DOI URL:https://doi.org/10.63944/0hj.JFEMR.3
Vol.1 No.3

Imbalance of Interests Between Grain Producing and Consuming Regions and the New Mission of Urban Agriculture: A Perspective From Marxist Ground Rent Theory

Bohan Wang*

School of Marxism, Jilin University, China | 13930882998@163.com

***Corresponding Author: Bohan Wang, School of Marxism, Jilin University, China | 13930882998@163.com**

Abstract: Food security serves as a critical pillar of national security.In China's food supply sector,phenomena such as "major grain producers but minor industrial players and fiscally constrained entities,""economic disincentives for grain cultivation,"and "increased production not necessarily translating into higher income"reflect a fundamental imbalance in benefit distribution between production and consumption regions.This imbalance essentially stems from the contradiction between "value generated from land" and "equitable value distribution."Using the Marxist theory of land rent as an analytical framework, this study analyzes the systematic rent drain from producing regions through a three-dimensional lens comprising absolute rent, differential rent (I & II), and monopoly rent. Guided by this perspective, and introducing the role of urban agriculture as a strategic vehicle for rebalancing, we propose an institutionalized compensation mechanism centered on urban agriculture and supported primarily by horizontal fiscal transfer payments.This approach aims to enhance new quality agricultural productivity,address the challenge of "economic disincentives for grain cultivation",and ensure that major grain-producing regions receive fair economic returns based on land ownership and ecological contributions.By rebalancing interests between production and consumption areas,the mechanism seeks to safeguard national food security and promote urban-rural integration.It should be noted, however,that while an urban agriculture model grounded in land rent theory offers a viable pathway for mitigating regional benefit imbalances and boosting advanced agricultural productivity,it is not the sole determinant.

Keywords: benefit imbalance between production and consumption regions; urban agriculture; absolute rent; differential rent; monopoly rent

Introduction

Food security is fundamental to both people's livelihoods and national stability.It is strongly correlated with economic fluctuations, public welfare,and overall national security. Since the late 1970s, China has undergone significant historical shifts in the regional pattern of grain production and sales. While the dependence on major production regions for food security has increased markedly, these areas face numerous challenges in sustaining economic and social development, particularly in grain production. Specifically, there exists an imbalance of interests between production and consumption regions, manifesting as inequitable distribution of economic value. Grain-producing regions are characterized by high output and substantial contributions, yet they remain economically disadvantaged due to significant outflows of grain value, tight local finances, and sluggish economic growth. The persistent challenge for these regions lies in their dual identity as "large granaries" coupled with "small industrial bases and weak fiscal capacity"[1].Hidden costs in production regions—such as ecological services like cropland preservation, carbon sequestration, and ecological barrier maintenance—remain uncompensated, creating a free-rider situation for consumption regions. Moreover, profits are unevenly distributed along the industry chain: production areas retain minimal benefits, while consumption regions capture higher profits from circulation, leading to high consumer prices coupled with low farmer income. Additionally, imbalanced factor mobility further exacerbates regional disparities, as production regions suffer from outflows of labor, capital, and talent toward consumption zones. This imbalance not only undermines farmers' enthusiasm for agricultural production but also epitomizes broader issues of uneven and insufficient development within Chinese society.

The Decision of the Central Committee of the Communist Party of China on Further Comprehensively Deepening Reforms and Advancing Chinese Modernization, adopted at the Third Plenary Session of the 20th Central Committee of the CPC, emphasized the need to "develop new quality agricultural productivity according to local conditions." It also called for "establishing a horizontal interest compensation mechanism between grain production and consumption regions and making substantive progress in compensating major production areas." The same year, the Food Security Law explicitly mandated "improving the interest compensation mechanism for main production areas," providing a legal foundation for balancing regional benefits. The 2025 Government Work Report further implemented the spirit of the plenary session by underscoring the need to "develop new quality agricultural productivity based on local conditions" and introducing for the first time an "inter-provincial horizontal interest compensation mechanism," shifting responsibility from central government support to shared accountability across consumption regions. Improving the compensation mechanism for grain-producing regions will be a crucial task in ensuring China's food security in the coming years. Within this context, what role can urban agriculture—as a key component of new quality agricultural productivity-play? This paper posits that urban agriculture can serve as a strategic vehicle for rebalancing interregional

interests by addressing rent drain.Drawing on Marxist rent theory from Capital, this paper constructs a three-dimensional analytical framework encompassing absolute rent, differential rent (I & II), and monopoly rent to analyze the core conflict between production and consumption regions: the loss of land rent in producing areas and its uncompensated appropriation by consuming regions. It then explores how urban agriculture, introduced here as a core analytical concept, can act as a lever for regulating interregional rent flow across all three dimensions, thereby opening new perspectives on its social value and enhancing its role in bridging regional benefit gaps and advancing new quality agricultural productivity.

