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MAIN PREREQUISITES FOR STARTING THE DOMESTIC NATURE AND AGRICULTURAL ZONING (SECOND HALF OF THE 19th CENTURY)

The purpose of the article is to analyze the main prerequisites for introducing natural and agricultural zoning on the territory of modern Ukraine. For this purpose, the achievements in the fields of economic analysis and soil science in the 19th century, which were decisive for the development of national science, were analyzed, as well as some achievements of Zemstvo's research works in the field of agriculture were considered. These works involved implementing a comprehensive study of regions in space and time based on historical and geographical studies. The research methodology is based on the principles of historicism, objectivity, systematicity and complexity. General scientific methods (analysis and synthesis, typology), historical (problematic-chronological), and methods of source and archival analysis were involved. It is shown that the results of scientific research in the fields of economic analysis and soil science and scientifically based statistical research in the field of agriculture in the second half of the 19th century became important factors of a new stage in the development of agricultural science. The principal characteristic of scientific research of the new stage was the consideration of the economic and climatic features of individual areas in the region. The work concluded that the main prerequisites for the introduction and formation of natural-agricultural zoning were: scientific achievements of foreign and domestic researchers and scientists in the field

of economic analysis, soil science; generalizing statistical studies of state bodies in the field of agriculture (Department of Agriculture and Rural Industry of the Ministry of Agriculture and State Property, Central Statistical Committee); the thoroughness and prevalence of Zemstvo's statistical works on the study of the current state, features of local agriculture and the analysis of the reasons affecting its state and prospects for its development.

Keywords: natural and agricultural zoning, natural and climatic factors, local economy, soil science, typical areas, regional economy, Zemstvo, Central Statistical Committee.

ОСНОВНІ ПЕРЕДУМОВИ ЗАПОЧАТКУВАННЯ ВІТЧИЗНЯНОГО ПРИРОДНО-СІЛЬСЬКОГОСПОДАРСЬКОГО РАЙОНУВАННЯ (ДРУГА ПОЛОВИНА XIX ст.)

Метою статті є аналіз основних передумов запровадження природно-сільськогосподарського районування на території сучасної України. Розглянуто визначальні для розвитку вітчизняної науки здобутки в галузі економічного аналізу та ґрунтознавства у XIX ст., а також деякі здобутки земських робіт у галузі сільського господарства, які передбачали виконання комплексного дослідження регіонів у просторі та часі на основі історико-географічного вивчення. Методологія дослідження базується на принципах історизму, об'єктивності, системності та комплексності. Залучалися загальнонаукові методи (аналізу та синтезу, типології), історичні (проблемно-хронологічний) та методи джерелознавчого й архівного аналізу. Показано, що результати наукових досліджень у галузях економічного аналізу і ґрунтознавства та науково-обґрунтовані статистичні дослідження в галузі сільського господарства у другій половині XIX ст. стали важливими чинниками досягнення нового щаблю у розвитку сільськогосподарської науки. Особливістю наукових досліджень нового етапу стало врахування економічних та кліматичних особливостей окремих місцевостей у регіоні. В роботі зроблено висновок, що основними передумовами запровадження та становлення природно-сільськогосподарського районування були: наукові здобутки зарубіжних і вітчизняних дослідників та науковців у галузях економічного аналізу, ґрунтознавства; узагальнюючі статистичні дослідження державних органів у галузі сільського господарства (Департаменту землеробства і сільської промисловості Міністерства землеробства та державного майна, Центрального статистичного комітету); ґрунтовність та поширеність земських статистичних досліджень з вивчення наявного стану, особливостей місцевого сільського господарства й аналізу причин, що впливають на його стан і на перспективи його розвитку.

Ключові слова: природно-сільськогосподарське районування, природно-кліматичні фактори, місцеве господарство, ґрунтознавство, типові місцевості, регіональна економіка, земство, Центральний Статистичний Комітет.

