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Review

A Review of Rural Land Capitalization: Current Status and Further Research

Weiguo Fan [1], Yuheng Zhang [1,*], Nan Chen [2] and Wanqing Nie [1]

[1] Department of Economic Management, North China Electric Power University, Baoding 071003, China; fwgcnan@ncepu.edu.cn (W.F.); nwq@ncepu.edu.cn (W.N.)
[2] School of Management, Hebei University, Baoding 071002, China; chennanf@hbu.edu.cn
* Correspondence: yoohen@ncepu.edu.cn

Abstract: Land stands as a crucial factor in the production process. The rational allocation of land resources and the enhancement of land use efficiency play pivotal roles in maintaining stable economic development. Various land use types facilitate the capitalization of land resources through activities such as land transfer, land investment, and large-scale land management. Presently, certain regions grapple with challenges characterized by abundant land resources, insufficient utilization of land elements, and a low degree of utilized land capitalization. To address these issues, scholars employ diverse research methods, delving into land capitalization from various perspectives. This paper provides a comprehensive review of the current academic research on land capitalization. It elucidates the conceptual nuances inherent in the process of land capitalization, traces the historical evolution of land capitalization, and establishes a research framework that considers land appreciation, ownership relationships, and functional transformations. By synthesizing and analyzing the existing research on land capitalization, this paper outlines the current status and identifies future research directions. It is concluded that land appropriation, ownership relationships and functional transformations are the three most important elements in the process of land capitalization. The paper proposes objectives for achieving high-quality development while avoiding excessive capitalization and the aim is to propel land capitalization as a catalyst for rural economic development.

Keywords: land resources; land property rights; excessive land capitalization; land use mode; farmers' property rights

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1. Introduction

The process of land capitalization intricately weaves through economic development. The challenges arising from human activities and the uneven allocation of land resources have garnered considerable attention within academic circles. Scholars have delved into the study of land capitalization from diverse perspectives. It is found that the process of land resources is closely related to land price, land ownership and land function. Land development and utilization, far from being a passive outcome of urbanization, are actively employed by local governments to generate income, fueling local economic growth [1]. The present state of rural land resource capitalization involves farmers incorporating land use rights into rural land use rights [2]. In the context of local rural industry digital transformation—a novel conceptual approach fostering high-quality integration—property land capitalization occurs through land lease, cooperation, or investment, resulting in economic remuneration. By altering land use types, the land utilization rate can be enhanced, leading to the realization of land capitalization, with farmers emerging as beneficiaries of land income [3]. Simultaneously, adhering to land use development regulations enables property owners to ascertain the accurate and appropriate compensation basis for the value of land rights [4].

Beyond economic value, land resources possess ecological significance in the capitalization process. From an ecological standpoint, capitalizing on land resources aligns

within the environmental framework of the national economy. Capitalization stands out as an effective method for realizing the value of ecological resources, while protection and development serve as conventional avenues for unlocking the value of ecological resources. As a component of ecological resources, land resources demand a balanced approach to development and protection during the capitalization process [5]. In contrast to property rights theory, some scholars also endorse the perspective of "de-capitalization", seeking to mitigate external costs resulting from the divergence of benefits and costs in land use [6]. The process and mechanisms of land capitalization are intricate, encompassing economic, ecological, and social values. A comprehensive analysis of land capitalization requires elucidating the logic behind transforming land resources into land capital and clarifying the forms and effects of land capitalization in practical applications.

In the examination of the land capitalization process, changes in land use types are intricately linked to pertinent land policies or agricultural policies. Various research models exist to evaluate the land capitalization process, offering valuable insights for practical applications. Quantitatively, land capitalization can be defined using the formula V = R/i, where the value of land or property is determined by dividing the net return/rent by the capitalization rate. The interplay between net return and the capitalization rate significantly influences land value. Net income, contingent on different potential and actual land uses, can be expressed through the hedonic model, incorporating cash rent, non-market ecological function, and non-market social factors. The location and type of land use impact land use capacity, and land use capacity is capitalized as land value from this perspective. Ordinary Least Square regression is employed to construct a hedonistic model, analyzing the interaction between land use and location, facilitating the evaluation of the impact of land use in various zones according to laws and policies, thus providing decision-making tools [7].

Utilizing the decoupling model, the degree of capitalization is predominantly measured based on the scarcity/surplus of rights relative to eligible hectares, implementation mode, and elasticity of land supply [8]. A computable general equilibrium model discerns the role of policy in land use conflicts, considering not only funding scale but also social and economic conditions, agricultural structure, and urbanization levels in areas with conflicting interests [9]. Under the hypothesis of urban geography theory, rural areas around developed areas rarely prosper. Population decline, inappropriate industrial structure and low land use efficiency constitute a negative feedback model. Local farmers in Zhaoqing, China, a city around the Pearl River Delta, set up investment companies, divided their farmland into shares, and cooperated with the local government to eliminate institutional obstacles and successfully promote the economic development of the surrounding underdeveloped areas [10].

Traditionally, research has primarily focused on land capital from the perspective that regards land capital as the form where production and circulation processes coexist, realizing value appreciation and creating surplus value [11]. With deeper exploration, land capitalization can also be elucidated from the standpoint of property rights relationships and political economy. Land ownership serves as the juncture of the relationship between land politics and economic issues [12]. Analyzing the relationship between land ownership division, land political and economic issues, and the land ownership system can offer potential directions for reforming the land ownership system.

It can be seen that the process of land capitalization is closely related to the growth of land capitalization, the transaction of ownership relationships and the changes in functional transformations. The global research on rural land capitalization is getting more in-depth, but with the changes in economic factors and environmental factors, the research status of rural land capitalization needs to be updated urgently, so it is necessary to sort out the research on rural land capitalization to show the latest research panorama. This paper aims to comprehend the research status, principal research directions, and methodologies in this field by synthesizing the existing literature on land capitalization, establishing a comprehensive understanding of the domain. It also seeks to summarize the primary

achievements, findings, and conclusions of existing research, providing a clear insight into related land capitalization issues and understanding the progress and accomplishments in this field. Identifying current research hotspots and frontier issues in the realm of land capitalization, clarifying the direction and focus of future research, and promoting academic exchanges and cooperation are additional objectives. The paper also highlights the shortcomings of existing research and the issues to be addressed, offering new ideas and directions for future research, thus fostering the advancement and development of academic research.

In order to achieve the research goal of this study, the following problems will be solved:

(1) What is the research framework of land capitalization?
(2) How has the research direction of land capitalization changed?
(3) How do we advance the research focus in this field?
(4) What issues does the land capitalization face with in the process of research?
(5) What is the future research direction of land capitalization?

2. The Conceptual Connotation and Historical Evolution of Land Capitalization

2.1. Concept and Connotation of Land Capitalization

Land resources are considered the foundation of material wealth, capable of fostering regional economic development. They serve as a crucial element of human activities, and their spatial heterogeneity significantly contributes to regional economic differentiation [13]. Furthermore, land resources not only offer a material basis and spatial carrier for human survival and development but also delimit the scope and scale of human activities through their carrying capacity [14,15]. The limited, fixed, and distinct nature of land resources set them apart from other natural resources and economic assets [16]. With the ongoing expansion of human activities, land resources have transitioned from mere factors of production to encompass social security and property functions, including ecological service functions [17].