1. An Interpretation of the Imbalance of Interests Between Production and Consumption Regions Based on a Three-Dimensional Rent Theory and the Role of Urban Agriculture

1.1. The Theoretical Foundation of Rent Drainage in Production Areas—A Three-Dimensional Rent Perspective

The Marxist theory of land rent provides a fundamental theoretical framework for analyzing the imbalance of interests between grain-producing and grain-consuming regions. Land rent refers to the income obtained by landowners through their monopoly of ownership, analogous to the "rent" collected from housing leases. As the economic realization of land ownership, the generation, distribution, and circulation of land rent profoundly shape regional development patterns. Within the context of China's urban-rural dual structure, the interest imbalance between producing and consuming regions essentially reflects an institutional disruption in the circular mechanism of land rent, manifesting specifically as the systematic drain of absolute rent, differential rent (encompassing both Forms I and II), and monopoly rent from producing areas. This comprehensive theoretical framework lays the groundwork for understanding how urban agriculture can later intervene to rectify these interconnected rent drains.

To elaborate, absolute rent constitutes the basic fee payable for the use of land, reflecting the rights of land ownership;differential rent I arises from natural advantages such as soil fertility and geographical location, while differential rent II results from value-added investments, such as enhanced agricultural productivity through technological inputs;monopoly rent stems from the monopolistic control over unique natural conditions or scarce resources, enabling the realization of supra-normal prices.

The core of the interest imbalance lies in the contradiction between the quasi-public good nature of agricultural products and the market-based distribution mechanism. This leads to a net loss of land rent in producing regions and uncompensated benefits accruing to consuming regions. Although the quasi-public attribute of agricultural products implies that associated costs should be socialized, the current market mechanism allows consuming regions to effectively appropriate land rent from producing regions without payment. This constitutes a form of "institutional deprivation," whereby consuming regions fail to adequately compensate producing regions for the "land services" they enjoy—such as food security, ecological buffering, and factor inputs.

This loss not only exacerbates regional disparities but also undermines the sustainability

of the national food security system. A thorough analysis of the internal mechanism behind the drainage of land rent from producing areas is essential to resolving the paradox of "major grain-producing counties suffering from fiscal poverty." In essence, the Marxist rent theory offers a three-dimensional analytical framework—comprising absolute rent, differential rent (Forms I and II), and monopoly rent—for holistically examining the interest imbalance between producing and consuming regions.

Critically, this framework integrates monopoly rent as a core dimension of rent drain. In the original Marxist theory, monopoly rent is distinct. Its incorporation here is essential because the "drain" of monopoly rent from producing regions possesses a unique character: it represents not merely the transfer of realized value, but more profoundly, the loss of potential value and the deprivation of value-realization opportunities. Producing regions often possess unique natural endowments (e.g., rare black soil, potential for geographical indications) capable of generating monopoly rent. However, within the current commodity grain circulation system, this potential for monopoly pricing remains largely unrealized at the source. Instead, the scarcity value embedded in raw materials is frequently captured and realized by consuming regions through downstream branding, processing, and marketing. Thus, integrating monopoly rent into the three-dimensional framework provides a complete picture of how producing regions lose not only existing value but also the opportunity to capitalize on their scarce resources, a key gap that urban agriculture, through its value-adding functions, can address.

Table 1. Mechanisms of Rent Generation and Dissipation in Production Regions: Insights from the Three-Dimensional Rent Theory

Type of Land Rent	Logic of Rent Generation in Production Regions	Manifestations of Rent Drainage
Absolute Rent	Returns derived from the monopoly of land ownership	Collective land ownership in production regions fails to translate into economic returns, with opportunity costs and social costs remaining uncompensated.
Differential Rent		
Differential Rent I	Premiums arising from natural endowments (e.g., soil fertility, location advantages).	The potential value of black soil resources and the ecological value of carbon sequestration in production regions are not factored into the pricing mechanisms of consumption areas.
Differential Rent II	Value appreciation through factor inputs (e.g., capital investment, smart agriculture technologies).	Insufficient investment in production regions results in a failure to channel technological premiums from urban agriculture back to these core areas.
Monopoly Rent	Excess returns derived from the monopoly of unique natural conditions or scarce resources.	The potential for monopoly pricing based on unique endowments (e.g., specific black soil, potential GI products) remains unrealized locally due to limited value-added capacity, with the scarcity value and high premiums being captured downstream by consuming regions.

