



ISSN: 2617-6548

URL: www.ijirss.com



Land management in Vietnam in the context of digital society

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Abstract

The Vietnamese real estate market is evolving in a complex and volatile manner, affecting land management activities. In fact, many problems arise when new technologies are applied, facilitating people's land transactions, but also posing requirements for innovation in management activities. Digital technology is developing; the goal of digital transformation, building a digital government, and developing a digital society is being widely deployed, requiring digital knowledge and skills for civil servants and citizens to improve the effectiveness of social management activities, including land management. This study addresses land management and land management efficiency in Vietnam and the requirements within the scope of technological factors, including digital data, digital civil servants, and digital citizens; these requirements play a role as factors that directly affect land management. The research model is built with scales including "Land Management", "Digital Data", "Digital Civil Servants", and "Digital Citizens". The author conducted a survey of 600 leaders of commune-level government agencies from three provinces representing three regions of Vietnam, including Bac Ninh Province (North), Nghe An Province (Central), and An Giang Province (South). The research and survey results help identify the practice of land management and factors affecting land management, from which the author draws research conclusions and discusses policies to improve the effectiveness of land management in Vietnam.

Keywords: Digital citizen, Digital civil servant, Digital data, Land management, Vietnam.

DOI: 10.53894/ijirss.v8i3.7095

Funding: This study received no specific financial support.

History: Received: 4 April 2025 / **Revised:** 12 May 2025 / **Accepted:** 13 May 2025 / **Published:** 16 May 2025

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Competing Interests: The authors declare that they have no competing interests.

Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Publisher: Innovative Research Publishing

1. Introduction

Land management in Vietnam is decentralized to the central government level (Government) and local authorities (provincial, district, and commune levels), under the unified management of the Government. This is prescribed in the 2024 Land Law: the Ministry of Natural Resources and Environment helps the Government unify the state management of land within the country; local authorities at all levels are responsible for state management of land within the local area [1].

In the locality, the task of land management is determined for the system of provincial, district, and commune governments within the administrative boundaries, under the unified management of the provincial government. According to 2024 statistics, the Vietnamese government apparatus includes 63 provincial governments, 705 district authorities, and 10,599 commune-level governments [2]. In that system, the commune-level government is the lowest level, which is staffed with 6 titles of specialized civil servants to perform the task of state management according to each force/group of each field: Commander of the Commune Military Command; Office - Statistics; Cadastral - Construction - Urban and Environment (for wards, townships)/or Cadastral - Agriculture - Construction - Urban and Environment (for the commune); Finance - Accounting; Justice - Civil Status; Culture – Society [3].

Vietnam's Land Law stipulates the task of land management with many contents such as surveys, measurement, evaluation, and land classification; cadastral maps, land use status maps, and land use planning maps; management of land use planning and plans; management of land allocation, land lease, land acquisition, and land use purposes; registration of land use rights, making and managing cadastral records, and granting land use right certificates ... [1]. At the commune level, cadastral officials are assigned to the local land management task, but the land management task is limited to a certain range, mainly supporting the process of registration and granting of land use certificates ... However, in fact, this is a necessary process and has a direct impact on the process and results of land registration for the people.

In the context of developing digital and digital governments, Vietnam is implementing a strategy to streamline the state apparatus: reducing about 50% of the provincial administrative units; a 60%-70% reduction of local administrative units; and maintaining district administrative units [4]. Land management tasks will be strengthened at the commune level, with a requirement for the development of digital technology applications and digital capacity development for commune civil servants and citizens to effectively resolve land management activities at the commune level, creating more favorable conditions for the people. This issue attracts the attention of many researchers and managers and is also the reason for the author's focus in this study.

2. Literature Review

Land is a natural resource and a special commodity, playing a decisive role in the development of the nation and the locality. In Vietnam, land is a special asset of the nation, a basic production material, an extremely valuable resource, and a source of life for the people and the great resources of the country, owned by the entire people and represented by the State with unified management [5]. The 2013 Constitution of Vietnam also stipulates that land is owned by the entire people, represented by the State with unified management; the State empowers land use to land users in accordance with the law [6]. According to Duyen [7], land is a special production material, a large source of internal resources, a significant source of capital for the country, an important component of the living environment, a population distribution area, and a foundation for building economic, cultural, social, security, and defense facilities; it has profound economic and social significance in the cause of national construction and defense.