In economic terms, assets refer to the resources owned by enterprises that can bring future benefits [18]. When land resources are defined through property rights and ownership, they transform into assets. This involves breaking down the ownership of rural land into specific rights and interests, such as farmland ownership and use rights, all exercised by different right subjects [19]. The pivotal aspect of this process is assetting land use rights, enabling farmers to receive economic remuneration and income [20]. Consequently, land asset is a process in which land, as a production factor, participates in the operational aspects of production, yielding profits for the owners [21]. This interpretation underscores the fact that profit remunerates capital, whereas land is remunerated by rent.

Capital represents a lasting outcome of past production processes, influencing future production, and is not inherently altered but, rather, is linked with specific economic actors [22]. Land capital can be delineated into natural and artificial capital. In the context of capitalist social relations, labor is expended for the landowner, granting control over land activities and transforming it into artificial capital. As a natural capital, land is significantly impacted by human activities, particularly in terms of land use and resultant land cover changes. It also serves as a component of ecosystem service assessment indicators, ensuring support for current and future human well-being [23]. In a deeper sense, capital refers to the production and accumulation of surplus value, while rent refers to the distribution of surplus value. In capitalist society, land has become a financial and virtual commodity, which promotes capital accumulation in the process of land value appreciation. Land capitalization does not necessarily indicate the monetization of land prices, but a process accompanied by primitive and capital accumulation [24]. Scholars have quantitatively scrutinized the coupling between ecosystem services and influential well-being factors in human economic and social systems, such as land use change, through the lens of the human–land relationship.

In essence, land resources, categorized as production factors, constitute a collective term for various natural resources untouched by human labor transformation. Landowners involve land in the production process based on ownership of production factors, gaining land income. When land resources enter the market, they circulate as land property. Functioning as a natural capital, land provides ecosystem services independently of direct human needs. As artificial capital, it predominantly supplies economic goods and services aligned with human primary and secondary needs. Activating rural land, the scale operation and expansion of rural land are realized, culminating in the appreciation of land capital through market transactions, reflecting the liquidity and value of land capital.

2.2. The Historical Evolution of Land Capitalization

Given the centrality of land private property rights, the international literature offers few theories on land capitalization, with research primarily focusing on the pathways and modes for maximizing land value and reflecting the capital attributes in market allocation. Figure 1 presents a timeline chart summarizing the historical evolution of the land capitalization concept based on this understanding. The concept of land capitalization was initially articulated in the context of China's land use development, recognizing that land resources can be transformed into land assets [25].

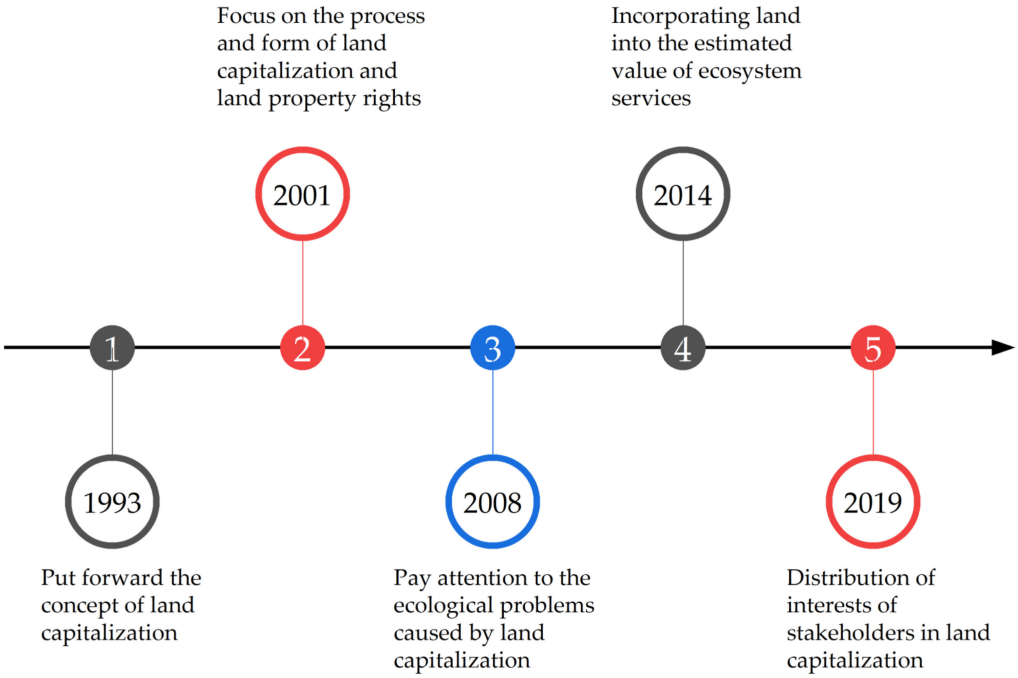

Figure 1. Historical evolution of the concept of land capitalization.

As China's market economy rapidly advanced, the establishment of an agricultural land system aligned with market principles laid the material and institutional foundation for rural modernization. The introduction of the innovative rural land shareholding cooperative system in Nanhai city played a pivotal role in promoting land capitalization, marking its early manifestations [26]. Subsequently, research on land capitalization extended into the realm of property rights systems and the evolution logic of land capitalization [27,28].

The augmentation of land use contributes significantly to building crucial assets and capital for the agricultural system [29]. However, the irreversible transformation of land resources into urban construction land poses a substantial impact on the global biosphere, leading to farmland loss, local climate alterations, habitat destruction, and biodiversity threats [30]. Worldwide recognition has emerged that, while land capitalization generates surplus value, it is also undergoing unreasonable consumption and utilization. The transformation of land use in some developing countries, resulting in increased forest

coverage rates and expanded agricultural production [31,32], further validates the notion that land can be capitalized to create value.

An evolving awareness of the value of land resources in providing ecosystem services has prompted efforts to measure the estimate of land use change. Emphasizing that the value of land resources for ecological services differs from commercialization or privatization, new evaluation methods have been proposed [33]. The utilization of land resources to address the people–land contradiction and achieve consensus is crucial. China, in particular, has been innovating approaches to use land for poverty reduction, yet decisions on land capitalization necessitate a comprehensive consideration of the interests of diverse stakeholders [34].

3. Selection and Overview of the Literature Related to Land Capitalization

3.1. Data Sources

Web of Science is a comprehensive and professional academic database, which contains a large number of documents. It is an important tool to retrieve global academic information, and is widely regarded as one of the most valuable resources in the world in this field. In contrast, its academic professionalism and accuracy are higher than other search engines, and it provides a tool for document retrieval and analysis. Therefore, this paper chooses the core database of Web of Science. We searched the literature related to land resources and land capitalization, and selected the articles that met the requirements by searching the search terms. The data were collected in December 2023, and the relevant studies from 2019 to 2023 were selected, and additional retrieval results were obtained by screening items to ensure retrieval quality. We expect to use the latest research results to show the latest research progress of land capitalization. The results were exported as "complete records and cited references" and saved in text format.