Absolute ground rent, as the economic realization of land ownership monopoly, constitutes a foundational component of the land rent system. Under the framework of socialist public land ownership, rural collective economic organizations legally hold land ownership and should therefore realize their property rights through forms of rent. However, a practical dilemma arises: primary grain-producing regions bear the special function of

ensuring national food security, and the implicit costs they incur—such as farmland preservation—exhibit significant public good attributes. These costs include opportunity costs (e.g., foregone industrial land use), ecological costs (e.g., soil quality maintenance), and social costs (e.g., emergency grain reserves), which far exceed direct production costs and account for the majority of the compensation required in these regions.Due to institutional shortcomings in the current compensation mechanism, these "implicit rents" arising from food security responsibilities are not incorporated into the payment calculation system of primary grain-consuming regions. As a result, absolute rent remains consistently under-collected. Meanwhile, central fiscal transfers are insufficient to fully cover the actual needs of producing areas, constrained by budget scales and allocation mechanisms. This institutional under-compensation not only undermines the effective ownership of collective economic organizations but also leads to a development paradox wherein "greater grain output exacerbates fiscal strain," severely impairing sustainable grain production capacity. There is a need for central government guidance and shared responsibility from consuming regions to implement horizontal compensation to producing areas. Methods such as opportunity cost analysis and shadow pricing can be employed to estimate the proportion of implicit costs in total compensation needs by comparing the income difference between land used for grain production and non-agricultural uses in primary producing regions. Based on the net grain outflow from producing areas and considering the fiscal capacity of consuming regions, initial payments can be designed to balance central-local and producer-consumer relationships.

Differential rent manifests through two distinct pathways that reflect different sources of land value advantage. Differential Rent I originates from innate differences in natural land endowments, generating excess returns from superior land due to higher soil fertility, favorable climate conditions, or advantageous geographic locations. China's major grain-producing regions, endowed with globally scarce black soil resources and large-scale contiguous farmland, possess significant natural advantages in agricultural production. However, the current grain pricing mechanism follows the principle that "market prices are determined by production costs on the least fertile land," homogenizing the value of land through market processes and systematically underestimating the actual output value of superior land. Environmental services provided by land ecosystems have long been excluded from the rent calculation system. According to scientific estimates, China's cropland net carbon sink exceeded 500 million tons in 2022, with producing regions contributing over 70% of this amount[2]. Ecological services such as water conservation in wetlands, carbon sequestration and oxygen release by black soil, and biodiversity maintenance continue to be delivered yet remain unquantified in the form of differential rent I. Meanwhile, Differential Rent II arises from enhanced land productivity due to capital investment. When capital is deeply embedded in the agricultural production process through technological intensification, it significantly alters land output efficiency and generates sustained value-added returns. Urban agriculture, as a typical form of capital-intensive farming, redefines the integration of land and capital through modern production factors such as intelligent greenhouse systems, vertical farming facilities, and soilless cultivation techniques. The intensive input of technological capital markedly increases per-unit land productivity, generating substantial differential rent II. In contrast, traditional producing regions are trapped in a vicious cycle of

capital constraint: significant portions of profits leak out of the production chain, and weak local public finance leads to underinvestment in infrastructure. These intertwined factors severely constrain the reproduction of differential rent II, trapping land value appreciation in a cycle of "underinvestment–low returns–weak reinvestment."

Monopoly rent completes the three-dimensional analytical framework by addressing the loss of potential value from unique resource endowments. This form of rent stems from the monopolistic control over scarce natural conditions or specialized resources capable of generating supra-normal returns. Producing regions often possess unique natural advantages—such as rare black soil compositions or potential geographical indication products—that create the foundation for monopoly pricing. However, within the current commodity grain circulation system, this potential remains largely unrealized at the source. The scarcity value embedded in these unique endowments is frequently captured and realized by consuming regions through downstream branding, processing, and marketing activities, rather than benefiting the producing regions where the foundational resources originate. This constitutes a distinct form of value drain that differs fundamentally from the mechanisms observed in absolute and differential rent: it represents not merely the transfer of realized value, but more profoundly, the systematic loss of potential value and the deprivation of value-realization opportunities. The failure to actualize monopoly rent reflects producing regions' limited capacity for value-added transformation and brand development, preventing them from converting their unique natural capital into sustainable economic advantages.

