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**STATISTICAL STUDIES OF ZEMSTVOS OF THE TERRITORY OF MODERN UKRAINE FOR THE DEVELOPMENT OF AGRICULTURAL SCIENCE (THE SECOND HALF OF THE 19th CENTURY – 1918)**

**Abstract.** *The purpose of publication is to analyze the experience and achievements of agricultural statistics of the provincial zemstvos of the territory of modern Ukraine and to clarify their significance for modern branches of agrarian science. The research methodology is based on the principles of historicism, objectivity, systematicity and complexity. There have been used general scientific methods (analysis, synthesis, typology), historical (periodization, problem-chronological) and methods of source and archival analysis. The Scientific Novelty.* The research by provincial statisticians led to results that became important factors in the rapid development of agricultural science at the beginning of the 20th century, contributed to the achievement of a qualitatively higher level of practical development of the region's agriculture and the development of a local type of intensive agricultural system. The presented work reveals and summarizes the main achievements of provincial statisticians in the territory of modern Ukraine in the main fields of agrarian science. **The Conclusion.** There have been illustrated the following issues: the application of statistics, as the latest scientific methodology, in

agricultural research allowed the zemstvo institutions to analyze and justify the results, to set and solve new actual practical tasks. There has been analyzed the experience of the statistical works of provincial zemstvos of modern Ukraine territory in the agricultural sector; has been found out their significance for modern branches of agrarian science and identified the main stages of their activity in the study of agriculture in the region. This led to the conclusion that the statistical institutions of the zemstvos have turned into scientific institutions in their activities. It has been determined that the search by provincial statisticians for new research methods to achieve a qualitatively higher level of development of the region's agriculture, based on adherence to scientific methodologies, got to outstanding scientific results. The achievements of Zemstvo statisticians in the fields of soil science, agriculture, agronomy, crop production, research work, and agricultural economics establish the power of Zemstvo statistics in shaping directions of research in various branches of agrarian science and prove the importance of the contribution of statistical research to the development of agrarian science.

**Key words:** accounting and statistical works, land use statistics, continuous observation, average values, zemstvo statisticians.

## СТАТИСТИЧНІ ДОСЛІДЖЕННЯ ЗЕМСТВ ТЕРИТОРІЇ СУЧАСНОЇ УКРАЇНИ ДЛЯ РОЗВИТКУ АГРАРНОЇ НАУКИ (ДРУГА ПОЛОВИНА XIX ст. – 1918 р.)

**Анотація.** Метою статті є аналіз досвіду та досягнень сільськогосподарської статистики губернських земств території сучасної України і з'ясування їх значення для сучасних галузей аграрної науки. **Методологія дослідження** базується на принципах історизму, об'єктивності, системності та комплексності. Залучалися загальнонаукові методи (аналіз, синтез, типологія), історичні (періодизація, проблемно-хронологічний) та методи джерелознавчого й архівного аналізу. **Наукова новизна.** Дослідження губернських статистів привели до результатів, які стали важливими чинниками бурхливого розвитку сільськогосподарської науки на початку XX ст., сприяли досягненню якісно вищого рівня практичного розвитку сільського господарства краю та розвитку місцевого типу інтенсивної системи землеробства. Пропонована робота розкриває та узагальнює основні досягнення губернських статистів на території сучасної України в основних галузях аграрної науки. **Висновки.** Показано, що застосування статистики як новітньої наукової методології в сільськогосподарських дослідженнях дало змогу земським установам аналізувати й обґрунтовувати результати, ставити і розв'язувати нові актуальні практичні завдання. Проаналізовано досвід статистичних робіт губернських земств на території сучасної України в аграрному секторі, з'ясовано їхнє значення для сучасних галузей аграрної науки, визначено основні етапи їх діяльності у вивченні сільського господарства регіону. Це дало підставу для висновку, що статистичні установи земств у своїй діяльності перетворилися на наукові установи. Ми показали, що пошук обласними статистиками нових методів дослідження для досягнення якісно вищого рівня розвитку сільського господарства регіону, заснованих на дотриманні наукових методологій, дав видатні наукові результати. Досягнення земських статистиків у галузі ґрунтознавства, землеробства, агрономії, рослинництва, науково-дослідної справи та економіки сільського господарства встановлюють потужну роль земської статистики у формуванні напрямів досліджень у різних галузях аграрної науки, доводять важливість внеску статистичних досліджень у розвиток аграрної науки.

**Ключові слова:** обліково-статистичні роботи, статистика землекористування, суцільне спостереження, середні значення, земські статистики.

**The Problem Statement.** For our country, as well as for many European countries, the level of agriculture plays an important role in the society development. Even in the imperial era, under the conditions of a great variety of forms of private ownership of land, the government's tasks always included issues aimed at developing measures to promote or help the owners to achieve a higher productivity in the leading branches of agriculture. However, to provide effective decisions, state institutions and zemstvos needed reliable statistical information. The provincial zemstvos, which performed the functions of local self-

government bodies, organized collection, processing and analysis of data on the agricultural life of the provinces. They studied the state and drew conclusions about the development prospects of localities. To study agricultural life, zemstvos established statistical institutions, which carried out special studies according to their own developed programmes based on the latest scientific achievements. Statisticians did research on methods of increasing the productivity of agricultural industries, worked on scientific substantiation of methodological problems and provided a scientific support for industry research.

Today, in the search of modern solutions to support an effective functioning and further development of agricultural science, the study of historical experience, initiatives and achievements of statistical institutions of provincial and district zemstvos on the Ukrainian lands is relevant. The importance of statistical methods for modern methodology of agricultural research also determines the relevance of studying the historical experience of their implementation in a general development of agricultural science.

Significance of statistical methods for the needs of modern agricultural science and practice, fragmentation of relevant historical research led to the choice of the topic of the presented paper.

**The Analysis of Recent Research and Publications.** Many researchers from the end of the 19th century to the present day studied statistical works of provincial zemstvos on the territory of modern Ukraine. The first to be published at the end of the 19th – the beginning of the 20th century were generalizing works (Veletsckyi, 1894; Veletsckyi, 1899; Rusov, 1914) and popularizing works (Sbornik Khersonskogo zemstva, 1890; Kasperov, 1890) of the statisticians about the performed statistical research.

With the weakening of the pressure of the Soviet authorities, interest in studying the activities of provincial and district zemstvos as local self-government bodies was renewed. A. M. Zubko (1988) studied the research of zemstvo statistical institutions on the issue of socio-economic development of Ukraine.

During the years of Ukrainian independence, numerous scientific publications appeared in which researchers tried to impartially analyze the development and achievements of national scientific thought. O. A. Makiyenko (2002) studied the organization and activity of the statistical bureau of the Kherson Zemstvo. O. O. Petrov (2002) studied the organizational aspects and general activity of statistical institutions of the Katerynoslav Zemstvo. V. V. Bobkov (2003) studied the historical aspects of statistical research in the Tavrichna province. V. A. Kulikov (2004) considered general aspects of zemstvo agrarian statistics in Kharkiv province. L. M. Mekshun (2008) studied the activities of statisticians of the Chernihiv provincial zemstvo in the field of public education. N. A. Doroshok (2013) studied the historical and regional aspects of the statistical activity of the Chernihiv provincial zemstvo. T. Kuznets (2022) carried out a superficial analysis of published information on current statistics (namely, weather conditions, yield and grain prices) in the Uman county and tried to trace the peculiarities of grain farming in the region, but her research needs further development and deepening.