With the role of land explained above, land management is an important task that has a direct impact on the development of the nation and the locality. In theoretical aspects, many researchers emphasize the content of land management, which is the process of effective and sustainable land use for national and local socio-economic development goals [8]. The definition of land management encompasses activities related to the establishment and implementation of rules for the management, use, and development of land, along with the profits obtained from the land and the resolution of disputes related to ownership and land use rights. Accordingly, effective land management contributes to increasing revenue for the state budget while simultaneously improving the efficiency of urban and rural land use in accordance with planning and legal provisions. Therefore, the protection of land resources sets requirements for both exploitation and land improvement for long-term goals. The issue of land management is not only about organizing the management apparatus but also about clearly defining the management content and strictly stipulating its legal contents. In this study, the author examines land management mainly in the context of land registration in Vietnam.

The law of Vietnam stipulates that land registration requires people to declare and register with local authorities to be granted land use right certificates [1]. With this regulation, the effectiveness of land management is determined based on many criteria to serve the people, which include transparent and timely information, clear and quick administrative procedures, service attitude, and satisfaction level of the people. In the current digital social context, the application of digital technology in management has fundamentally changed the way government agencies operate, also known as digital transformation [9]. The effectiveness of land management, in addition to the above criteria, is also reflected in the ability to meet the fast and accurate information needs and enhance the supervision of people based on the application of digital technology. With that in mind, the author built a scale of "Land management" (LM) that implies some contents: Local people have access to digital data on land quickly, accurately, and conveniently (LM1); Local people carry out the process of land registration on the digital data platform quickly, accurately, and conveniently (LM2); Local people are promoted to democracy when participating in and supervising the implementation of local land policies based on digital technology (LM3).

In terms of specific aspects of the process of digital transformation, digital social development, and effective land management activities, it is necessary to ensure the conditions for the implementation of digital transformation goals. That is the condition of digital and social infrastructure, along with people's understanding of knowledge and digital skills. This issue is explained by MIC - Ministry of Information and Communications [9] with three components, including Digital data, Digital civil servant, and Digital citizen.

- Firstly, digital data is formed from digitizing documents, allowing people to exploit information quickly and accurately to make official transactions with state organizations. In land management, the government agency digitizes

documents; policies and guidelines on land management are in effect, forming digital data on land management. With that interpretation, the scale "Digital data" (DD) is built implied: Local authorities digitize documents, policies, and guidelines on land management that are in effect to provide information to people (DD1); Local people are guided to exploit digital data to carry out official transactions in the land sector (DD2); Local people can proactively and conveniently exploit digital data to carry out official transactions in the land sector (DD3).

- Second, digital civil servants - civil service personnel are equipped with digital knowledge and skills to work in a digital environment. Professional tasks such as consulting, organizing task implementation, directing, operating, inspecting, supervising, and reporting on task performance results are all performed in a digital environment. Digital transformation has required government agencies to build a team of digital civil servants, changing the working habits of civil servants from the real environment to the digital environment. The "Digital Civil Servant" (CS) scale is built to imply the following contents: Civil servants are trained in digital knowledge and skills and perform professional tasks/land management in the digital environment (CS1); Civil servants proactively update and supplement digital knowledge and skills to perform professional tasks/land management in the digital environment (CS2); Civil servants successfully complete the tasks of advising, organizing the implementation of tasks, directing, operating, inspecting, supervising, and reporting the results of performing professional tasks/land management in the digital environment (CS3).
- Third, digital citizens - people with digital knowledge and skills to conduct social transactions in the digital environment. Digital transformation requires each citizen to equip themselves with digital knowledge and skills to conduct social transactions in the digital environment, forming a digital society; it also sets out the task for local authorities to support digital knowledge and skills for people to develop a digital society. The "Digital Citizen" (DC) scale is built to imply the following contents: Local people have digital knowledge and skills to conduct social transactions and participate in the land management process in the digital environment (DC1); Local people are supported by the government to equip themselves with digital knowledge and skills to conduct social transactions and participate in the land management process in the digital environment (DC2); Local people are proficient in exploiting digital data, conveniently conducting social transactions and participating in the land management process in the digital environment (DC3).

