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ASSESSMENT OF LAND ADMINISTRATION ACTIVITIES BY PLATEAU GEOGRAPHIC INFORMATION SYSTEM (PLAGIS), PLATEAU STATE, NIGERIA

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ABSTRACT
Effective land administration is essential for sustainable development, yet challenges within Plateau State's PLAGIS hinder this goal. This study assesses PLAGIS's performance amid growing urbanization and complex land management. Using a descriptive survey design, data were collected from 65 stakeholders—including PLAGIS staff, landowners, surveyors, urban planners, and policy officials—through a structured Likert-scale questionnaire. Findings reveal a partially functioning land administration system, with key processes such as land registration, titling, documentation, and dispute resolution experiencing significant constraints. Major challenges identified include political interference, bureaucratic delays, and security concerns, each recording a Challenge Index ≥ 3.0. Other issues—such as inadequate standards, unclear tenure systems, and limited public awareness—scored between 2.2 and 2.8. Less urgent but relevant concerns like weak infrastructure and scarcity of qualified personnel had indices of 1.9–2.2. Despite these obstacles, respondents expressed optimism for reforms aimed at strengthening institutional autonomy, improving funding, and expanding the use of GIS-based technologies. Priority solutions highlighted include enhancing security to reduce land disputes and prevent ownership conflicts that escalate into communal clashes (solution index 3.2), ensuring adequate funding, and safeguarding PLAGIS's political independence (3.1 each). Additional suggestions include standard adoption, capacity building, and process simplification (2.9 each), alongside harmonizing land laws, increasing public awareness, and continuous staff training (2.8 each). The study recommends full digital transformation of land records, protection from political interference, improved staff capacity, stronger public engagement, upgraded infrastructure, and harmonized policies. A context-sensitive framework will enhance transparency, efficiency, and equitable access while supporting sustainable land governance.

Keywords:
Land Administration, Cadastral System, Geographic Information System, Nigeria, Land Governance

1. INTRODUCTION

Land administration is defined as systems and processes that manage land tenure, land use, land value, and land development to improve governance, land security, and efficient land markets, ultimately supporting sustainable development (Enemark, Williamson, & Wallace, 2021; Isa & Umar, 2025). It is fundamentally concerned with ownership, value, and land use, and involves institutional processes such as land registration and cadastral systems aimed at ensuring secure tenure and sustainable land management (Adebiyi, 2025). Given the vital role of land in supporting agricultural, residential, cultural, and economic activities, governments—both developing and

developed—have prioritized efficient land management (Adesola, 2024). Increasing urbanization, globalization, and population growth have heightened the demand for reliable land information systems, as land and property assets constitute significant components of national wealth (Barthel, et al, 2019). To support sustainable land use, governments rely on policy tools such as land market regulation, taxation, and zoning (Morgan & Shahab, 2023).

The importance of effective land administration is reflected in its capacity to support sustainable development, equitable taxation, secure investments, and informed planning through accurate, accessible land data (Adebiyi, 2025). Well-organized systems enable planners, property developers, financial institutions, and government agencies to make evidence-based decisions while also preserving land information for future generations (Enemark et al, 2021). Historically, Nigeria's land administration evolved from undocumented private conveyancing to formalized systems introduced under British colonial rule, leading to the Registration of Deeds and Titles systems and eventually the Land Use Act of 1978, which remains the foundation of national land policy (Alkali, 2022; Okafor & Udobi, 2024). Despite these frameworks, challenges persist, particularly the lack of cadastral maps and comprehensive land registration, underscoring the need for stronger legal, political, economic, and social structures to support efficient land administration (Ewah & Emengini, 2025). These issues form the basis for assessing land administration activities within the Plateau Geographic Information System in Plateau State, Nigeria

Literature Review

Land administration involves a collection of coordinated activities, including land tenure security, cadastral surveying, registration, valuation, and land use planning (Enemark et al, 2021). Modern systems benefit from technological innovations such as GIS and remote sensing, which improve accuracy and transparency (Enemark et al., 2021; Herath & Nayanajith, 2025). Hybrid models combining formal cadastral systems with traditional community-based governance can enhance legitimacy and tenure security (Babalola, Hull & Whittal, 2025). The integration of digital tools within institutional reforms is critical for advancing efficient land administration (Adebiyi, 2025; Babalola et al, 2025).

