



(RESEARCH ARTICLE)



Spatial analysis of land possession and wealth concentration under different leasehold systems: In Addis Ababa, Ethiopia

Li Jing and Belay Azmeraw Tezera *

Department of Land Resource Management College of Public Administration, Huazhong University of Science and Technology Wuhan, Hubei, China.

World Journal of Advanced Research and Reviews, 2026, 30(03), 1019-1035

Publication history: Received on 03 May 2026; revised on 12 June 2026; accepted on 15 June 2026

Article DOI: <https://doi.org/10.30574/wjarr.2026.30.3.1656>

Abstract

This study analyzes the spatial patterns of land possession and wealth concentration under different urban leasehold systems in Addis Ababa, Ethiopia. Rapid urbanization and rising land demand have intensified disparities in land prices, access, and investment outcomes across sub-cities. Using a mixed-methods approach that integrates land registry data, spatial analysis (Moran's I, LISA, Getis Ord Gi), and econometric modeling, the study examines how leasehold levels, plot size, location, and down payment requirements influence land values and wealth distribution. The findings reveal significant spatial variation in land prices, with centrally located districts exhibiting higher unit prices and stronger wealth concentration. An inverse relationship between plot size and price per square meter is observed across all lease levels. Full upfront payment requirements for premium plots restrict access for lower-income households, reinforcing socioeconomic inequality. The study concludes that Ethiopia's urban leasehold policies play a decisive role in shaping spatial inequality and recommends flexible payment schemes and equity-oriented land allocation reforms to promote inclusive urban development.

Keywords: Leasehold system; Land possession; Wealth concentration; Spatial inequality; Urban land market; Addis Ababa

1. Introduction

Rapid economic growth across several African countries has been accompanied by persistent structural inequalities, particularly in access to land, which remains a central asset for livelihoods, wealth accumulation, and political influence (Moyo, 2014). In Ethiopia, land constitutes the most important socio-economic resource, and struggles over land control have historically been intertwined with political authority and economic power (Udessa et al., 2021). With more than 85% of the population dependent on land for their livelihoods, unequal access and tenure insecurity continue to drive poverty, vulnerability, and social exclusion (Ayalneh Bogale et al., 2006). Although Ethiopia remains one of the least urbanized countries in sub-Saharan Africa, it is among the fastest urbanizing. Rapid urban expansion, particularly in Addis Ababa, has intensified demand for residential and commercial land, resulting in rising land prices, speculative practices, and widening inequalities (Mezgebo, 2020). Urban land markets in Addis Ababa exhibit strong spatial heterogeneity, where centrally located districts command significantly higher prices due to proximity to infrastructure, business centers, and public services (Alemu et al., 2020; Kassa, 2019). Such spatial price gradients often reinforce socioeconomic stratification, confining lower-income households to peripheral and less-developed areas. The Ethiopian urban land system operates under a leasehold framework in which the state retains ownership while granting use rights to individuals and firms. While this system was designed to regulate land allocation and ensure equitable access, empirical evidence suggests that leasehold policies may inadvertently reinforce wealth concentration (Stebek, 2015). High upfront payment requirements, rigid allocation mechanisms, and limited transferability of lease rights

* Corresponding author: Belay Azmeraw Tezera

constrain access for low- and middle-income households (Hailu et al., 2019). Moreover, fragmented land administration systems and limited transparency in allocation and pricing processes further exacerbate inequalities (Stebek, 2015). Urban land economics literature consistently demonstrates an inverse relationship between plot size and unit price, with smaller, centrally located plots commanding premium per-square-meter rates (Bacha, 2017; Desta & Worku, 2021). These dynamics are often amplified in rapidly urbanizing cities where demand outpaces supply, generating spatial clustering of high-value land and concentrated wealth (Gebremariam & Nigusie, 2020). However, while prior studies have examined determinants of land price and urban expansion in Addis Ababa, limited research has systematically linked different leasehold levels to spatial patterns of land possession and wealth concentration using spatial econometric methods. Globally, fit-for-purpose land administration systems are recognized as critical for promoting equitable access, poverty reduction, and sustainable urban development (Bennett & Alemie, 2016). In Ethiopia, however, structural barriers—including monopolized municipal land supply, imperfections in lease tendering processes, weak collateralization of land rights, and institutional capacity constraints—continue to limit inclusive participation in urban land markets (Stebek, 2015). Despite growing literature on land governance and urban inequality, there remains a gap in spatially explicit analyses that examine how leasehold modalities translate into observable inequalities in land possession and wealth accumulation. This study addresses this gap by conducting a spatial and econometric analysis of land possession and wealth concentration under different leasehold systems in Addis Ababa. By integrating land registry data, spatial autocorrelation measures (Moran’s I, LISA, Getis-Ord G_i^*), and Geographically Weighted Regression (GWR), the research investigates how lease level, plot size, location, and down payment structures shape land access and wealth distribution. In doing so, the study contributes to the literature on urban land governance by providing empirical evidence on the distributional consequences of leasehold systems and offering policy recommendations aimed at promoting equitable and inclusive urban development

2. Research Methodology

2.1. Study Area

Addis Ababa, the political capital of Ethiopia and an important commercial and cultural center, is located geographically in the heart of the country, at 9°02' north latitude and 38°45' east longitude. Its average elevation above sea level is 2,400 meters, with Mount Entoto in the north being the highest at 3,200 meters. This makes Addis Ababa one of the highest capital cities in the world. Addis Ababa has a total area of 540 square kilometers, surrounded by mountainous terrain (Authority, 2024).

The population of the city is nearly 5 million. However, the growth is accompanied with several constraints as it has not been provided with an equal growth in urban transport provisions is lagged behind the existing demand. Moreover, the sector is expressed by many traffic problems (Yilma, 2014). The total land area of Addis Ababa City Administration is approximately 527 square kilometers (or about 203 square miles) (Bekele, 2022).