3.2. Data Analysis

As mentioned previously, the research scope of land capitalization is extensive, reflecting the complexity of the land capitalization process. Therefore, in theoretical research, it is essential to integrate land resources and land capital into ecosystem services, standardize the process, and subsequently evaluate it. A comprehensive search using the keywords "land capitalization" yielded 16,389 results, and it can be explained that land is an important part of ecosystem services, and the research on land in the field of ecology and the environment focuses on the relationship between land development, utilization and protection. As the most active factor of land entering the market, land capital has become one of the objects of economic research. Land resources are the carrier of farmers' production activities, and studying the process of land capitalization in the agricultural field can promote rural economic development, indicating widespread and in-depth global research on land with diverse perspectives. The selected literature is highly downloaded and cited, which can enhance the research quality of this paper. Through the search results of web of science, Figure 2 shows the number of papers published in the related fields of land capital. Notably, the predominant fields of focus include environmental science, business economics, and agriculture, underscoring the interdisciplinary nature of land capital research.

At the same time, this paper selects the academic papers that are very important for this study in the Web of Science. The keyword "land capitalization" was used. According to the research question, other related fields are related to the words "ownership" and "function". We used a Boolean operator "OR" instead of traditional "AND" to search journals containing technology and space. The search terms used are "land capitalization", "ownership" and "function", and they are used together with Boolean operators "and" and "or". The search results received a total of 859 papers from Web of Science. Due to the wide search scope, papers unrelated to land capital were also included. On account of the relationship of "ownership", it included the results unrelated to land ownership. By analyzing the titles, keywords and abstracts of these papers, 532 papers were finally

excluded. The remaining 327 papers were screened again, and only the titles were used to focus on land capitalization. The full text was searched online, because only the papers with full text available were considered qualified. Finally, after screening, the results were found, and are outlined in Figure 3.

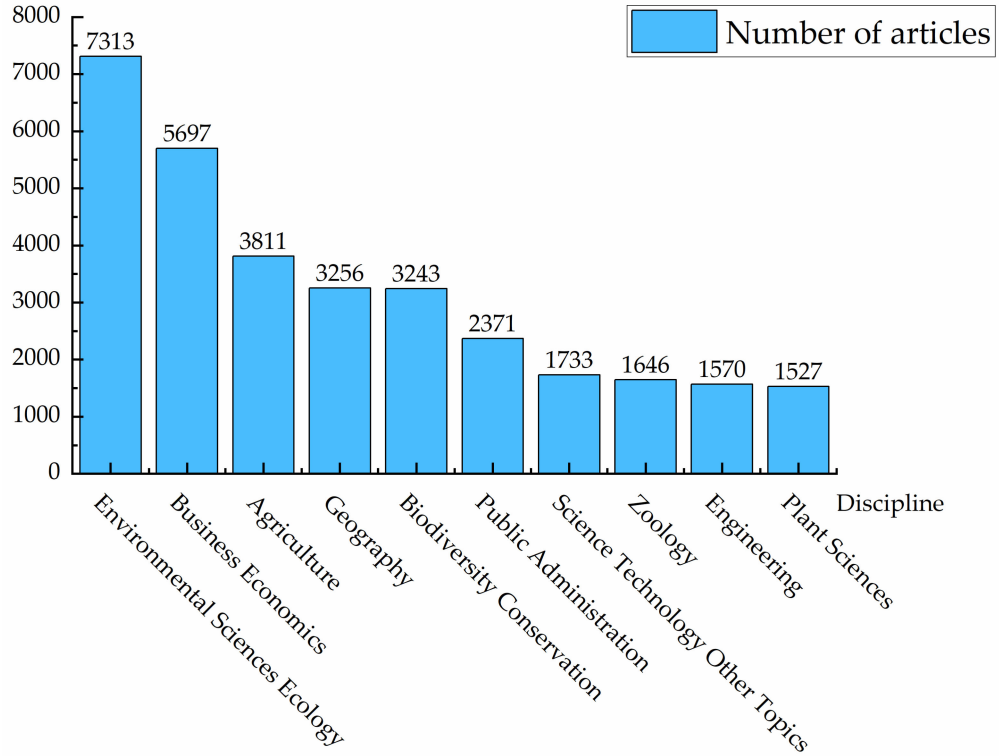

Figure 2. The number of papers published in the field of land capitalization research.

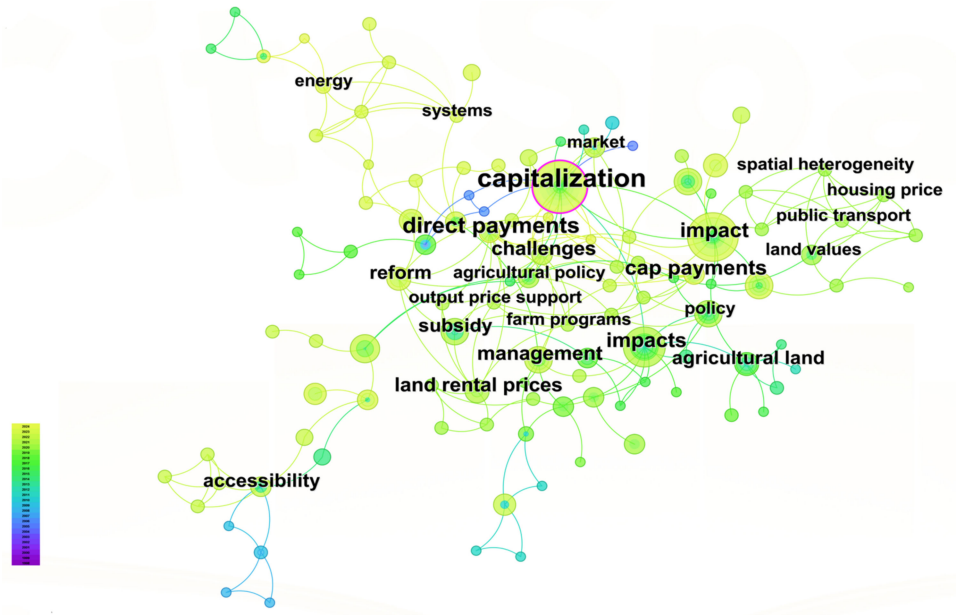

Figure 3. Time-based word frequency network visualization.

Figure 3 shows the visual effect of qualified retrieval documents, and the legend shows purple to light yellow. It represents the change of key words in the field of land capitalization research in different years. The red circle in the middle means that the research center of land capitalization always revolves around the process of capitalization. The head words related to capitalization are "direct payment", "impacts", "policy", "land

rental price" and "agricultural land". The research trends that reflect the research topic of land capitalization are from "market", "direct payments", "accessibility" to "challenges", "agricultural policies", "land impact" and "capitalization research system".

