

Residential Design as a House–Society Interface: Translating Lived Requirements into Context- Responsive Design Principles (Mlalakuwa, Dar es Salaam)

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Abstract

Residential architecture in rapidly urbanizing African cities often reflects standardized planning logics that assume fixed household structures and stable room functions. Yet, lived housing practices frequently reveal a different reality: dwellings evolve as sociocultural and socioeconomic requirements change over time. This article examines how user requirements are reflected through the transformation of residential plots and house layouts in Mlalakuwa, a high-demand settlement in Dar es Salaam. Drawing on field observation and mapped change narratives from 15 residential cases, the study treats post-occupancy modification as empirical evidence of “fit” (or mismatch) between initial design intentions and everyday living requirements. Findings show that transformation is widespread and patterned: most cases exhibit medium-to-very-high change intensity, largely driven by supplementary income generation through renting, changing household composition, religious practice needs, security concerns, and the need to sustain outdoor domestic life under densification. The paper then revises a socio-spatial conceptual framework that positions the house as a sociocultural construct and uses comparative typological/configurational reading to translate locally grounded dwelling logics into context-responsive design principles. The article concludes with a set of design propositions for residential layouts that can better accommodate incremental development, indoor–outdoor continuity, livelihood adaptation, and culturally shaped privacy and hospitality practices.

Keywords: User requirements, incremental housing, post-occupancy transformation, socio-cultural dwelling, rental adaptation

INTRODUCTION

The design of residential architecture is never purely technical. It is a socio-spatial project that materializes household values, routines, privacy expectations, livelihood strategies, and culturally shaped practices of hospitality and everyday life. Contemporary housing research increasingly

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recognizes that the house functions as a “house–society interface” where sociocultural dynamics and spatial configuration co-produce patterns of use and satisfaction [1]. The implication is direct: when design models embed assumptions that do not correspond with local living patterns, users will adapt the dwelling – sometimes subtly (room reassignment), sometimes structurally (extensions, subdivision, reorganization) [2, 3].

In Dar es Salaam, this issue becomes more visible under rapid urbanization, plot densification, and rising demand for accessible residential

locations [4]. The city’s contemporary spatial conditions and uneven infrastructure are also inseparable from longer historical trajectories, including colonial planning legacies that shaped African cities’ spatial form and governance logics [5]. Under these pressures, a residential plot is rarely a stable “finished product.” Instead, it becomes an adaptive asset that households modify to meet evolving requirements – especially income-generation through renting, changes in family size, shifts in social obligations, and changing economic conditions.

This article advances two related arguments. First, residential transformation should not be treated as design failure, but as patterned evidence of user requirements and socio-spatial logics that formal templates often overlook [2]. Second, these revealed logics can be translated into design knowledge – through a conceptual framework that links (i) the house as sociocultural construct, (ii) locally grounded dwelling principles, and (iii) adaptability as a core design capacity [3].

LITERATURE REVIEW: THE HOUSE AS A SOCIO-CULTURAL CONSTRUCT AND AN ADAPTIVE LIVELIHOOD PLATFORM

The House as Socio-Cultural Construct

A major shift in housing scholarship is the move from seeing housing as standardized “room programs” toward viewing it as a sociocultural system. Systematic synthesis work shows that sociocultural variables – values, norms, privacy expectations, household structure, and daily routines – interact with spatial arrangements to shape how housing is used and how satisfied residents are [1]. This perspective is especially important in contexts where domestic life frequently spans indoor and outdoor zones, where multi-generational co-residence is common, and where “public–private negotiation” occurs through thresholds, transitional spaces, and time-based sharing of spaces [2].

A complementary line of research emphasizes the analytical value of spatial configuration: domestic layouts encode social logics (access control, visibility, sequencing, co-presence) that can be studied systematically rather than assumed as universal [6]. In practice, this means room labels are less informative than spatial relations – how spaces connect, how privacy gradients are managed, and how transitional zones support culturally patterned living.