Through the overview study, the author has built a theoretical framework for land management. The research model is designed to analyze factors affecting land management in the context of a digital society, including 3 scales/independent variables: "Digital data" (DD), "Digital civil servant" (CS), and "Digital citizen" (DC), and 1 scale/dependent variable: "Land management" (LM). The above scales include 12 observed variables, designed by the author into 12 questions in the survey form and measured by a 5-level Likert scale: 1 - Strongly disagree; 2 - Disagree; 3 - No opinion; 4 - Agree; 5 - Strongly agree (Table 1, Figure 1).

Table 1.
Theoretical framework.

No	Scales	Encode	Rating levels				
			1	2	3	4	5
I	Digital data	DD					
1	Local authorities digitize documents, policies, and guidelines on land management that are in effect to provide information to the public.	DD1					
2	Local people are guided to utilize digital data to conduct official transactions in the land sector.	DD2					
3	Local people can proactively and conveniently exploit digital data to carry out official transactions in the land sector,	DD3					
II	Digital civil servant	CS					
1	Civil servants are trained in digital knowledge and skills and perform professional tasks related to land management in the digital environment.	CS1					
2	Civil servants proactively update and supplement their digital knowledge and skills to perform professional tasks related to land management in the digital environment.	CS2					
3	Civil servants successfully complete the tasks of advising, organizing the implementation of tasks, directing, operating, inspecting, supervising, and reporting the results of performing professional tasks/land management in the digital environment.	CS3					
III	Digital citizen	DC					
1	Local people have digital knowledge and skills to conduct social transactions and participate in the land management process within the digital environment.	DC1					
2	Local people are supported by the government to equip themselves with digital knowledge and skills to conduct social transactions and participate in the land management process in the digital environment.	DC2					

No	Scales	Encode	Rating levels				
			1	2	3	4	5
3	Local people are proficient in exploiting digital data, conveniently conducting social transactions and participating in the land management process in the digital environment	DC3					
IV	Land management	LM					
1	Local people have access to digital data on land quickly, accurately, and conveniently.	LM1					
2	Local people carry out the process of land registration on the digital data platform quickly, accurately, and conveniently.	LM2					
3	Local people are promoting democracy by participating in and supervising the implementation of local land policies based on digital technology.	LM3					

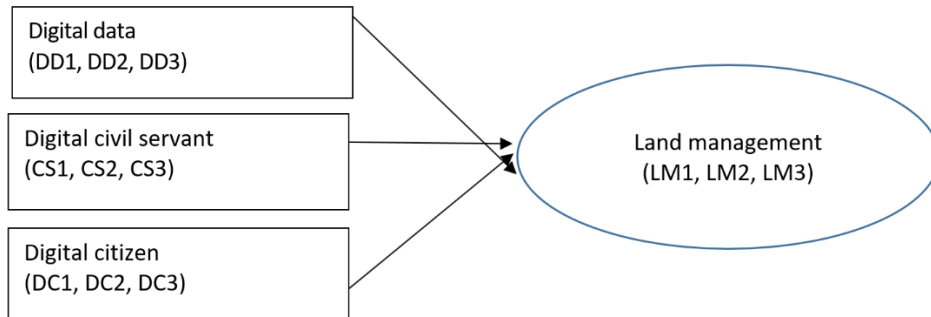


Figure 1. Research model.