Table 2. Interregional Transfer Mechanism of Differential Rent II

Segment	SourceofDifferentialRentII	ActualBeneficiary
Production	Land improvement (e.g., black soil conservation)	Producers (short-term)
Circulation	Brand premium, cold chain logistics value-added	Consuming region enterprises, retailers
Redistribution	Producer input → GDP growth in consuming region	Local governments, capital owners

1.2. Theoretical Rationale for Urban Agriculture in Restoring the Rent Circuit: A Spatial Political Economy Perspective

The theory of spatial production offers a profound theoretical lens through which to interpret the rent-regulation function of urban agriculture. This theory reveals how capital reshapes the value-creation logic of geographic space through the cyclical movement of two types of fixed capital.

Table 3. Producing-Consuming Region Rent Balance Model Embedded in Urban Agriculture: The Shanghai "Chongming Model" as a Paradigm

Type of Land Rent	Role of Urban Agriculture	Mechanism for Rebalancing
Absolute Rent	Vehicle for horizontal payments	Realizing returns on collective ownership
Differential Rent		
Differential Rent I	Monetization of ecological value	Compensating producing regions for premium natural endowments
Differential Rent II	Technology-enabled efficiency gains	Reinvesting in the productive capacity of producing regions
Monopoly Rent	Capture of scarcity value	Returning premiums from branding and emergency security to producing regions

The first category of fixed capital comprises material-technical apparatuses directly integrated into the agricultural production process, including blockchain traceability systems, photovoltaic smart irrigation equipment, and environmental control facilities. These technological embodiments significantly enhance per-unit land productivity by enabling precise management of water, fertilizer, light, and heat resources, thereby pushing beyond the conventional boundaries of land production efficiency and directly giving rise to differential rent II. Such a deep integration of "technology–land–capital" not only optimizes the combination of traditional production factors, but also reconfigures the formation mechanism of differential rent II—transforming capital investment from an exogenous variable into an endogenous engine for value appreciation, with technological premiums becoming the core driver of land value enhancement.

The second category of fixed capital refers to infrastructure networks within the circulation domain, particularly modern logistics systems such as government-led regional cold-chain hubs and digital supply chain platforms. Taking Shanghai's regional cold-chain hub as an example, it significantly enhances the market competitiveness of peri-urban agricultural products by shortening circulation time and reducing spoilage rates during transportation[3].Such circulation infrastructure transforms geographical advantages into economic premiums through the effects of spatio-temporal compression,enabling farmland within the urban economic sphere of influence to command a novel form of Differential Rent I.Digital platforms further reshape the logic of the spatial economy: when online trading systems integrate cold-chain storage and real-time distribution resources, the market accessibility of agricultural products transcends physical distance, leading to a fundamental transformation in the conditions that generate traditional Differential Rent I. This spatial revalorization effect offers preliminary pathways for monetizing advantages in ecological resources, yet requires institutional innovation to overcome existing conversion bottlenecks.

The dialectical movement of dual capital cycles constitutes a spatial fix mechanism within urban agriculture. The first type of fixed capital enhances the intrinsic quality of land through technological progress, thereby continuously generating differential rent II. Meanwhile, the second type of fixed capital improves external connectivity via a revolution

in circulation, effectively activating differential rent I. Through synergistic interaction, these two forms of capital collectively drive a distinctive process of spatial restructuring, enabling urban agriculture to open up new pathways for value augmentation.

