URBAN PLANNING

Integrating Urban Agriculture into Urban Land-Use Planning: Socioeconomic, Planning and Policy Barriers in Eldoret, Kenya

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Abstract

Urban agriculture remains an important livelihood activity in many rapidly growing African towns and cities, contributing to household food access and income generation. Despite its widespread practice and recognition in national policy frameworks, its integration into formal urban land-use planning remains limited. This study examined the socioeconomic, spatial planning, and regulatory barriers affecting the integration of urban agriculture into land-use planning in Eldoret, Kenya. The study employed a cross-sectional survey design supported by qualitative inquiry and documentary review. Using stratified random sampling, 402 households were selected from three residential areas representing different settlement densities: Langas (high density), Kapsoya (medium density), and Elgon View (low density). Data were collected in 2022–2023 through household questionnaires, three focus-group discussions, key-informant interviews, field observations, and reviews of relevant planning and policy documents. Quantitative data were analysed using descriptive statistics, while qualitative information was examined thematically. The findings revealed that complete lack of land for farming (mean = 1.25), inadequate capital (1.57), agricultural diseases (1.68), and lack of extension services (1.77) were the most strongly perceived constraints on a five-point agreement scale, where lower scores indicated stronger agreement. Other reported challenges included theft, harassment, inadequate water supply, and poor market infrastructure. Qualitative findings further revealed uncertainty over permissible farming locations, perceived inconsistencies in the enforcement of local regulations, and limited coordination between agricultural and urban planning institutions. The findings suggest that the barriers to integrating urban agriculture extend beyond household resource limitations to include weaknesses in spatial planning, institutional coordination, and regulatory implementation. Although Kenya's legal framework recognises the need to regulate urban agriculture, this recognition has not consistently translated into clearly designated production spaces, accessible agricultural support services, or predictable local regulatory procedures in the study area. The study concludes that effective integration requires a coordinated planning approach that addresses both the spatial requirements of urban farming and the institutional conditions under which it operates. It recommends participatory identification of suitable agricultural areas, clearer regulatory guidelines, improved interdepartmental coordination, and strengthened agricultural extension and market infrastructure. A spatially differentiated, participatory, and risk-sensitive planning approach is essential for accommodating urban agriculture while safeguarding public health, environmental quality, and competing urban land uses.

Keywords: urban agriculture; land-use planning; urban governance; policy coherence; household perceptions; Eldoret; Kenya

1 Introduction

Urban farming is a familiar feature of African towns, but its place in urban plans is often unclear. Families grow crops or keep livestock on home plots, vacant land and sometimes along road, river or

railway reserves. These activities can add to household food supplies and incomes. They can also compete with housing, infrastructure and other urban uses, particularly where production is poorly managed. The question for planners is not simply whether farming should be allowed. It is where, how and under what conditions it can be accommodated without putting public health, infrastructure or other land uses at risk.

The tension is especially visible where official development plans distinguish between formally recognised urban functions and activities treated as residual or temporary. Historically, agriculture was associated with rural and peri-urban zones, while urban plans gave priority to housing, transport, industry, commerce and public facilities. This separation often obscured the actual diversity of livelihood activities within towns. The resulting spatial mismatch allowed cultivation to persist on land reserved for other uses, where farmers frequently lacked clear tenure, service provision or predictable enforcement.

Eldoret provides a useful setting for examining this question. During the 2022–2023 survey, residential expansion and the subdivision of former agricultural land were reshaping the municipality. Crops and livestock were found in high-, medium- and low-density neighbourhoods, both within residential plots and on land outside them. Farming consequently took place close to roads, drains, homes and markets. This brought household needs for productive space into direct contact with planning and public-service responsibilities.

Existing research has shown why urban agriculture matters for livelihoods and food access. Less attention has been paid to how the practical difficulties facing farmers interact with local planning decisions and the enforcement of rules, especially in secondary cities. In Eldoret, the important issue is not only whether farming takes place, but whether the places used for farming are recognised, safe and supported. This study brings together household views, field observations, stakeholder accounts and policy documents to examine that gap. The article asks three questions: (i) what barriers to integration do households report in different residential settings; (ii) what do field observations and stakeholder accounts reveal about these barriers in planning practice; and (iii) how did the legal and policy framework influence the treatment of urban agriculture? By addressing these questions together, the study examines the difference between the continued presence of farming in town and its deliberate inclusion in urban planning.