2. MATERIALS AND METHODS

2.1. The Study Area

The Plateau Geographic Information System (PLAGIS) agency is situated in Jos, the Plateau State capital city. Its operational mandate spans the entire State, with primary focus on the Greater Jos Master Plan Area (Plateau State Government, n.d.). Geographically, the agency is located at the Ministry of Land Survey and Town Planning, Jos North Local Government Area of Plateau State. The institution spatially lies within latitudes 9°54'23"N and 9° 54' 49"N of the Equator, and longitudes 8° 53 '21" E and 8° 53' 42"E of the Greenwich Meridian (Figure 1).

2.2. Methodology

A descriptive survey design was employed to collect data from 65 purposively, but randomly sampled stakeholders. Five groups of stakeholders were identified to include PLAGIS staff, landowners, surveyors, urban planners, and policy officials. A preliminary inquest revealed that the PLAGIS agency had fifty (50) staff. A 25% sampling size was chosen to arrive at 13 respondents, and the sample size obtained was replicated across all four other stakeholders' groups who engage in land administration activities within the agency. The data collection tool was a

well-structured questionnaire focusing on land administration stages, perceived challenges, and improvement strategies. Quantitative data were analyzed using descriptive statistics and a numerical weighting that reflected the relative strength of each perceived option. Depending on the Likert Scale points, each category was assigned a numerical weight reflecting its relative strength, with the least having a value of 1 and the highest value corresponding to the Likert scale point. These

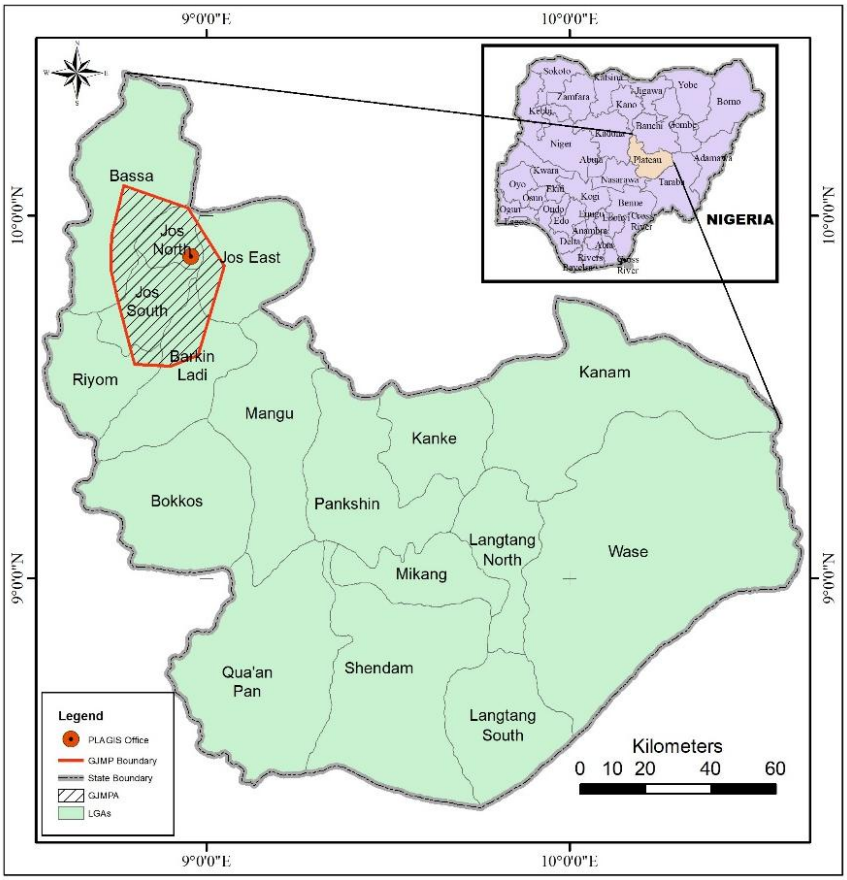

Figure 1: PLAGIS, Plateau State, Nigeria,

weights were used to convert respondents' qualitative judgments into quantitative values suitable for statistical analysis. For each administrative activity, the number of responses recorded in each category was multiplied by its corresponding weight to obtain a weighted efficiency score. The Efficiency Index (EI) for each activity was then computed by dividing the total weighted score by the total number of responses for that activity. Mathematically, the EI for a five-point Likert is expressed as:

