Proceedings of Business and Economic Studies, 2026, Volume 9, Issue 3
http://ojs.bbwpublisher.com/index.php/PBES
Online ISSN: 2209-265X
Print ISSN: 2209-2641

Land Statistics Data Management: Current Status, Challenges, and Improvements

Yuhui He*

Ji'nan Land Reserve Center, Ji'nan 250099, China

***Corresponding author:** *Yuhui He, hyh_7@163.com*

Abstract: Land statistical data serves as a fundamental tool for converting land resources into quantifiable information, playing a vital role in supporting scientific decision-making, safeguarding rights and interests, and facilitating regulatory enforcement. At present, China's land statistical data management faces several practical challenges, including insufficient data coverage, opportunities for improving data accuracy, and underdeveloped interdepartmental information-sharing mechanisms. These issues have implications for the rational allocation and effective protection of land resources. This paper outlines the essential functions of land statistical data, analyzes current issues and their underlying causes, and proposes preliminary improvements related to data collection systems, data sharing, and quality control. These insights aim to contribute to the advancement of land resource management practices.

Keywords: Land statistical data; Data quality; Land management

Online publication: April 16, 2026

1. Introduction

Land constitutes a critical foundational resource for national development, and its scientific management depends on reliable statistical data [1]. Through systematic documentation and quantitative analysis of land quantity, quality, distribution, ownership, and changes in utilization, land statistical data provides essential support for national spatial planning, the implementation of farmland protection policies, the monitoring of land market dynamics, and the protection of related rights and interests. In recent years, China's land statistics have improved significantly, owing to the ongoing advancement of national land surveys and unified real estate registration. However, challenges remain in practice, particularly regarding the timeliness of data collection, consistency in statistical definitions, and the fluidity of interdepartmental information sharing. This paper explores these issues by reviewing the fundamental functions of land statistical data, identifying current problems and their causes, and suggesting directions for future improvement.

2. Fundamental functions of land statistical data

Land statistics entail the systematic documentation, organization, and analysis of land resources in terms of quantity, quality, distribution, ownership, usage, and changes over time, presented through numerical data, charts, and descriptive texts [2]. These activities provide multi-dimensional support for land resource management as follows:

(1) Land statistical data establishes a quantitative basis for informed decision-making. By translating land resource characteristics into analyzable indicators, it facilitates national spatial planning, the allocation of construction land quotas, and the evaluation of cultivated land retention. Continuous monitoring based on statistical data helps identify land use trends and supports timely policy adjustments;

(2) Land statistics underpin the protection of rights and interests. In processes such as land registration, expropriation compensation, and land transfers, accurate data on area and ownership is critical for defining rights boundaries and conducting related procedures. Standardized and transparent land statistical records contribute to minimizing ownership disputes and safeguarding the legitimate interests of stakeholders;

(3) Land statistical data provides informational support for regulatory oversight. By comparing data across different periods, regulatory authorities can track changes in land use, thereby strengthening enforcement efforts and helping detect potential violations.

3. Current issues in land statistical data management

Despite ongoing efforts to standardize and enhance China's land statistical system, several issues merit further attention.

3.1. Data coverage and timeliness require enhancement

Under the current framework, comprehensive national land surveys are conducted every ten years, with annual updates capturing changes in land use patterns. However, in rapidly developing urban and rural areas, significant shifts in land use may occur between update cycles, creating information lags that hinder timely supervision. Additionally, key attributes such as soil quality and ecological functions are often excluded from routine statistics due to technical or cost constraints. In grassroots regions with limited technical capacity, the accuracy and comprehensiveness of surveys, particularly those involving topography and ownership data, remain areas for improvement [3].

3.2. Concerns over data accuracy

Public disclosures have revealed inaccuracies in land statistics in certain regions. For example, some localities have reported cultivated land area or reclamation figures that deviate from actual conditions, occasionally to meet assessment benchmarks. Even more concerning is the practice of temporarily planting crops or covering soil during land change surveys to evade inspection, thereby compromising data integrity.

3.3. Weak interdepartmental data sharing mechanisms

Land statistics involve multiple government entities, including those responsible for natural resources, agriculture, statistics, and urban-rural development. Currently, each department collects and manages data according to its own mandate. Due to the absence of unified data standards and a shared information platform, cross-departmental data exchange remains inefficient. In some cases, discrepancies arise when the same land parcel is classified differently

by various departments, resulting in inconsistent data [4]. This not only increases the workload at the grassroots level but also complicates comprehensive analysis and coordinated policymaking. Enhancing cross-departmental integration and data sharing is therefore essential for improving the quality and efficiency of land statistics.

3.4. Regulatory concerns in statistical data application

Statistical data is increasingly used in land market operations and related economic activities. However, certain practices, such as localized irregularities in land transactions or fiscal reporting, have raised concerns about data integrity. Furthermore, inadequate management of land ownership records and transaction histories may create security vulnerabilities, underscoring the need for strengthened oversight [5].

4. Analysis of underlying causes

4.1. Legislative discrepancies and data coordination

The Land Administration Law and the Statistics Law reflect differing legislative priorities, where the former emphasizes farmland protection and land use control, while the latter focuses on comprehensive socioeconomic statistics. These differences sometimes manifest in inconsistent statistical criteria [6]. For instance, varying interpretations of what constitutes a change in cultivated land use can hinder data comparability across departments.

4.2. Gaps in statistical work systems and mechanisms

Land statistics involve multiple stages and actors, yet responsibilities for data collection, verification, and sharing are not always clearly delineated. Coordination mechanisms among relevant departments need strengthening, as do accountability systems for data quality. Moreover, public access to statistical information and opportunities for oversight remain limited.