The analysis is based on evidence collected in 2022–2023 and describes the institutional and land-use conditions prevailing during that study period. Subsequent changes in Eldoret's administrative status and governance are considered only when discussing the implications of the findings. Comparative research shows that expansion of cities does not simply eliminate urban agriculture: it may displace, intensify or relocate production. Across 92 empirical articles covering 83 Global South cities, Follmann et al. (2021) identified agricultural land conversion and peripheralisation alongside adaptive intensification. The present Eldoret study asks a complementary governance question: how do land-use practices, farmer-reported constraints and the institutional framework intersect at municipal scale? Urban agriculture is not automatically appropriate for every available plot. The planning question is which types of production, under what tenure, environmental and infrastructure conditions, can be accommodated without compromising other legitimate urban land uses (Alkhaja et al., 2025).

2 Literature review and analytical framing

2.1 Urban agriculture and the spatial planning problem

Urban agriculture scholarship challenges a rigid separation between rural agricultural production and urban land uses. Farming can occur on residential plots, rooftops, balconies, institutional grounds, vacant parcels and other accessible spaces, while crop and livestock systems differ in their demands for land, tenure security and infrastructure. Such diversity complicates prescriptions for a single urban agriculture zone: planning must distinguish low-impact uses compatible with housing from production systems requiring larger sites, servicing or more stringent health and environmental controls.

Land competition is especially acute in densely settled neighbourhoods. As more of a residential plot is built over, households may have little space left to farm and may turn to land outside their plots. Yet open land is not necessarily available for lawful or safe cultivation. Its ownership may be uncertain, it may be earmarked for infrastructure, or its soil and water may be unsuitable. These differences between an empty space and a usable farming site matter for planning.

Planning for agriculture is therefore not equivalent to allocating every open space to food production. Urban roads, transport corridors, drainage reserves, riparian lands and public open spaces have specific statutory functions. Their use for agriculture raises competing public interests. Appropriate integration must be selective and spatially informed, protecting infrastructure and sensitive ecosystems while identifying safe and productive sites and techniques. Multifunctional land use, where demonstrably compatible, is more promising than indiscriminate occupation of vacant land.

Empirical studies in Kenya demonstrate that agricultural responses to urban growth are geographically differentiated. Willkomm et al. (2021) mapped replacement and intensification in Nakuru, while Follmann, Willkomm, Nduru, et al. (2021) showed how locational advantages, crop choices and irrigation can support continuity of market-oriented production under changing land-use conditions. These studies caution against treating urban agricultural land as a static category: a workable Eldoret strategy needs to anticipate transition and competing uses rather than only identify present cultivation sites.

2.2 Socioeconomic and service constraints

The resources available to urban farmers vary considerably. Lack of capital can make it difficult to obtain inputs, build suitable animal shelters or store water. Insecure water supplies can push farmers towards sources whose quality is uncertain, while crop and livestock diseases threaten production. Theft and damage to crops are additional risks, particularly on isolated sites. These difficulties matter to planners because households are less likely to invest in farming where land and services are insecure.

Being near urban markets does not necessarily guarantee good returns. Poor access roads, limited storage, inadequate market facilities and reliance on intermediaries can reduce what farmers earn. A planning response that only grants permission to farm would therefore leave some important constraints untouched. It also needs to consider where produce is sold, how it reaches buyers and what facilities are available.

Access to agricultural extension services is particularly important where cultivation occurs close to housing, drains, roadways and potentially contaminated sites. Technical support can address safe irrigation, waste management, pest control, crop suitability, animal health and post-harvest handling.

Without this support, public health concerns may become grounds for blanket exclusion instead of targeted risk reduction.

Available evidence further indicates that access to land cannot be separated from access to water, technical information and markets. The Kenya-focused analyses of Follmann, Willkomm, Nduru, et al. (2021) emphasise adaptive production choices, while the systematic review by Follmann et al. (2021) treats water, labour and land conversion as interacting drivers. This provides a comparative explanation for why the obstacles reported by Eldoret households should be read as an interconnected set of constraints, not as isolated items.

2.3 Policy coherence, regulatory discretion and institutional responsibility

Kenya's policy framework combines enabling principles with local regulatory responsibilities. The National Land Policy (Republic of Kenya, 2009) calls for an appropriate framework for urban agriculture, and the Urban Areas and Cities Act, 2011, provides for regulated UA within integrated development planning (Republic of Kenya, 2011). During the 2022–2023 fieldwork period, the Physical and Land Use Planning Act, 2019, was the relevant national spatial-planning statute (Republic of Kenya, 2019). Yet statutory recognition alone does not establish where particular agricultural activities are permissible, what safeguards apply or which authority supplies technical support. These operational issues must be settled through spatial plans and transparent local implementation.

Formal recognition and practical treatment are analytically distinct. A law or policy may allow regulation of an activity while particular actors remain uncertain whether it is lawful at a given site. When permissions, fees and enforcement are not transparent or consistent, informal accommodations may coexist with periodic confiscation or destruction of property. This creates uncertainty for farmers and weakens trust in planning institutions. It also inhibits public authorities from providing infrastructure or extension support to an activity that they do not clearly classify.