Statement of the problem. The rich creative heritage of the results of the activities of various scientific, state, and zemstvo institutions of the 19th century is significant in the formation and development of domestic agricultural science and practice. The introduction of new methods and directions of research by researchers of the 19th century determines the relevance of studying the historical experience of their scientific searches.

The introduction of zoning as a new research approach in the conduct of soil scientific agricultural research and the economic analysis of agriculture in the province allowed scientists and zemstvo researchers to structure and justify the results obtained from the study of natural and climatic conditions and the economy of the province, to indicate the possibilities of a better economic organization of the local economy, to develop a new a toolkit for analyzing the current and prospective state of the region's agricultural industries. The legacy of the results of the activities of the provincial zemstvos in the implementation of agricultural zoning became the basis for modern principles of structuring and understanding the construction of the regional economic system.

The importance of the role of agricultural zoning in solving the multifaceted tasks and needs of modern agricultural science and practice, the lack of relevant historical research led to the choice of the research topic.

Analysis of the latest studies and publications. Among the existing publications on the subject of research, the majority are reports, articles, and messages devoted to the agricultural activities of the institutions of the provincial zemstvos and researchers, where the work was financed by the provincial and district zemstvos, as well as resolutions and reports of state institutions. These

publications provide historical information on soil science research, research by statistical services, and study of natural and climatic factors of localities, where the result is the selection or description of soil, natural and climatic, and economic areas [1-11].

In the work of E. Z. Volkov [12], one can see how the achievements of the Zemstvo and the accomplishments of previous state institutions under the Soviet government were immediately embodied in the idea of allocating regions for more effective organizational and production management of agriculture. In Chapter 4, he considered the problem of zoning agricultural farms for organizational and production management of territories as well as the connection with budget studies.

Among the modern publications, the works [13-20] that dealt with various aspects of the formation of natural and climatic zoning deserve attention. Thus, in the work of A. M. Zubko [13], the study of zemstvo statistical institutions on the issue of the socio-economic development of Ukraine was considered based on the use of typical districts obtained by them. The work of O. A. Makienko [14] considered the concept of «regionalization» in statistical studies of the Kherson zemstvo, which contributed to the development of natural and climatic zoning. In the work of V. V. Sokyrskya [15] studied agricultural economic zoning under the conditions of the formation of the Russian-Ukrainian border in the 20s of the 20th century from the point of view of the need to build the entire country's economy. In the work of O. Drozdov [16], the question of studying the natural and climatic areas of the province in the publications of the Statistical Bureau of the Poltava Provincial Zemstvo was considered. In the work of V. K. Garkavko [17], the foundations in agricultural economics laid by the German scientist Johann Heinrich von Thünen (1783 – 1850) were studied. Their role in forming the regional agricultural economy in analyzing agricultural production was considered. In the work of O. I. Matskiv [18], a study of classical theories of regional economics regarding the

development of metropolitan processes in the country is presented. In the work of T. V. Gaidai [19], the influence of the theory of marginal utility and the ideas of J. von Tünen on domestic economic science in the last third of the 19th century was considered in the context of a historical and economic analysis of the development of the problem of value in domestic and foreign theory. It is shown that the result of the influence was the inclusion in the economic analysis of taking into account (the moment) the limitation of resources and market goods.

In the work of V. A. Vergunov [20], the achievements of Prof. V. I. Kovalevskyi in laying the foundations of agricultural zoning, namely his development of the geographical approach in agriculture, are briefly highlighted.

However, in none of the studies by historians of science, the formation and development of natural-agricultural zoning on Ukrainian lands was not comprehensively studied.

The purpose and tasks of the research. The purpose of this work is to study the use of statistical and economic analysis in the territory of modern Ukraine in the 19th century and the reflection in this analysis of natural and stable economic conditions, the implementation by zemstvos of a complex economic and geographical approach in the study of local agriculture in order to establish the main prerequisites for the formation of domestic natural and agricultural zoning. By the purpose of the study, the following tasks are defined:

- to analyze the coverage of the research topic in scientific sources;
- to find out the historical circumstances that led to the need to introduce zoning in the field of agriculture;
- to find out the scientific basis that led to the possibility of introducing zoning by zemstvos in the performance of agricultural research;
- to determine the features and main directions of Zemstvo works, the results of which were identifying districts and localities for solving practical branch problems.