The theoretical research model consists of four scales and twelve observed variables. The author designed a model to show the impact of the factors "Digital Data" (DD), "Digital Civil Servant" (CS), and "Digital Citizen" (DC) on "Land Management" (LM) and conducted an empirical study in three localities of Vietnam with the hypothesis that: *Digital Data (H1), Digital Civil Servant (H2), and Digital Citizen (H3) directly affect Land Management.*

3. Research Methods

In this study, the author uses a combination of qualitative and quantitative methods. The qualitative method is used by collecting and analyzing secondary data to build a theoretical framework for the study. The quantitative method is employed through a survey of 600 leaders of commune-level government agencies in three provinces representing three regions of Vietnam, including Bac Ninh province (North), Nghe An province (Central), and An Giang province (South). The survey is conducted in two steps: a preliminary survey and an official survey.

- Preliminary survey: The research model includes 4 scales and 12 observed variables. According to Hair, J.F. et al. (2009), the minimum sample size required in quantitative research for this model is $N = 12 * 5 = 60$. The author conducted a preliminary survey in Bac Ninh province with a sample size of $N = 200$ leaders of commune-level government agencies ($N > 60$). The results of the preliminary survey in Bac Ninh province showed that the scales and observed variables are reliable enough to be used in official surveys on a wider scale.
- Official survey: The official survey was conducted with a sample size of $N = 600$ leaders of commune-level government agencies from 3 localities representing 3 regions of Vietnam as mentioned above: $N > 60$, ensuring reliability when conducting survey research. The survey was conducted selectively: Survey respondents were leaders of commune-level government agencies for 3 years or more. Based on the consent of the respondents, the author conducted the survey and collected 600/600 valid ballots, achieving a response rate of 100%.

4. Research Results and Discussion

First, the author tested the reliability of the scales and observed variables in the research model. According to Hair, et al. [10], the scale ensures reliability when it reaches a Cronbach's alpha value > 0.6 ; the observed variable has reliability when it reaches a Corrected Item-Total Correlation value > 0.3 . The statistical and testing results are shown in Table 2.

Table 2.

Statistical results and testing results of the scale.

Scales	Observed variables	N	Min	Max	Mean	Std. Deviation	Cronbach' Alpha	Corrected Item-Total Correlation
1. Digital data (DD)	DD1	600	1	5	4.28	0.579	0.732	DD1 = 0.626
	DD2	600	1	5	4.19	0.556		DD2 = 0.618
	DD3	600	1	5	4.22	0.602		DD3 = 0.598
2. Digital civil servant (CS)	CS1	600	1	5	4.23	0.581	0.724	CS1 = 0.612
	CS2	600	1	5	4.25	0.587		CS2 = 0.606
	CS3	600	1	5	4.17	0.605		CS3 = 0.593
3. Digital citizen (DC)	DC1	600	1	5	4.04	0.622	0.672	DC1 = 0.398
	DC2	600	1	5	3.97	0.626		DC2 = 0.421
	DC3	600	1	5	3.99	0.618		DC3 = 0.408
4. Land management (LM)	LM1	600	1	5	4.21	0.586	0.702	LM1 = 0.631
	LM2	600	1	5	4.18	0.609		LM2 = 0.584
	LM3	600	1	5	4.10	0.595		LM3 = 0.537
Valid N (listwise)		600						

Data in Table 2 shows that observations on the scales "Digital data" (DD), "Digital civil servant" (CS), "Digital citizen" (DC), and "Land management" (LM) are all rated at an average level of Mean ≥ 3.97 , statistically significant according to the determined Likert scale (1-5). Commune-level government leaders all affirmed that local land management activities have achieved results and efficiency, reflected in the following contents: Local people have access to and use digital data on land and carry out the land registration process on a digital data platform quickly, accurately, and conveniently; people are promoted to democracy when participating in and monitoring the implementation of local land policies on a digital technology platform. Accordingly, the government applies digital technology in land management; people conduct digital transactions in the land sector officially and conveniently, achieving certain levels of efficiency, in accordance with the practical situation of the people's intellectual level and the development of the local digital society.