Further refining the search with secondary keywords "land capitalization" produced 182 results, emphasizing the deep exploration of capitalizing land from a land capital perspective. Within this, topics such as the transformation of land use types, value embodiment, land capitalization's relation to real estate development and urban construction, and the temporal and spatial effects of land capitalization have garnered significant attention. Subsequently, by adding the keyword "rural", 44 relevant search results were obtained, leading to a meticulous selection process.

To facilitate comparison and analysis, our focus narrowed to case studies involving land resource utilization and the realization of land capitalization. We excluded review articles and the articles that simply introduced land capital in the form of money or land value. This exclusion criterion ensured a more targeted selection that considered the intricate relationship between land utilization and land capitalization.

The articles selected for analysis were organized in reverse chronological order, spanning 27 articles from 2023 [35–39], 2022 [40–45], 2021 [46–50], 2020 [51–55], and 2019 [56–61]. Among the retrieved literature, the research methods employed were categorized into quantitative and qualitative analyses. For similar research methods, diverse research areas and directions were explored. This analytical framework serves as the basis for examining the theoretical underpinnings, research methods, and practical applications of land capitalization.

The spatial scale of the chosen case studies encompasses the world (3), country (13) and region (11). The majority of selected case studies concentrate on specific regions and countries, forming the basis for the subsequent analysis. While most case studies deploy multiple research methods, we primarily emphasize the main methods used for analysis. This approach enables a nuanced exploration of the intrinsic drivers and external factors influencing land capitalization. Combining quantitative and qualitative research methods, the process of land capitalization is comprehensively summarized, highlighting various capitalization forms across different land use types, and analyzing influencing factors and practical outcomes. Building on this foundation, efforts should be made to enhance the depth and breadth of research on land capitalization to achieve comprehensive insights. Specifics have been presented in Table 1. It summarizes the research methods, research emphases and research areas of the selected data and indicates the author's attitude towards the process of land capitalization.

Table 1. Case selection of land capitalization.

Source	Method	Support	Research Emphasis	Space Scale
[35]	Model	√	The influence of highway scale expansion on land use type	Region
[36]	Ethnography	√	Land capitalization melts into Buddhist culture to promote capital accumulation	Country
[37]	Model		There are regression and racial differences in the wealth benefits of land conservation policies	Region
[38]	Model	√	Changes in land-use types promote the process of capitalization	Region
[39]	Model	√	The relationship between the land income and the production cost after the land lease	Region
[40]	Model		The circular accumulative effect of land resources and land capital on rural economy	Country
[41]	Model	√	The willingness to buy farmland is greater than the willingness to lease	Country
[42]	Model		The future impact of land-use changes on cities	Region
[43]	Qualitative research		Feedback from local governments to different groups of people	Country

Table 1. *Cont.*

Source	Method	Support	Research Emphasis	Space Scale
[44]	Case study	√	Land joint-stock cooperatives are positively related to rural development	Region
[45]	Model		The remaining term of land use right is short, which should take into account various benefits	World
[46]	Qualitative research		The early Chinese-style land development model urgently needs to be changed	Country
[47]	Model		Excessive land capitalization limits the development of market economy	Country
[48]	Qualitative research	√	Land capitalization promotes rural economic development	Country
[49]	Model	√	Reorganize the ownership of the land to improve the land value	Region
[50]	Model	√	The impact of the land capitalization process on the economy, environment and ecosystem services	Region
[51]	Case study	√	Homestead transfer can provide land use space to realize rural revitalization	Country
[52]	Model	√	The influence of the capitalization of the rural land development right on the land capitalization in China	Region
[53]	Model	√	Analyze the influence of land ticket system on the environment, economy and ecology from the perspective of resource, asset and capital	Region
[54]	Qualitative research	√	Land-use planning suppresses the depletion of agricultural land	World
[55]	Model		Food subsidy policy for the impact of farmland land capitalization	Country
[56]	Case study		Land degradation forces the land capitalization to change the development mode	Country
[57]	Case study		Land capitalization is affected by the domestic political situation and the economic structure	Country
[58]	Model	√	Land economic value evaluation method	Region
[59]	Qualitative research	√	Land capitalization plays a positive role in rural development and revitalization of rural economy	Country
[60]	Qualitative research		The development and imbalance of land capitalization and urban industrialization process	Country
[61]	Model	√	Farmers passive land development, promote land rental and obtain rent and income	World

Notice: "√" means the author has a positive attitude towards land capitalization.

4. Theoretical Research, Research Methods, and Practical Application of Land Capitalization

4.1. Theoretical Research on Land Capitalization

The theoretical exploration of land capitalization unfolds as a multidisciplinary endeavor, intricately weaving together concepts from economics, geography, sociology, and other fields. This multifaceted discourse delves into the nuances of land property rights, ownership relationships, and their impact on land use and allocation. The concept of land capitalization is less prevalent in the English literature due to the emphasis on land private property rights. Research in this domain predominantly focuses on realizing the path and pattern of land value maximization, along with the calculation methods presented in Table 2. It summarizes the estimation methods of land value, as well as the applicable fields, characteristics and evaluation results of different methods.

Table 2. Land value evaluation methods.

Method	Apply	Feature	Assessment Result	The Pertinent Literature
Market comparison method	The property market is developed in areas with sufficient and comparable examples	According to the actual land price, compare and calculate the estimated land price	Relative price	[62–64]
Income reduction method	Suitable for profitable land	The price is the present value of the future net income, and the calculation deviates from the actual situation	Income price	[65,66]
Method of residue	There are trading areas, development and value in development	Close to market prices	The remaining price	[67–69]
Cost approach	There are new development areas	Cost does not equal the price	Costs add to the price	[70–72]
Benchmark land price coefficient correction method	Existing benchmark land price and land price correction coefficient table	Calculate according to the existing data	Relative price	[73,74]

Within the realm of the capitalist mode of production, land serves as a crucial means for capital accumulation. Topics such as land finance and land financing take center stage, addressing how local governments generate fiscal revenue through land transactions and employ land as a financial instrument in the capital market. This, in turn, instigates changes in the land system, reforms, and influences land use and distribution.

4.1.1. Land Capitalization and Land Value

Land capitalization denotes the process of regarding land as fixed capital, integrating rural collective land into the market value system through a standardized land property right system. This revitalizes increasingly scarce rural land resources, maximizing their value efficiency and triggering the process of land appreciation. Capitalizing land involves discounting the expected future income and production value to determine property value, facilitating market circulation, ensuring liquidity, and optimizing land resource allocation through competitive bidding mechanisms.