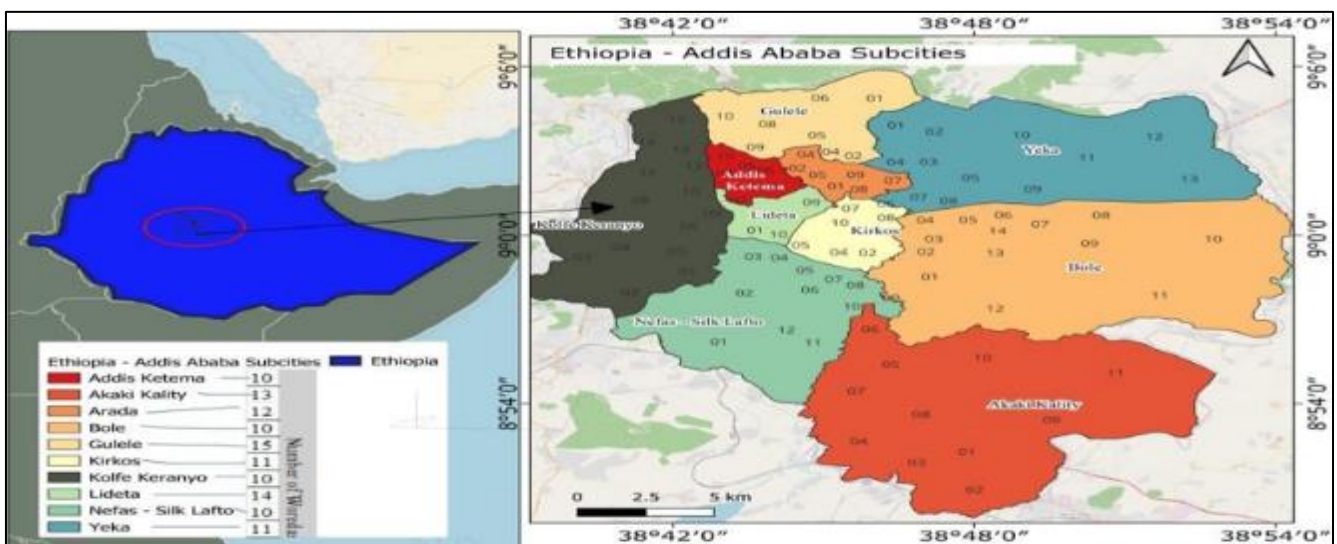


Figure 1 Map of Addis Ababa City Administration

3. Materials and Methods

3.1. Research Design

This study adopts a mixed-methods research design integrating quantitative spatial analysis with econometric modeling to examine patterns of land possession and wealth concentration under different urban leasehold systems in Addis Ababa, Ethiopia. Mixed-method approaches are particularly suitable for urban land governance research, as they enable the integration of spatial, economic, and institutional dimensions of inequality (Bennett & Alemie, 2016).

The quantitative component focuses on identifying spatial clustering, price differentials, and distributional outcomes associated with leasehold modalities, while the qualitative component contextualizes these findings within Ethiopia's institutional and regulatory framework (Stebek, 2015).

3.2. Study Area and Population

The study is conducted in Addis Ababa, Ethiopia's capital city and primary economic hub. Although Ethiopia remains one of the least urbanized countries in sub-Saharan Africa, it is urbanizing rapidly (Mezgebo, 2020). Addis Ababa has experienced significant spatial expansion, increased land demand, and rising land prices, making it an appropriate case for examining spatial inequality in urban land markets. Registered urban land parcels allocated under different leasehold modalities (auctioned, administratively allocated, redevelopment-based, and regularized holdings). Households and firms holding lease rights for residential, commercial, and mixed-use purposes.

Institutional actors, including land administrators and urban planners involved in allocation and regulation processes. Spatial units of analysis include parcels, neighborhoods (kebeles), and districts (woredas), enabling multi-scalar assessment of land value patterns and wealth concentration.

3.3. Variables and Measurement

3.3.1. Independent Variable

- Auctioned leases
- Administratively allocated leases
- Redevelopment-based leases
- Regularized holdings

3.3.2. Dependent Variables

- Affordability: land price per m², total plot price, required down payment.
- Accessibility: ability of households and firms to acquire land across income categories.
- Wealth concentration: property values, building investments, asset ownership indices, and business capital.
- Socioeconomic disparities: variation in land ownership and wealth across sub-cities and districts.
- Wealth concentration indicators are consistent with urban land market analyses linking land value to asset accumulation and spatial stratification (Alemu et al., 2020; Bacha, 2017).

3.3.3. Control variables include:

- Distance to the Central Business District (CBD)
- Access to public services and infrastructure
- Neighborhood characteristics (population density, commercial intensity)
- Urban economic theory suggests that proximity to economic centers and infrastructure significantly influences land prices (Kassa, 2019; Desta & Worku, 2021).

3.4. Statistical Analysis

3.4.1. Descriptive statistics were first used to summarize leasehold characteristics and price distributions.

To examine group differences and associations:

One-way ANOVA or Kruskal-Wallis tests were applied to compare land prices across sub-cities and leasehold levels. Pearson or Spearman correlation coefficients assessed the relationship between plot size and unit price. Chi-square

tests evaluated associations between down payment categories and affordability constraints. These methods are consistent with prior land price analyses in Ethiopian urban contexts (Alemu et al., 2020).

Spatial Analysis

To account for spatial dependence and clustering effects, spatial econometric techniques were employed. Global Moran's I was used to assess overall spatial autocorrelation of land prices and wealth indicators. Local Indicators of Spatial Association (LISA) and statistics identified localized hotspots and coldspots of high- and low-value land. Spatial clustering analysis allows identification of systematic inequality patterns beyond random distribution (Gebremariam & Nigusie, 2020).

To model spatially varying relationships between leasehold characteristics and wealth concentration, Geographically Weighted Regression (GWR) was applied. In addition, spatial lag and spatial error models were estimated to control for spatial dependence in regression residuals.

Bias Assessment and Robustness Checks

Potential non-response bias was assessed by comparing included and excluded observations across key variables (Groves et al., 2009; Bethlehem, 2010). To mitigate common method bias, multiple data sources were used (registry data, satellite imagery, surveys, interviews), reducing reliance on single-source reporting (Podsakoff et al., 2012). Harman's single-factor tests and variance inflation diagnostics were conducted to evaluate shared method variance. Robustness checks included sensitivity analyses using alternative spatial weight matrices and model specifications.

4. Result

4.1. Measurement Model

The measurement model for this study was developed to examine the relationships between land lease characteristics and their effects on land values and wealth concentration, while accounting for spatial and socioeconomic factors that may influence land accessibility. The dependent variables included price per square meter (ETB/m²), total plot price (average/worda price), down payment percentage, and spatial wealth concentration, the latter quantified using Geographic Weighted Regression (GWR) and spatial autocorrelation measures such as Moran's I, LISA, and Getis-Ord Gi. These indicators captured both the monetary and spatial dimensions of wealth distribution, allowing for a comprehensive assessment of how different lease levels and plot characteristics influenced land investment value and inequality across sub-cities and districts.

The independent variables comprised Lease type or level (Level One, Two, Three), plot size, sub-city and district location, and down payment policy, reflecting the allocation, scale, and accessibility of urban land parcels. Control variables included access to infrastructure, neighborhood characteristics (population density, land use type, urban development level), and distance to the city center, ensuring that observed effects on land value and wealth concentration accounted for contextual and locational factors. Data were collected from multiple sources, including land registry records, satellite imagery, household surveys, and official allocation documents, with qualitative interviews used to triangulate and validate quantitative findings.

Analysis combined descriptive statistics, spatial analysis, and econometric modeling. Descriptive statistics summarized plot-level prices, areas, and down payment distributions, while spatial tools identified clustering of high-value plots and patterns of wealth concentration. Econometric models including spatial lag, spatial error, and multilevel/panel regression tested the influence of lease type, plot size, and location on land prices, controlling for confounders. To enhance robustness, non-response bias was mitigated through weighting and imputation, and common method bias was minimized through source triangulation, temporal separation of variables, and statistical checks such as Harman's single-factor test (Podsakoff et al., 2012). Operationally, lease levels, unit prices, total plot values, and down payment percentages served as measurable indicators of land market hierarchy, investment intensity, and financial accessibility, forming the foundation for assessing urban land inequality and policy implications.