E. V. Halytska (2019) reviewed the outstanding figures of statisticians of provincial and district zemstvos and their activities on Ukrainian lands. V. Shandra (2020) showed the role of the zemstvo as an institution of local self-government and the importance of engaging specialists (statisticians, agronomists) for professional performance of work in provinces. V. A. Vergunov (2022) determined the issue of statistics which played an important role in the formation and development of agricultural experimental work. M. S. Poedynok (Poedynok, 2014a;

Poedynok, 2014b; Poedynok, 2015) studied the agrarian statistical activity of zemstvos in Chernihiv, Poltava, Kharkiv and Kherson provinces, analyzed the evolution of statistical research, but his periodization of formation and development of agricultural statistical activity of Kherson zemstvo provinces needs clarification.

However, a meaningful analysis of zemstvo statistics achievements in the field of agriculture, establishing their contribution to various branches of modern agricultural science has not been done yet.

**The purpose of the article** is to analyze the experience and achievements of agricultural statistics of provincial zemstvos of the territory of modern Ukraine and to clarify their significance for modern branches of agrarian science.

The subject of the research of this work is the results of statistical work in the field of agriculture performed by provincial and district zemstvos of the territory of modern Ukraine. Taking into account the fact that the main achievements in agricultural statistics were obtained by zemstvo institutions of Chernihiv, Poltava, Kherson and Kharkiv provinces, in the work we rely only on the results of zemstvo statisticians' work of these provinces.

**The Results of the Research.** The main source of funds for the activity of zemstvo institutions, as is known, were local fees, which were collected taking into account the value of real estate and its profitability. For this, zemstvos needed statistical data on local farms, which the Central Statistical Committee did not receive. Since zemstvos had the right to invite specialists (statisticians, agronomists, etc.) for their activities, if funds were available, they began to create their own statistical institutions and to invite statisticians to collect and develop information.

In the 70s of the 19th century, the country's population lived mainly in rural areas or small towns and lived off agriculture, which was the leading branch of the economy. That is why, in their research zemstvo statisticians focused on the agricultural sector, and the provincial zemstvos recognized that the level of development of agrarian practice is of great importance to a further development of society.

It is generally accepted that Chernihiv provincial zemstvo was the first zemstvo on the territory of modern Ukraine, which organized a statistical bureau (1876) (the fact that Kherson provincial zemstvo established a statistical bureau back in 1873 is not taken into account, since the bureau never became operational). Although its activity was interrupted in 1878 – 1880, Chernihiv immediately became one of the main centres of land statistics in imperial Russia. Numerous scientific and historical studies confirmed this conclusion. They consider the activities of the Zemstvo Statistical Bureau of Chernihiv province in terms of demographic (Mekshun, 2000), educational (Mekshun, 2003), agricultural (Poedynok, 2014a) and other directions.

Report of the member of the Administration N. A. Konstantinovich (1876) contains information on the following facts: in 1876 the statistical department began its work with the study of existing programmes and methods of collecting statistical information. Statisticians chose the system of indicators developed in the work of M. I. Sieber Experience of the statistical and economic data collection programme (1875) for the implementation of the balance method and the grouping method. He pointed out that the first research programmes of the department were drawn up and the first description was made according to the methodology of M. I. Zieber. The main method of collecting information was the expeditionary method, data were collected by seconded statisticians for small territorial units (dachas). Before the expedition surveys, the territory of the description was divided into strips and sections. Statisticians used direct

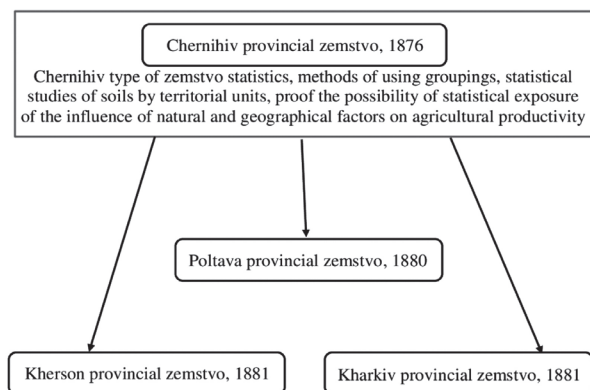
observation, surveys and documented records (in counties councils, zemstvo administrations, etc.). Already in 1877, the first research results were published (Proceedings of the Statistical Department, 1877). They contained descriptions of land ownership in Saltykovo-Divvytska, Redkivska and Dovzhytska counties. Subsequently, descriptions of Chernihiv, Borzhnyn, Nizhyn and Novozybkiv counties were obtained. The issue of land ownership, namely the quantity and quality of land, was the focus of statisticians' research, therefore, in 1881, a generalizing Agricultural programme adapted to the collection of agricultural agreements compiled by P. P. Chervinsky (Chervinsky, 1881) was published.

Descriptions by counties made it possible to compare them and obtain a summary description for the entire province. They surveyed land, soils, climate, etc.

In the description of the Novozybkiv county, V. E. Varzer (Materialy, 1880) first carried out a statistical study of soils. The results of his research allowed O. P. Shlykevych to make a map of the province's soils. O. O. Rusov (Rusov, 1914) claimed that the descriptions of Novozybkivsky and Ostersky counties by V. E. Varzer were considered as a model for conducting evaluation and statistical work. Characteristic for the presentation of the research results of Chernihiv statisticians was a single structure of division into sections: Territory and Population, Land Ownership and Agriculture, Agricultural Lands and their Productivity, Summary of Estimated Data. They contained statistical data on the classification and methods of land use, assessment of the influence of soil quality, farming systems, meteorological phenomena on the dynamics of crop yields, determination of the degree of profitability of natural resource exploitation. The last section had indicators for assessing the profitability of land property based on land productivity, rental prices, production costs, etc.

The approach developed by statisticians took into account natural, geographical, social, living and other conditions with the peculiarities of regional production resources. It envisaged a comprehensive study of a separate region in space and time. The results of such approach were the proof of ability to reveal the impact of natural and geographical factors on the productivity of agriculture and formed the Chernihiv type of statistics.

The achievements of zemstvo statisticians of Chernihiv province and the research needs of the province inspired the zemstvos of Poltava, Kherson and Kharkiv provinces to create their own statistical institutions (Fig. 1). They took into account both the experience of Chernihiv zemstvo statisticians and local features of the province.



**Fig. 1. Inheritance of statistical institutions of provincial zemstvos**

The fragmentation of farms and increased plowing led to the impossibility of proper farming. Therefore, soil depletion was characteristic of all provinces. The question arose of finding ways to increase land productivity. That is why, the zemstvos established statistical institutions in the provinces. The Poltava provincial zemstvo together with the Poltava agricultural society established a statistical bureau (1880), Kherson – statistical bureau (1881), Kharkiv – statistical committee (1881). From the beginning of 1882, active work of zemstvo statisticians began in almost all provinces, from that time the active development and establishment of zemstvo statistical institutions took place.

V. Bortnikov & Ya. Yarosh (2022) showed the reasons behind the lag of Volhynia, Podilska, and Kyiv provinces in the development of zemstvo institutions. This delay did not allow zemstvos of these provinces to carry out statistical work for their own needs until the beginning of the 20th century.

As for other zemstvos in the territory of modern Ukraine, it should be noted that statistical institutions in them were created later and were poorly financed. Therefore, the zemstvos sometimes took data obtained by the Central Statistical Committee, which were collected by the police and county administrations and often did not meet the needs of the zemstvos (this, for example, happened in the Kyiv, Volyn, and Podolsk provinces (Osadchy, 1899)). The Statistical Bureau of the Tavriysk Provincial Zemstvo also initially took information from official statistical publications (the Central Statistical Committee, the Department of Agriculture and Rural Industry), some scarcely available works (Werner, 1889). But the statistics of Tavria province under the leadership of K. A. Werner received a fairly complete picture of the region. Later, they also collected data independently. Focusing on the work of statisticians in the Kherson, Poltava and Chernihiv provinces, they compared the territories of the province according to fluctuations in the average monthly temperature, precipitation, etc.