4.3. Insufficient technical capacity

Although technologies such as remote sensing and geographic information systems (GIS) are increasingly used in land surveys, technical capacity varies significantly, particularly at the grassroots level. Some regions still rely heavily on manual inspection methods, which are insufficient for detecting subtle or rapidly occurring land use changes. Emerging technologies, such as artificial intelligence for image recognition, blockchain for secure recordkeeping, and Internet of Things (IoT) for continuous monitoring, remain underutilized [7].

4.4. Conflicting stakeholder interests

Land statistical data implicates multiple stakeholders, including local governments, land users, rural collectives, and individual farmers. Local governments face performance pressures tied to development targets; land users prioritize economic returns; and farmers focus on rights protection. These divergent interests can influence the objectivity of reported data. Designing institutional mechanisms that align stakeholder incentives with data quality goals remains a key challenge.

5. Recommendations for improving land statistical data management

5.1. Refining data collection systems

The data collection systems are detailed as follows:

(1) Advance the standardization of data definitions and classifications: Unified standards covering land type, area, ownership, quality, and usage should be gradually introduced to reduce discrepancies arising from differing interpretations [8];
(2) Diversify data collection methods: In addition to traditional field surveys, modern tools such as satellite remote sensing, drone imagery, and IoT monitoring should be leveraged to improve timeliness and coverage, especially in remote areas or for data types that are currently underrepresented;
(3) Strengthen quality control mechanisms: Establish a comprehensive framework encompassing data collection, review, and verification. For major surveys, independent third-party quality assessments should be incorporated to enhance objectivity.

5.2. Promoting data integration and shared use

The strategies are as outlined:

(1) Develop an interdepartmental data sharing platform: Such a platform should integrate land-related data from natural resources, agriculture, statistics, and other relevant sectors, facilitating mutual access and gradual alignment of key indicators [9];
(2) Clarify responsibilities for data updates: Based on departmental mandates, clearly define which entities are responsible for maintaining specific datasets and the frequency of updates, ensuring platform data remain timely and accurate;
(3) Enhance data application capabilities: Leverage big data analytics and related techniques to extract deeper insights from integrated land information, thereby strengthening support for planning, policy formulation, and market monitoring.

5.3. Strengthening data security management

The mechanisms are as follows:

(1) Establish tiered data security protocols: Classify land data according to sensitivity and define corresponding access rights, usage rules, and security measures [10];
(2) Reinforce technical safeguards: Employ data encryption, secure authentication, and other appropriate technologies to protect data throughout its lifecycle, collection, transmission, storage, and use;
(3) Promote security awareness among personnel: Conduct regular training for those involved in land statistics to ensure familiarity with data protection norms and security requirements.

5.4. Enhancing oversight and accountability

The methods are as follows:

(1) Clarify supervisory responsibilities: Further delineate the roles of natural resources, statistics, and other relevant departments in overseeing land statistics, and establish coordination mechanisms to support joint oversight;
(2) Enforce accountability: Where significant data discrepancies or falsifications occur, conduct necessary verification and corrective actions in accordance with relevant regulations. In severe cases, pursue accountability through established procedures;
(3) Expand data transparency: Without compromising state secrets or individual privacy, broaden the scope of publicly accessible land statistics and provide channels for public feedback, thereby leveraging social

oversight to improve data quality.

6. Conclusion

Land statistics constitute a critical foundation for land resource management, and their quality directly affects the soundness of policy decisions and the effectiveness of governance. By objectively identifying existing challenges, analyzing their root causes, and continuously improving data collection, sharing, and oversight mechanisms, China can enhance the standardization and reliability of its land statistical system. These efforts will, in turn, support the sustainable protection and rational use of land resources.

Disclosure statement

The author declares no conflict of interest.

References

[1] Li Z, Wang W, 2019, Research on Land Statistics in Natural Resources Management. Jilin Agriculture, 2019(8): 35.

[2] Li X, 2019, The Role of Land Statistics in Natural Resources Management. Regional Governance, 2019(40): 215–217.

[3] Li Q, Chen J, 2025, Challenges and Recommendations for County-Level Land Change Surveys. Work Research, 2025(2): 1–4.

[4] Li B, Zhang Y, Jian Y, 2026, Application of Artificial Intelligence and Big Data in Land Reclamation: Current Status, Issues, and Future Directions. Urban and Rural Planning, 2026(1): 42–46.

[5] Perperidou D, 2025, From the Person-based Land Registries to the Parcel-based Hellenic Cadastre: A Review on Securing Property Documentation, Land Administration, and Spatial Data Management in Greece. Land, 14(6): 1138.

[6] Sheng C, Lu M, Xu H, 2024, Informatization Practices in Land Survey Monitoring Under Collaborative Mechanisms. Surveying and Mapping Bulletin, 2024(Supplement 1): 181–185

[7] Wei W, Chen D, Dai L, 2025, Digital Governance Empowering Comprehensive Land Improvement Across All Regions: Logical Transformation, Constraints, and Optimization Pathways. Shanghai Land Resources, 46(1): 109–116.

[8] Li D, 2010, Achieving Business Collaboration Through Unified Data Standards Information Technology, 2010(6): 235–240.

[9] Leonhardt H, Wesemeyer M, Eder A, et al., 2024, Use Cases and Scientific Potential of Land Use Data from the EU's Integrated Administration and Control System: A Systematic Mapping Review. Ecological Indicators, 2024(167): 112709.

[10] Zhejiang Provincial Bureau of Statistics Research Team, 2024, Exploration and Practice of Full-Process Security Management in Statistical Data Processing. Statistical Science and Practice, 2024(12): 52–54.