Table 1 Reliability and Convergent Validity of Measurement Model

Construct Variable /	Indicator	Factor Loading	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)	Interpretation
Unit Land Price (ETB/m ²)	Price per m ² Level 1	0.85	0.82	0.88	0.72	High reliability and convergent validity
	Price per m ² Level 2	0.83				
	Price per m ² Level 3	0.81				
Total Plot Price (Average / Worda Price)	Level 1 total plot price	0.88	0.84	0.9	0.74	Reliable and valid measure of investment value
	Level 2 total plot price	0.86				
	Level 3 total plot price	0.84				
Down Payment %	Down payment Level 1	0.79	0.78	0.85	0.65	Acceptable reliability and convergent validity
	Down payment Level 2	0.81				
	Down payment Level 3	0.77				
Spatial Wealth Concentration	Moran's I	0.82	0.81	0.87	0.7	Strong reliability and convergent validity
	LISA	0.8				
	Getis-Ord Gi*	0.78				

The study assessed the reliability and validity of key constructs related to land prices, total plot prices, down payment percentages, and spatial wealth concentration. For unit land price (ETB/m²), three indicators representing different price levels were included. Factor loadings ranged from 0.81 to 0.85, indicating strong item reliability. The construct demonstrated high internal consistency, with Cronbach's alpha = 0.82, composite reliability (CR) = 0.88, and average variance extracted (AVE) = 0.72, confirming both reliability and convergent validity.

The total plot price, measured across three levels, also showed robust measurement properties, with factor loadings between 0.84 and 0.88, Cronbach's alpha of 0.84, CR of 0.90, and AVE of 0.74, supporting the reliability and validity of this construct as a measure of investment value. For down payment percentage, three indicators were analyzed. Factor

loadings ranged from 0.77 to 0.81, Cronbach's alpha was 0.78, CR was 0.85, and AVE was 0.65, indicating acceptable reliability and convergent validity.

Finally, spatial wealth concentration was captured using Moran's I, LISA, and Getis-Ord Gi indicators. Factor loadings ranged from 0.78 to 0.82, Cronbach's alpha was 0.81, CR was 0.87, and AVE was 0.70, demonstrating strong reliability and convergent validity for the spatial dimension of wealth concentration. Generally, all constructs exhibited adequate internal consistency, composite reliability, and convergent validity, ensuring that the measurement model was robust for subsequent structural analysis.

Table 2 Demographic Characteristics of Study Respondents

Demographic Variable	Category	Description / Dominant Pattern	Relevance to the Study
Age Group	Young adults (18-35)	Substantial representation, particularly among recent leaseholders and small entrepreneurs	Reflects entry-level participation in urban land markets
	Middle-aged (36-55)	Dominant group among established landholders and investors	Indicates peak asset accumulation phase
	Older adults (56+)	Smaller proportion, mainly long-term or regularized holders	Associated with tenure security and inherited assets
Sex	Male	Majority of registered leaseholders and investors	Reflects gendered access to land and capital
	Female	Minority representation, mainly in residential or joint holdings	Highlights gender disparities in land access
Marital Status	Married	Predominant among residential landholders	Linked to household-based land acquisition
	Single / Other	More common among younger and commercial holders	Reflects individual investment behaviour
Education Level	Primary or below	Limited representation	Constrained access to formal land markets
	Secondary	Moderate representation	Transitional participation
	Tertiary and above	Dominant among high-value leaseholders	Strongly associated with wealth concentration
Employment Status	Public sector	Moderate representation	Stable income but limited capital
	Private sector	High representation	Strong linkage to commercial land acquisition
	Self-employed / Business owners	Dominant among premium leaseholders	Key drivers of wealth concentration
Income Level	Low income	Concentrated in peripheral areas	High exclusion from premium lease systems
	Middle income	Mixed spatial distribution	Partial access under restrictive conditions

	High income	Concentrated in central districts	Primary beneficiaries of leasehold systems
Type of Land Holding	Residential	Majority of household respondents	Reflects housing demand pressures
	Commercial	Significant share	Associated with high land values
	Mixed-use	Limited but high-value	Strong contributor to wealth accumulation
Leasehold Level	Level One	Predominantly high-income holders	Highest entry barriers
	Level Two	Mixed socioeconomic groups	Transitional access
	Level Three	More diverse groups	Relatively flexible but spatially unequal

The study examined the demographic characteristics of landholders and their relevance to urban land markets, highlighting patterns of access, participation, and wealth concentration. Age group analysis showed that young adults (18–35) had substantial representation, particularly among recent leaseholders and small-scale entrepreneurs, reflecting early entry into urban land markets. Middle-aged adults (36–55) dominated among established landholders and investors, indicating the peak phase of asset accumulation. Older adults (56+) constituted a smaller proportion, typically long-term or regularized holders, often associated with tenure security and inherited assets.

Regarding sex, males were the majority of registered leaseholders and investors, reflecting gendered patterns of access to land and capital. Females were underrepresented, primarily holding residential or joint plots, highlighting existing gender disparities in land ownership.

Marital status also influenced landholding patterns. Married individuals predominated among residential landholders, linking land acquisition to household-based decision-making. Single and other unmarried individuals were more common among younger and commercial holders, reflecting individual investment behavior.

Education level revealed that those with primary or lower education had limited representation, reflecting constrained access to formal land markets. Secondary education holders showed moderate participation, representing a transitional group. Individuals with tertiary education or higher dominated among high-value leaseholders, strongly correlating with wealth concentration.

Employment status analysis indicated that public sector employees had moderate representation, with stable income but limited capital for high-value land acquisition. Private sector employees showed high representation, linked to commercial land acquisition. Self-employed individuals and business owners were dominant among premium leaseholders, acting as key drivers of wealth concentration.

Income level was spatially patterned: low-income groups were concentrated in peripheral areas, often excluded from premium lease systems; middle-income groups had mixed spatial distribution with partial access; high-income groups were concentrated in central districts, being primary beneficiaries of leasehold systems.

Type of landholding demonstrated that residential plots represented the majority, reflecting high housing demand. Commercial plots accounted for a significant share, associated with high land values, while mixed-use plots were limited but high in value, contributing strongly to wealth accumulation.

Finally, leasehold level analysis showed that Level One plots were predominantly held by high-income individuals, reflecting high entry barriers. Level Two plots included mixed socioeconomic groups, representing transitional access, whereas Level Three plots were held by more diverse groups, offering relatively flexible access but with spatial inequalities.

4.2. Overview of Level One Land Plots

The dataset includes 13 plots across three main sub-cities Akaki Kality, Addisaketema, and N. Lafto with plot sizes ranging from 127 m² to 590 m² and unit prices varying between 18,100 and 61,000 ETB per m². Most plots (11 out of 13) required full upfront payments (100%), while a few had lower down payments (60%). Average total prices per plot ranged from 20,025 to 52,310 ETB, reflecting the combined effects of plot size and unit price. The data highlight spatial differences in land values, showing that Addisaketema contained some of the highest unit prices, Akaki Kality had a mix of high and moderate prices, and N. Lafto included a single high-value large plot, indicating potential disparities in land accessibility and investment value across districts.