The Statistical Bureau of the Katerynoslav provincial zemstvo began to carry out surveys from the second half of the 1890s. At the end of the 1890s, its statisticians used forms for information on crops and grain harvests for the agricultural year, made according to the model of the forms of the Kaluha statistical bureau. The forms were sent to the county administrations, village elders, and landowners (Statistiko-ekonomicheskij obzor, 1898). At the end of the 1890s, seconded persons also collected some data. However, the information was developed by the statistical department, which in 1897 consisted of one statistician. The same situation with the number of employees of the statistical department took place in the Kyiv province, where a statistical department with 3 employees was established only in 1910 (Sbornik statisticheskikh svedenij, 1910). As a result of a constant poor financing of statistical work by the provincial administration, Kyiv province was the worst examined. Almost until 1910, there was no statistical soil survey in it. A completely different situation occurred in the provinces selected by us for consideration.

According to the characteristics of the terrain and soil, the statisticians of Chernihiv province introduced a division into natural districts. Areas of counties were divided into strips and districts. Much attention was paid to the study of the province soils. Taking into account the heterogeneity of soils in the provinces, soil maps were created based on statistical studies. These maps were further refined. According to the results of the research of Novozybkivsky county in 1880 statisticians created a new map of the county's soils, which more clearly substantiated harvest conclusions (Materialy, 1880). Using the scientific developments of V. V. Dokuchaev, statisticians of the Chernihiv Region conducted a study of the soils of the province and based on it, identified six main types of soils of the province, obtained their



characteristics and determined the territorial distribution (Materialy, 1882). Moreover, the performed statistical studies of the soil allowed the statisticians of the Chernihiv region to draw up a map of the province's soils in the 1 verst scale (Table 1). The statisticians of the Chernihiv province indicated: "the diversity of soils and terrains requires more microscopic studies" (SAKhr, f. 5, d. 1, c. 63, p. 3). Therefore, in the provinces with a greater diversity of soils, they obtained more detailed soil maps. Statisticians of the Poltava region took into account characteristics from soil studies by V. V. Dokuchaev and M. I. Arandarenko when creating own soil maps (Statistiko-ekonomicheskij obzor, 1888) (Table 1). This allowed them to be the first to show the distribution of land and moisture supply for districts based on the characteristic features inherent in a specific county. Statisticians of the Poltava province, based on soil characteristics and measurement data for the 26 districts into which they divided the province, carried out zoning into food, fodder and construction districts, developed a map of the province. The resulting map corresponded very precisely to the existing soil distribution and geological structure in the province (Table 2). Statisticians of the Kharkiv Provincial Zemstvo carried out a land description using the classification of soils with physical and chemical characteristics (Kasperov, 1890) (Table 1).

In the description of the Borzna county (Materialy, 1877), the statistics of the Chernihiv province obtained the characteristics of the soils from the point of view of productivity, as well as the influence of climatic conditions on productivity. This gave them the opportunity to establish the general trend of dependence of soil productivity on precipitation in the district.

At the beginning of the 1890s, statisticians began to analyze the distribution of precipitation, average temperatures and other factors. Initially, as, for example, in the description of Lokhvytsky county of Poltava province, distributions of precipitation and average temperatures (for 15 years) were studied only based on the information of correspondents (Statistiko-ekonomicheskij obzor, 1892). Information from correspondents mainly contained qualitative characteristics. Subsequently, with the emergence of weather stations, more and more data from weather stations were involved in the analysis. At the beginning of the 1890s, the issue of the correct setting of meteorological observations was considered by the statisticians of the Poltava province. Statisticians immediately drew attention to the need for data from a sufficient number and evenly distributed weather stations. Based on meteorological data, statistics also compiled descriptions for long periods. Thus, the statistician Baranovych, in the description of Lokhvytsky county of the Poltava province, compiled a statistical description of spring and autumn in the district based on twenty-year meteorological observations (Digital data, 1899).

The statisticians of the Kherson region used the data of 2 meteorological observatories (temperature and precipitation) in the description of the first district (Odesa county) and calculated the monthly average, monthly maximum and minimum, seasonal averages and annual averages. Based on observations for 16 years, they presented the general characteristics of the climate in the county. In 1885 – 1891, the statisticians of the Kherson region provided information on precipitation in the district based on the data of 17 rain gauge stations, obtained the monthly average and average for each year and analyzed the distribution (Poedynok, 2014b).

The economic description of the Volchansky county of the Kharkiv province by statistician I. Klingen (1882) included a geographical description of the district, water resources and soil moisture, soils, geological structure, climatic characteristics of the district (long-term temperature measurements, winds, precipitation and their distribution throughout the year, climatic features, etc.) (Klingen, 1882). In the description, the statistician first paid attention

to the movement of heat in the soil and its distribution by periods of the year (Table 1). I. Klingen (Klingen, 1882) pointed out the usefulness of studying the dependence between the time of ripening of grain plants at different points, under relatively similar soil and topographical conditions, and the amount of heat and moisture received at the corresponding time (Table 2). However, he limited himself only to setting the problem.

In order to obtain correct statistical characteristics in each county, the statisticians considered the structure of land ownership and the distribution of land by agricultural land for farms of different ownership types and sizes. The zemstvo statisticians of the Poltava province began to provide characteristics of farm types by categories of their capacity (Table 2). From the obtained values of arable areas for peasant farms, the statisticians of the Poltava region came to the conclusion about the need to use more intensive systems than the three-field system and a conclusion about the need for harvesting fodder for livestock based on the introduction of grass seeding, root crop cultivation, and corn sowing (Veletsckyi, 1899) (Table 1). Statisticians of the bureau studied the relationship between the farming system and natural conditions, began studying the main places of crops, respectively, their predecessors, the time of sowing, crop rotations in tilled and tilled-free farming systems. They began to do research on usefulness of soil fertilization and showed the consequences of irregular crop rotation.

As a next step, the statisticians of the Chernihiv Zemstvo began to use more precise settings of the method of determining the amount of yield, mandatory accurate recording of soil and climatic data affecting productivity of the land of the studied dacha, accurate determination of crops proportion (Rusov, 1914).

In those times, the concept of land productivity was widely used, which influenced the assessment of land. That is why, the statisticians conducted research on determining the yield of fields. Thus, in the first descriptions of the counties, the Kherson statisticians received gradations of productivity levels for the tithes of the same field depending on the year of cultivation of this field (attention was not paid to the soil quality, if it was considered uniform in the county). They paid attention to the economic system, which determined the different land productivity. This approach caused difficulties in determining the average productivity of the land in the presence of the influence of climate features. However, statisticians showed that in order to determine the average productivity of land in the county, it is necessary to have observations and accurate records for at least 10 years for all crops grown in different points of the county (Table 2). In the description of the last county (Kherson county) there was a sufficient amount of data to determine the average yields (Statisticheskoe Otdelenie, 1890) but with the introduction of constant use of fertilizers, the statisticians of the Chernihiv province showed the needlessness of the concept of natural land productivity.

Due to the action of natural factors, each province was characterized by a large unevenness of the obtained harvests by districts and even individual fields. Therefore, statisticians of all provinces studied the reasons for such disparities. Analyzing the difference in yields, the statisticians of the Kherson province not only showed the reasons for this situation (different varieties, farming culture, etc.), but also came to the objective of studying the behaviour of varieties under different weather conditions (Selsko-hozyajstvennyj obzor, 1893). They proved that the grain yield strongly depends not only on sufficient and timely precipitation, but also on soil cultivation and crop rotation. They called the strongest dependence on the method of tillage and crop rotation (Statistiko-ekonomicheskij obzor, 1890) (Table 2).

