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AGRICULTURAL LAND PROTECTION IN CHINA: CURRENT STATUS AND HISTORICAL BACKGROUND

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Agriculture has always been central to China's cultural and economic development. The traditional calendar used in China to this day tells villagers the best time to sow and harvest, further confirming the importance of agriculture in everyday life. Land has always been the backbone of the agricultural sector, which in turn is the cornerstone of China's economy. Over the years, they have ensured national food security and provided livelihoods for large populations. Although the total amount of agricultural land in China is the third largest in the world, for a large area of land, only 0.106 hectares per capita is accounted for, which is far below the world average. Given the pressures of shrinking agricultural land due to economic development, rapid population growth, and urban growth, the Chinese government has developed a series of measures to protect agricultural land and ensure food security. This article is aimed at a detailed analysis of the evolution of agricultural land protection policy in China, an attempt to analyze the reasons for policy change, the measures introduced and their effectiveness. It will also provide experience and inspiration for solving issues related to land resources in Ukraine and can become

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the basis for cooperation between China and Ukraine in the field of agriculture to jointly address the global challenges of food security.

Keywords: Cultivated land conservation, Land policy, Land management, Remote sensing applications

Problem description. Ukraine currently faces problems of irrational land use and overexploitation of land resources. In particular, agricultural land is used for other purposes, there is a problem of land degradation, and the lack of a full-scale land survey results in the absence of up-to-date statistics on the quantity and quality of land resources. The outbreak of the Russian-Ukrainian war in 2022 also affected agricultural land in Ukraine, and this impact cannot be assessed at this time, as the country is still at war [1]. [China, which, like Ukraine, is a developing country, has similar problems in the field of land resources.](#)

Analysis of recent research and publications. Poprozman N.V., Korobska A.O. discuss the importance of land resources for national security and the need for their economical and rational use in order to ensure ecological balance, which is of great importance for national security. Novakovska I. O., Ishchenko N. F., Skrypnyk L. R. discuss the main problems of land reform in Ukraine and point out the use of agricultural land for non-agricultural purposes. Tretyak A. M., Tretyak V. M. and others summarize the results of Ukraine's current land policy for 2021, noting that Ukraine has not yet formed a global paradigm of sustainable land use. Tretyak A. M., Tretyak V. M. consider the conceptual basis and environmental aspect of the modern system of land use in Ukraine, believing that this system should be a complex

combination of socio-economic and natural systems [2-5].

Meanwhile, Chinese researchers have analyzed China's policy on agricultural land protection. Zhang et al. studied the amount of agricultural land and monitoring methods and proposed to create a multi-level monitoring system that includes monitoring of ecological functions [6]. Wang et al. studied the implementation of arable land protection policies and concluded that the protection of arable land quantity in China is stable, but the protection of quality is not effective [7], Li studied grain subsidy policies in China and argued that subsidies for agricultural construction and subsidies for agricultural science and technology should be strengthened at present [8], and Dang et al. investigated the compensation policy of environmental protection of agricultural land, and concluded that the country has not yet formed a systematic system and structural method, and proposed a set of quantitative methods for calculating environmental compensation [9], Zhong et al. used econometric methods to evaluate the effectiveness of the Chinese government's use of remote sensing technology to monitor land against illegal encroachment on agricultural land, and the results showed that the method plays a role, and the reform of the It also contributes to the implementation of conservation policies [10].

Remote sensing technology, as a method that allows obtaining information about agricultural land on a large scale, is also widely used for monitoring agricultural land. However, due to China's vast territory and spatial differences in farmland and soil quality, most studies are based on small and medium-sized areas. Zhang et al. analyzed the research on remote sensing methods to obtain indicators for assessing farmland quality, outlining the methods commonly used at present and proposing the

establishment of a remote sensing big data platform for assessing the quality of arable land [11], Yang et al. used satellite data to assess the productivity of high quality farmland in the study area, and the results showed that the productivity of this type of farmland is higher than that of ordinary farmland [12]. Zhang et al. used Google Earth Engine to analyze the environmental changes caused by the consolidation of farmland in the study area, and the results showed that farmland consolidation may have a short-term negative impact on the environment, and the positive effect will appear after more than 3 years, and relevant government policies may also have an impact [13]. Luo et al. used satellite data to detect the change in the area of abandoned farmland in the study area from 2015 to 2019 to assess the impact of policies on abandoned farmland, and the results showed that more policies are not necessarily effective, and that attention should be paid to the scientific basis of policies [14].