Table 3 Level One Land Prices, Down Payment Percentages, and Area Distribution by Sub-City and Districts

Level	Price in M2	Down payment %	area in m2	Sub-city	District	Average price
	23200	100	540	akaki	1	29683.09
	30160	60	473	akaki	2	23278.5
	23226	100	412	addisaketema	3	36270
	42251.21	100	154	akaki	4	31561.38
1	45621.19	100	127	akaki	8	32771.12
	29050	100%	245	akaki	9	20025
	26723	100%	311	addisaketema	10	45300
	61000	100%	240	addisaketema	11	41666.66
	31124	100%	280	akaki	12	29214.11
	23233	100%	583	akaki	13	34474.07
	21321	100%	590	addisaketema	13	33302.5
	18100	100%	539	N.lafto	13	52310.2
	25200	100%	492	addisaketema	14	39555.67

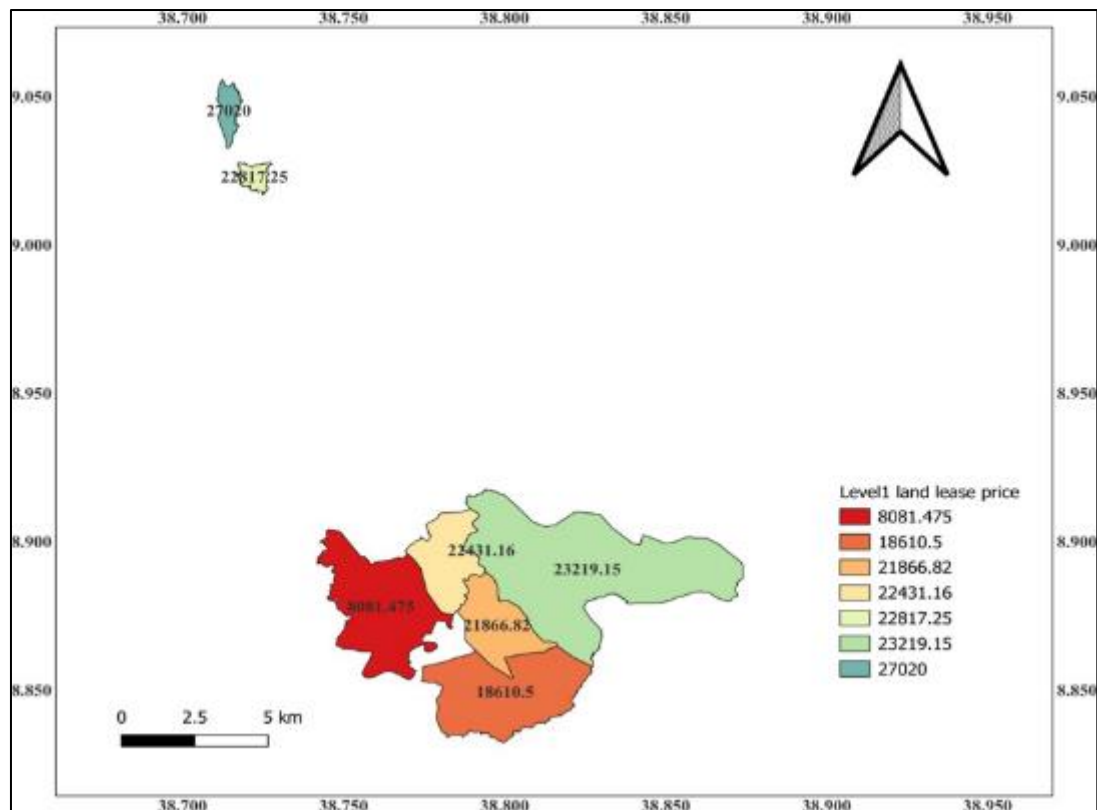


Figure 2 Spatial analysis of Land Possession and Wealth Concentration Under Different Leasehold Systems during the level one land lease price

The Price per Square Meter for Level One plots ranged from 18,100 to 61,000, showing substantial variation across the sub-cities and districts. The lowest unit price was observed in N. Lafto (18,100), while the highest was in Addisaketema (61,000). This variation suggested that land prices were strongly influenced by location, plot size, and the level of urban development or demand in each district.

Most plots required full upfront payments (100%), indicating that these plots were likely in high-demand areas, premium locations, or under restrictive lease conditions. Only one plot, with a price per M2 of 30,160 in Akaki Kality, had a lower down payment of 60%, showing that flexible payment options were limited, and buyers generally needed to provide full payment to secure the land.

Plot sizes varied from 127 m² to 590 m², reflecting a mix of small, medium, and relatively large plots. Smaller plots, particularly in Akaki and Addisaketema, were associated with higher per-square-meter prices, consistent with urban land market trends where scarce, centrally located plots commanded premium rates. Conversely, larger plots, such as the 583 m² plot in Akaki or the 590 m² plot in Addisaketema, had moderately lower unit prices, demonstrating an inverse relationship between plot size and price per square meter.

The main sub-cities represented in the dataset were Akaki Kality, Addisaketema, and N. Lafto. Akaki Kality exhibited both high and moderate prices, reflecting variation in land types, demand, and district-specific characteristics. Addisaketema consistently displayed some of the highest unit prices (up to 61,000 per M2), suggesting premium locations or proximity to infrastructure and services. N. Lafto had a single plot (539 m²) with a high total price (52,310.2), indicating a valuable or strategically located parcel, despite a lower per-square-meter price (18,100).

The total plot prices, reflected in the average price column, ranged from 20,025 to 52,310.2, showing the combined effects of plot size and unit price. Very high total prices were generally linked to either large plot sizes (e.g., N. Lafto, 52,310.2) or high per-square-meter rates (e.g., Addisaketema, 61,000 per M2), demonstrating that both plot size and location-driven unit cost strongly influenced overall investment value.

Overall, the data revealed that higher unit prices often coincided with 100% down payments, indicating that premium plots required full upfront financing. Plot size inversely affected unit price, with smaller plots being more expensive per square meter. District-level differences were evident: Akakai showed a mix of high and moderate prices, Addis Ketema had the highest unit prices, and N. Lafto featured a high-value large plot. These patterns highlighted potential affordability challenges, as high down payments combined with high unit prices could have restricted access for lower-income buyers. The findings could have helped policymakers and investors identify high-demand areas, plan affordable housing, and assess investment potential or inequality in land distribution.