Urban agriculture addresses the imbalance of interests between production and consumption regions by systematically reshaping the logic of rent generation and distribution through a three-dimensional synergistic mechanism: technological embedding and circulation optimization reactivate Differential Rent, horizontal compensation fulfills Absolute Rent, and industrial integration coupled with brand innovation enables the capture and redistribution of Monopoly Rent.At the technological and circulation levels, the application of smart agricultural facilities and modern logistics systems significantly enhances land productivity and monetizes locational advantages, transforming capital investment into sustained growth in Differential Rent and enabling the effective monetization of ecological value. Institutionally, horizontal payment mechanisms provide a vehicle for realizing Absolute Rent, ensuring that the economic returns from land ownership are returned to collective economic organizations. At the value enhancement level, urban agriculture, by deeply exploiting the unique ecological and cultural resources of producing regions, creates distinctive brand experiences and emergency support functions, thereby actualizing the "potential" Monopoly Rent of producing regions and ensuring, through institutional design, that these excess returns are fed back.The urban agriculture practice of Shanghai's Chongming Farm demonstrates the feasibility of this three-dimensionalmechanism. Supported by interprovincial horizontal payments, the smart agriculture demonstration zone employs precision irrigation and digital management platforms to internalize ecological value and increase Differential Rent II derived from capital investment. Meanwhile, through institutional design, scarcity premiums —i.e., Monopoly Rent—are captured, allowing collective economic organizations to regain benefit-distribution power via a rent fund. Part of the value-added gains is channeled back to major grain-producing areas, specifically directed toward high-standard farmland construction in regions like Heilongjiang. This approach of combining "consumption region capital + production region land" forms a cross-regional rent circulation loop: "consumption region capital → urban agriculture → production region capacity."The significance lies not only in rectifying spatial economic imbalances but also in returning to the essence of land ownership — enabling producing regions to become true beneficiaries ofa complete rent system, including monopoly rent,transforming agriculture from a "subsistence safeguard" into an "engine for common prosperity." Moving forward, building on the national policy orientation toward horizontal compensation between production and consumption regions, and adapting to local conditions, the Chongming model can be institutionalized to advance a socialist agricultural vision where "land rent returns home" and "urban and rural areas thrive together."

Table 4. A Rent Balance Model Between Producing and Consuming Regions Using Urban Agriculture as a Vehicle: Exemplified by the “Chongming Model” in Shanghai

Type of Rent	Role of Urban Agriculture	Mechanism for Rebalancing Producing and Consuming Regions
Absolute Rent	Serves as a vehicle for horizontal payments	Realizes returns on collective ownership
Differential Rent I	Monetizes ecological value	Compensates producing regions for premium natural endowments
Differential Rent II	Enhances efficiency through technological enablement	Reinvests in the productive capacity of producing regions
Monopoly Rent	Captures scarcity value	Reinvests premiums from branding and emergency security into producing regions

Viewed through the lens of Marxist rent theory, the fundamental cause of the imbalance of interests between grain-producing and grain-consuming regions lies in an institutional disconnection between the realization of land ownership and the mechanisms of value distribution. The erosion of differential rent reflects the systematic undervaluation of natural endowments and structural contradictions in capital allocation. The insufficient realization of absolute rent highlights the economic challenges faced in enacting collective ownership. The drain of monopoly rent reveals the deprivation of producing regions' rights to realize the value of their scarce resources.Functioning as a vehicle for spatial fix, urban agriculture reconfigures the logic of three-dimensional rentformation through dual circuits of capital. It offers a framework for regions to share the responsibility for food security within a market-oriented system, thereby providing a practical pathway to overcome the predicament where "grain producers are economically disadvantaged." Future policy design must strengthen institutional supports covering all three rent dimensions:** clarifying the legal status of rural collective economic organizations as the entities entitled to collect absolute rent, establishing a standardized system for incorporating ecological service values into the calculation of differential rent, and creating mechanisms to activate and feedback monopoly rent from unique resource endowments.Only through such measures can the essential requirement of land rent, as revealed by Marxist theory, be truly fulfilled: to enable land ownership to be fully realized in economic terms, thereby laying an institutional foundation for sustainable agricultural development.

2. Utilizing urban agriculture as a leverage mechanism to regulate land rent presents a pathway to establishing a more equitable interest distribution framework between grain-producing and consuming regions

2.1. Urban agricultural land rent value-added model and calculation

Within the framework of Marxist rent theory, the multidimensional rent restructuring of urban agriculture requires systematic theoretical modeling and practical pathways for support. Essentially, this restructuring is a process of making implicit land values explicit and monetizable through institutional innovation and technological empowerment. At its core lies

the construction of a composite rent accounting system that integrates economic value, ecological services, and emergency security functions.

In accordance with the inherent logic of rent formation and the characteristics of contemporary agricultural transformation, the following conceptual model for urban agricultural rent composition is proposed:

$$R=\alpha\cdot(V_m-V_p)+\beta\cdot E_c+\gamma\cdot U_v$$

This model comprehensively reflects the multidimensional nature of land value. Vm represents agricultural market value, V_P indicates production costs, with their difference forming the economic basis for traditional differential rent II; Ec denotes ecosystem service value, corresponding to the natural endowment premium of differential rent I; Uv embodies the monopoly rent reflecting emergency support functions. α, β, and γ serve as adjustment coefficients reflecting the value weights of different functions in specific regions[4]. The theoretical foundation lies in: Marx's differential rent theory emphasizes that natural force differences (differential rent I) and capital investment differences (differential rent II) jointly determine super profits[5]; modern ecological economics reveals ecosystem services possess explicit economic value; emergency economics demonstrates market premiums generated by agricultural supply assurance during special periods. The integration of these three dimensions forms a complete framework for land rent accounting. In practical applications, parameters require regional characteristic calibration. Taking Shanghai's urban agriculture as an example, its land rent restructuring demonstrates multidimensional value integration: Ec-wise, Chongming wetland ecosystem carbon storage creates quantifiable incremental differential rent I. Following Beijing's GEP-R methodology, this algorithm represents China's first accounting scheme for ecosystem regulation service value, with wetland carbon sequestration accounting for approximately 12%-18% of total ecosystem service value[6]. Regarding emergency premium (Uv), empirical studies show pandemic-based food security payment willingness models indicate an emergency support premium range of 8%-20%, constituting monopoly rent during special periods[7]. The comprehensive compensation mechanism requires balancing the costs of farmland protection with its functional value. According to documents from Shanghai's Agriculture and Rural Affairs Commission, Chongming's ecological compensation fund allocation follows the formula: "basic farmland area × tiered soil fertility coefficient × assessment weighting". Given its largest land area, Chongming receives the highest funding amount. A scientific compensation benchmark can be established through comprehensive evaluation, with the total compensation calculated as "total compensatio=basic farmland area × (municipal compensation unit price + ecological service value increment)". This methodology transcends traditional land rent theory limitations by integrating the multi-dimensional functions of land into a unified valuation system.

2.2. The practical path of land rent value reconstruction in urban agriculture

Drawing from existing case studies, the reconstruction of land rent value relies on three

practical approaches: spatial substitution, technological integration, and tertiary industry convergence. First, the spatial substitution mechanism activates differential rent II through innovative land ownership models. A typical example is the cross-regional farmland adoption model, where consumers in primary consumption areas purchase urban farmland at annual rents of 50-300 yuan/㎡, directly converting consumption capacity into capital accumulation in production areas. This model essentially serves as a prepayment mechanism for differential rent II, enabling production areas to obtain capital reserves for land improvement in advance[8]. Data shows that approximately 30%-40% of adoption funds are allocated to drip irrigation systems and soil improvement facilities, enhancing land productivity by 28%-35%[9]. This aligns with Marx's classic assertion that "capital investment creates differential rent II." In institutional design, it is crucial to establish contractual constraints on profit-sharing ratios in adoption agreements to prevent excessive capital encroachment on land value appreciation. Second, the technological integration approach reconstructs land rent distribution chains through digital tools. The application of blockchain traceability systems transforms value transfer mechanisms. When consumers pay quality premiums, for example,smart contracts automatically convert 20%-30% of premium amounts into absolute rent payments to collective economic organizations, achieving land ownership income. This reduces the distribution cycle from 15 days to 5-7 days. The deeper institutional value lies in distributed ledger technology establishing tamper-proof records of land rent transfers, effectively addressing collective asset supervision challenges and safeguarding farmers' land rent entitlements. Third, tertiary industry convergence innovation expands land rent sources through industrial coupling. Urban farms can adopt an "organic farming + homestays + educational tourism" model to create a value cycle. A portion of tourism revenue is reinvested into agricultural land rent funds, supporting ecological farmland development. This integration generates dual rent effects: On one hand, brand premium creates monopoly rents, such as the high premium rates for organic-certified products; on the other hand, agritourism optimization enhances land utilization efficiency, generating new differential rents I (e.g., scenic value of prime locations)[10]. The key institutional design lies in establishing benefit linkage mechanisms to ensure that value-added revenues from integration are reinvested in agriculture at reasonable ratios (recommended minimum 30%). This synergistic approach forms a complete rent restructuring loop: spatial reallocation addresses capital sourcing issues while creating initial momentum for differential rents II; technological integration optimizes distribution efficiency ensuring absolute rents realization; tertiary industry convergence expands value dimensions activating both monopoly and new differential rents. The core mechanism operates through market-driven cycles of "multi-functional land value discovery-value quantification-value distribution," ultimately establishing a fair and efficient rent generation and allocation system[11].