Regulation nonetheless serves legitimate public purposes. Food safety, water quality, manure disposal, animal welfare, nuisance prevention and protection of road or riparian reserves cannot be treated as negligible. The relevant policy question is whether controls are proportionate, spatially differentiated, consistently implemented and accompanied by affordable compliance options. A productive policy framework should distinguish risks associated with particular sites and production systems from assumptions that all urban farming is incompatible with city life.

International comparative evidence suggests that effective implementation requires alignment between planning rules, civil-society participation and practical access arrangements. Reviewing 51 peer-reviewed studies, Alkhaja et al. (2025) identified restrictive zoning, tenure insecurity, densification and differences between municipal and community priorities as recurring barriers. This provides an independent analytical benchmark for testing whether statutory recognition in Eldoret has been translated into predictable sites, conditions of use and responsible authorities.

2.4 Critical urban theory and the right to the city

The right-to-the-city perspective helps explain why some uses of urban land are formally recognised while others remain marginal. This question becomes important when land values rise and space previously used for farming is redeveloped. In Eldoret, the perspective helps us consider whose needs are reflected in planning decisions and how farmers experience restrictions on access to land. The study uses this perspective to interpret the evidence; it does not claim to have measured planning justice directly.

Three ideas guide this interpretation. Access to suitable land and services can shape who benefits from urban opportunities. Unclear responsibilities and unevenly perceived enforcement may make it harder for farmers to use that space, even where farming is tolerated. Involving farmers in decisions about sites and conditions of use could make the rules easier to understand and apply. This does not diminish the need to protect health, infrastructure and the environment.

2.5 Literature synthesis and analytical proposition

Shannon et al. (2021), examining Beira, Mozambique, frame urban farming as an issue of competing claims to the city, rather than merely a land-use category awaiting administrative classification. Their analysis is useful for Eldoret because it draws attention to whose uses of land are recognised and whose may be displaced during redevelopment. It does not, however, establish that the same land-rights history or institutional mechanisms operated in Eldoret. In this paper, planning justice is an interpretive lens for reading documented survey responses and interview accounts, not a separately measured outcome.

The literature points to three related concerns: access to secure and suitable land; access to inputs, technical services and markets; and clear, predictable planning rules. These concerns provide a practical way to organise the survey, interview and observation findings. They are themes for discussion, not components calculated from a statistical model.

3 Materials and methods

3.1 Study area

The study was conducted in Eldoret, Uasin Gishu County, western Kenya. The town serves as a commercial and transport centre for a productive agricultural region. As urban development expanded, former farmland was subdivided and residential areas developed at different densities. Langas, Kapsoya and Elgon View were selected to represent high-, medium- and low-density neighbourhoods, respectively. These contrasting settings made it possible to examine farming both within residential plots and on land used outside them.

3.2 Research design, population and sample

The study used a cross-sectional household survey, supported by focus-group discussions, key-informant interviews, field observation and documentary review. The three selected estates formed the sampling strata: Langas (high density), Kapsoya (medium density) and Elgon View (low density). According to the 2009 Kenya Population and Housing Census figures used for sampling, the estates contained 11,156, 892 and 506 households, respectively, giving a combined population of 12,554 households. The minimum sample was calculated using $n = Z^2pq/d^2$, with $Z = 1.96$ for a 95% confidence level, $p = 0.50$, $q = 0.50$ and $d = 0.05$. This yielded 384.16, approximately 384 households. Proportional allocation initially gave 342 households in Langas, 27 in Kapsoya and 15 in Elgon View. The Kapsoya and Elgon View allocations were then raised to 30 households each because their original allocations were considered too small for useful estate-level descriptive comparisons. Thirty was used as a practical target for these smaller strata, not as a guarantee of statistical generalisability. The Langas allocation remained 342, giving a final planned sample of 402 households. The resulting design was stratified random sampling with disproportionate allocation. Enumeration maps were used to identify households in the selected areas, after which households were selected by simple random sampling within each stratum. Both farming and non-farming households were included

because their views could affect the acceptance and regulation of farming within residential neighbourhoods.

Key informants were purposively selected from agencies responsible for agriculture, land administration, physical planning, public health, environmental management and urban governance. Their accounts were used to contextualise household responses, not to estimate the prevalence of institutional practices.

3.3 Primary and secondary data

The household questionnaire covered farming practices, land and site conditions, perceptions of urban agriculture, production and marketing constraints, extension services and possible interventions. Respondents rated the challenge statements on a five-point scale: 1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree and 5 = strongly disagree. A lower mean therefore means greater agreement that the stated problem exists; it does not measure the objective severity of that problem. The two land-related statements addressed different circumstances: complete lack of land for farming meant having no land available for farming, while insufficient land area for farming meant having some land, but too little for the intended activity.