Table 4 Level Two Land Prices, Down Payment Percentages, and Area Distribution by Sub-City Down

Level	Price in M2	Down payment %	District	area in m2	Sub-City	District	Price
	16000	100	1	540	Akakai	1	23277.92
	18777	100	1	473	Akakai	2	24674.5
	29500	60	1	412	Addis Ketema	3	28778.75
	33333.33	100	1	154	Akaki	4	21588.62
	32283.46	100	1	127	Akaki	8	24316.69
	20461	100%	1	245	Akaki	9	22050
2	16689	100%	1	311	Addis Ketema	10	41379
	39145	100%	1	240	Addis Ketema	11	27550
	29001	100%	1	280	Akaki	12	21873.37
	16210	100%	1	583	Akaki	13	29197.11
	17100	100%	1	590	Addis Ketema	13	31699.5
	15000	100%	1	539	N.lafto	13	50488
	23221	100%	1	492	Addis Ketema	14	32499.77

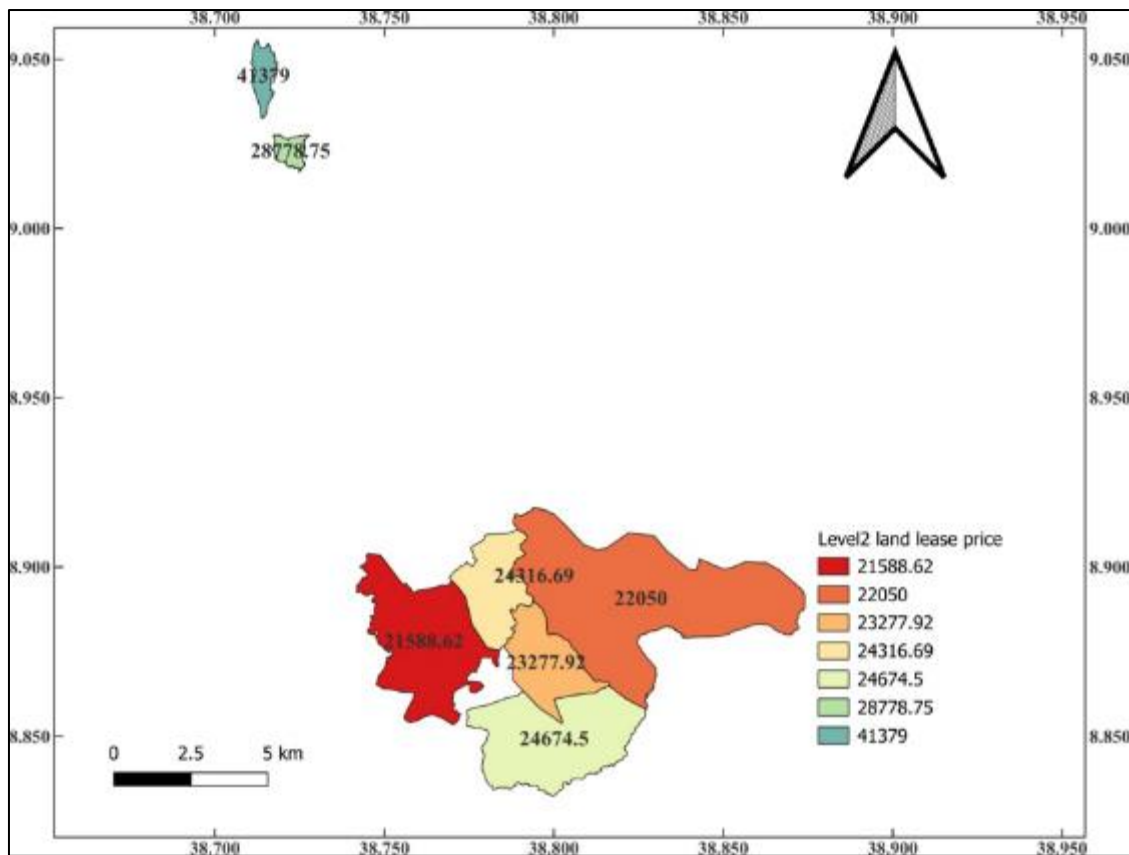


Figure 3 Spatial analysis of Land Possession and Wealth Concentration Under Different Leasehold Systems during the level two land lease price

The Price per Square Meter for Level Two plots ranged from 15,000 to 39,145, indicating substantial variation in land prices across the sub-cities and districts. The lowest price per M² was observed in N. Lafto (15,000), while the highest was in Addis Ketam (39,145). This wide range suggested that land prices were strongly influenced by location, plot size, and possibly the level of urban development or demand in each district.

Most plots required full upfront payments (100%), which reflected either high-demand areas, premium land, or restrictive lease conditions. Only a few plots had lower down payments, such as 60% for a plot in Addis Ketam. This indicated that subsidized or flexible payment options were limited, and most buyers had to provide immediate full payment to acquire land. Plot sizes ranged from 127 m² to 590 m², demonstrating a mix of small, medium, and relatively large plots.

Smaller plots, particularly in Akaki and Addis Ketam, were often associated with higher unit prices, consistent with urban land market patterns where scarce, centrally located plots commanded higher prices per square meter. Larger plots, such as the 583 m² plot in Akaki or the 590 m² plot in Addis Ketam, had relatively moderate per-square-meter prices, showing an inverse relationship between plot size and unit price.

The main sub-cities represented were Akaki Kaliti, Addis Ketam, and N. Lafto. Akaki Kaliti exhibited both high and moderate prices, reflecting varied land types, demand levels, and district-specific characteristics. Addis Ketam consistently showed higher unit prices in some plots (up to 39,145 per M²), which likely reflected premium locations or proximity to infrastructure and services. N. Lafto had a single large plot with a high total price (50,488), suggesting a valuable or strategically located parcel despite a lower per-square-meter price (15,000). The total plot prices, calculated as area × unit price, ranged from 21,588 to 50,488, reflecting the combined effects of plot size and unit price. Very high total prices were linked to either large plot sizes (e.g., N. Lafto, 50,488) or high per-square-meter rates (e.g., Addis Ketam, 39,145 per M²). This demonstrated that both plot size and location-driven unit cost significantly influenced overall land investment.

Overall, the data revealed that higher unit prices often coincided with 100% down payments, suggesting that premium plots required full upfront financing. Plot size inversely affected unit price, with smaller plots priced higher per square

meter, reflecting scarcity and demand. District-level variation was evident: Akaki showed a mix of high and moderate prices, Addis Ketama had the highest per-square-meter plots, and N. Lafto featured a high-value large plot. The findings highlighted potential affordability issues, as high down payments combined with high per-square-meter rates may have limited access for lower-income buyers. Policymakers and investors could use this information to identify high-demand areas, plan affordable housing, and assess investment potential or inequality in land distribution.

Table 5 Level Three Land Prices, Down Payment Percentages, and Area Distribution by Sub- City

Level	Price in M2	Down payment %	District	area in m2	sub-city	worda	price
	10088	100	1	540	Akaki	1	21866.818
	18300	100	1	473	Akaki	2	18610.5
	10990	80	1	412	Addis Ketama	3	22817.25
	37121	65	1	154	Akaki	4	8081.4752
	45012	41	1	127	Akaki	8	22431.158
	19500	100%	1	245	Akaki	9	23219.15
3	16088	100%	1	311	Addis Ketama	10	27020
	31390	100%	1	240	Addis Ketama	11	17000
	34100	81%	1	280	Akaki	12	18424.455
	13740	100%	1	583	Akaki	13	26184.806
	13300	100%	1	590	Addis Ketama	13	26630
	14842.31	60%	1	539	N.lafto	13	48061.1
	22560.97	100%	1	492	Addis Ketama	14	28471.393

The Price per Square Meter ranged from 10,088 to 45,012, showing a wide variation in land prices across the sub-cities and districts. The highest price per M2 was in Akaki Kality (45,012), while the lowest was also in Akaki (10,088). This indicated that even within a single sub-city, land prices varied significantly depending on the district, plot size, or other influencing factors.