3. Development path of urban agriculture to play the role of interest balance

Urban agriculture serves as a critical mechanism for adjusting ground rent distribution between grain-producing and consuming regions. However, its institutional efficacy ultimately depends on the establishment of a sustainable framework covering the entire

process of rent generation, capture, and distribution. A core issue that must be urgently addressed is the "incomplete contracting of rent," which refers to the systemic imbalance caused by ambiguous rights and responsibilities, weak contractual enforcement, and inadequate oversight between producing and consuming regions. As Marx profoundly elucidated in Capital, Volume III: "Rent is the economic form in which landed property is realized."[12] Guided by this principle, institutional design must ensure a triple balance: safeguarding the rent income rights of collective economic organizations, incentivizing long-term investment by land operators, and preserving the public good attribute of food security. Essentially, this involves channeling the movement of rent into a regulated track through legal means.

Regarding the clarification of rights and empowerment, legal recognition is the institutional foundation for realizing absolute rent. Although the current Rural Land Contracting Law affirms collective ownership, it lacks detailed provisions on the specific implementation mechanisms for rent income rights. When revising the implementing regulations of this law, three key institutions could be established: First, explicitly designating village-level collective economic organizations as the statutory entities responsible for collecting rent, thereby preventing non-agricultural actors from intercepting rental income at the source. Second, creating a dedicated and rational income distribution mechanism that guarantees basic rental returns to farmers while allocating value-added operational earnings according to a structured ratio—with the majority directly benefiting contracted farmers and the remainder earmarked for maintaining farmland infrastructure and mitigating market risks[13]. Third, establishing a digital-based supervision system to achieve full traceability and transparent management of fund flows, thereby eliminating institutional loopholes that lead to the "diversion of agricultural rent to non-agricultural uses."

The explicit realization of ecological rent relies on a dual mechanism combining scientific accounting and market transactions. The implementation of differential rent I requires the development of a conversion model linking "carbon sink equivalence to grain output" (e.g., 10,000 tons of carbon sink corresponding to 100,000 tons of grain ecological cost), supported by a dynamic monitoring system integrating satellite remote sensing and ground verification. In terms of transaction mechanisms, a statutory category for ecological rent should be incorporated within the interprovincial horizontal compensation framework, mandating that major grain-consuming regions purchase carbon sink quotas based on their net grain inflows. Drawing from the logic of water eco-compensation referenced in National Development and Reform Commission documents—and inspired by the principles of "water quality target orientation" and "shared cost responsibility" applied in the Xin'an River Basin cross-border eco-compensation mechanism—a composite payment formula can be constructed:

$$P=Q_g\times(C_b+0.3\times C_c)$$

where Qg is the net grain transfer volume, Cb is the base grain price, and Cc is the unit carbon sink price. This design provides tangible returns for the ecological contributions of producing regions and aligns with the eco-compensation principle of "protectors benefit, beneficiaries pay," much like the mechanism in the Xin'an River Basin[14][15][16][17][18].

To address regional imbalances in differential rent II, a technology-driven regional collaboration mechanism can be established. Given the limited capacity for technological absorption in major grain-producing areas, a trilateral support system integrating "technology, talent, and equipment" should be developed: promoting urban R&D institutions to license patented technologies to producing regions, with corresponding licensing fees injected into rent feedback mechanisms; enhancing the agricultural science and technology commissioner system to strengthen technical dissemination and training; and establishing joint investment mechanisms whereby consuming regions participate in upgrading smart agricultural equipment in producing regions. Such designs respect market principles while internalizing the positive externalities of technology diffusion, facilitating a virtuous cycle of "technology investment—rent valorization."

To mitigate risks from agricultural price fluctuations and natural disasters, a three-tier risk hedging system could be implemented. At the financial instrument level, a portion of the rent fund may be used for futures hedging, with insurance payouts triggered when grain prices fall beyond a certain threshold. At the regional cooperation level, a joint disaster relief fund between producing and consuming regions can be established, apportioning losses based on grain trade volume. At the contract design level, a "fixed rent + flexible sharing" model can be adopted, automatically adjusting payment levels in disaster years. This system ensures basic income for farmers while reducing moral hazard and contractual default.