In terms of use at the national level, remote sensing of agricultural land is mostly carried out by agricultural authorities in government departments, and it is difficult to find information other than government announcements.

The purpose of this study is to analyze the changes in agricultural land protection policy in China over the past 40 years, discuss the reasons for policy changes, and summarize the experience in order to provide recommendations for land management in Ukraine.

Materials and methods of research. In the course of the research, the method of analysis and the method of generalization were mainly used. . The method of analysis included the analysis of legal documents of the Chinese government and the

review of statistical data published by the Chinese government. The method of synthesis was to summarize the information found during the research.

Research results and discussion. After World War II, China has been constantly facing the problem of a large population and insufficient agricultural land [15,16,17]. The problem of food security is particularly urgent. Over the past 40 years, the Chinese government has made great efforts to establish a system of agricultural land protection, including the protection of its quantity, quality and ecological environment, and has used technological means to establish an annual system for monitoring changes in land coverage at the national level.

"Bread is the foundation of the nation" is an ancient philosophy in China that has been passed down through the ages. As a historically deep country with a traditional agricultural civilization, the Chinese nation is strongly imbued with the philosophy of "harmony between heaven and men," which emphasizes the harmonious relationship between humans and nature. In agricultural operations, it follows the seasons and the traditional calendar. But in modern times, under the influence of the industrial revolution in the West and the colonization of the world, China's traditional agricultural model began to face challenges. In the middle of the 20th century, with the establishment of the PRC, the main challenge for the state was the problem of food shortages, In 1949, the country's grain production was only 113 million tons, and grain consumption per capita was only 209 kilograms [18]. Despite the government's efforts to expand the area of agricultural land, the limited technological capabilities at the time and unpredictable natural disasters led to excessive tension in the area of food security. Therefore, increasing the yield and

quality of agricultural land became the government's main task.

Changes in agricultural land protection policy in China. From 1981 to 2019, after the launch of the reform policy and the introduction of the "family land use and responsibility" system in 1978 in China [19], achievements in agriculture have significantly improved agricultural land productivity and reduced the long-term problem of food shortages. However, rapid economic development, the growing share of the urban population and construction are associated with a large reduction in agricultural land at their expense and the general problem of agricultural land protection.

In 1981, a government report emphasized the value of land resources and the need for their rational use. For the first time, the strategy of "farmland protection" was explicitly formulated in the "Urgent Notice to Stop the Construction of Rural Houses that Encroach on Agricultural Land" [20]. In 1986, the protection of agricultural land was recognized as a major national policy [21], and in 1987 a land tax was introduced [22].

Despite these policy measures, due to the desire for economic benefits, the illegal use of agricultural land continues to be widespread. In order to further strengthen the protection of agricultural land, in 1992, the Chinese central government first introduced the concept of "core agricultural land" and in 1993 established "core agricultural protection zones" [23], which clearly defined that these lands cannot easily change their purpose. In 1996, the government further defined the strategy of "dynamic balancing of the total amount of agricultural land" in order to ensure equilibrium in the total amount of agricultural land [24]. By 1997, to prevent

the illegal use of agricultural land, the law defined the crime of "damage to agricultural land" [25]. During this period, although the central government issued many regulations and laws on agricultural land protection, they were mainly aimed at the quantity of agricultural land, lacked consideration of land quality, lacked economic regulation, and the level of implementation of relevant measures remained low.