Among the above scales, the observed variables of the "Digital Citizen" (DC) scale were assessed at the lowest level with Mean (DC1) = 4.04, Mean (DC2) = 3.97, Mean (DC3) = 3.99, showing that local leaders assessed that many people have certain limitations in digital knowledge and skills when conducting transactions and participating in the land management process in the digital environment. This is because many local people have limited digital knowledge and skills to conduct social transactions and participate in the land management process in the digital environment; but it also stems from the reason that many localities have not performed well in supporting the provision of digital knowledge and skills for people to conduct social transactions and participate in the land management process in the digital environment. This requires each person to equip themselves with digital knowledge and skills to conduct social transactions in the digital environment, forming a digital society; but it also sets out the task for local authorities in supporting digital knowledge and skills for people to develop a digital society. When these two contents are well implemented, it will be of great significance, creating an initiative for local authorities to successfully implement the goal of developing a digital society and improving the efficiency of land management in the digital environment.

The statistical and test data in Table 2 show that all four scales and twelve observed variables in the model have standard test values: Cronbach's alpha > 0.6 ; Corrected Item-Total Correlation > 0.3 . This allows us to perform exploratory factor analysis to test the theoretical model of the study. The author conducts exploratory factor analysis with Varimax rotation to preliminarily assess the unidimensionality, convergent validity, and discriminant validity of the scales to have a stronger basis for drawing research conclusions about the suitability of the initial theoretical model. The results of exploratory factor analysis are shown in Table 3 and Table 4.

Table 3.

Total Variance Explained.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.748
Bartlett's Test of Sphericity	Approx. Chi-Square	2654.823
	df	133
	Sig.	0.000

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.792	31.598	31.598	3.792	31.598	31.598	3.263	27.190	27.190
2	3.123	26.026	57.624	3.123	26.026	57.624	3.128	26.065	53.255
3	1.250	10.416	68.041	1.250	10.416	68.041	1.671	13.924	67.178
4	1.125	9.373	77.413	1.125	9.373	77.413	1.228	10.235	77.413
5	0.946	7.615	83.841						
6	0.833	6.941	84.355						
7	0.787	6.554	90.909						
8	0.461	3.841	94.750						
9	0.253	2.105	96.855						
10	0.218	1.815	98.670						
11	0.113	0.939	99.609						
12	0.047	0.391	100.000						

Extraction Method: Principal Component Analysis.

Table 4.

Rotated Component Matrix.

Rotated Component Matrix^a

Scales	Observed variables	Component			
		1	2	3	4
1. Digital data (DD)	DD1	0.811			
	DD2	0.809			
	DD3	0.798			
2. Digital civil servant (CS)	CS1		0.810		
	CS2		0.795		
	CS3		0.806		
3. Digital citizen (DC)	DC1			0.781	
	DC2			0.784	
	DC3			0.776	
4. Land management (LM)	LM1				0.804
	LM2				0.794
	LM3				0.797

Note: Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

In quantitative research, according to Hair et al. [10], exploratory factor analysis was performed in accordance with the data set through the values: $0.5 \leq KMO \leq 1$; Bartlett's test has an observed significance level Sig. < 0.05 ; Eigenvalue ≥ 1 ; Total Variance Explained $\geq 50\%$; Factor Loading ≥ 0.5 . The data in Table 3 and Table 4 show that:

KMO coefficient = $0.748 > 0.5$, confirming that exploratory factor analysis is appropriate for the data set; Bartlett's test has an observed significance level of Sig. = $0.000 < 0.05$, showing that the observed variables have a linear correlation with the representative factor. Total Variance Explained with Cumulative % = $77.413\% > 50\%$ (Table 3), indicating that 77.413% of the variation of the representative factors is explained by the observed variables; all observed variables have Factor Loading > 0.5 (Table 4), demonstrating that the observed variables have good statistical significance. The theoretical research model initially proposed is consistent with the survey research practice.

The observed variables were extracted into four factors corresponding to the four initial factors with eigenvalues greater than one (Table 3), continuing to confirm the suitability of the initial research model. The initial research model was kept intact, including three independent variables: "Digital data" (DD), "Digital civil servant" (CS), "Digital citizen" (DC), and one dependent variable: "Land management" (LM) with twelve observed variables that have good statistical significance, which can perform multivariate linear regression analysis to examine the relationship of the scales in the model. The results of the regression analysis are shown in Table 5, which is the basis for the author to draw research conclusions.