As seen in various studies, the process of land capitalization has far-reaching effects. For instance, the construction of highways acts as a catalyst for the development of new built-up areas by transforming vacant land. Infrastructure improvements raise the potential for constructing new industrial and commercial buildings, subsequently enhancing the value of nearby land [35]. Greenway infrastructure, when considered in terms of land capitalization, impacts the value of surrounding land based on spatial location, showcasing the heterogeneous nature of this influence, ranging from 4% to 12% [38]. However, the rapid expansion of land and capital appreciation does not necessarily ensure perpetual benefits for urban development [42]. In the context of land capitalization, understanding the environmental impact and balancing the trade-off between economic and ecological considerations is crucial [50,53]. Additionally, the unchecked development and excessive capitalization of land can necessitate a forced transformation in the mode of land capitalization, potentially hindering sustainable land development [56].

4.1.2. Land Capitalization and Land Function

In the dynamic framework of land capitalization, as outlined in Table 3, the functions of land undergo continuous transformations over time and space. It vividly shows the types of land use and the changes in land use types caused by the changes in land functions, from which we can see that land use types change with the changes in land functions.

Traditionally, land is viewed as having roles as production factors, supporting social security, and serving as property. The institutional arrangement of land property rights is seen as directly influencing the exercise of these functions, particularly as economic development progresses through different stages [75].

Table 3. Land function transformation in the process of land capitalization.

Land Function Form	Land Function Type	Land Use Type
Function of factors of production	Agricultural production and sources of income	Cultivated land, woodland
Social security function	Residence, social security	Homestead and construction land
Property income function	Sustainable development, capitalization	Woodland, grassland, water area and unused land

During the early phases of rural development, land functions as the primary means of production for farmers, with income derived from land management serving as the economic backbone for rural communities. However, with the advent of industrialization and urbanization, rural land experiences a notable reduction in its functions as both a production factor and a source of social security for farmers. Consequently, there is a shift in farmers' demands for land functions towards emphasizing its property function [76].

To address this evolution, a more comprehensive rural social security system beyond land is deemed necessary. Establishing an inclusive social security system covering both urban and rural residents becomes imperative. Simultaneously, creating an environmental mechanism to facilitate the effective utilization of land functions, especially optimizing the allocation of land resources through land circulation, is crucial [77].

The essence of rural land capitalization lies in capitalizing on rural land use rights or the capitalization of land leases, with a heightened emphasis on the property function of land. This results in the transfer of rural land management rights. Through these transfers and the transaction of land property rights, the realization of the property function of land is further facilitated [2]. Additionally, the transformation of land function accompanies changes in both form and type, transitioning from production-oriented roles to supporting life and eventually culminating in ecological functions.

4.1.3. Land Capitalization and Land Property Rights

Within the realm of land capitalization, changes in ownership relationships manifest in the land use rights market, where original land use right owners engage in activities such as transfer, leasing, and mortgage. Land property rights encompass ownership rights, usage rights, income rights, and disposition rights related to land. In China, land is owned by the state, and land use rights can be legally transferred, leased, mortgaged, etc. However, in certain regions, farmers' land rights are restricted, leading to land expropriation becoming a significant source of rural conflicts in contemporary China [43].

To address this issue, there are calls for returning land rights to farmers, reorganizing land ownership to enhance land value, promoting the positive impact of capitalizing land development rights on land capitalization, and considering multiple benefits, especially when the remaining term of land use rights is short. This approach aims to maximize farmers' land rights and interests [45,49,52]. Moreover, different types of land use undergo varying changes in ownership during the capitalization process. The transfer of homestead usage rights, for instance, can provide space for land use [51].

The establishment of joint-stock cooperatives for rural land allows farmers to share the right to manage land as assets within agricultural-related production entities. This integrated approach to land circulation yields returns in the form of dividends and facilitates the transfer of management rights [44]. Overall, realizing the capitalization of land management rights, land use rights, and land ownership can significantly contribute to the economic development of rural areas [48].

The process of land capitalization is intricately linked to land property rights. Land capitalization assigns a certain value to land, which can be transformed into capital through the confirmation and transaction of land property rights. The success of land capitalization often hinges on the stability and clarity of land property rights. Only when land ownership and land use rights are protected and regulated can the process of land capitalization be effectively promoted.

4.1.4. Research Framework of Land Capitalization

The process of land resource capitalization places emphasis on the dynamics and value-added nature of land capital, as illustrated in Figure 4. The shift from agricultural to non-agricultural land use and land nationalization results in an increase in the value of land ownership and usage rights [78]. Through various means such as land transfer, subcontracting, replacement, sharing, and leasing, farmers transfer management to agricultural management entities and between different subjects. This promotes the scale production, professional management, and market-oriented management of agriculture, realizing the capitalization of land value in the circulation process [79].

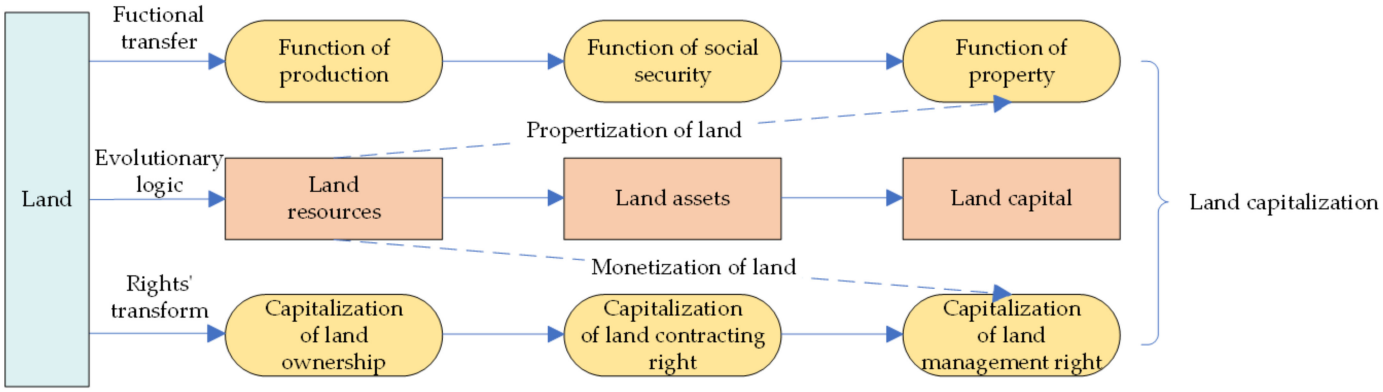

Figure 4. Frame diagram of land capitalization process.

Land resources serve both as assets and property, and landowners capitalize on land appreciation through enclosure, rent extraction, property income, and other mechanisms. The complex process of land capitalization encompasses changes in property rights relations. Real rights, a legal concept, imply that farmers will actualize land ownership to some extent. The functional value measurement method utilizes model indices to estimate the material quality of ecosystem services, monetizes these values, and thereby achieves the monetary measurement of the ecological value of land, facilitating land monetization in this process [80].

Property subdivision proves beneficial not only for broadening the financial function of land and realizing its mortgage value [81], but also for stabilizing definitions that encourage long-term investment by land property subjects. This, in turn, optimizes farmers' production factor configurations, enables scale management, and ultimately yields higher circulation rent. Developed countries like the United States predominantly implement private land ownership. Land, treated as a commodity, can be traded, leased, mortgaged, or given, with transaction prices determined by market supply and demand dynamics [81].