$$EI = \frac{(5 \times EE) + (4 \times VE) + (3 \times ME) + (2 \times PE) + (1 \times NE)}{EE + VE + ME + PE + NE}$$

The resulting index yields a continuous value ranging from 1 to 5, where higher values indicate greater perceived efficiency. This procedure enabled a standardize comparison of efficiency levels across all stages of concern.

3. RESULTS AND DISCUSSION

3.1. Demographic Profile of Respondents

The dataset in Table 1 shows a male-dominated respondent sample of 83.1% and females with only 16.9%. Age distribution peaks in the 41-51 cohort with 41.5% respondents, and a significant representation above 51 years (18.4%). Experience levels indicate maturity, as 35.4% have 11-20 years of experience in land matters and 21.5% exceed 20 years, giving a total of about 60%; this emphasizes a high professional response level. Professional distribution also revealed a cross-section of skilled stakeholders. Professions like surveyors (26.2%), town planners (33.8%), estate surveyors (15.4%) and architects (13.8%) form the core of land administration roles, enabling evaluation of expertise distribution and potential biases in activity implementation. This dataset presents a highly relevant and direct stakeholders profile for assessing land administration activities, supports analysis of institutional capacity, knowledge gaps, and their operational effectiveness.

Table 1: Gender, Age, Experience Years and Professional Distribution of Respondents

Gender	**Frequency**	**Percentage**
Male	54	83.1
Female	11	16.9
Total	65	100
Age Cohort	**Frequency**	**Percentage**
19 – 29	8	12.3
30 – 40	18	27.8
41 – 51	27	41.5
Above 51	12	18.4
Total	65	100
Working Experience Years	**Frequency**	**Percentage**
< 5 years	7	10.8
5 – 10	21	32.3
11 – 20	23	35.4
> 20	14	21.5
Total	65	100
Profession of Respondents	**Frequency**	**Percentage**
Lawyer	4	6.2
Estate surveyor	10	15.4
Town planner	22	33.8
Engineer	3	4.6
Architect	9	13.8
Surveyor	17	26.2
Total	65	100

3.2. Land Administration Activities and Efficiency

Key activities include the opening of property files, the approval of land forms, digital scanning of applications, and the distribution of certificates Table 2. Activities stages rated highest for

efficiency were opening of property file, scanning of a new application and other documents, confirmation of payments and issue receipts, approve of land form 5 and endorsement of R of O with efficiency index of between 4.4 to 3.8; while issuance of land certificates, dispute resolution, and digitization stages tend to have lower efficiency scores, signaling critical bottlenecks. It is noteworthy that the system appears well structured, but its performance is uneven across different land administrative activities. This finding is corroborated in the works of Babatunde et al. (2014), where similar operational stages were identified with identical efficiency levels.