Since the 1890s, statisticians began to study the technical aspects of agriculture: the use of tools to perform various stages of crop cultivation, taking into account the influence of



soil conditions (preparation of arable land for sowing, etc.), the insufficiency of the action of shallow plowing, types of plows, harrows, etc. (Statistiko-ekonomicheskij obzor, 1892). Obtaining a sufficient amount of data allowed them to begin a statistical study of the main characteristics of crops varieties in the province, their advantages and disadvantages (Statistiko-ekonomicheskij obzor, 1890; Statistiko-ekonomicheskij obzor, 1892; Statistiko-ekonomicheskij obzor, 1893) (Table 2).

Statisticians made the conclusion that agriculture required determining the quantity and quality of land, the number of workers and livestock. The study of the relationship of these factors led to the study of methods of land cultivation, forms of land ownership, customs in agriculture management. Statisticians of the Kherson Zemstvo recognized that when dealing with phenomena that change every year, the description, which cannot be repeated every year, should choose such statistical factors that appear to be the most stable (Rusov, 1914), A. M. Zubko (1988). Such invariable factors according to Rusov (Rusov, 1914) are: the quantity and quality of land, determined by productivity; population distribution, provision of land and labor force; yield of land plots; the general situation of farms and the nature of their activity, which determines the existing methods of land exploitation (Table 2).

In 1882 I. Klingen was the first to perform an economic calculation of the average peasant economy (agricultural work, cattle breeding, etc.) (Kasperov, 1890). He described the complete sequence of performed operations for various methods of growing agricultural plants and economically evaluated the results of the performed actions for spring crops for farms of four types (Klingen, 1882). Also he described the technology of growing sugar beet in the county (seed preparation, sowing, care, digging), its possible place in crop rotations and differences in land cultivation, as well as the main varieties of sugar beet. I. Klingen gave economical evaluation of all operations on the cultivation of this crop (Table 2).

I. Klingen in 1882 also considered the main operations of animal husbandry and obtained economic evaluations separately for care, keeping in summer, keeping in winter, fattening of livestock. Based on the obtained results, he concluded that the farms of the region need reorganization so that fodder is produced in the fields and harvested (Klingen, 1882) (Table 2). Improvements require an increase in inventory, working livestock, and working capital. Then the land in the fields will be enriched and it will become profitable to establish a more intensive system, which requires increased exploitation of the soil, but will give high payments for invested capital and labor (Klingen, 1882).

Using the results of Klingen's works, statisticians of the Kharkiv provincial zemstvo conducted an analysis of methods of obtaining income from land, productivity and product prices (Table 2).

At the time of transition to the next stage of activity of zemstvo statistical institutions, activity as scientific institutions, statisticians revealed significant changes in various branches of agricultural life of the province. A well-established implementation of current statistics allowed the zemstvo statisticians to have data for conducting an annual review of the state of agriculture.

In 1905, the statistics of the Chernihiv zemstvo revealed, according to current statistics, significant changes in the structure of land ownership and in the field of farming techniques (methods of plowing, etc.). Changes in agriculture were manifested in a systematic increase in productivity: the productivity of the main grain crops increased significantly on peasant and privately owned lands in 24 years (a reliable and homogeneous material, 1885 – 1908) (On the issue of general grounds for land valuation, 1910). However, the economic conditions

and character of the peasant-type economy became completely different from those of 1876 – 1883. Paying attention to this point, statisticians proved that old materials can't be supplemented with data from current statistics, since tasks of current statistics do not include tasks of basic statistics of the economy (Rusov, 1914).

The constant study of the dynamics of crop yield was characteristic of the end of the 19th and beginning of the 20th. However, it should be noted that in Chernihiv province, for the statistical comparison of the harvest of 1910 and the previous year of 1909, for the main crops grown on large and small farms, the work of statisticians of Poltava province has already been used as a model.

The assessment and statistics bureau of the Chernihiv province constantly continued to survey the soil. Their result was the receipt by 1911 of detailed soil maps of Nizhynskiy, Kozeletskiy, Osterskiy, Chernihivskiy, Sosnytskyi, Horodnyanskiy, Borzneskiy counties on a 1 verst scale (Rusov, 1914) (Table 1).

The statisticians of the Chernihiv Zemstvo in their work mainly carried out a selective survey of the object of observation with the involvement of various types of groupings. They considered the methodological issues of conducting research based on the data of selective observations. They showed how to compare materials obtained from different sources as a result of the processing of sample data, to study and build methods of collecting such statistical data in order to obtain conclusions of high reliability. However, the statisticians of Chernihiv region developed a methodology for calculating the average yields of crops, which began to be used by statisticians of other province (Table 2). They set the objective of researching the amount of the obtained harvest, its quality depending on the types of soils (Rusov, 1914; On the issue, 1910).

The statistical institutions of the Poltava provincial zemstvo were the most powerful of all in the Ukrainian lands in terms of the number of employees and funds allocated by the zemstvo. In 1907, there were 181 rain gauge stations in the Poltava province (of which 98 had the devices of the provincial zemstvo), which provided information about the weather (About works, 1908).

While carrying out work on current statistics, the zemstvo statisticians of Poltava province introduced the division of counties into localities, which they called "seeded districts" (About works, 1908, p. 10). In the province, they were able to identify 49 such localities that had their own special character and took into account natural and economic conditions (Table 2).

In 1911, the statistical bureau of the Poltava provincial zemstvo was divided into two departments, each of which had a rather complex organizational structure, and there were district departments (About the, 1909). The provincial zemstvo highly appreciated the scientific level of statisticians' work and their significance for agricultural science (Appropriations, 1911). Based on this, a proposal was created in 1909 for the organization of a higher agricultural institute in Poltava (About the, 1909). The proposals indicated that the Poltava province is the best scientifically studied region. Moreover, the long-term works of statisticians of the provincial zemstvo are rich sources for scientific work of the department of economics and statistics of agriculture and for study by future students of the institute. (About the, 1909) (Table 2).

Table 1

**Main Achievements of Zemstvo Statisticians  
in the Study of Soils and Agricultural Experimentation**

Provincial zemstvo	Main achievements and improvements of statistical institutions of the province during the period	
	Formation and development	Activities and current statistics
Chernihiv	<b>From 1876</b> (cessation of activity in 1878 – 1880). Groupings in agricultural investigations; statistical studies of soils by territorial units; <b>construction of maps of the province's soils</b> ; initiation of methods of current agricultural statistics (1888) <b>Chernihiv type of zemstvo statistics</b>	<b>1903 – 1918</b> . Methodological issues of conducting selective research for agriculture
Poltava	<b>From 1880</b> . Characteristics of soils based on the results of research under the leadership of V. V. Dokuchaev; <b>conclusion about the dependence of the harvest on the nature of the soil, the method of management, fertilizer, tillage and the number of workers</b>	<b>1895 – 1918</b> . Regional soil maps of the province; statistical study of the characteristics of varieties of the main cultivated crops; statistical study of the use of artificial fertilizers (phosphates, potassium and nitrogen fertilizers)
Kherson	<b>From 1881</b> (unsuccessful initiation attempts in 1863, 1873). <b>The technique for detecting the dependence of one factor on others</b> (the influence of climatic factors on the crop, weather factors on the development and yield of the main crops)	<b>1899 – 1918</b> . Implementation of statistically obtained normal values of indicators and analysis of deviations of actual values of indicators from normal values (temperature, precipitation, etc.); <b>multifactorial research</b> (the analysis of the impact of precipitation on the amount of crop yields, taking into account the action of other weather factors; <b>study of changes in various agricultural indicators according to functional dependence</b> (linear))
Kharkiv	<b>From 1881</b> . Adding data on soil moisture, geological structure and soils, climatic characteristics (long-term measurements of temperature, amount and distribution of precipitation, winds, climatic features, heat movement in the soil and its distribution throughout the year, etc.)	<b>1908 – 1918</b> . <b>Analysis of the issue of the smallest number of experimental fields for the province</b> ; statistical works for conducting collective experiments on the study of the effect of mineral fertilizers and testing varieties (at the same time, on a large territory, a large number of experiments under the same program gave a huge amount of data under different weather, soil and other conditions)