Along with the further industrialization and urbanization of the country, China in the new century is paying increased attention to the protection of agricultural land. In 1998, the Chinese government established the Ministry of Land Resources for a more systematic management of land resources, whose task is to develop rational land planning, promote international cooperation and amend the Land Administration Law to consolidate the legal status of agricultural land protection as a major national task [26]. In 2001, the central government emphasized the need to introduce a land use compensation policy to ensure the protection of agricultural land [27]. In 2003, the central government issued a notice on improving land use management to improve approval procedures and define liability mechanisms [28]. Although legislative measures were aimed at legal protection of agricultural land during this period, there was a lack of land quality definition and effective regulatory mechanisms in the economic sector, and the implementation of the relevant measures remained low.

In 2004, the country's main document highlighted the use of prime agricultural land and the continuous improvement of agricultural land quality [29]. In order to control land occupation by local governments, a procedure for assessing agricultural

land protection goals at the regional level was introduced in 2005, in which agricultural land protection was identified as an important indicator of government performance [30]. In 2006, the central government issued the Decree on the Temporary Organization of Land Use Taxation on Land Objects, aimed at strengthening tax collection and joint management. Based on an extensive study, the central government determined that at least 120 million hectares of agricultural land should be reserved to ensure national food security [31]. This policy was incorporated into the 11th Development Plan and was named the "Red Line of Agricultural Land" [32]. In 2008, the central government introduced the "eternal prime agricultural land" strategy and adopted stricter management rules [33]. In 2009 and 2010, the country's main document doubled down on the need for local governments to strictly adhere to the "red line of agricultural land" policy and increase subsidies for agriculture [34].

In this phase, through a series of legal and policy measures, the awareness of different levels of government regarding the protection of agricultural land increased significantly. On this basis, a system of responsibility and supervision was established, and the economic sphere emphasized the importance of agriculture through financial support.

With economic growth comes many environmental problems that negatively impact agricultural land. To address this issue, the central government issued a decree in 2016 that emphasized increasing the level of protection of agricultural land and improving its quality [35]. In this decree, the central government also proposed to pilot a "duty and rest" system for agricultural land. In addition, in 2017, the central

government issued an opinion aimed at improving the balance between the protection of agricultural land and compensation for its use [36].

In 2018, the third national land survey was launched to provide a complete overview of the country's land use [37]. The land survey includes three main aspects: a survey of the current status and changes in land use, a survey of land tenure and changes in land tenure, and a survey of social and natural conditions. At the same time, the government has launched an initiative to preserve and restore contaminated agricultural land as part of its rural restoration strategy [38]. In 2019, the central government additionally published a directive on agricultural and rural development [39], which focused on the cleanup and remediation of contaminated agricultural land, as well as the creation of highly productive farmland. Also in the same year, the Land Management Law was amended to clearly define the criteria and standards for determining "perpetual prime agricultural land," including a specific list of designated areas, conditions for their use, additional requirements, and the content of control and management. During this period, the central government clearly changed its strategy and paid attention not only to the quantity of agricultural land under protection, but also to its quality and environmental component.

An examination of the reasons for policy change in agricultural land protection shows that it is a complex and systematic work involving many different factors that interact with each other. When reviewing the policy changes in agricultural land protection in China over the past four decades, it can be seen that many of the policy decisions and adjustments have usually been aimed at addressing various problems and challenges arising from economic development.

From the analysis of individual economic needs, it can be seen that as owners and users of agricultural land, peasants usually aim to maximize the economic efficiency of agriculture. When comparing the cultivation of grain crops with the cultivation of highly profitable economically valuable crops, many farmers may choose the latter to generate more profit. Additionally, when agricultural productive capacity decreases, farmers may adopt selective strategies for protecting agricultural land. A selective cropland protection strategy prioritizes the protection of more valuable cropland and abandons the protection and restoration of low-value cropland. The policy formulation and implementation process is usually controlled by higher levels of government, and peasants who directly use the land have little participation in decision-making and find it difficult to express their needs and demands. This affects not only the initiative of peasants in relation to agricultural land protection, but can also pose challenges to the effectiveness and enforceability of agricultural land protection policies.