Table 2: Land Administration Activity Stage and Respective Efficiency

S/N	Stage-by-stage activity	Likert Scale					Weighted Score					Efficiency Index
		EE	VE	ME	PE	NE	5	4	3	2	1	
1	Opening of property file	27	38	0	0	0	135	152	0	0	0	4.4
2	Approve of land form 5	27	16	10	12	0	135	64	30	24	0	3.9
3	Scanning of a new application and other documents	32	23	0	0	10	160	92	0	0	10	4.0
4	Confirmation of payments and issue receipts	23	22	11	9	0	115	88	33	18	0	3.9
5	Checking of 6,7 & 8 and approval of survey reports	19	22	17	7	0	95	88	51	14	0	3.8
6	Recommend land form 5	24	14	18	0	9	120	56	54	0	9	3.7
7	Raise demand notice, acceptance and issuance of the R of O to the applicants	20	21	19	7	0	100	84	56	14	0	3.8
8	Assigned files for inspection coordinators	24	14	18	0	9	120	56	54	0	9	3.7
9	Print of R of O	19	19	19	10	0	95	76	56	20	0	3.7
10	Check land form 5	19	17	22	7	0	95	67	66	14	0	3.7
11	Review planning reports	20	20	5	20	0	100	80	15	40	0	3.6
12	Receive the property file for recommendation	16	17	22	10	0	80	67	66	20	0	3.6
13	Assign file for R of O endorsement	15	18	25	7	0	75	72	75	14	0	3.6
14	Receive property file for planning permission	15	18	25	7	0	75	72	75	14	0	3.6
15	Confirmation of payments and issuance of receipts	23	14	19	0	9	115	56	57	0	9	3.6
16	Digitising of property	19	20	13	0	15	93	80	39	0	15	3.4
17	Pass land form 5	15	18	7	25	0	75	72	21	50	0	3.4
18	Receive property file	15	15	15	20	0	75	60	45	40	0	3.4

19	Approve the issuance of the R of	16	12	10	27	0	80	48	30	54	0	3.3
20	Payment of demand notice	15	13	12	21	4	75	52	36	42	4	3.2
21	SQCO (check survey quality	15	3	32	7	8	75	12	96	14	8	3.2
22	Endorsement of R of O	24	14	10	0	8	120	56	30	0	8	3.8
23	Property inspection	12	16	10	27	0	60	64	30	54	0	3.2
24	Approve the planning report	23	12	8	2	20	115	48	24	4	20	3.2
25	Prepare land form 5	10	17	16	0	22	50	67	48	0	22	2.9
26	Payments of outstanding demand notices	7	16	25	0	19	35	64	75	0	19	2.9
27	Lodgment of application	3	5	8	35	14	15	20	24	70	14	2.2
	Mean											3.5

3.3. Operational Challenges within the PLAGIS

The Likert scale data in Table 3 provide clear, measurable insights into how stakeholders perceive the operational challenges within the PLAGIS land administration system. This helps prioritize issues based on the strength of respondents' agreement. On average, the overall challenge rating was 2.6. The most pressing concerns, with strong consensus, are political interference in PLAGIS management and difficulties in allocating and acquiring public land, both rated highest at 3.2. Close behind are serious security issues and conflicts that hinder regulation enforcement (3.1), and excessive bureaucracy in document processing (3.0). Funding shortages for enforcement (2.9) and weak application of standards (2.8) also emerged as a significant challenge. Meanwhile, other challenges received ratings below the average and showed less agreement among respondents. These included a shortage of qualified personnel for project activities (1.9), inconsistencies between land and subsector laws (2.1), weak infrastructure (2.1), limited public awareness of the benefits of a standardized land system (2.2), and unclear land tenure arrangements (2.2). Overall, the data reveal broad recognition of political, bureaucratic, security, and standardization issues, while challenges related to infrastructure and human resources appear more debated or less widely acknowledged.

Table 3: Challenges Associated with Each Stage

S/N	Perceived Challenges	Likert				Weighted Score				Challenge Index
		SA	A	D	SD	4	3	2	1	
1	Political interference in the management, allocation and acquisition of public land	27	23	15	0	107.9	69.03	30.03	0	3.2
2	Severe security concerns and Conflict Issues	26	20	10	4	104	60.06	19.89	4.03	3.1
3	Too much red tape in the processing of documents	22	28	9	6	87.88	84.045	17.94	5.98	3.0
4	Inadequate provision of funding for the enforcement regulation agencies	20	22	18	5	80.08	65.91	35.88	4.94	2.9
5	Inadequate use of standards to support the creation and management of land information	21	22	12	10	83.98	65.91	23.92	9.945	2.8
6	Undefined tenure arrangements and responsibilities	11	24	0	30	43.94	71.955	0	30.03	2.2
7	Poor public awareness of the benefits of the standard land administration system	10	20	10	25	39.78	60.06	19.89	25.025	2.2
8	Inadequate and weak infrastructure	10	12	15	25	39.78	35.88	29.51	25.025	2.1
9	Land laws and subsector-related laws are not always in sync	11	14	10	30	43.94	41.925	19.89	30.03	2.1
10	Inadequate qualified manpower to carry out the activities of the project	8	12	11	34	31.98	35.88	21.97	33.995	1.9
	MEAN									2.6

Note: SA – Strongly Agree; A – Agree; D – Disagree; SD - Strongly Disagree.