The scientific setting of objectives in the studies of the statistical bureau allowed in 1914, in cooperation with the Poltava Agricultural Society, to start solving the task of organizing the economy with a predetermined level of economic productivity (Table 2). To create such economy, a preliminary study and analysis of local soil, physical and geographical, economic

and other conditions were required. In addition, statisticians proved the need for typicality in the soil-climatic relationship of experimental field and identity of the soil properties of the site and the entire district (Duvin, 1913, p. 16) and found a field with such properties in the newly formed farm. Using the concept of typicality and developed methods, the statisticians of Poltava province were the first to statistically study the use of artificial fertilizers (phosphates, potash, and nitrogen fertilizers) (About the, 1909) (Table 2).

However, not all the results of research in cooperation with the Poltava Agricultural Society were so successful. Thus, D. Korzun (2021) in his research exposed an example of obtaining incorrect results of statistical processing of research data based on research works carried out by order of the Kyiv Society of Agriculture and Agricultural Industry at the Poltava Experimental Field in 1899 – 1903. The reason was the incorrect method of measuring soil moisture in the experiments, i.e. the inaccuracy of the experimental data, which caused the statisticians to obtain an incorrect conclusion.

In the statistical review of 1905, the zemstvo statisticians of the Kherson province processed data on the harvest of 5% of all peasant farms by counties and groups of farms using the methods of a sample survey. As a result, they found that the yield of bread decreased from the northwest to the southeast and reached a difference of 140% (due to a significant difference in soil and climatic conditions). Therefore, statisticians calculated normal average yields for individual districts and compared the yields of different parts (SAKhR, f. 5, d. 1, c. 63, 57 p.). Analyzing the harvest in counties and provinces, they showed its closeness to the average level in almost all counties. Next, they formed a general idea about the results of the harvest based on grouping according to 5 different groups of signs and the use of relative values (the ratio of the annual harvest to the average harvest for 10 years) (SAKhR, f. 5, d. 1, c. 63, 57 p.).

In 1897 – 1898, V. F. Arnold conducted a sample survey of the budgets of peasant farms in the Kherson province and introduced functional dependencies of the selected type into use. Using the formula of a linear equation, he constructed dependencies for the main factors of the economic well-being of the peasant economy (Meeting of representatives, 1899). This made it possible to recognize the need for periodic budget surveys of various types of farms with the aim of providing agro-technical assistance to farms. Introducing functional dependencies into the statistical and economic analysis of the peasant economy, he made additional theoretical studies on the analysis of statistical dependencies (using the example of the relationship between the size of the sown area and the number of livestock (Assembly of representatives, 1899; Makiyenko, 2002). According to their results, he proposed a method of data analysis, which became a practical basis for the implementation of regression data analysis in agricultural research, and proved that the obtained relationships between factors, expressed mathematically, allow designing the main types of farms in the district based on minimal data (Table 2).

In reviews of agriculture, statistics of the Kherson province provided a detailed description of weather conditions throughout all seasons. Based on the statistically obtained concept of normality of the indicator value, they determined the average (normal) values of weather factors, calculated deviations from the norm, temperature and precipitation fluctuations, winds, measurements of soil freezing, etc. The revealed large unevenness of precipitation by season prompted statisticians to study, based on long-term data, the impact of precipitation on the amount of harvests of various crops, taking into account other weather factors (Table 2). It should be noted that the data were collected from the rain gauge stations of the districts. As of 1912, there were many stations (for example, 34 stations worked in the Kherson district). Although in 1912, the number of stations that provided observation data in one or another month was no more than 32, and in January only 20 (Statistiko-ekonomicheskij obzor, 1914).

In the annual reviews of statistics, temperature data and amounts of precipitation for the autumn and winter were given in order to reflect the influence of weather on fieldwork, and they gave a complete description of the development and growth of the main crops. And in the review for 1908, when studying the influence of weather conditions on the development of plants, they cited the results of experiments of the Kherson experimental field regarding the density and bushiness of cereals. The presented results related to the study of the density and bushiness of cereals during the growing season under different cultivation options and for three plowing depths (Statistiko-ekonomicheskij obzor, 1910).

Since 1904, a new section was introduced in the annual surveys of the Kherson province of statistics, which included the processed and summarized results of observations on the Kherson experimental field (Statistical and economic survey, 1904). In the section, the zemstvo statisticians analyzed the influence of the method of land cultivation and its predecessors on the amount of the harvest. They concluded that the main influence on the harvest in the province is the amount of precipitation, namely soil moisture, and the very method of field cultivation affects the preservation of moisture in the field (Table 2). Statisticians analyzed the experiments results of the Kherson experimental field for the entire period of research (up to 21 years). Among the findings were, for example, increasing the plowing depth beyond 4 inches did not greatly affect wheat yield, and plowing depth above 6 inches did not greatly affect rye yield.

As you can see, the research was repeated over many years and became more complicated. With the development of management systems, statistics began to consider experiments on the influence of predecessors in 9-field, 6-field and 4-field crop rotations (Statistiko-ekonomicheskij obzor, 1910). According to the results of the processing and analysis of the experimental data, the statisticians of the Kherson province proved that the accumulation and conservation of moisture through appropriate soil cultivation is very important for the province. When surveying the province in 1909, they analyzed vegetative laboratory experiments with various crops grown in the laboratory on various soil samples. Since 1910, statisticians began to analyze the data of experiments on determination of the content of nitrogen, humus, sulfuric and phosphoric acids for seven settlements of the Kherson province (as average of 2-4 determinations) and laboratory experiments on the use of fertilizers (Statistiko-ekonomicheskij obzor, 1914) (Table 2).

In 1908, statisticians of the Kharkiv province developed a programme (Doklady, 1908) for collecting information from district agronomists, which consisted of six sections and included questions about crop rotations and grass sowing, improvements, forms of land use, number of strips in the field, grouping of strips into larger uniform sets, obstacles to the transition to four fields, crop sizes, equipment and much more. The experience of work on obtaining the characteristics of the province “on the basis of meteorological data” (Reports, 1908, p. 151) allowed the zemstvo statisticians to formulate and solve the problem of the smallest number of experimental fields for the Kharkiv province (Table 2). Moreover, they singled out 3 regions according to the amount of precipitation (north-western, central and southeastern (Reports, 1908, p. 151) and showed that, in accordance with the data on moisture, data on yield for 10 years were distributed. According to the results of the statistical study of the Akhtyr county, the Evaluation and Statistics department carried out districting of the county and compiled the location map of organizational and industrial districts and plots (“Reports”, 1908). Obtaining a large amount of data from collective experiments in the province allowed the statisticians of the Kharkiv province to start work on the study of the effect of mineral fertilizers and variety testing (Reports, 1908).