Outdoor/Transitional Space, Climate Mediation, and Domestic Continuity

In many warm-climate contexts, residential life relies on semi-open and outdoor spaces for ventilation, social interaction, domestic work, and household spillover functions. Some empirical work has demonstrated that courtyard/outdoor space supports multiple roles – social, cultural, environmental, and functional – while urban pressure tends to transform these roles through densification and changing routines rather than eliminating them entirely [7]. This reading is reinforced by research on East African coastal urbanism that interprets transitory courtyards and transitional spaces as durable socio-environmental mediators in indigenous settlement patterns [8]. Together, these perspectives support an interpretive shift: locally grounded residential knowledge is best understood as socio-spatial principles (thresholding, transitional mediation, indoor–outdoor continuity), not simply stylistic identity.

Incrementality, Adaptation, and the Normality of Change

Housing in African cities is often produced and improved through incremental building – a time-based logic shaped by affordability constraints and evolving household needs. Work on self-building in Dar es Salaam conceptualizes dwelling form as emerging through phased investment and social negotiation rather than one-off completion, emphasizing that change is an expected condition of housing rather than an exception [9]. This aligns with adaptability scholarship that treats long-term housing quality as the ability to accommodate changing households, evolving work patterns, and shifting domestic routines [3, 10].

Post-Occupancy Modification as Patterned Response (Not Random “Informality”)

International evidence shows that residents modify layouts in patterned ways when housing does not meet privacy, hospitality, safety, or evolving household requirements. For example, sociocultural

drivers (gendered practices, hospitality, privacy, and safety) have been shown to motivate systematic layout transformations in public housing contexts [1]. Such findings support a core methodological stance used here: user modifications can be read as diagnostics of mismatch between generalized design assumptions and lived requirements [2].

Typology/Configuration as a Translation Bridge

A persistent challenge is how to translate locally grounded dwelling logics into design knowledge without reducing culture to “style.” Typological and configurational methods enable systematic comparison by coding recurring spatial relationships – thresholds, depth, connectivity, and transitional zones – and interpreting how these correspond to everyday practices [11, 12]. Used carefully, this approach allows locally observed socio-spatial intelligence to inform contemporary housing design in a way that remains analytically rigorous and transferable [13].

CONCEPTUAL FRAMEWORK

Conceptual Point of Departure

This article conceptualizes residential architecture as a house–society interface: a socio-spatial system through which households organize privacy, hospitality, domestic work, gendered use, livelihood strategies, and everyday routines. In this view, the “house” is a sociocultural construct whose performance is assessed through use and transformation over time [1, 2, 6].

Core Constructs and Relationships

Construct A: Locally Grounded Dwelling Requirements (Lived Socio-Spatial Knowledge)

Locally grounded dwelling requirements refer to culturally shaped and context-specific needs that users enact through space – often across indoor and outdoor zones. In socio-culturally responsive residential design studies, these include (i) indoor–outdoor continuity for daily domestic tasks and social life, (ii) flexible multi-use spaces, and (iii) the normalization of incremental change [2, 9]. A particularly visible component which is mostly revealed in the field study is the functional centrality of outdoor space for washing, drying, gatherings, cultivation, and relaxation, alongside the need for privacy and security boundaries. This resonates with evidence that courtyard/outdoor space supports intertwined sociocultural and environmental roles [7, 8].

Construct B: Generalized Contemporary Residential Design Assumptions

Generalized contemporary residential assumptions include fixed room-function zoning, stable household models, and designs that treat housing as a completed product rather than an evolving asset. Comparative work on African housing layouts demonstrates cultural imprints in configuration and cautions against a one-size-fits-all spatial script [14]. When generalized assumptions are applied without translation, they may constrain the very adaptations that residents predictably need over time [3, 10].

Mechanism: Post-Occupancy Transformation as Empirical Diagnostic (Evidence of Mismatch and Adaptation)

The key mechanism linking A and B is user-led transformation. Rather than treating modification as noise, the framework treats it as data: a patterned response to unmet requirements, densification pressures, and livelihood strategies. Some empirical evidence explicitly frames housing requirements as non-static – expanding and transforming as family size, social obligations, and economic conditions change – a point already demonstrated by the research on “popular traditions” and post-occupancy adaptation [2]. This stance is consistent with broader evidence that sociocultural factors systematically motivate layout change [15].