The object of the presented work is historical and scientific sources that reflect the research activity of provincial and district zemstvos in the territory of modern Ukraine.

Results and discussion. Let's consider the main areas in which the research works of the provincial and county zemstvos for the needs of the region's agriculture were carried out. Based on the results of these works, we will show the contribution of zemstvos to the establishment and development of natural and agricultural zoning on Ukrainian lands.

Since our research concerns the formation and development of zoning as a scientific direction, we will recall the works of foreign and domestic scientists of the 19th century, which became the starting point in the formation of zoning ideas. This is a study by J. von Thunen «An isolated state in its relation to agriculture and the national economy», which had a significant impact on domestic economic science [19]. The theory of the location of agriculture presented in this work by J. von Thunen proved the profitability of using various options for the location of agriculture in an «isolated state» relative to a large city, which was considered as a single market for products. The introduction into economic analysis of considering the limitations of resources and market goods provided further development of economic analysis, and the influence on domestic economic science at the end of the 19th century brought its theoretical development into line with the leading world trends in economic science [17]. In addition, the development of statistics as a science and the inclusion of statistical analysis methods in the performance of economic analysis have inextricably linked statistical analysis with economic theory since the 19th century.

Droughts that caused significant damage to agriculture and a general decline in crop yields due to soil depletion prompted both the state and local levels to search for ways to achieve food security. Research into ways to obtain sustainable crop yields

prompted the state to create the Statistical Committee (1852) (based on the statistical department under the Ministry of Internal Affairs of the Russian Empire organized in 1834 and was transformed into the Central Statistical Committee in 1858) and later the sectoral ministry - Ministry of Agriculture and State Property (1894) [1]. The Central Statistical Committee for work performance had the Statistical Department, the Economic Department and the Zemsky Department. Various documentary information and information collected by provincial statistical committees (subordinate to the Committee) were used in the work of these departments. In 1861, the Zemstvo department was separated into a separate institution. His tasks became issues of land and the economic structure of the state [1].

As is known from historical sources [1, 12], the Committee took care of state work on economic and population statistics, processed, analyzed and published information received from provincial, regional and city statistical committees. It also prepared data for the distribution of land duties. Since 1866, the Central Statistical Committee has published the obtained information in the collection «Statisticheskiiy vremennyk Rossiiskoi imperii». According to land use statistics, since 1877, the Committee has carried out censuses of land ownership, taking into account the distribution by categories of ownership and the land fund by land. Such censuses were prompted by the need to compile data from land use statistics for the European part of the country, which was obtained by the Department of Agriculture and Rural Industries of the Ministry of Agriculture and State Property. In 1881, according to land use statistics, the Committee, for the first time, collected and organized information taking into account the distribution of arable land by various crops and recorded the sown areas by crops with the calculation of the yield level per unit area. This provided new data on crops and cultivated crop yields and made organizing harvest statistics possible. Since 1883, its management was started for 49 provinces [21]. Since 1881, the Department of Agriculture and Rural Industry of the Ministry of Agriculture and State

Property began to collect statistical data on harvests, but these materials related to the yield of crops on the allotment and privately owned lands.

Since 1884, the Department of Agriculture and Rural Industry has been publishing statistical harvest compilations based on the agricultural year's results. The founder of this series of publications was Prof. V. I. Kovalevsky, who not only participated in soil research under the leadership of V. V. Dokuchaev, but also analyzed statistical data for various provinces of the European part of the country from the north to the south [20]. Based on the performed analysis, he indicated the dependence of the duration of the vegetation period of grain crops on latitude and longitude. The corresponding conclusions, which later came to be known as Kovalevsky's law, were published by him in 1884 in his report «On the duration of the growing season of cultivated plants depending on the latitude and longitude of the place» to the St. Petersburg Society of Naturalists. Based on the results of these studies, he concluded that it is necessary to create and develop a network of agricultural research institutions specifically by natural and climatic zones.

