

RESILIENT AND CULTURALLY RESPONSIVE PLANTATION HOUSING: SOCIO-SPATIAL ADAPTATION IN DUNSINANE ESTATE, SRI LANKA

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ABSTRACT

The tea plantation housing originated in the colonial era, shaped by standardisation, efficiency and minimised cost, resulting in home spaces that are insufficient to support sociocultural practices, climatic comfort and long-term resilience. Although state and donor-led initiatives (e.g., India-funded programmes) have substituted communal line rooms with separate units, formal provision remains inadequate to lived spatial, cultural and infrastructural realities of marginalized plantation communities. This results in informal retrofitting and spatial change by residents, raising concern about the sustainability and responsive housing development. This paper analyses the socio-spatial factors of housing adaptation in Dunsinane Estate, Nuwara-Eliya, with reference to the interplay between cultural and physical limitations. The methodology comprised semi-structured interviews and household surveys (n = 40), field observations, and spatial documentation of domestic modifications. The results show that adaptation is affected by the embedded needs for privacy, social boundaries, hospitality rituals, and religious practices, including layout changes, veranda enclosures, and prayer-oriented spaces. At the same time, physical limitations, including limited floor area, inadequate sanitation, poor thermal performance in upcountry climates, and construction defects also drive housing adaptation. These transformations show the resourcefulness and resilience of plantation communities, exposing the shortcomings of standardized housing plans that treat homes as static rather than adaptable. This study suggests that sustainable housing should allow flexibility, climate-responsive design, participatory planning, and incremental frameworks to reduce unsafe construction and support long-term liveability. The findings contribute to socio-spatial theory while offering practical guidance for culturally responsive and adaptable housing design in plantation communities.

Keywords: Incremental Upgrading; Plantation Settlements; Resilient Housing; Socio-Cultural Adaptation; Sustainable Housing Policy.

1. INTRODUCTION

Built in the late 19th and early 20th centuries, these line houses were intended to provide housing for small, migrant working families. They provided little in the way of comfort, privacy, hygiene or future expansion (Hollup, 1993). Although the socio-economic conditions of plantation families have changed over time, with increasing aspirations,

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increasing family size and new lifestyle requirements, the basic housing structures have largely remained unchanged (Hapuarachchi & Kariyawasam, 2021). Recent government and donor-led projects have replaced communal units with individual houses (World Bank Group, 2017). Overcrowding, lack of hygiene and vulnerability to upcountry climate extremes are evident, as reflected in widespread informal redevelopment such as verandah dwellings and internal partitioning (Krieger & Higgins, 2002). This challenge extends beyond welfare provision, creating a built environment resilience concern and a whole-of-life sustainability issue, where unplanned housing changes can create safety risks, repeated material consumption, poor thermal performance and long-term infrastructure stress (Azami & Razavian, 2013). Estate housing should therefore be understood as a socio-technical system where long-term sustainability depends on adaptability, cultural adequacy and climate efficiency rather than the provision of minimal shelter (Chiu, 2004).

Standardised individual housing, while improving upon line room conditions, often imposes uniform layouts that respond inadequately to the socio-cultural needs of estate households, including privacy for gendered domestic boundaries, hospitality practices and religious spatial requirements (Abed et al., 2023; De Macedo et al., 2022; Van Noorloos et al., 2020). As a result, residents are forced into cycles of escalating adaptation, often engaging with limited technical guidance, highlighting both the social agency and the systemic shortcomings of standard housing delivery models (Boonyabancha, 2009).

Existing scholarship on Sri Lankan estate housing has predominantly focused on policy analysis, poverty alleviation and historical labour traditions, with limited empirical attention to how residents have actively constructed domestic environments through adaptation, particularly within new housing schemes (Abed et al., 2023; Hapuarachchi & Kariyawasam, 2021). Accordingly, this study aims to examine the socio-spatial drivers of housing adaptation in plantation communities, with particular focus on the interaction between socio-cultural practices and physical constraints within estate housing. To achieve this aim, the study objectives are to: (1) identify dominant patterns of user-led spatial modification, (2) analyse socio-cultural and physical factors influencing adaptation, and (3) propose context-responsive housing strategies.

2. LITERATURE REVIEW

2.1 HOUSING ADEQUACY, SUSTAINABILITY, AND CULTURAL RESPONSIVENESS

Housing is not merely physical shelter, but is widely recognized as a fundamental determinant of health, dignity, social inclusion and cultural continuity (Krieger & Higgins, 2002). International frameworks establish good housing as a fundamental human right, extending beyond the structural provision of housing to include access to services, affordability, security, and cultural practices (Hapuarachchi & Kariyawasam, 2021). In marginalized settlement contexts, the provision of standardized housing often fails to align with everyday domestic practices and socio-cultural expectations (Chiu, 2004).

Within the sustainability discourse, housing adequacy is increasingly understood through a whole-of-life perspective. Sustainable housing should ensure long-term livelihoods,

resilience and adaptability rather than short-term quantitative provision (Geels, 2002). Cultural adequacy is therefore inseparable from sustainability, as houses that ignore household norms, gendered privacy requirements, hospitality customs and ritual practices are often subject to informal changes, generating additional material waste, unsafe renovations and low life cycle performance (Abed et al., 2023).