Moderating Construct: Adaptability Capacity (Spatial + Plot-Level)

Adaptability is treated as a moderating capacity that determines whether housing can absorb change without producing negative outcomes (overcrowding, loss of ventilation/daylight, circulation conflicts). Adaptability includes:

- *Spatial Adaptability*: Ability to reassign functions, subdivide or combine spaces without collapsing circulation and privacy gradients.
- *Plot Adaptability*: Ability to add rental units or service spaces while preserving minimum outdoor utility (washing, light/air access, gathering).

Adaptability research stresses that long-term housing performance depends on enabling multiple uses and change without restricting residents to a single functional script [3, 10]. Empirical evidence on socio-culturally oriented dwelling transformation demonstrates what happens when plot-level adaptation overwhelms environmental and social performance –, e.g., rental expansion that consumes outdoor space and produces dark, unventilated corridors.

Conceptual Output: Translation Principles for Context-Responsive Design

The framework, therefore, produces translation principles – design propositions that reconcile locally grounded requirements (A) with contemporary design practice (B) through diagnostic reading of transformation patterns and explicit design-for-change strategies. The use of vernacular knowledge as a resource for contemporary design is consistent with arguments that vernacular architecture can function as an analytical model for present-day problem-solving, rather than as a stylistic reference [13].

METHODOLOGY

The study uses a qualitative-dominant case study approach supported by systematic plot and layout documentation. A dense informal Mlalakuwa settlement is selected from the city of Dar es Salaam as the case study area (Figure 1). Mlalakuwa, situated within Makongo Ward in Kinondoni District, lies approximately 11.4 km from the City Center and is bounded by key roads and institutional edges (including proximity to major universities), conditions that intensify demand for residential space and related commercial activity clusters. Evidence is drawn from 15 residential cases (Figure 2) investigated through field observation and recorded as plot descriptions, functional inventories (indoor/outdoor), and transformation narratives over time. The documentation includes plot area, built area/coverage, observed uses, and mapped changes in layout evolution. Mapped change sequences are explicitly presented by tracking the transformation from an initial arrangement to an intensified rental build-out.

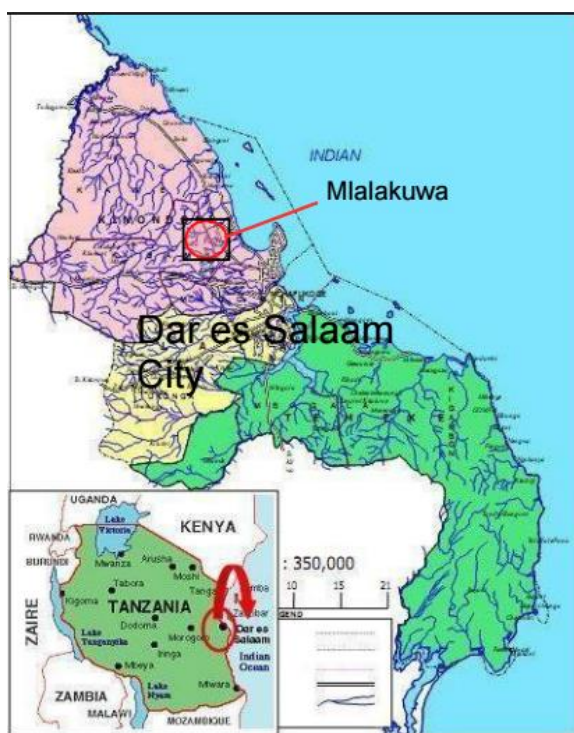


Figure 1. Location of Mlalakuwa case study area.