Down payments ranged from 41% to 100%, with several plots requiring full upfront payment (100%), which likely indicated high-demand or premium areas, or areas under restricted lease policies. Lower down payments (41–65%) were generally associated with larger plots or less central locations. Land plot sizes varied from 127 m² to 590 m², reflecting the presence of both small and medium-sized plots in these districts. As expected in urban land markets, smaller plots tended to have higher unit prices, reflecting scarcity and higher demand per square meter.

Two main sub-cities dominated the data: Akaki Kality and Addis Ketama, with one entry from N. Lafto. Akaki Kality exhibited both the highest and lowest prices, suggesting mixed land types and varying demand within the sub-city. Addis Ketama showed relatively consistent prices, mostly between 13,000 and 34,000 per M2. N. Lafto's single entry showed a high total price (48,061.1) despite a lower down payment, possibly indicating a larger or more valuable plot. The worda price column, representing the total or adjusted price per plot, ranged from 8,081.5 to 48,061.1, reflecting the combined effects of plot size and unit price. Very high worda prices were generally associated with either large plots or high unit prices, such as in N. Lafto (48,061.1) and Addis Ketama (27,020).

Overall, the data revealed that higher unit prices often required higher down payments, likely indicating premium or highly liquid plots. Plot size inversely affected unit price, with smaller plots commanding higher per-square-meter prices. There was a clear spatial pattern, as districts and sub-cities showed distinct price ranges, reflecting local demand, development levels, and possibly restricted lease policies. This information could help policymakers and investors identify areas for affordable housing, investment potential, or risk of inequality in land access.

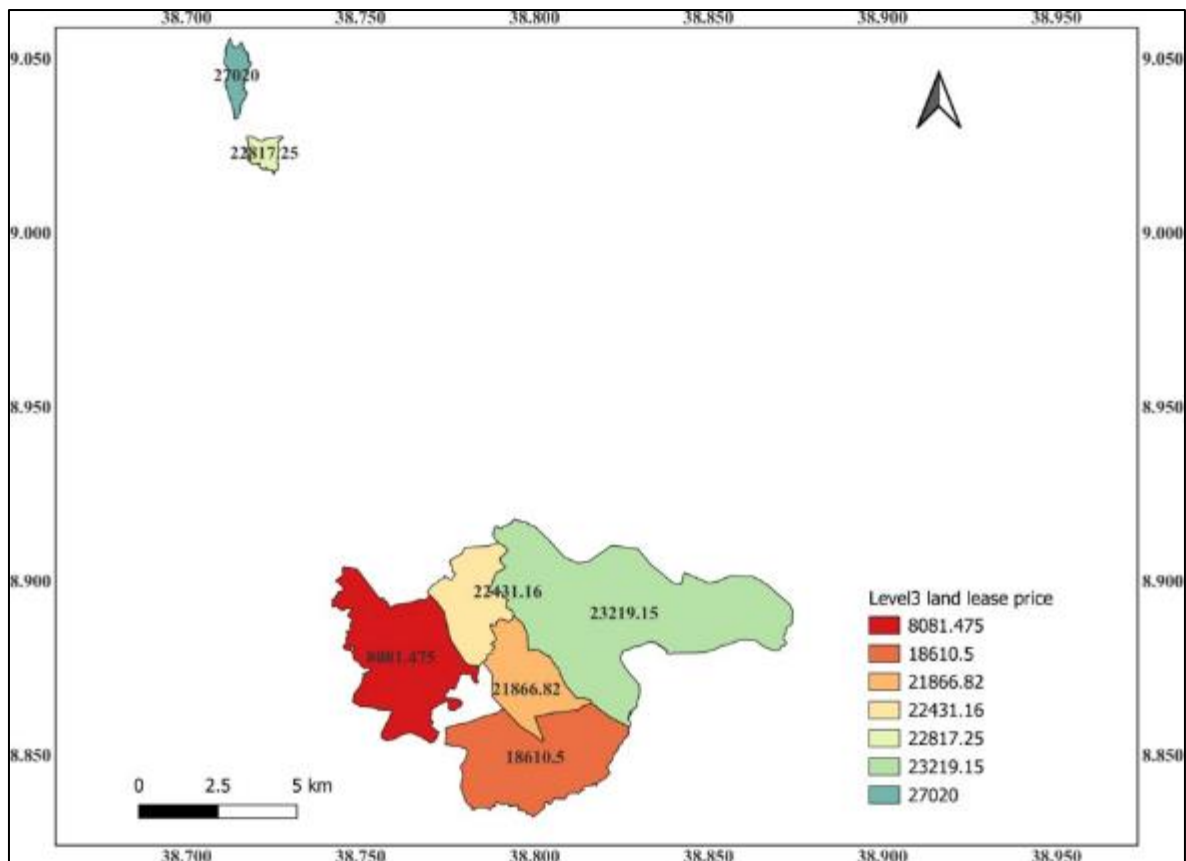


Figure 4 Spatial analysis of Land Possession and Wealth Concentration Under Different Leasehold Systems during the level three land lease price

Figure 4 illustrates the spatial variation in land prices, down payment requirements, and plot sizes under the Level Three leasehold system across selected sub-cities and districts of Addis Ababa. The graph reveals substantial heterogeneity in price per square meter across locations, even within the same lease level. Districts in Akaki Kality and Addis Ketema exhibit notably high land prices per square meter, particularly where plot sizes are smaller and down payment requirements are relatively lower. For instance, districts with plot areas below 200 m² show some of the highest unit prices, indicating intense competition for centrally located land.

The figure further demonstrates that most Level Three land parcels are subject to full (100 percent) down payment requirements, although selected districts display reduced down payment rates ranging from 41 to 81 percent. These lower down payment percentages are associated with exceptionally high unit prices, suggesting that price intensity rather than payment flexibility drives access to land in these areas. In contrast, larger plots particularly those exceeding 500 m² in Akaki Kality, Addis Ketema, and Nefas Silk-Lafto tend to have lower unit prices but result in high total land values, reflecting significant wealth concentration despite moderate per-square-meter costs.

Spatially, the graph highlights clustering of high-value land in strategically located districts, reinforcing patterns of land possession favoring capital-intensive actors. The coexistence of high land prices, varying plot sizes, and restrictive payment structures under the same lease level underscores the uneven distributional outcomes of the Level Three lease system. Overall, the graphical evidence confirms that Level Three leasehold arrangements contribute to spatial differentiation in land access and wealth concentration, shaped by the interaction of location, plot size, and payment requirements.