Table 2

**Main Achievements of Zemstvo Statisticians in Crop Farming and Economics**

Provincial zemstvo	Main achievements and improvements of statistical institutions of the province during the period	
	Formation and development	Activities and current statistics
Chernihiv	<b>From 1876</b> (cessation of activity in 1878 – 1880). Proof the possibility of statistical exposure of the influence of natural and geographical factors on agricultural productivity; production of research in crop farming (study of crop rotation, fertilization). <b>Chernihiv type of zemstvo statistics</b>	<b>1903 – 1918</b> . Research on the size of the harvest depending on the type of soil; <b>methodology for calculating average harvests</b>
Poltava	<b>From 1880</b> . Characteristics of farms by capacity categories; study of the degree of intensity of agricultural work; livestock feeding research and a conclusion on the need to introduce grass seeding and root crops for fodder harvesting; research in crop farming (tillage, crop rotation)	<b>1895 – 1918</b> . Study of farming systems and crop rotations, technical aspects of farming (various tools, taking into account the influence of soil type, tillage methods, plowing depth, field operations); <b>zoning of the province</b> (food, fodder and construction areas) for the development of economic activity in accordance with the natural conditions of the area; <b>selection of sowing areas</b> , taking into account natural and economic conditions; proposal for the organization of a higher agricultural institute in Poltava (1909) with the department of agricultural economy and statistics; <b>solving the problem of organizing the economy with a predetermined level of economic productivity</b>
Kherson	<b>From 1881</b> (unsuccessful initiation attempts in 1863, 1873). Proving the need to study soils, land ownership, forms of labor of all strata of the population to study the state of agriculture	<b>1899 – 1918</b> . Analysis of the unevenness of the obtained harvests due to the influence of weather, the amount of precipitation, differences in land cultivation; study of varieties of main crops; <b>proving the decisive role for the development of plants in the province of moisture conservation by appropriate soil cultivation</b>
Kharkiv	<b>From 1881</b> . Formulation of the task of studying the dependence between the time of ripening of crops under fixed soil and topographic conditions and the amount of heat and moisture, the time of sowing; research on farming systems (crop rotation); economic assessment of the sequence of operations in the cultivation of agricultural crops for different types of farms; economic assessment of productive cattle breeding; <b>economic calculation of an average peasant farm</b> ; analysis of characteristics of beet farms	<b>1908 – 1918</b> . <b>Obtaining organizational and production districts and districts according to the proportions of agricultural crops</b>

**The Conclusion.** As a result of the conducted research, it has been determined that the application of statistics, as the latest scientific methodology, in agricultural research allowed

the zemstvo statistical institutions to analyze and justify the results, to set and solve new actual practical tasks. The paper analyzes the experience and achievements of the statistical work of the provincial zemstvos of the territory of modern Ukraine in the agricultural sector and finds out their significance for modern branches of agricultural science. Establishing the importance of the results of the zemstvo statisticians' work for agricultural science was carried out on the example of statisticians' work of Chernihiv, Poltava, Kherson and Kharkiv provinces, since these provinces had the most powerful statistical institutions.

The analysis of the work of the provincial statisticians made it possible to identify the main stages of their activity in the study of agriculture in the region. It also allowed us to conclude that the statistical institutions of the zemstvos turned into powerful scientific institutions in their activities. It has been shown that the search by provincial statisticians for new research methods to achieve a qualitatively higher level of practical development of the region's agriculture, based on strict adherence to scientific methodologies, led to outstanding scientific results.

The highlighted achievements of the Zemstvo statisticians in the fields of soil science, agriculture, agronomy, crop production, research work, and agricultural economics establish the power of Zemstvo statistics in shaping directions of research in various branches of agrarian science and prove the importance of the contribution of statistical research to a rapid development of agrarian science in the 20th century.

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#### BIBLIOGRAPHY

**Anonymous.** (1876). O pervonachalnykh deistviyakh statisticheskogo otdeleniya pri Gubernskoi Zemskoi Uprave (Doklad chlena Upravy N. A. Konstantynovicha) [About the initial actions of the statistical department at the Provincial Zemstvo Administration (Report of the member of the Administration N. A. Konstantinovich)]. *Zemskiy sbornik Chernigovskoi gubernii – Zemsky collection of the Chernihiv province, 1–4*, 116–120. [in Russian]

**Anonymous.** (1890a). Istoricheskij ocherk razvitiya Hersonskoj zemskoj sel'skohozyajstvennoj statistiki [A historical sketch of the development of the Kherson Zemstvo agricultural statistics]. *Sbornik Hersonskogo zemstva – Collection of Kherson zemstvo, 10*, 1–24. [in Russian]

**Anonymous.** (1890b). K voprosu ob obshih osnovaniyah ocenki zemel v Chernigovskoj gubernii [To the question of the general grounds for assessing land in the Chernigov province]. *Zemskij sbornik Chernigovskoj gubernii – Zemsky collection of the Chernigov province. Year forty-two, 4*, 47–180. [in Russian]

**Anonymous.** (1899). Soveshanie predstavitelej uездnyh i Odesskoj gorodskoj uprav i agronomicheskikh smotritelej (17–20 marta 1899 g.) [Meeting of representatives of the county and Odessa city governments and agronomic supervisors (March 17–20, 1899)]. *Sbornik Hersonskogo zemstva – Collection of the Kherson Zemstvo, 5*, 1–96. [in Russian]

**Anonymous.** (1909, June 27). Ob ustrojstve v g. Poltave v uvekovechenie 200-letiya Poltavskoj pobedy vysshego s.-h. instituta s prisvoeniem emu naimenovaniya Petrovskogo [About the device in Poltava in perpetuation of the 200th anniversary of the Poltava victory of the Higher Agricultural Institute with the assignment of the name Petrovsky]. *Hutoryanin – Khutoryanin*, 853–855. [in Russian]

**Anonymous.** (1911). Assignovaniya Poltavskogo gubernskogo zemstva na ekonomicheskie meropriyatiya na 1911 god [Appropriations of the Poltava provincial zemstvo for economic activities for 1911]. *Yuzhno-russkaya sel'sko-hozyajstvennaya gazeta (izdanie Harkovskogo obshestva sel'skogo hozyajstva) – South Russian agricultural newspaper (publication of the Kharkiv Society of Agriculture)*, 8, 16. [in Russian]

**Bobkov, V. V.** (2003). K ystorry zemsko-statystycheskykh yssledovanyi v Tavrycheskoi hubernyy (1884 – 1889) [To the history of land-statistical research in the Tavrichesky province (1884 – 1889)]. *Kultura narodov Prychernomoria – Culture of the peoples of the Black Sea region*, 46, 122–127. [in Russian]

**Bortnikov, V. & Yarosh, Ya.** (2022). Peculiarities of zemstvo introduction in Volyn province (the second half of the XIXth – the beginning of the XXth century). *Skhidnoievropeiskyi istorychnyi visnyk – East European Historical Bulletin*, 23, 31–39. Doi: 10.24919/2519-058X.23.258964. [in English]

**Chervynsky, P. P.** (1881). *Zemledelcheskaia prohramma, prysposoblennaia k sobyraniiu svedenyi dlia otsenky zemledelcheskykh uhodyi* [Agricultural program adapted to the collection of information for the evaluation of agricultural land]. Chernigov: Printing house of the provincial zemstvo. Issue 1–4. [in Russian]

*Derzhavnyi arhiv Khersonskoy oblasti [SAKhr – State archive of the Kherson region].*

**Doklady.** (1908). *Doklady Harkovskoy gubernskoy zemskoj upravy ocherednomu gubernskomu zemskomu sobraniyu (22 noyabrya 1908 g.) po ekonomicheskomu otdelu s prilozheniyami zhurnalov gubernskogo ekonomicheskogo soveta 20 iyunya i soveshaniya po organizacii opytynogo dela 16–17 oktyabrya 1908 g.* [Reports of the Kharkiv provincial zemstvo council to the next provincial zemstvo assembly (November 22, 1908) on the economic department with the annexes of the journals of the provincial economic council on June 20 and a meeting on organizing an experimental business on October 16–17, 1908]. Kharkov. [in Russian]