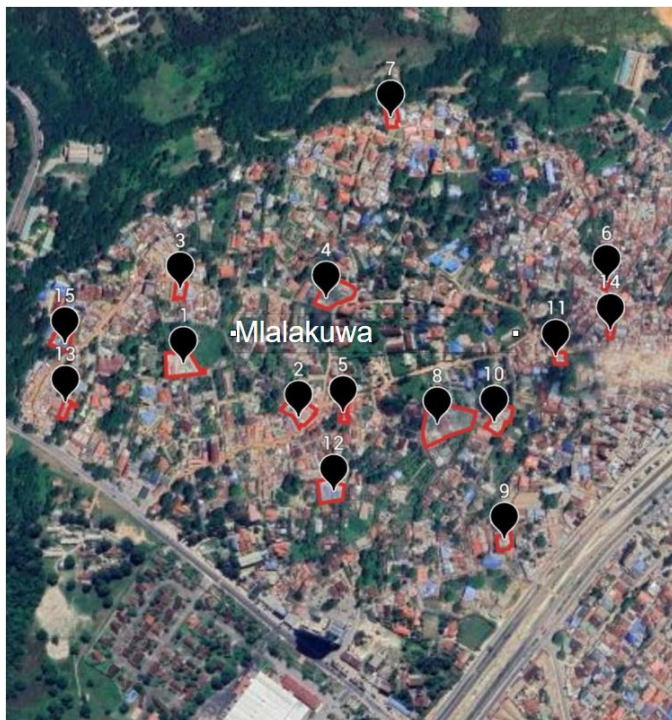


Figure 2. Location of 15 studied houses.

FINDINGS: USER REQUIREMENTS EXPRESSED THROUGH SPATIAL AND PLOT TRANSFORMATIONS

Transformation Intensity: Change is the Dominant Condition

Across the 15 documented plots (Figure 2), transformation is widespread. The field study synthesis indicates that about 30% of cases show very high transformation, 47% show medium transformation, and 23% show low transformation. This distribution alone challenges any assumption that residential layouts remain stable after occupation. Instead, the dominant pattern is incremental, requirement-driven change [2, 9].

Livelihood Requirement: Renting as a Primary Driver of Spatial Restructuring

A central empirical finding is that rental income is not a marginal add-on but a core organizing logic of many plots. In Case 1 (Figures 3–5), the owner organizes the plot by placing rental rooms at the plot edges, forming boundaries and leaving a central courtyard for circulation and landscaping; the plot contains 24 rented rooms, while the owner’s residence is comparatively compact. This is a clear example of how income generation shapes spatial order: boundary densification and internal courtyard utility.

Security Requirement: Fortification and Boundary-Making as Spatial Response

Security concerns emerge as a concrete driver of spatial reconfiguration. In Case 2 (Figures 6–9), the field observation notes that the living room is transformed into rented office space, and the plot experiences fortification and security-related changes, including “tall fences and an increased number of doors”. This indicates that users do not only add rooms; they transform circulation, access control, and boundary conditions – core configurational features of the dwelling [6, 12].

Stability Plus Selective Adaptation: When Indoor Layouts Remain, Outdoor Functions Shift

Not all cases show extensive internal change. Case 4 (Figures 10–13) demonstrates a different pattern where the indoor use pattern remains largely unchanged for about 30 years, with changes concentrated in outdoor additions and functional intensification – outdoor seating/eating space, rental, and commercial-like add-ons. This is important because it suggests transformation is not uniform: some

households preserve internal socio-spatial order while adapting the plot edge and outdoor program to meet new demands [3].

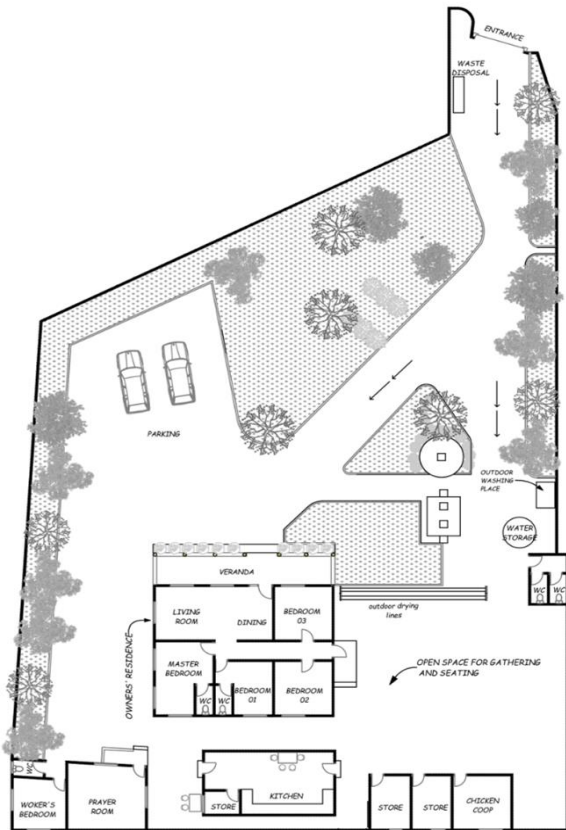


Figure 3. The Case 1 house in 1990.



