed in the process of post-harvesting and processing agricultural products.

Interesting, in our opinion, views on the economic nature of land as a production factor, were formed by Nassau William Senior, who identified the three main agents of public production: labor, natural agents, and knowledge (abstinence) [3]. The natural agents included land, rivers, forests, the ocean, the atmosphere, and physical laws. Within the framework of his theory, capital was neither a factor nor a tool of production but appeared as the result of combining the three agents. Land was the most important of the natural agents, since the possession of it resulted in the possession of the others. But the energy of production (the component that launched the production pro-

cess) was considered knowledge. In his opinion, only knowledge of natural laws could create a profit for its owner [28].

A quite rigorous and socially significant for further development research was conducted by K. Marx. He noted the low efficiency of small landowners and the impossibility of their employing achievements of scientific and technological progress [11]. K. Marx came to the conclusion that the nationalization of the land and the subsequent creation of a state-owned land conglomerate was one of the most effective forms of its use. Although practice has not confirmed his conclusion (e.g., collectivization), but the idea of conglomerating land is now observed in activities of agricultural holdings, concentrating powerful financial and production resources in a single center, which gives them the possibility to use the latest achievements of science (GMO, IT, GIS) and technology (the latest and most powerful equipment of leading world manufacturers). Furthermore, according to Marx's theory, land could not have value, private ownership of land was unnecessary for the economy and caused only a harmful effect both on the processes of development of a country's economic system as a whole and its social order.

In *Capital*, Volume III, K. Marx developed and expounded the theory of ground-rent. According to him, ground-rent expressed the relationship among different classes of bourgeois society: wage-workers, capitalists, and landowners. Capitalist ground-rent was that part of the surplus-value, which remained with the landowner after deducting the average rate of profit on the capital invested which fell into the hands of the capital owner. It is necessary to distinguish between absolute and differential ground-rent. Differential rent is associated with the government land monopoly. This type of rent is a surplus over the average profit and is the difference between the individual price of production with the best and medium plots of land and the price of production formed with the worst plots of land [8].

Differential rent has been the object of research of many scientists. In his writings, K. Marx identified two forms of differential rent: differential rent I and differential rent II. According to him, differential rent I was due to the difference in natural fertility and location of land plots in relation to sales markets. The land plots which were more fertile and more favorably located in relation to sales markets allowed for producing and selling agricultural products at lower costs and, consequently, receiving higher profits. The capitalist who rented land paid this additional profit to the landowner [8].

The representatives of the marginalist school of economic thought (the end of the 19th century), whose ideas are widely used in the analysis of economic processes and laws of marginal value, viewed the land along with other natural resources only in terms of utility of the consumer wealth. But they noticed that, given the fact of limited land resources and an increase in the population of the planet, its price would grow despite a gradual decrease in its fertility. Supporters of the marginalist theory considered capital and labor to be the most important factors of production while ignoring land in general as a category of production [10].

Quite opposite views on land were presented by Johann Heinrich von Thünen, who, in his work *The Isolated State*, used the distance from the city as a central concept. He developed the model of agricultural production around the central (re-

gional) city in an isolated state. The model rests on principles for determining the price or bid rate for land formed on the basis of the profits that farmers receive from products grown on the land plot. As a result of his research, there was elaborated a pattern of concentric rings in which bulky or quickly perishable goods were produced closer to the city where these goods were consumed or processed, and, accordingly, valuable (capital-intensive) or long-term storage goods were produced or grown in areas remote from the city. In the end, von Thünen arrived at the same conclusions as Ricardo did, noting that the differences in soil quality determined the price or rent of land in the same way as its proximity to the central city did.

Classical economists made a significant contribution in the study of land as a factor of production. The primary manifestations of globalization allowed the use of a single measure for assessing efficiency of the production process. It should be noted that these studies considered land as a resource playing a special role. This was due to the limited fertile soils and gradual increase in the population of the planet, and hence the increase in the demand for food products, which were mainly produced from agricultural ones that were grown on land. Also, the elaboration of the fundamentals of the classical economic theory was significantly influenced by the development of industrial machines that demonstrated their effectiveness in agriculture. Representatives of the school developed the basic principles of the depreciation process for a continuous updating of the known today agricultural power machines and aggregates.

Classical economists proposed an aggregate production function, which can be represented as the equation:

$$Y = f(L, K, P),$$

where Y is aggregate output,

L – land,

K – capital,

P – labor.

This classical triad evolved on the ground of the recognition of three categories of participants in the economic process of production – landowners, capitalists (investors), and workers – formed based on the triad of incomes – rent, interest, and wages. A characteristic feature of the classical school of economic thought was considering their relation to values reflected in the product to determine the future price. But, given the large number of publications criticizing this theory, it can be argued that the triad theory was not unanimously accepted [12].