**Doroshok, N. A.** (2013). Istoriohrafia zemskoi statystyky Chernihivskoi hubernii (druha polovyna XIX – poch. XX st. [Historiography of zemstvo statistics of the Chernihiv province (second half of the 19th – beginning of the 20th century)]. *Hilea: naukovyi visnyk: zbirnyk naukovykh prats – Gilea: scientific bulletin: collection of scientific papers*, 77, 87–89. [in Ukrainian]

**Duvin, S.** (1913, August 10). Hadiachskoe rayonnoe opytne pole [Gadyachsky regional experimental field]. *Poltavskie agronomycheskye izvestiya – Poltava agronomic news*, 16. [in Russian]

**Halytska, E.** (2019). Pamiati zemskykh statystykyv [In Memory of Zemstvo Statisticians]. *Statystyka Ukrainy – Statistics of Ukraine*, 87(4), 136–139. Doi: 10.31767/su.4(87)2019.04.13. [in Ukrainian]

**Kasperov, V. I.** (Ed.). (1890). Itogi zemskoj statistiki v Harkovskoy gubernii za proshloe desyatiletie [Results of zemstvo statistics in Kharkov province for the past decade]. *Harkovskij sbornik – Kharkov collection*, 4, 82–103. [in Russian]

**Klingen, I.** (1882). *Opisanie Volchanskogo uезда Kharkovskoy gubernii v sel'sko khoziaistvenno-statisticheskoy otnošenii* [Description of the Volchansky county of the Kharkov province in agricultural and statistical terms]. Kharkov. [in Russian]

**Korzun, D.** (2021). “Nova systema zemlerobstva” I.Ie. Ovsinskoho: spryiniattia hromadskistiu (kinets XIX – pochatok XX st.) [I. Ye. Ovsynskyi ‘New System of Agriculture’: Public Perception (end of 19th – early 20th century)]. *Eminak: naukovyi shchokvartalnyk – Eminak: Scientific Quarterly Journal*, 4(32), 253–262. Doi: 10.33782/eminak2020.4(32).487. [in Ukrainian]

**Kulikov, V. O.** (2004). Zem'ska ahrarna statystyka Kharkivskoi hubernii kintsia XIX – pochatku XX st. (biudzhetni obstezhennia selianskykh gospodarstv, epizodychna y potochna statystyka) [Agrarian statistics of the zemstvo of the Kharkiv province at the end of the 19th and the beginning of the 20th centuries]. *Visnyk Kharkivskoho natsionalnoho universytetu im. V. N. Karazina. Istoriiia. – Bulletin of Kharkiv National University named after V. N. Karazina. History. Kharkiv*, 36(633), 289–298. [in Ukrainian]

**Kulyabko-Koretsky, N.** (Ed.). (1892). *Sbornik po hozyajstvennoj statistike Poltavskoy gubernii. Tom XIII. Lohvickij uезд* [Collection of economic statistics of the Poltava province. Volume XIII. Lokhvitsky district]. Poltava. [in Russian]

**Kulyabko-Koretsky, N.** (Ed.). (1899). *Cifrovye dannye po hozyajstvennoj statistike Poltavskoy gubernii, poluchennyye pri osnovnom opisani ee v 1882 – 1899 gg. (Prilozhenie k svodnomu sborniku po osnovnomu statisticheskomyu opisaniyu Poltavskoy gubernii)* [Numerical data on the economic statistics of the Poltava province, obtained during its main description in 1882 – 1899. (Appendix to the summary collection on the main statistical description of the Poltava province)]. Poltava. [in Russian]

**Kuznets, T.** (2022). Zemlerobstvo v Umanskomu poviti za materialamy kyivskykh hubernskykh hazet ostannoii chverti XIX – pochatku XX st. [Land husbandry in Uman county on materials of Kyiv provincial newspapers of last quarter of 19th – Beginning of 20th Century]. *Eminak: naukovyi shchokvartalnyk – Eminak: Scientific Quarterly Journal*, 1(37), 46–59. Doi: 10.33782/eminak2022.1(37).570. [in Ukrainian]

**Makiyenko, O. A.** (2002). Statistichne byuro Hersonskogo zemstva: problemi stvorennia ta diyalnosti [Statistical Bureau of the Kherson Zemstvo: problems of creation and activity]. *Pivdennij arhiv. Istoria nauky: Zbirnyk naukovykh prac – Southern archiv. History of science: Collection of science works*, 7, 163–173. [in Ukrainian]

**Materialy.** (1877). *Materialy dlya ocenki zemelnykh ugodij, sobrannyye ekspedicionnym sposobom statisticheskim otdeleniem pri Chernigovskoj gubernskoj zemskoj uprave. Tom II. Borznenskiy uezd* [Materials for the assessment of land, collected by the expedition method by the Statistical Department at the Chernihiv Provincial Zemstvo Administration. Volume II. Borznensky province, with three lithographed maps and Applications]. Kyiv. [in Russian]

**Materialy.** (1880). *Materialy dlya ocenki zemelnykh ugodij, sobrannyye ekspedicionnym sposobom po programme byvshego statisticheskogo otdeleniya pri Chernigovskoj Zemskoj Uprave. Novozybkovskij uezd* [Materials for the assessment of land, collected by the expeditionary method under the program of the former Statistical Department at the Chernihiv Zemstvo Administration. Novozybkovskiy province]. Chernigov. [in Russian]

**Materialy.** (1882). *Materialy dlya ocenki zemelnykh ugodij, sobrannyye Chernigovskim statisticheskim otdeleniem pri gubernskoj zemskoj uprave. Tom V. Kozeleckij uezd* [Materials for the assessment of land, collected by the Chernihiv statistical department at the provincial zemstvo council. Volume V. Kozeletsky province]. Chernigov. [in Russian]

**Mekshun, L. M.** (2000). Rol zemskoi statystyky kintsia XIX – pochatku XX st. u provedenni oblikovykh doslidzhen u Chernihivskii hubernii [The role of Zemstvo statistics of the end of the 19th and the beginning of the 20th centuries in conducting accounting studies in the Chernihiv province]. *Siverianskyi litopys – Siveryansky chronicle*, 3, 178–180. [in Ukrainian]

**Mekshun, L. M.** (2003). Zemska statystyka osvity v Ukraini [Zemsky statistics of education in Ukraine]. *Siverianskyi litopys – Siveryansky chronicle*, 4, 120–122. [in Ukrainian]

**Mekshun, L. M.** (2008). Stanovlennia i rozvitok zemskoyi statistiki v Ukrayini [Formation and development of Zemstvo statistics in Ukraine]. *Naukovij visnik ChDIEU – Scientific Bulletin ChDIEU. Chernigiv*, 1, 148–159. [in Ukrainian]

**O rabotah.** (1908). *O rabotah, proizvedennykh Statisticheskim Byuro v 1908 g. i predlozhennykh na 1909 god. Doklad Poltavskoj Gubernskoj Zemskoj Upravy XLIV ocherednomu gubernskomu zemskomu sobraniyu. № 53* [On the work carried out by the Statistical Bureau in 1908 and proposed for 1909. Report of the Poltava Provincial Zemstvo Council XLIV to the next provincial zemstvo assembly. No. 53]. Poltava. [in Russian]