Figure 4. The Case 1 house in 2025 where its incremental transformation started around 2000.



Figure 8. The Case 2 courtyard between the rental house and the owner’s house.



Figure 9. Part of Case 2 owner’s house transformed into a rented office space.

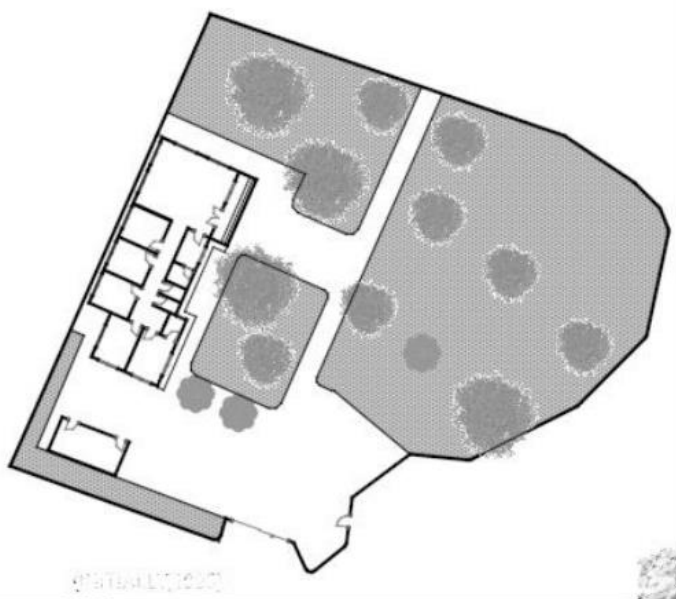


Figure 10. The Case 4 with owner’s house only in 1995.

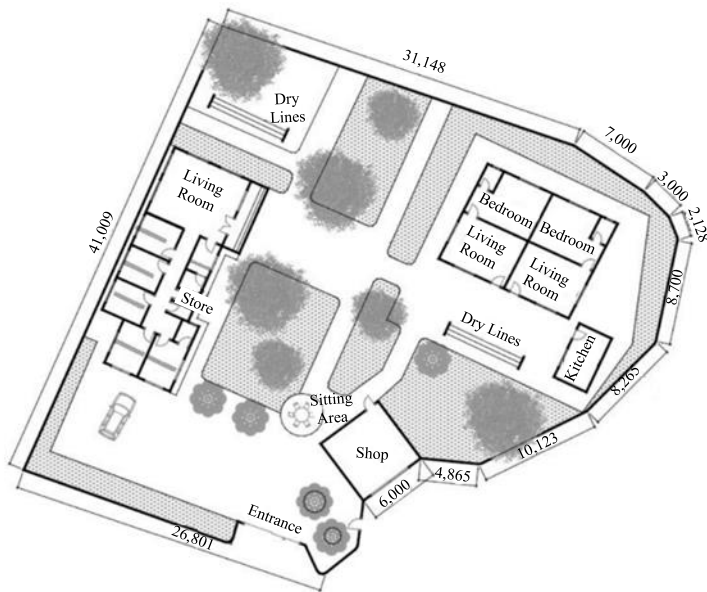


Figure 11. The Case 4 compound in 2025 where its incremental transformation started in 2005.



Figure 12. The Case 4 treatment of outdoor landscaping for outdoor activities.



Figure 13. The Case 4 introduced commercial spaces facing the street.

Similar logics appear across other cases. Case 8 (Figures 14–17) shows rental rooms located at plot edges while maintaining a central courtyard for circulation and landscaping. In Case 6 (Figures 18–20), the owner repurposes internal rooms for rent as household composition changes and then extends rental construction to cover the entire outdoor space, leaving only movement corridors for tenants. This illustrates a critical performance trade-off: rental maximization can reduce outdoor life-support functions and degrade environmental quality [3, 10].