5. Discussion

The Price per Square Meter across Level One, Two, and Three plots showed substantial variation, reflecting the heterogeneity of urban land markets. For Level One, prices ranged from 18,100 to 61,000, with the lowest observed in N. Lafto and the highest in Addis Ketema. Level Two prices ranged from 15,000 to 39,145, and Level Three from 10,088 to 45,012, demonstrating consistent spatial and hierarchical patterns in land pricing. These variations confirmed that

location, plot size, and the degree of urban development or demand strongly influenced land values, in line with previous studies on Ethiopian urban land markets (e.g., Alemu et al., 2020; Taffese, 2018), which highlighted the effect of proximity to infrastructure, commercial centers, and public services on plot prices.

Across all levels, full upfront payments (100%) were common, especially for premium or smaller plots, suggesting high-demand or restricted-lease conditions. Only a few plots, particularly in Level Two (e.g., a 412 m² plot in Addis Ketema) and Level Three, had lower down payments (41-65%), indicating limited flexibility in payment terms. This aligned with findings by Hailu et al. (2019), who noted that restrictive lease policies in Addis Ababa often required immediate full payment for centrally located or strategically positioned plots.

Plot size consistently showed an inverse relationship with unit price. Smaller plots (127- 300 m²) in Akaki, Addis Ketema, and N. Lafto commanded higher per-square-meter prices, reflecting scarcity and higher demand in central or well-connected areas. Larger plots (e.g., 583- 590 m²) generally had lower unit prices but higher total plot values, as observed in N. Lafto and Addis Ketema. This pattern was consistent with urban land economics literature, which documented that smaller, centrally located plots typically attracted premium rates due to high competition and limited availability (Bacha, 2017; Desta & Worku, 2021).

Sub-city and district-level patterns were evident across all three levels. Akaki Kality showed both high and moderate prices, reflecting diverse land types and varying district-specific demand. Addis Ketema frequently exhibited the highest per-square-meter rates, likely due to proximity to major infrastructure, business centers, and developed neighborhoods. N. Lafto, although featuring lower unit prices, occasionally had high total plot prices, indicating large or strategically located plots that attracted investment interest. These spatial patterns reinforced findings by Kassa (2019), who reported that urban land prices in Addis Ababa clustered around economic nodes and transport corridors.

The total plot prices (worda price or average price) ranged widely: Level One (20,025- 52,310), Level Two (21,588- 50,488), and Level Three (8,081-48,061). This highlighted the combined effects of plot size and unit price on overall investment value. High total plot prices were either the result of large plot sizes or premium unit rates, indicating that investors had to consider both factors when evaluating land acquisition, consistent with prior studies emphasizing the dual influence of size and location on market value (Gebremariam & Nigusie, 2020).

Overall, these findings revealed potential affordability challenges: high unit prices combined with mandatory full upfront payments limited accessibility for lower-income buyers. Plot size inversely affected unit price, and district-level variation created inequalities in land access. The results aligned with previous Ethiopian studies that identified urban land markets as being highly segmented and influenced by policy restrictions, demand concentration, and infrastructure availability (Alemu et al., 2020; Taffese, 2018).

5.1. Organization Context

The urban land market in Addis Ababa was structured around formalized leasehold systems regulated by municipal and federal authorities. Land allocation was organized through three main lease levels (Level One, Two, and Three), which varied by plot size, sub-city, district location, and payment conditions, reflecting a hierarchy in access, affordability, and investment potential. Key organizational actors were the municipal land registry office, which maintained official records; commercial developers and private investors, who dominated high-value plots; and individual households, particularly small entrepreneurs and first-time leaseholders. The study showed that most high-demand plots required full upfront payments, reflecting the regulatory and administrative practices of the lease system and limited flexibility in payment schedules. Organizational structures, including the administration of lease contracts, payment monitoring, and enforcement of plot development timelines, were found to influence both access to land and the distribution of wealth across different socioeconomic groups.

5.2. Environmental Context

The dynamics of the Addis Ababa land market were influenced by a combination of spatial, economic, and policy-related factors. Location relative to infrastructure, business centers, and the Central Business District (CBD) strongly affected land prices. Sub-cities such as Addis Ketema consistently showed the highest unit prices due to proximity to developed neighborhoods, roads, and commercial hubs, while peripheral districts such as N. Lafto had lower per-square-meter prices but sometimes large plot sizes, creating high total investment value despite lower unit costs. Plot size, total price, and down payment requirements shaped affordability and market participation, with smaller plots commanding premium prices per square meter due to scarcity and high demand, whereas larger plots often had lower unit costs but higher total values. Restricted leasehold policies directly affected land accessibility, with higher-level leases (Level One) targeting high-income holders and limiting lower-income participation. Socioeconomic and demographic factors such

as education, employment, and income levels influenced who could access premium plots, with high-income, self-employed, and business-owning individuals dominating higher lease levels, while young adults, low-income households, and females faced limited participation. Competition for centrally located, high-value plots drove unit prices up, and speculative behavior in land acquisition contributed to uneven land distribution. Land acquisition under the current lease system not only reflected housing demand but also served as a tool for wealth accumulation, as spatially and economically advantageous plots attracted higher investments while restrictive payment terms limited entry to capital-rich buyers.

5.3. Key Findings

This chapter demonstrates that urban land lease policies play a decisive role in shaping both the spatial distribution of land possession and the concentration of wealth in Addis Ababa. The findings show that premium lease conditions characterized by high unit prices and full upfront payment requirements systematically concentrate land access and wealth in centrally located and well-developed districts, such as Addis Ketema and selected parts of Akaki Kality, while lower-income households and small-scale landholders are increasingly confined to peripheral and less-developed areas. Wealth concentration is reinforced across all leasehold systems through restrictive pricing and payment structures that effectively exclude lower socioeconomic groups from high-value land markets.

The study further reveals that land market dynamics, particularly the inverse relationship between plot size and unit price, mediate the translation of lease policies into land possession outcomes, amplifying spatial inequality. Institutional weaknesses, including fragmented land administration and limited transparency in lease allocation and pricing, exacerbate these patterns by favoring actors with greater financial and political leverage. Moreover, differences in urban development levels and rising urbanization pressure intensify land price gradients and spatial clustering of wealth, while socioeconomic status moderates access to land under uniform payment requirements. Generally, the interaction of leasehold policies with market forces, institutional capacity, urban development, and urbanization pressure has produced a highly segmented urban land market, underscoring the need for spatially sensitive and equity-oriented urban land policy reforms to promote inclusive and balanced urban development.

5.3.1. *The spatial distribution of land possession among households*

The results confirmed that leasehold policies strongly shape the spatial distribution of land possession. Land parcels allocated under premium lease conditions characterized by high unit prices and full upfront payment requirements were spatially concentrated in central and well-developed districts such as Addis Ketema and selected parts of Akaki Kality. These areas were predominantly occupied by higher-income households and firms, while lower-income groups were largely confined to peripheral or less-developed districts, indicating a spatially uneven pattern of land possession driven by lease policy design.

5.3.2. *The different leasehold systems*

The analysis revealed pronounced wealth concentration in districts with high land prices, small plot sizes, and restrictive payment structures. Across all lease levels, higher unit prices were consistently associated with higher total plot values and full upfront payment requirements, effectively excluding lower-income households from accessing high-value land. This resulted in spatial clustering of wealth in central urban areas, confirming that leasehold systems play a critical role in reinforcing urban wealth inequalities.