Three focus group discussions were undertaken across the residential-density strata, engaging farmers' group officials or, in Elgon View, estate association representatives where no dedicated farmers' group was available. Group sizes reportedly ranged from six to twelve participants. Key informant interviews examined the official treatment of UA, permitted locations, policy responsibilities, enforcement, production constraints and possible remedies. Field observation documented agricultural sites, livestock practices, roadsides, market structures, drains and possible exposure pathways. Secondary materials included relevant legislation, municipal by-laws, development plans, reports and research literature.

3.4 Data analysis

The analysis summarised responses to the 12 challenge statements shown in Table 1 using descriptive statistics and mean ratings for each estate. Lower ratings indicate stronger agreement with a statement. Differences between estate means are discussed descriptively; no inferential tests of those differences are reported. The qualitative accounts, field observations and policy materials were compared to identify where evidence supported or challenged the patterns seen in the survey. Socioeconomic, spatial-planning and legal-policy concerns are used as broad themes for interpreting the findings, not as statistically extracted factors. A new PCA of these 12 statements was not undertaken. Because the two smaller estates were intentionally oversampled relative to their share of households, the reported overall means should be read as descriptive sample summaries unless population weighting can be verified from the original analysis.

4 Results

4.1 Household perceptions of barriers to integration

Respondents identified several barriers to accommodating urban agriculture within land-use planning. The survey covered Langas, Kapsoya and Elgon View, which represent different residential densities. Table 1 gives the mean ratings for 12 challenge statements. On the five-point scale, lower means indicate stronger agreement.

Table 1. Household mean agreement ratings for 12 reported challenges to integrating urban agriculture, by residential estate, 2022–2023.

Challenge	Langas	Kapsoya	Elgon View	Overall
Complete lack of land for farming	1.25	1.32	1.18	1.25
Inadequate capital	1.58	1.61	1.43	1.57
Diseases	1.61	1.82	1.71	1.68
Lack of extension services	1.81	1.65	1.48	1.77
Theft	1.84	1.82	2.00	1.85
Harassment	1.67	1.87	3.21	1.90
Poor markets	2.21	1.82	1.96	2.16
Inadequate water	2.27	1.82	2.79	2.27
Insufficient land area for farming	2.27	3.82	2.39	2.40
It is a rural activity	2.65	2.68	2.46	2.64
It is an illegal activity	3.98	4.00	4.00	3.99
Food-safety risks	4.59	4.61	4.50	4.59

Lower values indicate stronger agreement on a five-point scale. Overall means are weighted by the number of respondents in each estate.

Respondents most strongly agreed with the statements on complete lack of land for farming (overall mean 1.25), inadequate capital (1.57), disease (1.68) and lack of extension services (1.77). Harassment drew stronger agreement in Langas (1.67) than in Elgon View (3.21). Respondents generally disagreed that urban agriculture was illegal (3.99) or that food-safety risks constituted a barrier (4.59). The two land statements should not be conflated: complete lack of land means no land is available for farming, whereas insufficient land area means land exists but is too small for the intended activity. In Kapsoya, these produced markedly different means (1.32 and 3.82).

4.2 Residential patterns and interpretation of the challenge ratings

Overall, households expressed greater agreement with problems involving space, capital and support services than with statements about illegality or food safety. The estate figures also show differences in reported experience, although these have not been tested for statistical significance. They should be read as patterns in responses, not as measurements of how seriously each problem affected production.

4.3 Socioeconomic barriers: investment, water, disease and security

Farmers described problems with capital, water, agricultural advice, disease, theft and harassment. These concerns are discussed together because they affect the ability to farm, but the study does not claim that they form one statistically established component.

Water access illustrates the connections between affordability, location and environmental risk. The survey's separate water-source summary identified river water as the major reported source (75.4%), followed by piped water (19.1%), shallow wells (3.0%) and rainfall (2.5%). Participants also described the expense of piped water as a constraint. These figures describe sources of water, not

laboratory-tested water quality; nevertheless, dependence on untreated or unverified sources warrants assessment where crops are grown near polluted waterways.

4.4 Planning and infrastructure constraints

Field observations documented limited space for farming within residential plots, especially in high-density Langas, and cultivation on vacant or otherwise contested land, including transport corridors. Such sites may involve insecure access, road-safety risks, possible contamination or competition with infrastructure needs. Integrating UA therefore requires more than general recognition: specific activities must be matched to locations where they are lawful, safe and compatible with neighbouring uses.

Limited access to extension services was reported across all three estates. A key informant from agricultural extension described uncertainty about responsibility for supporting UA within the urban area, although advice was sometimes provided upon request. This account suggests that recognising UA in policy without specifying service-delivery mandates may leave farmers without routine technical assistance.