The findings reveal a partially functional land administration system hampered by systemic issues Table 3. The overall challenge rating of 2.6 reflects moderate concern. Key operational challenges

centre around political interference, difficulties in public land allocation and acquisition, and security challenges during regulatory enforcement, each rated above 3.0 in concern. Political interference manifests through administrative manipulations, appointment of unqualified political appointees based on party allegiance rather than merit, and delayed policy reforms to protect entrenched interests. Moreover, politicians often use land administration agencies to build patronage networks by selectively distributing land rights, deepening governance challenges. These issues are echoed in the works of Ikechukwu (2020) and John & Bello (2025), who emphasize political dynamics as a fundamental barrier to land governance in developing countries, particularly those of sub-Saharan Africa. Security problems further complicate enforcement, closely tied to bureaucratic inefficiencies, scoring a 3.0 concern rating. Issues such as cybersecurity breaches, data theft, and unauthorized cadastral database manipulation exacerbate the situation, alongside insider threats and corruption. In urban centre like Jos, security challenges from urban violence make some communities inaccessible, undermining effective land administration (Lohor, Dung-Gwom, & Laka, 2014). Excessive bureaucracy also slows service delivery and erodes public trust, but reforms involving digitization, institutional capacity building, and streamlined procedures could greatly improve efficiency and public confidence, aligning with Ghebru & Okumo's (2017) findings. Financially, enforcement suffers from funding shortages (rated 2.9) and weak adherence to standards (2.8), reflecting resource constraints and institutional gaps highlighted by Adeyemi et al. (2020). These constraints worsen infrastructure conditions and compromise policy implementation.

3.4. Improvement Strategies

The average solution index for addressing the main operational challenges faced by the PLAGIS land administration system was 2.9 (see Table 4). Respondents rated these strategies based on their perceived effectiveness and priority, highlighting several key areas for improvement. Security concerns within the operational jurisdiction scored highest at 3.2, followed closely by the need for government funding for enforcement agencies and the institution's independence from political interference, both rated at 3.1. These indicate strong support for these critical solutions. Strategies with medium ratings of 2.9 included adopting standards to enhance land information management, simplifying process stages to reduce bureaucratic delays, and strengthening institutional capacity and development. Solutions rated below the average emphasized the importance of increased and coordinated public awareness and capacity-building programs, the need for better alignment between land laws and related sub-sector laws, and ongoing training and retraining to address the shortage of qualified personnel, all rated at 2.8. The lowest-rated solution, with a score of 2.6, involved clearly defined tenure arrangements and responsibilities.

Against all odds, an optimistic solution rating of 2.9 reflects strong support for enhanced security protocols, consistent government funding, and greater institutional independence from political interference. Scholars like Eze et al. (2024) and Ibrahim & Ahmed (2025) advocate for politically insulated and capacity-strengthened agencies equipped with improved finance and technology to boost governance effectiveness. Medium-priority reforms include adopting standards for land information management, simplifying procedures, and institutional capacity building (all rated 2.9), echoing international best practices for modernized land administration systems (Global Land Alliance, 2021). Lower-priority areas—public awareness campaigns, harmonization of laws, and workforce training—though rated below 2.8, require strategic emphasis for sustainable reforms. Ghebru & Kennedy (2019) underscore the importance of combined administrative and institutional reforms to formalize land rights robustly, enhance resource capacities across agencies, and incorporate innovative technologies like GIS and web interactive dashboards to increase

efficiency and reduce errors. Overall, the study supports a reform agenda focused on legal clarity, stronger institutional autonomy, and integration of GIS-based land information systems, which together would address resource limitations, political interference, security challenges, and bureaucratic inefficiencies embedded in the states' land administration framework.