The beginning of the 20th century was characterized by significant changes both in the social and economic structure of many countries of the world. The economic order changed due to significant technological implementations in the production process. A new component of the production process – energy resources (mineral fuels, energy, petroleum products) appeared on the market. All these changes led to the formation of a new economic theory – neoclassical one.

In the framework of neoclassical economics, interesting views on the role of land in the process of social production were formed by scientists from the United States (S. P. Hays [17], J. Martinez-Alier and K. Schlüpmann [21]). Their main idea was to conserve part of the land and maintain the effective use of the rest of it. The reasons for such views were an increase in the population of the country and, as a consequence, an increase in food prices.

During this period, some British economists believed that the main factor in the growth of any economy was interest rate, considering land only as an intermediate resource for further development (H. Hotelling) [19]. In other words, land was regarded as one of partially replaced resources (a certain amount of land (at the entrances to the production process) which could be replaced with an appropriate amount of a fertilizer to obtain the same amount of product at the output).

An important contribution to developing the theory of production and studying the role of land in this process was made by L. Walras [25], who mathematically justified the foundations of economic equilibrium. Walras's ideas were used by V. Pareto, who founded modern welfare economics, in which land was both a resource and public good.

A. Marshall, one of the pioneers of neoclassical economics, agreed the classical principle of cost and the neoclassical principle of marginal productivity. A. Marshall officially introduced the fourth principle of the production process – organization of labor (division of labor and management), while considering land as a full-fledged factor of production. At that time he also introduced a new quasi-rent concept, combining the theory of capital and land. Quasi-rent of A. Marshall was by nature a super-profit, an excess over the normal profit, which was caused by a more or less long-term limitation for using any factors of production in the situation of rising demand and a corresponding increase in prices for products.

An important contribution to studying the development of the role of land as a production factor was made by D. Robinson, who systematized the works of previous researchers on economic importance of land, singling out the role of land rent as a separate theory, considering the studied categories at three levels: that of a society, industry, and individual enterprise [23]. Also, the author justified land rent, which in an economic sense was considered as a surplus that exceeded the transfer price (the minimum earnings necessary for survival of a business entity in a market environment) [11]. In the process of building a production function, Robinson stressed that all factors of production could be divided into four categories, namely: land, labor, capital, and enterprise.

Starting from the second half of the 20th century, in works of economists, land or environmental resources were completely removed from the production function and included into capital or labor. An important role in this process was played by international trade which was based not on resource-intensive products but on capital-intensive ones. A group of scientists (B. Ohlin, E. F. Heckscher) [18, 22] developed the factor proportions theory which explains the scheme of comparative advantages of interstate differences in the relative allocation of the main factors of production – capital and labor. Similarly, R. Solow in his work *A Contribution to the Theory of Economic Growth* did not include land in the production function, which looked as follows:

$$Y = f(K, N),$$

where K is capital,
 N – labor.

But in the later Solow model (1974), exploring the long-term prospects for the development of the economy which uses exhaustible resources, the production function takes the form:

$$Y = f(D, K, N),$$

where D stands for exhaustible resources.

In later studies, scientists reduced the production function only to capital:

$$Y = f(K).$$

A feature of this function is that capital as a production factor includes labor and exhaustible natural resources, since labor productivity is very strongly correlated with investments in work in the form of personnel training and development. Some researchers call this feature an ultimate resource. But along with these views, the scientific direction founded by H. J. Barnett and Ch. Morse, who believed that the main factor of production was knowledge in the form of scientific and technological advancement, gained its further development. In their opinion, knowledge and technological process was an automatic and self-productive phenomenon and obeyed the law of increasing profits [24].

Among domestic scientists who considered issues of land economics under conditions of a market economy, there should be mentioned P. Haidutskiy, M. Harbuz, V. Gorlachuk, A. Danylenko, V. Dankevych, D. Dobriak, S. Doroguntsov, L. Novakovskiy, P. Sabluk, V. Trehobchuk, A. Tretiak, M. Fedorov, and others. In view of recognizing land as one of production factors, the main areas of economic research are: institutionalization of the land market; economic foundations of ecologically safe land use; investment support for land use development; insurance of losses caused to land resources due to deterioration in quality of soil parameters; innovative technologies of land use development which ensure its competitiveness in foreign and domestic markets.

Conclusion. Summing up the results of the development of various schools of economic thought and their studies on land resources, it should be noted that land has been considered from different points of view and included in different subgroups of production factors. The basic idea underlying modern scientific views is that economic subjects involved in the production process are guided by their own interests, which is due to the maximization of utility or profit. Thus, production decisions regarding allocation or use of land as a production factor are made in order to maximize profits, taking into account the state of technological development (society, industry), available resources, and government policies. At the same time, in shaping future concepts of economic theories, it is necessary to take into account that land is a very important factor of production, which is like water and air is exhaustive and can be negatively affected by human activity, which results in a decrease in its quality and quantity.

LITERATURE

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