Field observation identified nuisance and sanitation concerns associated with some livestock practices, including free-ranging animals, droppings, noise and interference with roads or drains. Pigs were observed occupying a roadside stormwater drain. Such observations illustrate site- and activity-specific management problems; they do not establish that all livestock keeping is incompatible with urban settlements.

Reported market barriers included informal roadside selling locations, inadequate storage and hygiene facilities, limited market information, transport constraints and reliance on intermediaries. Observation of a poorly equipped produce market reinforced the need to consider sales and distribution facilities alongside urban production sites. Proximity to consumers alone did not guarantee adequate market infrastructure or favourable trading conditions.

4.5 Legal and policy barriers: formal recognition versus actual practice

Documentary analysis indicated a gap between enabling national policy and practical local implementation. The National Land Policy (Republic of Kenya, 2009) and the Urban Areas and Cities Act (Republic of Kenya, 2011) supported a framework for regulated urban agriculture. Nevertheless, the field evidence indicated uncertainty about designated farming spaces and the application of stock-control, impounding and market rules. A licence for selling produce, for example, does not itself establish permission to cultivate on a road reserve. The specific legal effect of local by-laws depends on their operative text and the applicable statutory framework.

The qualitative evidence reveals how this gap was experienced. One focus-group participant described paying for permission to trade or operate at a roadside location while also being told that the farming activity was illegal:

> "I have no idea that farming was illegal because I pay for a license to operate along the road yearly. The county should not be accepting our money if the activity is illegal"

A second participant alleged unpredictable crop destruction near harvest:

> "The county officials wait until our maize is almost mature and destroy it saying it is not required by law. The way they do it leaves a lot of questions unanswered. Those related to the employees of the county are never harassed."

Another participant who kept cattle within the town similarly reported impoundment and unequal treatment, stating:

> "Those with something small give it to the askaris and their cattle are released. If you have no money with you, your animals are taken to the holding ground and the fine is too high. It is unfair to some of us who are simply trying to survive yet all of us are Kenyans"

These accounts reflect participants' perceptions, including allegations of selective enforcement and unofficial payments, rather than independently verified instances of administrative misconduct. Quotations are reproduced as recorded in the study materials.

Food safety emerged as an issue in institutional interviews and site observations even though households generally disagreed that it constituted a challenge (overall mean 4.59). A public-health informant raised concerns about emissions near roads, possible soil contamination and exposure to open sewage. Field observations placed vegetable cultivation beside the A104 road and open sewage infrastructure. Proximity to potential contamination sources provides grounds for site assessment, but no laboratory testing was undertaken to demonstrate contamination of the produce.

4.6 Integration of household, institutional and documentary findings

Across evidence sources, the major challenge is not one isolated barrier but the mismatch between where UA occurs, the resources farmers can access, and how public institutions regulate the activity. Household ratings highlight practical constraints; field observations reveal contested locations and infrastructure gaps; key informant evidence identifies service-delivery uncertainties; and legal documents show that enabling policy aspirations may coexist with restrictive local rules. The apparent disagreement between household perceptions of legality and the institutional account is substantively valuable: widespread social acceptance does not necessarily ensure clear permissions, predictable enforcement or access to services.

Table 2. Triangulation of household, institutional and observational evidence with proposed planning responses.

Empirical observation	Corroborating evidence	Planning implication
Land and capital constraints	Strong household agreement; off-plot cultivation	Provide compatible sites and affordable access arrangements
Extension and water gaps	Survey means; KIIs; water-source table	Coordinate safe water, training and risk management
Market and nuisance issues	Survey findings; observed livestock/ market conditions	Plan market facilities and activity-specific safeguards
Legal ambiguity and uneven enforcement	Policy/by-law review; FGD quotations	Clarify permissions, mandates, charges and appeal procedures
Food safety exposure concerns	Public-health KII; roadside photographs	Site assessment and testing, not unqualified safety claims

The planning responses are recommendations of this study and not current county policy.

The findings point to a practical difficulty for planners: farming continues in Eldoret even where the land on which it takes place is not clearly set aside for that purpose. Access to space, agricultural services and fair, understandable rules are closely connected in the accounts collected. The three themes used here—socioeconomic, spatial-planning and legal-policy concerns—help organise those accounts. They should not be mistaken for a statistical three-factor solution.

5 Discussion

5.1 Urban agriculture integration as an interconnected planning-governance problem

The findings show that barriers to integrating UA in Eldoret involve more than scarce land or restrictive by-laws considered separately. Household responses highlighted land, finance, production support and market constraints, whereas qualitative and documentary evidence identified uncertainty about permissible sites, service responsibilities and enforcement. The study's contribution is to connect these issues within a place-sensitive account of how an existing urban livelihood activity may remain insufficiently recognised in operational planning.