**Osadchy T. I.** (1899). *Zemlya i zemlevladelycy v Yugo-zapadnom krae (na Ukraine, Podolii i Volyni). Opyt statistiko-ekonomicheskogo issledovaniya* [Land and landowners in the South-Western Territory (in Ukraine, Podolia and Volyn). Experience of statistical and economic research]. Kyiv. [in Russian]

**Petrov, O. O.** (2002). Diyalnist statistichnih zakladiv Katerinoslavskogo zemstva [Activities of statistical institutions of the Katerynoslav Zemstvo]. *Gumanitarnij zhurnal – Humanitarian journal*, 1, 102–110. [in Ukrainian]

**Poyedinok, M. S.** (2014a). Rol chernihivskoho typu zemskoi statystyky kintsia XIX st. u rozvytku ahrarnykh doslidzhen [The role of the Chernihiv type of zemstvo statistics at the end of the 19th century. in the development of agrarian research]. *Istoriia nauky i bihrafistyka – History of science and biography*, 2. URL: [http://nbuv.gov.ua/j-pdf/INB\\_Title\\_2014\\_2\\_14.pdf](http://nbuv.gov.ua/j-pdf/INB_Title_2014_2_14.pdf). [in Ukrainian]

**Poyedinok, M. S.** (2014b). Znachennia silskohospodarskoi statystyky Khersonskoi hubernii dlia rozvytku ahrarnoi nauky (kinets XIX st.) [The importance of agricultural statistics of the Kherson province for the development of agricultural science (end of the 19th century)]. *Istoriya nauki i tehniki: zbirnyk naukovykh prac – History of science and technology: collection of science works. Kyiv*, 5, 207–212. [in Ukrainian]

**Poyedinok, M. S.** (2015). Statystychni roboty Poltavskoi ta Kharkivskoi hubernskykh zemskykh uprav dlia rozvytku ahronomichnykh doslidzhen (kinets XIX – pochatok XX st.) [Statistical works of the Poltava and Kharkiv provincial zemstvo administrations for the development of agronomic research (end of the 19th – beginning of the 20th century)]. *Visnyk ahrarnoi istorii: zbirnyk naukovykh prac – Herald of Agrarian History: collection of science works. Kyiv*, 6, 206–217. [in Ukrainian]

**Rusov, A. A.** (1914). *Kratkij obzor razvitiya russkoj ocenochnoj statistiki* [Short review of the development of Russian evaluation statistics]. Kyiv. [in Russian]

**Sbornik statisticheskikh svedenij.** (1910). *Sbornik statisticheskikh svedenij po Kievskoj gubernii za 1907, 1908 i 1909 gg.: vremya nachala i razgara selsko-hozyajstvennykh robot, urozhajnost hlebov*

*i drugih polevyh rastenij v ekonomiyah, urozhajnost hlebov i drugih polevyh rastenij u krestyan, urozhajnost senokosov: 1-j god izd.* [Collection of statistical information on the Kyiv province for 1907, 1908 and 1909.: the time of the beginning and height of agricultural work, the yield of grain and other field plants in the economy, the yield of bread and other field plants among peasants, the yield of hayfields: 1st year ed.]. Kyiv. [in Russian]

**Selsko-hozyajstvennyj obzor.** (1893). *Selsko-hozyajstvennyj obzor po Aleksandrijskomu uezdu za 1890/91 selsko-hozyajstvennyj god* [Agricultural review of the Alexandria district for the 1890/91 agricultural year]. Kherson. [in Russian]

**Shandra, V.** (2020). Dvorianstvo “Ukrainskykh gubernii” Rosiiskoi imperii u zemskomu samovriaduvanni (1860-ti rr. – pochatok XX st.) [The Nobility of “Ukrainian Provinces” of Russian Empire in Zemstvo Self-Government (1860s – Beginning of the Twentieth Century)]. *Ukrainskyi istorychnyi zhurnal – Ukrainian Historical Journal*, 4, 46–60. Doi: 10.15407/uhj2020.04.046. [in Ukrainian]

**Statisticheskoe Otdelenie.** (1890). Statisticheskoe Otdelenie pri Hersonskoj Gubernskoj Zemskoj Uprave [Statistical Department at the Kherson Provincial Zemstvo Administration]. *Materialy dlya ocenki zemel Hersonskoj gubernii. T. 6. Hersonskij uezd (statistiko-ekonomicheskoe opisanie uezda)* [Materials for assessing the land of the Kherson province. V. 6. Kherson county (statistical and economic description of the county)]. Kherson. [in Russian]

**Statistiko-ekonomicheskij obzor.** (1898). *Statistiko-ekonomicheskij obzor Ekaterinoslavskoj gubernii za 1897 god* [Statistical and economic review of the Yekaterinoslav province for 1897]. Yekaterinoslav. [in Russian]

**Statistiko-ekonomicheskij obzor.** (1900). *Statistiko-ekonomicheskij obzor Hersonskoj gubernii za 1898 god* [Statistical and economic review of the Kherson province for 1898]. Kherson. [in Russian]

**Statistiko-ekonomicheskij obzor.** (1908). *Statistiko-ekonomicheskij obzor Hersonskoj gubernii za 1904 god* [Statistical and economic review of the Kherson province for 1904]. Kherson. [in Russian]

**Statistiko-ekonomicheskij obzor.** (1910). *Statistiko-ekonomicheskij obzor Hersonskoj gubernii za 1908 god* [Statistical and economic review of the Kherson province for 1908]. Kherson. [in Russian]

**Statistiko-ekonomicheskij obzor.** (1914). *Statistiko-ekonomicheskij obzor Hersonskoj gubernii za 1912 god* [Statistical and economic review of the Kherson province for 1912]. Kherson. [in Russian]

**Tereshkevich, N.** (Ed.). (1888). *Sbornik po hozyajstvennoj statistike Poltavskoj gubernii. T. VII. Kremenchugskij uezd* [Collection of economic statistics of the Poltava province. Volume VII. Kremenchug district]. Poltava: Type-litograph. I. A. Dokhman. [in Russian]

**Veleckij, S. N.** (1899). *Zemskaya statistika: Sprav. kniga po zemskoj statistike v 2-h ch. – Ch. I. Istorija i metodologiya* [Zemskaya statistics: Reference. book on Zemstvo statistics in 2 parts – Part I. History and methodology]. Moskva. [in Russian]

**Veletsckiy, S. N.** (1894). *Dvadcat pyat let deyatelnosti zemstva v Poltavskoj gubernii, s 1866 po 1892 god. Kratkij ocherk* [Twenty-five years of zemstvo activity in Poltava province, from 1866 to 1892. A brief essay]. Poltava. [in Russian]

**Vergunov, V.** (2022). Agricultural Experimental Work as a Component of Modern Natural Science and Culture of the Nation: History of Formation and Evolution of Concepts. *Skhidnoevropejskyi Istorychnyi Visnyk [East European Historical Bulletin]*, 25, 213–226. Doi: 10.24919/2519-058X.25.269535. [in English]

**Werner, K. A.** (Ed.). (1889). *Pamyatnaya knizhka Tavricheskoj gubernii. Tom IX* [Memorable book of the Tavrichesky province. Volume IX]. Simferopol. [in Russian]

**Ziber, N. I.** (1875). *Opyt programmy dlia sobiraniya statistiko-ekonomicheskikh svedeniy* [Experience of the program for collecting statistical and economic information]. Kyiv. [in Russian]

**Zubko, A. M.** (1988). *Vivchennya zemskimi statistichnimi organami socialno-ekonomichnogo rozvitku Ukrayini (1864 – 1917 rr.)* [Study of the socio-economic development of Ukraine by zemstvo statistical institutions (1864 – 1917)]. *Ukrayinskij istorychnij zhurnal – Ukrainian historical magazine*, 3, 130–138. [in Russian]

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