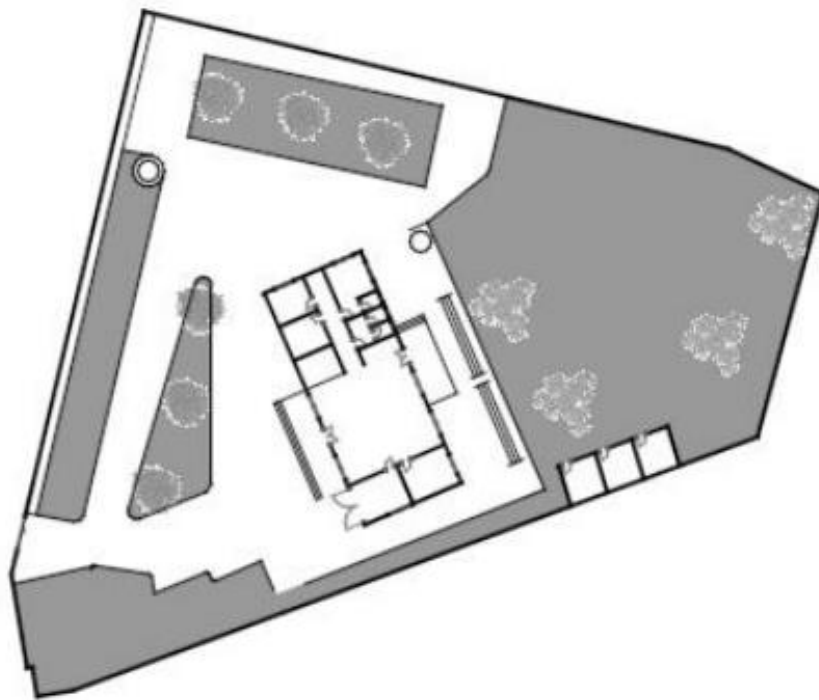


Figure 14. The Case 8 house in 1988.

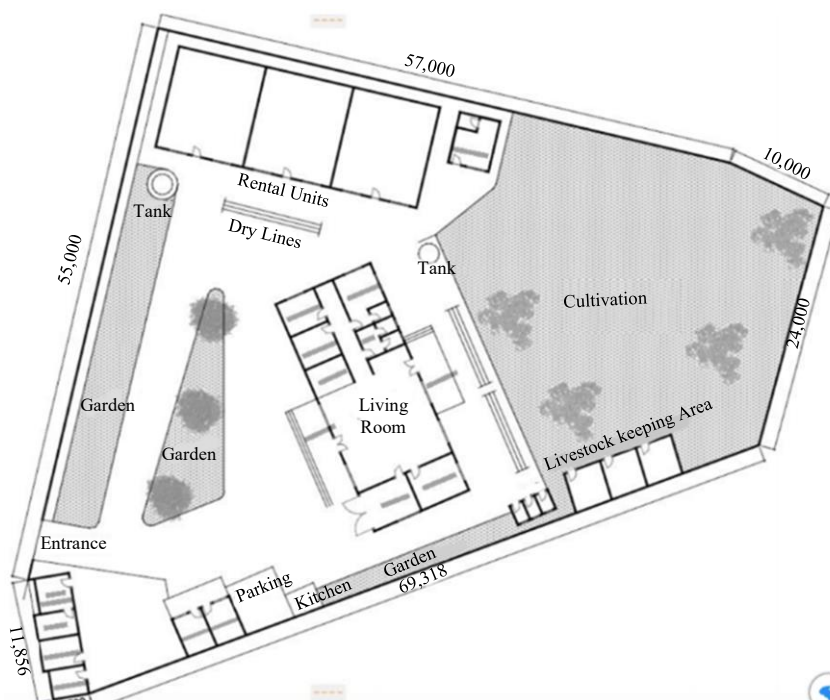


Figure 15. The Case 8 house in 2025 where its incremental transformation started around 2010.



Figure 16. The Case 8 rental house across the boundary edges.



Figure 17. The Case 8 owner's house at the middle of the plot.