The three analytical themes—socioeconomic vulnerability, spatial suitability and legal-policy coordination—are supported by the convergence of descriptive and qualitative evidence, not by statistical factor extraction. Their value lies in showing how a constraint can cross administrative boundaries: uncertainty over land access affects investment incentives, and the absence of extension support can increase the difficulty of complying with health and environmental requirements.

The interaction among barriers is the central insight. Inadequate access to suitable land may encourage production on residual, temporary or contested spaces; such locations can generate conflicts over public use, drainage or sanitation. Uncertain permission and enforcement may then reduce incentives to invest in water systems, animal housing and other improvements, while weak technical support leaves preventable production and food-safety risks insufficiently addressed. This is a proposed explanatory pathway consistent with the triangulated evidence, rather than a causal effect measured by the survey. Its practical implication is that isolated interventions—for example, providing a plot without legal clarity or safe water—are unlikely to resolve the full integration challenge.

This interpretation is consistent with Alkhaja et al. (2025), whose review identifies the coexistence of formal policy support, insecure tenure, restrictive land-use rules and limited municipal-community collaboration. In Eldoret, the empirical contribution is the locally grounded account of these intersecting concerns, rather than a claim to have established their direction of causation.

5.2 Land availability, spatial suitability and planning justice

Strong agreement with "lack of land" (1.25) must be interpreted in terms of access to space that is both suitable and authorised. Vacant urban land may be unavailable for agriculture because of tenure, infrastructure protection, contamination risks or prospective conversion. The observed use of contested open spaces suggests that a lack of planned alternatives may contribute to informal cultivation, although the study does not establish this pathway causally.

This interpretation is consistent with research showing that agricultural activity in growing African cities can persist, fragment, intensify or relocate rather than disappear uniformly. Willkomm et al. (2021) document the coexistence of replacement and intensification in Nakuru, Kenya. Ahogle et al. (2025), studying Nairobi's southeastern fringe, identify distinct spatial and socioeconomic farm types and argue that land access, tenure, irrigation and production type should inform tailored planning responses. These comparisons do not establish identical processes in Eldoret, but demonstrate why agricultural land use should not be treated as a homogeneous category.

The planning implication is differentiation. Household gardens, institutional plots, community gardens, commercial horticulture and livestock rearing have different land requirements and externalities. Where agriculture can be safely accommodated, planning instruments could designate

suitable areas and establish conditional permissions; where it conflicts with road safety, drainage, sensitive ecosystems or unsafe exposure pathways, restrictions should be explicit and proportionate. Such a framework should be developed through consultation, because spatial decisions distribute both opportunities and burdens. Shannon et al. (2021) frame the urban land question as one of whose claims are recognised during city development. Applied cautiously to Eldoret, this perspective suggests that participation is important not only for gaining compliance but also for making decisions about competing land uses more equitable and transparent.

The comparison with Kenyan evidence reinforces the need for spatial differentiation, rather than assuming a single pattern of agricultural decline. The present data provide a cross-sectional view of residential contexts, so they cannot establish long-term land-use transitions without time-series spatial evidence.

5.3 Socioeconomic vulnerability and the need for service-oriented integration

Land alone is not enough to sustain farming. Strong agreement with statements about capital, disease, extension services, theft, harassment, markets and water suggests that farmers also need reliable services and conditions that make investment worthwhile. The figures reflect respondents' views, not measured losses in production or income. They nevertheless show why permission to farm needs to be considered alongside extension advice, water access and facilities for bringing produce to market.

The extension finding is especially significant because it connects agricultural service delivery with spatial governance. Where planners regard agriculture as an uncertain urban use, responsibility for farmer support may remain fragmented. Yet preventing harmful pesticide use, reducing disease, improving livestock handling and adopting safe irrigation practices require regular advice. An integrated response should therefore bring agricultural and veterinary extension into city planning and compliance systems instead of treating extension as a separate rural-sector activity. Water, storage, market access and production security similarly should be understood as infrastructure requirements of particular designated agricultural uses.

Conditions also differ across the three estates. Respondents in Langas agreed more strongly with the harassment statement than respondents in Elgon View, while answers about water varied. Without statistical tests, these are descriptive differences only. Even so, they give planners a reason to examine conditions in each neighbourhood rather than assume that one solution will suit the whole town.

Kenyan comparative work underscores that productive adaptation is often constrained by more than plot access. The livelihoods and food-access effects reported for Kisumu and Thika by Omondi et al. (2017) establish the importance of urban farming, but the present paper focuses on a distinct issue: how municipal planning practices and public services condition whether farming can operate predictably. Its contribution should therefore be read as planning and governance analysis, not another estimate of households' food-security gains.