In the changing landscape of ownership relationships, property right subjects trade land property rights through property right trading markets, thereby promoting the realization of the economic value of land assets and transforming them into land capital. Consequently, land capitalization specifically aims at realizing the capitalization of land property rights, further categorized into land ownership capitalization, land contract right capitalization, and land management right capitalization.

4.2. Research Method of Land Capitalization

4.2.1. Classification of Research Methods

Land capitalization employs various research methods, broadly categorized into quantitative and qualitative methods, each serving distinct purposes in data analysis and research assessment. Quantitative methods, aligned with natural science logic, elucidate relationships between variables through data, aiming to provide an overview of phenomena, capture correlations, and predict trends. Specific quantitative methods include experimental research, investigative research, statistical analysis, empirical research, and more. By collecting comparative information related to land capitalization for calculation, these methods unveil developmental laws, clarify relationships, and conduct extensive quantitative analyses of the mechanisms and impact assessments of land capitalization. This allows for predictions of future developments in land capitalization and the formulation of corresponding recommendations.

On the other hand, qualitative methods are grounded in scientific reasoning and often involve qualitative analysis and summary induction. Leveraging literature research and theoretical analysis methods, these methods summarize the domestic and international literature on the motivations, modes, and issues surrounding land capitalization. They explore the relationship between land capitalization and economic development, analyzing the need for improvements in economic, political, legal, and management systems during the operational processes. Additionally, qualitative methods delve into the occurrence mechanisms of land capitalization, study the challenges faced at different times and locations in the land capitalization process, and analyze the impact of expectations.

4.2.2. Comparison of Different Research Methods

Quantitative analysis primarily centers on data modeling, empirical analysis, and investigation. Commonly used methods include the Hedonic pricing model and multiple regression analysis, particularly for calculating land costs and the value derived from land capitalization. The Hedonic pricing model is often employed to assess the wealth generated in the housing market through land protection, transforming protection benefits into approximate housing values. This allows for the quantification of benefit distribution among population groups and determining the incidence of land income resulting from land protection policies, such as the feasibility of greenway expansion [37,38].

The panel vector auto-regression model serves to analyze the interaction mechanisms among land resource endowment, land capital endowment, and rural poverty. Findings indicate that the improvement in land resource endowment has a prominent short-term effect on poverty reduction, while the enhancement of land capital endowment exhibits a relatively prolonged impact on rural poverty [40]. Additionally, when calculating land lease prices and considering the impact on economic benefits, models like the present value analysis model [41], income capitalization model, and multiple component analysis are employed [39,41,47,49,58].

Utilizing a life cycle model, the study of the economic benefit model of land capitalization, from the perspective of resources–assets–capital, involves analyzing the impact of land capitalization on the environment, economy, and ecology. This approach quantifies the entire process of land resource capitalization, encompassing different stages of environmental load, economic cost, and changes in ecosystem services [50]. In summary, quantitative analysis develops mathematical models to represent the value emergence in the land capitalization process, making intricate processes more comprehensible through mathematical means.

Qualitative research employs methods such as interviews, text analysis, projection techniques, and ethnography. Through literature research and qualitative analysis, research questions are interpreted and inferred, and the results are validated and evaluated for reliability and effectiveness. Rural areas have historically overlooked the assets and capital attributes of land, limiting its role in poverty alleviation and hindering the sustainable development of rural areas. To enhance rural development by integrating production–

life–ecological functions, anti-poverty policies in rural areas should prioritize land system reform [48].

Over time, rural land has often been underutilized, with land use planning aimed at curbing agricultural land depletion [54]. Common issues like land capitalization, urban industrialization development, and imbalances in rural land compulsory requisition are usually addressed through qualitative analysis, relying on cases as evidence [60]. For instance, in Cameroon, where over 60% of the rural agricultural workforce resides in central Africa, women's groups play a crucial role in land reclamation, highlighting the positive impact of women in the restoration process [56].

As populations migrate from rural to urban areas, there is an increased demand for urban land, leading to urban expansion. The scarcity of urban land and strained land resources necessitate more efficient methods of land use. However, an excessive focus on economic benefits may result in the deterioration of the urban ecological environment [42]. Examining the case of Sri Lanka, early land expansion combined with Buddhist culture promoted the accumulation of temple land and property capital, potentially replacing less efficient fundraising practices and leaving a profound impact [36]. In the context of China's land system reform, the early Chinese-style land development model is deemed unsuitable for economic development and requires urgent transformation [46]. As outlined in Table 4, it listed the research methods of the selected literature, classified them, discussed the advantages and determination of different research methods, and analyzed them.

Table 4. Research methods of land capitalization.

Divided	Method		Sources	Analysis
Quantitative analysis	Modeling	Multiple regression analysis	[35,40,47,52,55,58]	To shorten the data processing time and present the evaluation results in charts, the evaluation results can be quantified to facilitate the comparison between different scholars and organizations. However, quantitative research requires a large number of data samples, for which it is difficult to obtain data and research methods.
		Pleasure pricing	[37,38]	
		Capitalization of income	[39,49]	
		Life cycle assessment	[50,53]	
	Empirical analysis	Discrete experiments	[41]	
		Link tracking	[42]	
		Game theory	[61]	
Qualitative analysis	Literature research		[46,48,59]	Study and explore the driving factors; the research process is more flexible. As qualitative research is dedicated to exploring in-depth reasons, the process is time-consuming, requires more effort, and is limited by personal experience and knowledge background.
	Case study		[54,56,60]	
	Ethnography		[36]	

In summary, qualitative analysis utilizes existing research to comprehensively analyze the issue of land capitalization, aiming to deepen the understanding and provide theoretical suggestions for corresponding field research.

4.3. Practical Application of Land Capitalization

4.3.1. Research on Land Capitalization Modes

The central focus of land capitalization modes is the transformation of land assets, with land transfer being a key mechanism to convert land resources into assets and capital, reflecting an increase in land value. Techniques such as land leveling, which transforms mountains into fields, contribute to the differentiation of construction land income, ef-

fectively addressing funding shortages in certain regions [82]. The process of rural land capitalization can be realized through either government-led or market-led modes [83,84].

Government-led land capitalization has been a longstanding mode, relying on the nationalization of land and the government capturing differences in land values. On the other hand, market-led land capitalization involves clearly defining land transfer rights and allowing market forces to play a leading role in the allocation of land elements. Different regions actively explore and innovate various modes to achieve land capitalization through market operations. For agricultural land, cooperatives or companies in the form of shares are established for agricultural production and operation [85]. Regarding collective construction land, the South China Sea mode in the Pearl River Delta continually grants village land rights, fostering collective land assets and capitalization [86]. For homesteads, their asset benefits are incorporated into the utilization process of homesteads and housing, generating economic benefits for farmers [87].