The Central Statistical Committee's use of various data on land ownership statistics (collected by provincial statistical committees under the committee's leadership) necessitated the involvement of zemstvo institutions in collecting information. But for the zemstvo itself, in order to fulfill its tasks, the study of the local economy in Chernihiv, Poltava, and later Kherson and other gubernias required data that the Committee and the Ministry of Agriculture did not collect. Therefore, the resolution of tasks by the zemstvo to describe the socio-economic life of the province was reproduced in the conduct of its own statistical and economic research on crop production, population, etc.

At the end of the 19th century, state bodies and zemstvos achieved a transition in their research from the task of simply collecting a sufficient number and quality of accounting data for studying the economic life and state of the provinces, the economic

structure of the state estates of the Western provinces to the task of increasing the efficiency of the local economy by considering the relevant set of statistical data [22]. Statistical accounting of farms (estates, peasant farms, etc.) was carried out within the general economic characteristics of the respective provinces. When performing accounting, the division of land according to different areas and types of crops, yield of grain and straw, industries, etc. was considered. A similar approach, taking into account the natural-geographical and social-living conditions, features of production resources, was also used by zemstvos in carrying out statistical-evaluative and descriptive works in the provinces on Ukrainian lands. The Zemskyi method provided for a comprehensive study of the region in space and time based on historical and geographical study. The development of the historical-geographical approach in agriculture contributed to the further development of natural-agricultural zoning for the construction of a regional economic system.

The increase in the scale and number of economic-statistical works and research in the agrarian field in the second half of the 19th century, which state institutions and zemstvo institutions carried out, contributed to the strengthening of their analytical character, since all research strictly adhered to scientific foundations. Zemstvo soil and climate studies were of great importance in the development of agricultural zoning. Thus, according to the results of the soil and climate study in the Yekaterinoslav province, which is relatively homogeneous in terms of soil, agricultural, and climatic conditions, 8 types of soil areas and 3 climatic layers were identified only for the Katerynoslav county [22].

As a result of conducting the first Zemstvo soil science studies based on statistical data, soil maps of counties of Chernihiv province were obtained. The maps showed a diverse and complex distribution of soils in the province (although only 4 types of soils were identified). In addition, even in the very first studied county, Novozybkivskyi, the zemstvo statisticians explained the obtained statistical values of

average yields with the available type of soils. Subsequently, for the entire Chernihiv province, the zemstvo statisticians grouped the yield data by the identified soil bands and obtained the average yield of all four types of soils by counties. Using the results of the research of soil scientist V.V. Dokuchaev, who was invited by the zemstvo, statisticians studied the territorial distribution of soils in other counties of the province. In Kozeletsk County, the zemstvo statisticians identified 6 main types of soils, described their general characteristics and determined their territorial distribution, in Konotopsky County – identified 3 types of soils and corresponding soil areas [4, 23].

The results of soil scientists' study of the soils of the Poltava province influenced the zemstvo statisticians' statistical studies. According to information about the soil type and other soil characteristics, they distinguished strips and districts in the province's counties. For example, in the Myrhorod county, they identified three strips along the direction of the Psel and Khorol rivers, and according to the general nature of the area, they identified 4 districts [1, 5]. Due to the presence of different quality soils (according to the research of V. V. Dokuchaev and M. I. Arandarenko), they also identified 4 natural areas in the Kremenchug county [1, 5]. Further research by V. V. Dokuchaev in other counties [1, 5, 6] allowed them to statistically confirm that the type of soil significantly impacts the farming system and crop rotation. Based on the natural and soil characteristics of the localities, before 1900, statisticians identified 26 districts in the province and built a district-by-district map of the province [6]. The resulting map fully corresponded to the hypsometric and soil maps from the studies of Prof. V.V. Dokuchaev [6].