An analysis of the needs and goals of different levels of government shows that there is a mismatch in strategies and objectives. The central government focuses mainly on preserving strategic interests and national security, developing comprehensive policies and recommendations at the macro level. Meanwhile, local governments are more focused on social and economic growth and development within their jurisdictions. When the economic costs of protecting agricultural land conflict with the potential economic benefits of non-agricultural industries, the local government, as a concrete policy implementer and feedback loop, has difficulty implementing central government policies. At the same time, local governments,

focusing their efforts on regional development, can make more flexible decisions and deviate from the central government's policy on the use of agricultural land [40]. This mismatch of goals can lead to inconsistencies and conflicts of strategies between central and local governments, which in turn can affect the overall effectiveness of such policies.

From an environmental perspective, agricultural land, as an important component of ecosystems, plays a critical role not only in supporting agriculture and food supply, but also in biodiversity conservation, climate regulation, water cycle and soil fertility. However, due to rising labor costs, agricultural production methods in China have undergone significant changes: the traditional approach of alternating field and fallow plots is gradually being replaced by direct application of mineral fertilizers, pesticides and herbicides. According to statistics, in 2013, the total use of mineral fertilizers in China amounted to 59.12 million tons, which was 35% of the total global use [41]. This excessive use of chemicals in production, while it may lead to increased yields in the short term, can have a negative impact on soils and the environment in the medium and long term. In order to better understand this problem, China conducted the first national soil pollution survey from 2005 to 2013. The results of this study showed serious soil pollution in certain regions of China, especially heavy metal pollution [42].

To date, China has taken a number of measures to address the issue of soil protection. Since the start of the reform in 1978, China's growing population and limited land resources have created a serious problem in the food supply. Despite the fact that China has implemented the strictest system of agricultural land protection in

the world, the results have not been as expected. According to the third national natural resource inventory conducted in 2019, the total area of agricultural land in China is 127.8619 million hectares. Although this figure is higher than the red line requirements for agricultural land set out in the regulation, compared to the second national inventory, the area of agricultural land has decreased by 7.53 million hectares [43].

To address this issue, the Chinese authorities have made innovative changes to current protection policies, and strengthened cooperation between different agencies to avoid conflicts and policy gaps. The authorities continue to implement the principle of dynamic balance in land use, which involves encouraging local governments to optimize land development patterns and increase land use efficiency, while strengthening the system of responsibility and control. To prevent the use of land for growing other economically viable crops, the government has strengthened agricultural research and is developing agriculture based on the environmental and climatic characteristics of the area to increase farmers' income [44].

In the context of the excessive use of mineral fertilizers and pesticides in agriculture, the authorities have taken measures to promote a scientific approach to their use and increased investment in research to develop effective and low-risk alternative products, as well as improved the system for identifying sources of pollution and actions at contaminated sites. A system of classification of agricultural land was introduced, risk-based management of contaminated land was implemented, and projects with high levels of contamination were strictly controlled [44,45].

In addition, the government has established a system of agricultural land reserves and uses remote sensing technology to conduct inspections using satellite images. An annual system for recording changes in land use has been established [46]. Dynamic remote monitoring of land use is carried out annually and information on changes in land classification is obtained. This policy is implemented by the state: The Ministry of Natural Resources of China is responsible for collecting modern remote sensing satellite images of varying accuracy covering the entire country in different regions from August to the end of December each year, as well as for orthographic correction of the images, using the data of the Third Territorial Land Survey as input data for creating orthophotomaps. Then, the direct subdivision of the Ministry of Natural Resources compares the results with the previous year's results, identifies areas of change, compiles a description of the changed data and sends it to local authorities for review. After receiving the description, the local authorities start verification and conduct field surveys, and the final updated data is sent to the provincial authorities for verification, after which the final results are sent back to the Ministry of Natural Resources for final verification [47]. Violators and non-complainers of the law are subject to appropriate sanctions. According to statistics for 2022, compared to 2021, the area of agricultural land increased by about 8.67 thousand hectares, the second year in a row that the area of agricultural land has increased [48].