As an innovative mode of land consolidation, utilization, and transfer, the land ticket trading system responds to the contemporary need for the common development of urban and rural areas. By establishing a connection between urban construction land and rural construction land, this system facilitates the sustainable development of land capitalization. Notably, the total amount of urban and rural construction land remains constant, and cultivated land does not decrease, yielding a series of positive effects. The system realizes the potential relationship between rural and urban construction land, promoting land circulation and significantly enhancing the value of rural land in remote areas [88]. However, the inherent disadvantages of the land ticket system, coupled with unclear policy guidance, raise concerns about the possibility of rural resource exploitation [89].

Homestead circulation achieves the overall revitalization of rural areas through the capitalization effect of homestead value, the compaction effect of housing, and the diversification effect of labor resources. The realization of rural revitalization depends on both external, top-down policy support and endogenous bottom-up measures. Homestead transfer serves as a pivotal carrier, integrating various aspects of the rural revitalization process. In China, practical modes such as Chongqing's "land ticket", Zhejiang's "Lianzhong" mode, "two points and two exchange", Tianjin's "homestead housing" and others utilize forms like paid withdrawal, scale circulation, and reclamation to mobilize farmers' enthusiasm and increase their property income, thereby contributing to the realization of the rural revitalization strategy. As presented in Table 5, it classifies and compares different land capitalization practice modes, from which the characteristics of different practice modes can be obtained, so as to provide reference for the subsequent land capitalization practice.

Table 5. Comparison of land capitalization practice modes.

Land Capitalization Subject	Practice Mode	Advantages	Disadvantages	Sources
Government-led	Chongqing "land ticket" Homestead housing exchange mode	Improve the efficiency of land use; play the role of government	Restrain the enthusiasm of farmers; relevant system measures are not perfect	[88,89] [90,91]
Market-led	Zhejiang "Lianzhong" mode	Mobilize the enthusiasm; increase the income of collective economic organizations and farmers	It is difficult to guarantee the stable property income of farmers	[92–94]
	Transfer, lease, investment, joint venture, mortgage mode	Farmers have the spontaneous initiative to trade	Circulation of the market information asymmetry is not complete, the wind Risk is bigger	[95,96]

4.3.2. Analysis of the Influencing Factors of Land Capitalization

Firstly, the change in rural land use types and the allocation mode of land resources significantly impact the degree of land capitalization. Due to restrictions on rural homestead transactions, the value of rural homesteads has not been fully developed, leading to the irrational exploitation of land. The increasing urbanization of rural areas has shifted focus towards consumer interests, sometimes at the expense of traditional agriculture and forestry interests [97]. China's rural land capitalization is intricately linked to the household contract responsibility system for the rational allocation of farmland resources, highlighting the inseparable connection between the land system and the land capitalization process [98]. Additionally, financial decentralization serves as a key influencing factor for local governments to choose land finance, playing a crucial role in the land division process, and can be considered one of the important causes of land capitalization.

Secondly, factors affecting the scale of land circulation encompass land market institutions, land regulations, transaction costs, credit market restrictions, profit levels, and legal means of contract execution. These factors, operating at different levels and under varying mechanisms, dynamics, and conditions of capitalization, contribute to the development of the scale of land circulation. Market-oriented development, low agricultural economic benefits, and poor interests of operators are internal economic factors that influence the land capitalization process [99]. Challenges in the mortgage loans of farmers' contracted land management rights include low mortgage values of contracted land, an imperfect realization mechanism of mortgage rights, and an excessive reliance on the government for risk-sharing mechanisms.

Thirdly, large-scale land management and land circulation represent the manifestation of land capitalization. The pursuit of maximum income for farmers through a single-target solution is defined as a moderate scale [100]. The process of substituting agricultural production factors with the aim of maximizing labor and land productivity will increase the proportion of rice fields, enhancing the capitalization level of rural land. This, in turn, ensures food security and sustainable agricultural intensification. By integrating land resources and implementing scale management, the land in the hands of farmers gains exchange value and use value. Managing and trading land allows farmers to overcome the dual economic and financial dilemma [101], fully mobilizing farmers' enthusiasm to invest in land value production, driving rural economic growth, and ultimately realizing invisible value.

Different countries have distinctive land systems, with the influence factors of land capitalization circulation primarily centered around the market mechanism. Land circulation, with its internal and external conditions and the influence of land use type, is a systematic undertaking that requires improvements at the micro and macro levels.

4.3.3. Problems Existing in the Practice Mode

Firstly, the excessive exploitation and utilization of land resources can result in damage to the ecological environment [47]. When land becomes an investment tool rather than a factor of production, investors may excessively capitalize on land, leading to inflated land prices and the formation of bubbles. When a bubble bursts, it can cause financial risks and economic crises [102]. While land capitalization partly promotes investment and drives economic growth, in the long term, it may limit growth and increase the risk of the non-grain development of cultivated land, which cannot support the sustainable development of land resources [47].

Secondly, government-led land capitalization results in the centralization and monopoly of land resources, allowing a few individuals or specific interest groups to control a significant amount of land resources, while the majority cannot enjoy the fair benefits of land resources [103]. The land ticket policy highlights high risks, presenting environmental changes in the reclamation of cultivated land, risks to the cultivated land balance system, farmers' social security, and the lack of legal supervision and management between

land planning index and land ticket holders, who may fail to obtain constructive land indices [104].

Finally, land capitalization serves as a significant source of fiscal revenue for local governments and a crucial tool for leveraging bank funds, urban infrastructure, and real estate investment and financing [105]. However, the regional poverty resulting from the process of land capitalization is not solely about low income but, more importantly, about the "lack of exchange rights". The land auction system elevates land prices, subsequently raising urban housing prices, increasing the threshold for migrant individuals to live and settle down, and widening the income gap between urban and rural areas. The growth of the urban economy is accompanied by the rise in urban housing prices, leading to the re-concentration of national wealth in the urban and real estate sector and further widening the income gap between urban and rural areas [106].

4.4. Transformation of Land Capitalization

4.4.1. Land Capitalization under High-Quality Development

Land serves as the foundation of development, and the unique pattern of spatial and temporal evolution of land use in resource-based cities reflects regional development. This pattern contributes to the efficient and rational utilization of land resources, promotes scientific regulation, and achieves high-quality development [107]. Marketizing land circulation through the financing effect and resource allocation effect can enhance the marketization of land circulation, improve the degree of land capitalization, increase the financing scale of the city to promote the expansion of production scale, and more effectively leverage the role of land in guiding the efficient allocation of production factors [108]. Simultaneously, land use change holds great significance for ecological protection and high-quality development [46]. Aligned with the principles of present sustainable development and the concept of human destiny community development, the path to green development and high quality is sought through innovative land capitalization, introducing financial products to improve the liquidity of land assets, reduce land transaction costs, enhance the accuracy and reliability of land value evaluation, and provide a reference basis for land transactions.