Table 4: IMPROVEMENT STRATEGIES

S/N	STRATEGIES	Likert Scale				Weighted Score				Solution Index
		SA	A	D	SD	4	3	2	1	
1	Improvement of the weak security concern	30	20	15	0	120.12	60.06	30.03	0	3.2
2	Provision of funding for the enforcement regulation agencies by the government	29	21	10	5	115.96	62.985	19.89	4.94	3.1
3	The institution should be independent of political interference	28	21	12	4	112.84	62.985	23.92	3.965	3.1
4	There should be use of standards to support the creation and management of land information – cadastral information and land administration systems	23	20	17	5	92.04	60.06	34.06	4.94	2.9
5	Process Simplification and Reengineering to avoid many red-tapes	22	21	19	3	86.58	62.01	38.87	3.25	2.9
6	Provide capacity development and institutional strengthening	23	20	10	10	92.04	60.06	19.89	9.945	2.9
7	Need for increased and coordinated awareness and capacity-building programs for the public	20	20	20	5	80.08	60.06	40.04	4.94	2.8
8	There should be synergy between land laws and sub-sector-related laws always	22	19	15	10	87.88	57.135	30.03	9.945	2.8
9	Training and retraining to bridge the gap of inadequately qualified manpower to carry out the activities of the project	22	18	15	10	87.88	53.82	30.03	9.945	2.8
10	Defined tenure arrangements and responsibilities	18	12	20	10	71.76	35.88	40.04	9.945	2.6
	Grand Mean									2.9

Challenges of political interference and institutional inefficiency align with prior research highlighting governance fragility in Nigerian land sectors (Deininger & Feder, 2019). Digitization efforts at PLAGIS have potential yet suffer from infrastructural and human resource constraints (Rajabifard et al., 2010). The importance of combining technological advancement with community participation is underscored to improve legitimacy, transparency, and conflict resolution (Zevenbergen & Augustinus, 2014). The study supports a reform agenda emphasizing legal clarity, institutional autonomy, and integrated GIS-based land information systems.

4. CONCLUSION

PLAGIS plays a vital role in the Plateau State's land governance system but faces pervasive security, political, infrastructural, and procedural challenges that limit effectiveness. Political manipulation and patronage networks distort land allocation and delay critical reforms. Security concerns, including data breaches and urban violence, further hamper regulatory enforcement. Financial constraints weaken institutional capacities and infrastructural stability. Despite these obstacles, there is optimism for reform focused on enhancing institutional autonomy, securing funding, and upgrading technology through digitization and GIS integration dashboard platforms accessible on the World Wide Web. Medium-priority reforms emphasis standardize land information management, simplifying processes, and building institutional capacity. Public awareness, legal harmonization, and workforce training, though lower priorities, are essential for sustainable land governance. A comprehensive, multi-faceted approach combining legal clarity, political neutrality, resource adequacy, and technological innovation is critical for advancing the agency toward greater efficiency and equity.

5. RECOMMENDATIONS

To improve the efficiency of land administration activities under PLAGIS in Plateau State, Nigeria, sustained digital transformation is essential through the full implementation of GIS-enabled land registration and mapping systems with real-time data-sharing dashboards for agencies and stakeholders. The PLAGIS website, which is currently incomplete and non-functional in some areas, needs to be made fully functional. In addition, institutional reforms should strengthen PLAGIS's independence through transparent recruitment and legal safeguards against political intrusion, alongside regular capacity development programs training technical and administrative staff in cadastral and GIS technologies. Public engagement efforts must include awareness campaigns integrating traditional authorities and community groups into governance, supported by infrastructure investments in ICT upgrades, interactive dashboards, and physical facilities for seamless service delivery. Finally, policy harmonization aligning sub-sectoral land laws with international best practices will minimize disputes and boost compliance, fostering an overall structured yet high-performing system.

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