However, given the changing economic conditions at home and abroad, the volatility of international circumstances, and climate change around the world, the

Chinese authorities continue to develop agricultural land protection policies to ensure national food security.

Ukraine is currently in a critical period of land use and land policy improvement. China, which, like Ukraine, is a developing country, has accumulated a wealth of practical experience in defining agricultural land protection policies. In the context of rapid economic development, China is also facing pressure to convert a large amount of agricultural land to other uses, as well as conflicting interests of many parties and difficulties in implementing agricultural land protection policies. In order to ensure the quantity and quality of agricultural land, while taking into account the sustainability of the ecological environment, China has developed and implemented a number of effective policies. Among them, the "permanent arable land policy" and the "red line arable land policy" are particularly unique, as they aim to ensure that certain lands are designated for food production in order to maintain the country's food security in extreme situations. Ukraine could look to and learn from China's experience and practices in this area to better address its own land management challenges. But it must be clearly understood that each country is unique, and there is no such thing as a success story that can be copied exactly to another country and still succeed. Ukraine will have to decide for itself what to try, based on its own culture and history.

Conclusion. China, as a country with a long history of agriculture, has made a significant transition over several decades from a poor country in which agriculture was the main activity to a country that has achieved full industrial development and is the only country in the world with a complete industrial chain. Rapid economic

development is accompanied by the loss of a large amount of agricultural land. To address this problem, the Chinese government is taking decisive steps and developing policies to comprehensively protect the quantity, quality and ecology of agricultural land, creating a strategy for the long-term development of the agricultural land protection system. To obtain more accurate information on land use, the government is using remote technologies to conduct state land surveys, and an annual system for monitoring land use changes has been developed by 2022. Thanks to the system of comprehensive protection of agricultural land and the use of modern technology, China achieved a net increase in agricultural land area in 2022.

For countries where agriculture is the main industry, such as Ukraine, China's experience provides valuable guidance. Ukraine can use the experience and methods developed by China in the areas of agricultural land protection policy making, technology use, and policy implementation to ensure the long-term sustainable use of its land resources and healthy agricultural development.

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Л. Жень

ОХОРОНА СІЛЬСЬКОГОСПОДАРСЬКИХ ЗЕМЕЛЬ У КИТАЇ: СУЧАСНИЙ СТАН ТА ІСТОРИЧНІ ПЕРЕДУМОВИ

Анотація. Сільське господарство завжди займало центральне місце в її культурному та економічному розвитку Китаю. Традиційний календар, який використовується в Китаї до цього дня, вказує селянам найкращий час для посіву та збору врожаю, що додатково підтверджує важливість сільськогосподарської культури в повсякденному житті. Земельні ділянки завжди були основою сільськогосподарського сектору, який, у свою чергу, є кутнім каменем для економіки Китаю. Протягом багатьох років вони забезпечували національну безпеку щодо продовольства та надавали засоби прожиття для великої кількості населення. Незважаючи на те, що загальний обсяг сільськогосподарських земель в Китаї є третім за величиною в світі, на значну площу земель, на душу населення припадає лише 0,106 гектара, що значно нижче світового середнього рівня. З врахуванням тиску, який створює зменшення сільськогосподарських земель через економічний розвиток, швидкий ріст населення та зростання міст, уряд Китаю розробив низку заходів з метою захисту сільськогосподарських земель та забезпечення продовольчої безпеки. Ця стаття спрямована на детальний аналіз еволюції політики з охорони сільськогосподарських земель в Китаї, спробу аналізу причин зміни політики, введені заходи та їх ефективність. Вона також надасть досвід та натхнення для розв'язання питань, пов'язаних із ресурсами землі в Україні, і

може стати основою для співпраці між Китаєм і Україною в галузі сільського господарства, щоб разом відповісти на глобальні виклики продовольчої безпеки.

Ключові слова: *охорона сільськогосподарських земель, аграрна політика, управління земельними ресурсами, дистанційне зондування*