4.4.2. Land Capitalization and Excessive Capitalization of Land

The promotion of land capitalization by the central government relies on the commercialization process of rural labor force and is constrained by its structure [40]. Understanding the connection between land and labor force, placing agricultural transformation within the context of national capital accumulation, and conducting an in-depth study on the degree of rural land capitalization are necessary. Research on the excessive capitalization of rural land lacks a systematic theory and remains unclear. Existing studies expressing "moderate capitalization" need further clarification [47]. Forming quantitative indicators for rural land excessive capitalization and capitalization degree research will provide data support, enhancing the quantitative measurement of urban and rural land capitalization. Attention should be given to preventing excessive capitalization of land, which may result in damage to land resource endowments [109].

4.4.3. The Influence of Spatial Heterogeneity in the Process of Land Capitalization

The change in the income gap is closely tied to the transformation of the economic development stage, economic system, and distribution system. Spatial heterogeneity is evident in the process of land capitalization. For instance, in Thailand, land capitalization complicates the gap in rural identity politics. In China, the dual land capitalization in urban and rural areas contributes to the gradual widening of the income gap [110]. Strengthening the protection of rural land property rights is essential to prevent excessive income disparities. Analyzing cultivated land development ownership and income distribution patterns from the perspectives of ownership and subdivision is crucial. In China, despite varying degrees of economic growth acceleration during the reform period, the economic growth

rate in the eastern coastal areas significantly outpaced that of the central and western regions over the past 20 years, leading to a widening income gap between regions. Building a model that combines market-led and government-led approaches is necessary to better understand research at both the macro and micro levels.

5. Discussion

5.1. Issues in the Process of Land Capitalization Research

Upon reviewing the existing research literature, a relatively general research framework of land capitalization was established, providing a theoretical basis for basic land capitalization research. However, current research faces certain limitations. In the conceptual analysis and definition of related concepts, the distinction between the land systems of Western developed capitalist countries (private ownership) and socialist countries like China (state and collective ownership) should be acknowledged and incorporated into the concept of land capitalization. While current studies often start from the natural, economic, and social attributes of land, comprehensive clarification of the multi-layer attributes is lacking, and the evolution logic of land capitalization is not thoroughly explained. Future expectations are insufficiently considered, particularly in interpreting the capitalization of rural land. The multifaceted impacts on land capitalization make it challenging to weigh the advantages and disadvantages of the land capitalization tendency. Therefore, evaluating rural economic development and farmers' property income may require further empirical analysis across multiple regions.

Addressing the issue of excessive land capitalization is crucial for a comprehensive understanding of the problems exposed in practical development. To study the overall picture of moderate development in the land capitalization process, consensus and quantifiable indicators are needed to define excessive land capitalization. In analyzing the factors affecting the degree of land capitalization, there is a bias towards macro-level analysis over micro-level analysis, with more focus on internal causes than external causes. Non-property right institutional factors and participants in the land capitalization process have not received sufficient attention. Moreover, a contradiction exists between government-led land capitalization and farmers' participation in land market transactions. Therefore, there is an urgent need for more concentrated and targeted micro-analysis of different land use types in various research areas to identify corresponding coordinated development modes, addressing both theoretical and practical perspectives.

5.2. Further Prospects

As a review study, this paper serves a valuable purpose in summarizing the research direction and focus of current scholars through the compilation and organization of the existing literature. However, several aspects require more in-depth exploration in subsequent studies.

Firstly, in the realm of research methods for land capitalization, while empirical research relies on theoretical foundations, continuous updates to guide empirical analysis are necessary. Therefore, ensuring the representativeness of data during empirical research is crucial. Panel data, challenging for long-term tracking, requires supplementary sampling over time. Data analysis should involve comparisons among similar regions or patterns. A systematic and comprehensive evaluation of memory is essential to ensure general adaptability and representativeness.

Secondly, policies related to the land system and agriculture play a crucial role. Initiating the exploration from policy changes and conducting a comprehensive analysis of the subjects involved in land capitalization can provide valuable insights. While current research primarily focuses on the impact of land capitalization on rural development, farmers' welfare, and overall national economic development, assessing the benefits brought by rural land capitalization in the process of realizing rural-to-urban land transfer can offer a comprehensive evaluation. This evaluation can consider factors such as land carrying capacity, land productivity, and land utilization rate.

Thirdly, in the exploration of the land capitalization model, a more detailed analysis from the perspective of farmers is recommended. This involves not only analyzing the land factors influencing the land capitalization process but also exploring ways to enhance the participation and enthusiasm of farmers in land capitalization development. Farmers are both the owners of land and the transfer owners of management rights during land property rights transactions. While there has been significant empirical analysis of farmers' property income, exploring how to expand farmers' income and further capitalize on the basis of rural land capitalization is a critical aspect to consider.

6. Conclusions

The utilization of land resource elements is directly influenced by human activities and the rational allocation of land resources, contributing to the degree of land capitalization. This paper systematically addresses various aspects of land capitalization issues, elucidates the essence of relevant concepts, and outlines the historical evolution process. Firstly, it organizes the process of capitalization of land resources from multiple perspectives, delineating the progression from land resources to land assets and ultimately to land capital. This includes the interconnected components of land assets, land property, and land monetization. Establishing the framework of land capitalization involves exploring the transformation of land appreciation, land ownership, and land function. It is clarified that land appreciation, ownership relationships, and functional transformations are extremely related to land capitalization. Additionally, the paper summarizes research methods for land capitalization issues, considering both quantitative and qualitative aspects, providing valuable insights for future academic research. It points out the change in the research direction of land capitalization, which has gone through the process from putting forward the concept of land capitalization, focusing on the changes in land rights in the process of land capitalization, and then paying attention to the changes in ecological environment and economic development caused by land capitalization.

In addition, building on theoretical research, the paper analyzes the practical effects of land capitalization, discerns patterns of land capitalization, and examines the influencing factors in the process. Key areas focus in land capitalization include further study of capitalization theory, understanding the motivations, internal and external factors, degree of influence, development trends, and outcomes. It also delves into the challenges manifested in factors such as property rights systems, land markets, policies, and ecological environments. Addressing the problems revealed in the evolutionary process over time is crucial. The balance between ecological value and economic value in the process of land capitalization, such as excessive capitalization and insufficient capitalization, appears in the process of realization.

More importantly, based on the review, future research prospects are outlined. Land capitalization should align with the requirements of high-quality development, fostering the innovation of green land financial products to ensure sustainable land resource development. Attention must be given to the impact of excessive land capitalization, necessitating the continual exploration of quantitative indicators for the degree of capitalization. This deeper understanding of excessive land capitalization provides theoretical support for land development. Acknowledging the spatial heterogeneity in the process of land capitalization across different regions, there is a need to address the widening regional economic gap and achieve a balance in benefits between the government and farmers.

There are some limitations in the writing process of this paper. In the process of capitalization, because more western countries seldom talk about the concept of land capitalization, they judge the degree of capitalization by land value and rent increase, so this paper talked more about land capitalization under public ownership. In addition, in the selection of the literature, the author made a choice to consult the relevant literature, which is subjective to some extent. Finally, this paper reviewed the literature from the perspective of qualitative analysis, but did not discuss the factors such as land capitalization rate from the quantitative perspective, which needs further research.

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