However, since the main tasks of the zemstvo included issues of correct taxation, the zemstvo studied in detail the general economic conditions of agricultural production. When determining the profitability of the exploitation of natural resources, the zemstvo of Chernihiv province considered natural-geographical, social-household, economic and business characteristics (for example, land productivity, information on

land, rental prices, production costs). The division into classes according to the natural and economic conditions of the investigated farms in the counties gradually led to the study of territorial distribution, and then to the selection of typical districts according to the signs of natural and economic conditions. And a statistical study of the distribution of spring crops by main crops allowed zemstvo statisticians to carry out economic zoning of crops in the province, taking into account the type of soil [6].

In the Poltava province, the zemstvo statisticians divided into natural areas according to the ratio of lands [6]. They identified 26 districts of three types (food, fodder, construction) for a more accurate economic study of the province [6]. Almost 20 years later, using information on the proportions of grain crops that simultaneously reflected natural and economic conditions, another province division into seeded areas was developed and 49 seeded areas were identified [3].

In the Kyiv, Volyn, and Podil provinces, the allocation of districts on economic grounds took place at the beginning of the 20th century by T. I. Osadchii [24]. The resulting division was based on using a geographical approach in agriculture and on the experience of zemstvos of other Ukrainian provinces.

In the formation and development of natural-agricultural zoning on Ukrainian lands, the research of Zemstvo expeditions (1882-1916) in the Poltava, Chernihiv, and Podil provinces played a major role, the results of which were partially included in V. V. Dokuchaev's work «Our Steppes Then and Now» (1892) and to research on physical and geographical zoning. The growing study of natural conditions, in-depth knowledge of the differences in the nature of individual parts of a large territory contributed to obtaining more profound results of the researches of Zemstvo statisticians. And since the natural and economic conditions of the regions of the Poltava province were best studied in the zemstvo statistical studies, significant results were also obtained in the implementation of the economic-geographical methodology in this province.

Therefore, the results of the Zemstvo work on agricultural statistics significantly contributed to the formation of natural-agricultural zoning and the implementation of its methods, since the division of districts was based on the results of local research and statistical works. From the published results of such works in Chernihiv, Poltava, Kherson, Kharkiv and other provinces, it is possible to obtain information about the allocation of soil areas, methods of taking into account the cartographic distribution of soils in determining yields, etc. In reviews based on the results of current statistics for counties and provinces, information is provided on the allocation of natural areas based on the Zemstvo surveys for a detailed study of the natural and climatic conditions of the territories. Adoption of an approach in its activities by zemstvo institutions in the territory of modern Ukraine, which comprehensively took into account the specifics of the natural-geographical, social-living and other conditions of life of the local population, the peculiarities of local production resources, contributed to the study of the current state and development prospects of the selected region in the spatial-temporal dimension. This, in turn, led to a complex economic and geographical survey of local agriculture and issues of its territorial organization, which manifested itself in the study of soils, productivity, structure of arable land, proportions of crops, climate and the selection of different types of districts (soil, crop, economic and economic), which were a reflection of natural and stable economic conditions.

The study by statisticians of the zemstvos of soil, physical-geographic and ethnographic conditions, conditions of sale of agricultural products, types of farms, as well as the implementation of divisions into specific localities based on selected characteristics, led the provincial zemstvos to justify the importance of zoning and the need to study the chosen areas. They concluded that without detailed knowledge of the statistical-economic and all economic-agronomic conditions of the region, the research may be unnecessary, since a preliminary study of the region must condition it.

Conclusion. It is shown that the following factors were the main prerequisites for the initiation of natural-agricultural zoning on Ukrainian lands:

- scientific achievements of foreign and domestic researchers and scientists in the field of economic analysis, soil science;

- research statistical works of state institutions (Department of Agriculture and Rural Industry of the Ministry of Agriculture and State Property, Central Statistical Committee);

- research statistical works of provincial and county zemstvos on the study of the state and prospects for the development of local agriculture.

The specified factors in the general complex formed a powerful basis for implementing multi-faceted zoning, which contributed to solving practical and scientific branch problems.

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