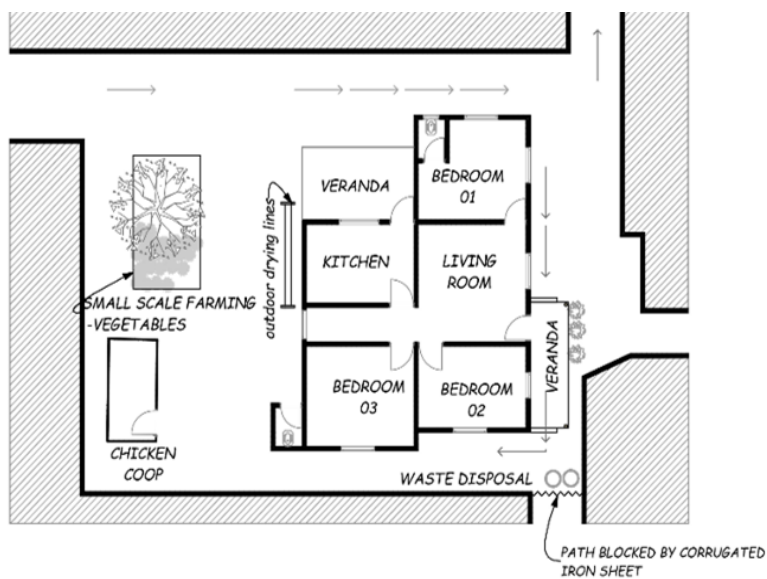


Figure 18. The Case 6 house in 1992.

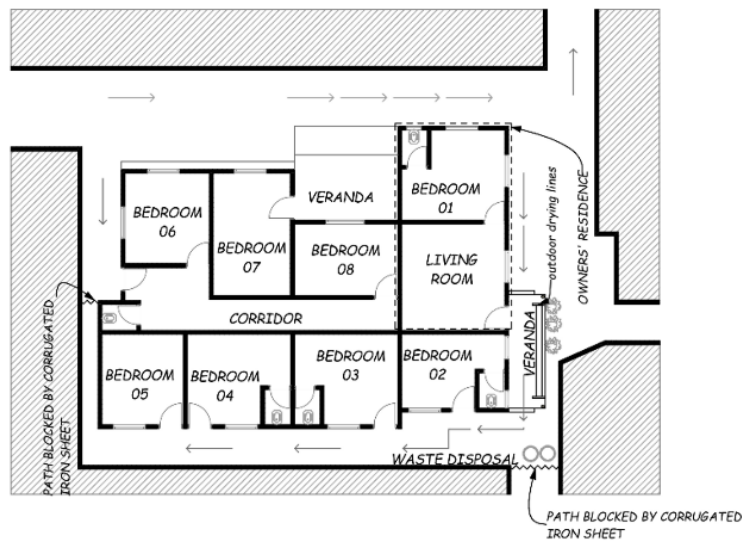


Figure 19. The Case 6 house in 2025 where its incremental transformation started in 2002.



Figure 20. The narrow space between Case 6 House and the neighbouring building.

Socio-Cultural Requirement: Religious Practice and Social Obligations

Beyond renting, plots also incorporate functions linked to sociocultural practice. Case 1 (Figure 4) includes a prayer room among the plot functions and explicitly identifies religious space as part of activities beyond “conventional residential functions”. Such inclusions show that household requirements cannot be captured by a generic room list; specialized spaces may be socially necessary and become drivers of spatial allocation [1, 2].

Outdoor Domestic Life: Washing, Drying, Gathering, Cultivation, and “Fresh Air”

Outdoor space repeatedly appears as a functional necessity rather than decorative surplus. Case descriptions list outdoor space used for washing, drying clothes, gatherings, cultivation, parking, and relaxation/fresh air. These practices are consistent with interpretations of transitional/courtyard spaces as socio-environmental mediators that organize domestic routines and comfort [7, 8].

However, densification and rental expansion can compress these outdoor functions. Case 6 (Figure 15) demonstrates this compression sharply: the owner expands renting “to the extent of covering the entire outdoor space,” leaving only movement space for tenants. This pattern aligns with the literature emphasizing the socio-environmental role of courtyard/outdoor space and the risks when it is eliminated under pressure [7, 8].

DISCUSSION: REVISING THE FRAMEWORK CONSIDERING THE FINDINGS

What the Transformations Reveal About “Requirements”

The Mlalakuwa evidence supports a refined definition of user requirements as multi-layered and time-dependent. Requirements are not simply preferences for room sizes; they include economic requirements (rental income; office/shop conversion), sociocultural requirements (religious space; social gathering), everyday domestic requirements (washing/drying; outdoor domestic continuity; fresh air), and security requirements (fortification; access control).