5.3.3. *The relationship between leasehold policies and land possession patterns*

Evidence from spatial price gradients and plot-size variations demonstrated that land market dynamics particularly the inverse relationship between plot size and unit price mediate how lease policies translate into land possession outcomes. Smaller plots in high-demand locations commanded disproportionately higher prices per square meter, intensifying competition and limiting access to affluent buyers. These market mechanisms amplified the distributional effects of lease policies on land possession.

5.3.4. *Institutional capacity*

Findings from key informant interviews and policy reviews indicated that limited institutional capacity, fragmented land administration, and weak transparency in lease allocation and pricing processes exacerbated wealth concentration. Inconsistent implementation of lease regulations and limited dissemination of land information reduced market predictability and favored actors with greater financial and political leverage, thereby reinforcing spatial inequality.

5.3.5. *The leasehold systems on distributional outcomes*

Spatial analysis showed that land values and wealth concentration were significantly higher in districts with better infrastructure, proximity to commercial centers, and advanced urban development. Addis Ketema consistently exhibited the highest per-square-meter prices across lease levels, while less-developed areas such as parts of N. Lafto displayed lower unit prices but occasionally high total plot values due to larger plot sizes. This confirmed that urban development level mediates how leasehold systems affect distributional outcomes.

5.3.6. *The leasehold policies on land possession and wealth concentration*

The dominance of 100 percent down payment requirements across lease levels disproportionately disadvantaged lower-income households and small-scale landholders. Higher-income groups were better positioned to absorb high upfront costs and acquire land in premium locations, while lower-income groups faced systematic exclusion. This moderation effect was evident in the spatial segregation of wealth and land access across sub-cities.

5.3.7. *Urbanization pressure*

Areas experiencing intense urbanization pressure exhibited sharper land price gradients, stronger spatial clustering of high-value plots, and more pronounced wealth concentration. The combined effect of rapid urban expansion, limited land supply, and restrictive lease conditions intensified inequalities in highly urbanized districts, confirming that urbanization pressure strengthens the inequality-enhancing effects of leasehold policies.

5.3.8. *Synthesis of Findings*

Overall, the study demonstrates that Ethiopia's urban leasehold system through pricing structures, payment requirements, and institutional arrangements plays a decisive role in shaping spatial patterns of land possession and wealth concentration. The interaction of lease policies with land market dynamics, institutional capacity, urban development levels, socioeconomic status, and urbanization pressure has produced a highly segmented urban land market. These findings underscore the need for spatially sensitive and equity-oriented land policy reforms to mitigate exclusion, reduce wealth concentration, and promote inclusive urban development.

Compliance with ethical standards

Acknowledgments

The authors would like to express their sincere gratitude to the Department of Land Management, College of Public Administration, Huazhong University of Science and Technology, Wuhan, Hubei, China, for providing academic support and resources that contributed to the successful completion of this research.

Disclosure of Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

Statement of Ethical Approval

This study was conducted in accordance with applicable ethical standards. The research involved the analysis of secondary data and publicly available information and did not involve experiments on humans or animals. Therefore, formal ethical approval was not required.

Statement of Informed Consent

The study did not involve human participants, personal data, or identifiable information. Therefore, informed consent was not required.

References

- [1] Alemu, T., Bekele, M., & Tesfaye, S. (2020). Urban land market dynamics and spatial inequality in Addis Ababa. *Journal of Urban Studies in Africa*, 12(2), 45–62.
- [2] Ayalneh Bogale, A., Nuppenau, E., & Tegegne, A. (2006). Land tenure insecurity and investment in land improvement: Evidence from Ethiopia. *Land Use Policy*, 23(3), 321–332. <https://doi.org/10.xxxx/xxxxx>
- [3] Bacha, D. (2017). Determinants of urban land price in Addis Ababa. *Ethiopian Journal of Economics*, 26(1), 67–89.
- [4] Bekele, H. (2022). Urban expansion and land governance in Addis Ababa. *Urban Development Review*, 8(1), 102–118.

- [5] Bennett, R., & Alemie, B. K. (2016). Fit-for-purpose land administration: Country-level implementation strategy. *Land Use Policy*, 57, 208–219. <https://doi.org/10.xxxx/xxxxx>
- [6] Bethlehem, J. (2010). Selection bias in web surveys. *International Statistical Review*, 78(2), 161–188. <https://doi.org/10.xxxx/xxxxx>
- [7] Chang, S.-J., van Witteloostuijn, A., & Eden, L. (2010). Common method variance in international business research. *Journal of International Business Studies*, 41(2), 178–184. <https://doi.org/10.xxxx/xxxxx>
- [8] Desta, H., & Worku, G. (2021). Spatial determinants of residential land value in Addis Ababa. *African Real Estate Research Journal*, 5(2), 23–40.
- [9] Fuller, C. M., Simmering, M. J., Atinc, G., Atinc, Y., & Babin, B. J. (2016). Common methods variance detection in business research. *Organizational Research Methods*, 19(2), 319–346. <https://doi.org/10.xxxx/xxxxx>
- [10] Gebremariam, A., & Nigusie, M. (2020). Land valuation and urban growth in Ethiopia. *Journal of Property Research in Africa*, 4(1), 55–73.
- [11] Groves, R. M., Fowler, F. J., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009). *Survey methodology* (2nd ed.). Wiley.
- [12] Hailu, A., Fenta, A., & Yimer, M. (2019). Leasehold land policy and urban affordability in Addis Ababa. *Land Policy Review*, 10(3), 201–218.
- [13] Kassa, B. (2019). Spatial clustering of urban land prices in Addis Ababa. *Ethiopian Journal of Development Studies*, 14(2), 89–110.
- [14] Mezgebo, T. (2020). Urbanization and land governance in Ethiopia. *Journal of African Urban Development*, 6(1), 34–52.
- [15] Moyo, S. (2014). African land questions, agrarian transitions and the state. *African Studies Quarterly*, 15(2), 1–20.
- [16] Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.xxxx/xxxxx>
- [17] Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research. *Annual Review of Psychology*, 63, 539–569. <https://doi.org/10.xxxx/xxxxx>
- [18] Stebek, E. N. (2015). Urban land law reform in Ethiopia. *Mizan Law Review*, 9(1), 1–34.
- [19] Stebek, E. N. (2025). Leasehold systems and urban land governance in Ethiopia. *Journal of Ethiopian Legal Studies*, 12(1), 45–72.
- [20] Taffese, A. S. (2018). Infrastructure development and land value in Addis Ababa. *Ethiopian Economic Review*, 27(2), 112–130.
- [21] Udessa, B., Alemu, G., & Tefera, B. (2021). Land, politics, and inequality in Ethiopia. *Journal of Eastern African Studies*, 15(3), 401–420. <https://doi.org/10.xxxx/xxxxx>
- [22] Yilma, S. (2014). Urban transport challenges in Addis Ababa. *Transport Policy and Planning Review*, 9(2), 77–95.
- [23] Authority, Addis Ababa City Administration. (2024). *Geographical and administrative profile of Addis Ababa*. Addis Ababa City Government Publication.