5.4 Policy recognition, local implementation and regulatory predictability

Farmers and officials did not always describe the rules in the same way. Although the household survey showed general disagreement with the statement that urban agriculture was illegal (overall mean 3.99), interview and focus-group accounts raised concerns about where cultivation was permitted, what licences covered and how rules were enforced. These statements document parti-

cipants' experiences and perceptions. They do not, by themselves, establish that officials acted unlawfully or selectively.

National legislation provided a basis for regulated urban agriculture during 2022–2023. Section 36(1)(f) of the Urban Areas and Cities Act, 2011, requires integrated development planning to provide a framework for regulated UA (Republic of Kenya, 2011). The Physical and Land Use Planning Act, 2019, was in force during the study period and had repealed the Physical Planning Act, 1996 (Republic of Kenya, 2019). The core issue identified here is thus not the complete absence of statutory recognition, but the challenge of turning enabling provisions into site-specific local decisions and coordinated services.

The problem, then, is how national recognition becomes workable local practice. A statutory provision does not by itself identify farming sites, define appropriate activities, explain licensing requirements or determine which agency will provide support. Physical planning, agriculture, public health, veterinary, environment, water and market departments need procedures that farmers and officials can follow. A county or city policy could help, but only if it is consistent with the law and accompanied by practical arrangements for implementation.

Importantly, the national framework does not confer an unrestricted right to farm on public roads, drainage reserves or environmentally unsuitable sites. It enables cities to define appropriate locations, activities and controls. Clear and participatory standards would help reconcile the legitimate interests of farmers, infrastructure managers and public-health authorities; any finding that a particular local by-law conflicts with national legislation would require examination of that by-law's authentic text.

5.5 Reconciling farmer perceptions and public-health responsibilities

The household and public-health accounts differ in an important way. Respondents generally disagreed that food-safety risks were a barrier (overall mean 4.59), while public-health informants were concerned about cultivation near roads and possibly polluted sites. These are not necessarily contradictory findings: one reflects household perceptions, and the other identifies potential exposure pathways. The study did not test crops, soils or irrigation water for contaminants. It would therefore be inappropriate to conclude from these accounts that produce grown in Eldoret was unsafe.

A defensible planning response is risk-based rather than universally permissive or universally prohibitive. Site suitability assessment, source-specific irrigation-water checks, buffer distances from roads or drains where warranted, appropriate livestock-waste management, pesticide advice and crop-specific safeguards would allow risk to be addressed without treating every form of UA as equivalent. Ahogle et al. (2025) similarly emphasise the joint relevance of irrigation sources, pollution, tenure and farm type in peri-urban Nairobi. Clear risk communication would also help resolve the difference between farmers' understanding of their practices and regulators' concern for wider public-health impacts.

5.6 Eldoret's city transition and implications beyond the study period

The fieldwork was undertaken in 2022–2023, when Eldoret had not yet been conferred city status; conferment occurred on 15 August 2024 (City of Eldoret, 2024). The study thus captures a transition-stage municipality rather than evidence of conditions under the later city administration. This temporal distinction matters: initiatives or official priorities introduced after the study should be

discussed as possible policy opportunities, not treated as explanations of respondents' earlier experiences.

Eldoret's transition to city status offers an opportunity to reconsider the place of agriculture in land-use plans and urban services. Similar questions arise in other growing secondary cities where residents continue to farm but formal planning arrangements remain uncertain. The findings support neither permission to farm everywhere nor a blanket ban. They point instead to rules that reflect local land conditions, the type of farming involved and the need to protect infrastructure and public health.

5.7 Study limitations

Several limitations should be kept in mind. The cross-sectional survey cannot show how barriers changed over time or establish causal relationships. The reported means indicate agreement with questionnaire statements, not the measured scale of economic or environmental harm. Estate differences were not tested inferentially. The two smaller estates received more than proportional sample allocations; consequently, unweighted overall sample means may not represent population-wide averages. The study also did not test water, soil or produce for contamination or independently establish allegations about enforcement. These limits call for care in interpreting the findings, but they do not negate the concerns raised by participants and observations.

6 Conclusions and planning recommendations

Urban agriculture in Eldoret faces more than one barrier. Households identified problems of land access, capital, disease and agricultural advice, while interviews, observations and document review raised questions about suitable locations and the consistency of local rules. The findings suggest that national recognition of urban agriculture has not always been matched by clear local arrangements for land use and services.

The response should be neither to prohibit farming everywhere nor to allow it without conditions. Urban plans need to show where different forms of agriculture are suitable, how they will be regulated and what support farmers can expect. Kenya's Urban Areas and Cities Act provides a basis for regulated urban agriculture; the challenge lies in making that provision workable in everyday planning and administration.