This reinforces the literature’s argument that the house is a sociocultural construct whose spatial relations and thresholds are continuously negotiated through living practice [1, 2, 6].

Where Generalized Design Assumptions Break Down

Generalized room-function zoning assumes stable “living room,” “kitchen,” and “bedroom” roles. The field study revealed an evolution of room functions and transformation through the shrinking of the family residence while renting expanded externally until outdoor space was nearly eliminated. These are not anomalies; transformation intensity data suggests they are part of a broader pattern.

Comparative studies of housing layouts demonstrate that cultural routines and socio-spatial priorities shape apartment configurations even within “modern” housing types, warning against a one-size-fits-all spatial script [16]. The Mlalakuwa evidence similarly suggests that any design approach seeking contextual relevance must assume multi-use, livelihood adaptation, and incremental growth as normal [2, 4].

Updating the Conceptual Framework: From “Two Knowledge Domains” to “Translation Under Pressure”

The earlier conceptual framing of locally grounded dwelling knowledge versus generalized residential knowledge remains useful, but the findings require two refinements:

- *Livelihood and Plot Economics Must be Central (Not Peripheral)*
Rental income is a dominant driver of spatial reconfiguration, shaping plot boundaries, courtyard retention or loss, and internal downsizing.
- *Adaptability Must be Evaluated as Performance, Not Merely Possibility*
Some adaptations preserve functional outdoor life (boundary renting and central courtyard), while others produce negative environmental outcomes (dark corridors; loss of outdoor space). This aligns with adaptability scholarship emphasizing that enabling change must be paired with safeguards for liveability and equity [3, 10].

Design Propositions Derived from the Diagnostic Reading

From the transformation patterns, four propositions follow:

- *Design for Boundary Densification with Protected Outdoor Utility*
Since renting often expands at plot edges while users try to preserve central circulation/landscaping, designs can intentionally support “edge growth and core outdoor reserve,” as evidenced in cases where rental rooms form boundaries while keeping a central courtyard. Such strategies resonate with transitional/courtyard logics documented in coastal East Africa and Dar es Salaam contexts [7, 8].
- *Provide Multi-Use Front Zones that can Legally Shift Between Social and Income Functions*
The conversion of living rooms into income-generating spaces (office/shop) suggests the need for layouts that anticipate such shifts without collapsing privacy gradients. Approaches to flexible housing have long argued for accommodating change in use through adaptable spatial planning rather than treating program as fixed [3].
- *Embed Security as a Configurational Design Variable (Access, Thresholds, Controlled Permeability)*
Fortification practices indicate that residents actively redesign boundaries and access control. Rather than leaving security to after-the-fact barriers, design should embed defensible threshold

sequences and controlled permeability – features that configurational studies can capture and compare systematically [6, 12].

- *Safeguard Minimum Environmental Performance Under Incrementality*
Case 6 illustrates that uncontrolled rental growth can eliminate outdoor space and create dark, unventilated circulation. Design-for-change, therefore, needs minimum rules-of-thumb (light/air access, circulation widths, service placement) that keep incremental densification from degrading habitability. More broadly, using vernacular knowledge as an analytical model can support robust contemporary solutions when combined with performance safeguards [13].

CONCLUSION

This article shows that residential transformation in Mlalakuwa is not incidental: it is the primary way user requirements become visible in-built form. Across 15 cases, most plots exhibit medium-to-very-high change intensity, indicating that “requirements” are dynamic, multi-layered, and deeply tied to livelihood strategies and sociocultural practice. Treating the house as a sociocultural construct enables a more accurate reading of these transformations – not as disorder, but as evidence of how households negotiate privacy, income, security, outdoor domestic life, and evolving family realities.

The revised conceptual framework proposed here connects sociocultural dwelling theory with post-occupancy diagnostic reading and adaptability as a core design capacity. For policy and practice, the implication is clear: context-relevant residential architecture must be designed for incremental change – while safeguarding minimum liveability conditions and preserving the socio-environmental value of outdoor domestic space.

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