4. Conclusion

The institutional construction guided by Marxist rent theory is, in essence, a reestablishment of the dialectical unity among "land, capital, and labor." As a vehicle for spatial fix, the deeper value of urban agriculture lies in its ability to realize a threefold justice:For producing regions, it means ending the historical predicament of "financial loss from grain cultivation" through the realization of absolute rent, the monetization of differential rent , and the activation and feedback of monopoly rent. For consuming regions, it entails the quantified and shared fulfillment of food security responsibilities, thereby resolving the institutional paradox of "free-riding."For the nation as a whole, it relies on the circulation of rent to cultivate new quality productive forces in agriculture, elevating food security from mere subsistence guarantee to a pathway toward common prosperity.With the full implementation of the interprovincial horizontal interest compensation mechanism by 2025, it is imperative to deepen innovation in three areas: legislative support, standardization of criteria, and regional coordination, ensuring these efforts comprehensively address the three dimensions of rent. Through such development, we may ultimately realize Marx’s ideal: that land truly becomes "the common and permanent property of all human generations."[19]

References

[1] Chen, M. X., & Zhang, S. J. (2023). Agricultural ecological compensation dilemmas in major grain-producing areas and pathways to solutions. Regional Economic Review, (3), 111–117.https://doi.org/10.14017/j.cnki.2095-5766.2023.0036

[2] Wu, H. Y., Meng, Y., Huang, H. J., & Chen, W. K. (2022). Spatio-temporal coupling

characteristics between net carbon sink of cultivated land use and agricultural production in China. Journal of Soil and Water Conservation, *36*(5), 360–368. https://doi.org/10.13870/j.cnki.stbcxb.2022.05.044

[3] Shanghai Chongming District Agriculture and Rural Affairs Commission, & Shanghai Chongming District Finance Bureau. (2024). Management Measures for Urban Modern Agriculture Development Projects and Funding in Chongming District (Document No. Hu Chong Nong Gui [2024] No. 2).

[4] Beijing Municipal Ecology and Environment Bureau. (2023). Accounting scheme for the value of regulatory ecosystem services (GEP-R) in Beijing.

[5] Marx, K. (2004). Capital: A critique of political economy (Vol. 3). People's Publishing House. (Original work published 1894)

[6] Beijing Municipal Ecology and Environment Bureau. (2023). Accounting scheme for the value of regulatory ecosystem services (GEP-R) in Beijing.

[7] Wang, H., Lu, L., Liu, Z., & Sun, Y. (2025). Study on measurement and prediction of agricultural product supply chain resilience based on improved EW-TOPSIS and GM (1,1)-Markov models under public emergencies. PLOS ONE, *20*(5), e0321248. https://doi.org/10.1371/journal.pone.0321248

[8] Zheng, X. F. (2017). Spatiotemporal deconstruction of rent and reproduction of rights. Sociological Studies, *32*(4), 85–112. https://doi.org/10.19934/j.cnki.shxyj.2017.04.004

[9] Ministry of Agriculture and Rural Affairs, PRC. (2019). Typical cases of rural collective economies.

[10] Beijing Municipal Ecology and Environment Bureau. (2023). Accounting scheme for the value of regulatory ecosystem services (GEP-R) in Beijing.

[11] Zheng, X. F. (2017). Spatiotemporal deconstruction of rent and reproduction of rights. Sociological Studies, *32*(4), 85–112.https://doi.org/10.19934/j.cnki.shxyj.2017.04.004

[12] Marx, K. (2004). Capital: A critique of political economy (Vol. 3). People's Publishing House. (Original work published 1894)

[13] Jiangsu Provincial Department of Agriculture and Rural Affairs. (2024). Innovative practice report on large-scale land management in Jiangyan District .

[14] Liu, Y. L., & Hu, P. (2009). Ecological compensation standards in the Xin'an River Basin based on Pareto optimality. Journal of Hydraulic Engineering, *40*(6), 703–708. https://doi.org/10.13243/j.cnki.slxb.2009.06.005

[15] Dai, J., Hu, S., Zhang, B., & Yang, Q. (2021). Study on ecological compensation standards based on opportunity cost and ecosystem service value accounting: A case

study of the Xin'an River Basin. HuBei Agricultural Sciences, *60*(21), 5–24. https://doi.org/10.14088/j.cnki.issn0439-8114.2021.21.033

[16] Ren, Y., Lu, L., Yu, H., & Zhu, D. (2023). Study on the ecological compensation mechanism in the Xin'an River Basin from the perspective of politics of scale. China Financial & Economic Publishing House.

[17] Ministry of Ecology and Environment of the People's Republic of China. (2012). Implementation plan for pilot compensation for water environment in the Xin'an River Basin.

[18] People's Government of Zhejiang Province, & People's Government of Anhui Province. (2017). Supplementary agreement on upstream-downstream horizontal ecological compensation in the Xin'an River Basin.

[19] Marx, K. (2004). Capital: A critique of political economy (Vol. 3). People's Publishing House. (Original work published 1894)