6.1 Priority actions for city and county government

Effective integration of urban agriculture into land-use planning in Eldoret requires coordinated action by the city and county governments. A key priority is to identify and map existing and potential agricultural production areas and assess their suitability through participatory planning processes. This would enable the designation of appropriate zones or conditional-use areas for household gardening, institutional and community farming, horticulture, and livestock keeping, while ensuring that each activity is subject to relevant environmental, public health, and land-use safeguards.

There is also a need to strengthen regulatory coherence by reviewing existing city and county by-laws, licensing requirements, and development-control practices in relation to the Urban Areas and Cities Act, 2011, and the Physical and Land Use Planning Act, 2019. This review should inform the development of clear and accessible regulations specifying permissible agricultural activities,

licensing procedures, restrictions, and avenues for appeal. Such measures would help reduce regulatory uncertainty and promote greater consistency in enforcement.

Given the involvement of several government departments in urban agriculture, improved institutional coordination is equally important. The city and county governments should establish a mechanism that brings together physical planning, agriculture, veterinary services, public health, environment, water, markets, and urban administration. This would facilitate joint planning, clarify institutional responsibilities, and support coordinated implementation and monitoring of urban agriculture initiatives.

The integration of urban agriculture should also be accompanied by adequate technical services and infrastructure. Agricultural extension services, safe irrigation practices, animal health support, soil and water quality assessments, and appropriate waste management should be incorporated into planning for designated agricultural areas. Where feasible, provision should also be made for suitable market and produce collection facilities to improve the viability of urban farming while minimising potential environmental and public health risks.

Finally, meaningful public participation should remain central to the planning and regulation of urban agriculture. Farmers from different residential areas should be involved in identifying suitable production sites, developing regulations, and determining practical compliance requirements. Accessible communication channels, complaint-handling procedures, and opportunities for reviewing administrative decisions would further promote transparency, strengthen public trust, and encourage fair and consistent enforcement of urban agriculture regulations.

References

[1] Ahogle, A. M. A., Korir, N. K., Schaab, G., & Letema, S. (2025). Typology of peri-urban farming in the southeastern fringe of Nairobi city: A spatial and socioeconomic approach. Urban Agriculture & Regional Food Systems, 10(1), e70024. https://doi.org/10.1002/uar2.70024

[2] Alkhaja, N., Alawadi, K., Almemari, K., & Alshehhi, G. (2025). How is urban agriculture practiced, institutionalized, implemented, and sustained? A literature review. Progress in Planning, 192, 100917. https://doi.org/10.1016/j.progress.2024.100917

[3] City of Eldoret. (2024, August 15). *Conferment of Eldoret to city status*. https://eldoretcity.uasingishu.go.ke/event/conferment-of-eldoret-to-city-status/

[4] Follmann, A., Willkomm, M., & Dannenberg, P. (2021). As the city grows, what do farmers do? A systematic review of urban and peri-urban agriculture under rapid urban growth across the Global South. Landscape and Urban Planning, 215, 104186. https://doi.org/10.1016/j.landurbplan.2021.104186

[5] Follmann, A., Willkomm, M., Nduru, G., Owuor, G., & Dannenberg, P. (2021). Continuity under change: Towards a spatiotemporal understanding of market-oriented urban and peri-urban agriculture—Insights from Kenya. Applied Geography, 135, 102528. https://doi.org/10.1016/j.apgeog.2021.102528

[6] Omondi, S., Oluoch-Kosura, W., & Jirström, M. (2017). The role of urban-based agriculture on food security: Kenyan case studies. Geographical Research, 55(2), 231–241. https://doi.org/10.1111/1745-5871.12234

[7] Republic of Kenya. (2009). Sessional paper No. 3 of 2009 on national land policy. Ministry of Lands. https://lands.go.ke/wp-content/uploads/2023/11/Sessional-paper-on-Kenya-National-Land-Policy.pdf

[8] Republic of Kenya. (2011). Urban Areas and Cities Act, No. 13 of 2011 (version applicable 31 December 2022). https://leap.unep.org/en/akn/ke/act/2011/13/eng%402022-12-31

[9] Republic of Kenya. (2019). Physical and Land Use Planning Act, No. 13 of 2019. https://new.kenyalaw.org/akn/ke/act/2019/13/eng%402022-12-31/source

[10] Shannon, M., Otsuki, K., Zoomers, A., & Kaag, M. (2021). On whose land is the city to be built? Farmers, donors and the urban land question in Beira city, Mozambique. Urban Studies, 58(4), 733–749. https://doi.org/10.1177/0042098020929237

[11] Willkomm, M., Follmann, A., & Dannenberg, P. (2021). Between replacement and intensification: Spatiotemporal dynamics of different land use types of urban and peri-urban agriculture under rapid urban growth in Nakuru, Kenya. The Professional Geographer, 73(2), 186–199. https://doi.org/10.1080/00330124.2020.1835500