Table 5.
Multivariate regression results.

Coefficients ^a		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
		B	Std. Error	Beta			
Model 1	(Constant)	1.104	0.526		14.856	0.000	
	Digital data (DD)	0.397	0.305	0.423	12.204	0.000	1.769
	Digital civil servant (CS)	0.346	0.288	0.377	9.963	0.000	1.801
	Digital citizen (DC)	0.282	0.190	0.195	7.854	0.000	1.812

Note: a. Dependent Variable: Land management (LM)
R Square: 0.728; Durbin-Watson: 2.102.

The data in Table 5 shows: + R Square = 0.728, confirming that the scales "Digital data" (DD), "Digital civil servant" (CS), and "Digital citizen" (DC) explain 72.8% of the variation in the scale "Land management" (LM); VIF = 1.769, VIF = 1.801, VIF = 1.812 ($1 < VIF < 2$), showing that the regression model does not have multicollinearity; Durbin-Watson = 2.102 ($1 < d < 3$), indicating that the regression model does not have autocorrelation, confirming that the scales "Digital data" (DD), "Digital civil servant" (CS), and "Digital citizen" (DC) are independent and have the same impact on the scale "Land management" (LM), confirming the suitability of the theoretical research model with the survey data set.

The regression coefficients of the three independent variables "Digital data" (DD), "Digital civil servant" (CS), and "Digital citizen" (DC) are all statistically significant with Sig. = 0.000 (Sig. < 0.05) and have positive values: B(DD) = 0.397, B(CS) = 0.346, and B(DC) = 0.282, confirming the positive relationship between the three independent variables "Digital data" (DD), "Digital civil servant" (CS), and "Digital citizen" (DC) and one dependent variable "Land management" (LM); hypotheses H1, H2, and H3 are accepted; the initial research model continues to be confirmed as appropriate.

Based on the generalized regression model of Hair et al. [10]: $Y = B_0 + B_1 \cdot X_1 + B_2 \cdot X_2 + \dots + B_i \cdot X_i$, the author determined the multivariate regression model of this study as follows: $LM = 1.104 + 0.397 \cdot DD + 0.346 \cdot CS + 0.282 \cdot DC$.

Based on the regression coefficient (B), it can be seen that the correlation level of the independent variables and the dependent variables in decreasing order is: "Digital data" (DD), "Digital civil servant" (CS), "Digital citizen" (DC). This contributes to further affirming the results of empirical research in Vietnam, indicating that the development of a digital society is a trend and has a positive impact on state management and land management activities. Thanks to this, the government applies digital technology in land management; local people can access and use digital data on land and carry out the land registration process on a digital data platform quickly, accurately, and conveniently. Local people can also promote democracy by participating in and monitoring the implementation of local land policies on a digital technology platform.

However, many people have certain limitations in digital knowledge and skills when conducting transactions and participating in the land management process in the digital environment. The main reason is that people themselves have not proactively equipped and updated their digital knowledge and skills to conduct social transactions and participate in the land management process in the digital environment; but also from the state side, many localities have not performed well in supporting the provision of digital knowledge and skills for people to conduct social transactions and participate in the land management process in the digital environment.

The above practice is posing requirements for both sides: the Government and the people. From the results of this study, the author discusses the issue of land management in the context of digital society development. Accordingly, each citizen must equip themselves with digital knowledge and skills to conduct social transactions in the digital environment, forming a digital society; local authorities need to implement policies in supporting/training to equip and update digital knowledge and skills for people in a timely manner with the development of digital technology to develop a digital society. That is because developing a digital society is not only the task of state agencies, but also the task of the active participation of each citizen. After all, developing a digital society is to serve the people, so when each citizen becomes a digital citizen, the goal of developing a digital society will be successful. And so, when both of the above contents are well implemented, it will be of great significance, creating an initiative for local authorities to successfully implement the goal of developing a digital society and improving the efficiency of land management in the digital environment.

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