2.2 PLANTATION HOUSING IN SRI LANKA: COLONIAL LEGACY AND CONTEMPORARY CHALLENGES

Sri Lanka's plantation settlements are historically rooted in colonial labour regimes, where housing was designed primarily to support the economic efficiency of tea production rather than domestic well-being (Hollup, 1993). Characterized by a series of small units arranged in linear rows with shared sanitation, line housing embodies a spatial logic of containment, minimal investment, and restricted privacy (Periyasamy, 2018). These houses are not designed to accommodate multi-generational family structures, culturally rooted practices, or future expansion, resulting in persistent overcrowding, infrastructural deficiencies, and limited adaptability over time (Hapuarachchi & Kariyawasam, 2021). Even after decades of improvements, estate housing still shows significant differences in quality and conditions. Recent government and donor supported programmes have introduced individual housing units to replace colonial line houses and improve living conditions (Asian Development Bank, 2016). These programmes focus on physical upgrading but often prioritise delivery targets over daily adequacy. This reflects a quantitative approach that overlooks lived spatial needs. Significant issues include poor infrastructure integration, weak basic service coordination, low building standards, unclear ownership, and inadequate responsiveness to social and cultural needs (World Bank Group, 2017). These limitations demonstrate that housing inadequacy in plantation settlements extends beyond physical conditions and must also be understood through the relationship between social practices and spatial organisation.

2.3 SOCIO-SPATIAL THEORY AND THE PRODUCTION OF DOMESTIC SPACE

Socio-cultural factors refer to social values, religious practices, beliefs, rituals, privacy, and everyday behavioural patterns that influence domestic life within housing environments (Chiu, 2004; Fallah Tafti et al., 2026; Jabareen, 2005). Whereas socio-spatial theory explains how these practices actively shape and produce space. In socio-spatial studies, housing adaptation is understood as a dynamic process rather than viewing houses as fixed physical objects (Bruyns, 2018; Pelsmakers & Warwick, 2022). Theoretical perspectives emphasize that space is actively produced through everyday practices, social relations, and cultural meanings (Lefebvre & Nicholson-Smith, 2013; Soja, 1980). The concept of spatial production argues that home environments are continually shaped through lived experience rather than being passively occupied (Lefebvre & Nicholson-Smith, 2013). Similarly, socio-spatial dialectics emphasises the reciprocal relationship between built form and social practices, where families reshape spaces in response to evolving needs and identities (Soja, 1980).

In low-income and community-based settlements, domestic spaces often serve as a site of cultural reproduction, hospitality, gender roles, and religious practices (Abed et al., 2023; Chiu, 2004). In plantation communities, housing is not merely shelter, but a structure where identity, dignity, and belonging are negotiated daily. Modifications such as connecting verandas to the living room, reorganizing interiors, or creating prayer areas

represent culturally embedded spatial practices rather than isolated informal actions (Abed et al., 2023; Van Noorloos et al., 2020).

2.4 HOUSING ADAPTATION, FLEXIBILITY, AND INCREMENTAL UPGRADING

Housing adaptation has been widely documented as an inevitable process in low-income settlements, where rigid layouts rarely accommodate changing household structures, livelihood practices, or cultural expectations (Yates & Milligan, 2007). User-centred housing theories emphasize that residents adapt dwellings over time to achieve functional adequacy and social meaning, particularly in low-income and marginalised settlements where formal housing provision often fails to respond to evolving household needs (Boonyabancha, 2009). These adaptations are often responses to limited space, inadequate services or the need to accommodate guests, ensure privacy, and support religious rituals (Van Noorloos et al., 2020).

International experiences with modular and participatory housing highlight the value of flexible structures that allow for safe and planned change. Projects such as the Baan Mankong Development Initiative in Thailand demonstrate that community-led adaptation can produce more sustainable and inclusive housing outcomes when institutionally supported (Denaldi & Cardoso, 2021). Similarly, progressive housing approaches in Latin America prove that design for periodic development can improve affordability, resilience, and long-term livelihoods (Ferguson & Navarrete, 2003). However, in Sri Lanka's plantation sector, housing provision remains largely standardised allowing limited capacity for formal adaptation (Chiu, 2004). As a result, residents conduct informal renovations without technical guidance, concerns about safety, durability, and environmental performance. Therefore, Sustainable plantation housing needs to integrate flexibility and incremental development mechanisms to reduce unsafe construction cycles and improve whole-life outcomes (Asian Development Bank, 2016).

2.5 CLIMATE RESPONSIVENESS AND WHOLE-LIFE PERFORMANCE IN UPCOUNTRY HOUSING

Over the time, performance of tea estate homes are affected by the climatic and infrastructural circumstances of the upcountry area (Abeyrathna et al., 2024; Asian Development Bank, 2016). Housing that fails to respond to local microclimatic conditions such as temperature and air flow, often requires residents to improve roofs, penetrations, or change spatial layouts, affecting energy efficiency and indoor comfort (Abeyrathna et al., 2024).

Unplanned changes often result in increased carbon footprints over time, increasing material consumption, and continuous maintenance requirements (Cabeza et al., 2014). Therefore, climate-responsive design strategies such as improved envelopes, ventilation planning, and infrastructure integration are essential for regenerative housing development in plantation environments. Sustainable development must consider environmental performance alongside community way of living (Cabeza et al., 2014; Chiu, 2004).

2.6 CONCEPTUAL FRAMEWORK FOR THE STUDY

The conceptual framework is based on socio-spatial theory, in particular to the socio-spatial dialectic of Lefebvre and Soja, which views the dialectic between social

behaviours and the physical environments as a function of ongoing development of domestic space. The framework also includes ideas of housing adaptation and incremental development, noting the transition of housing as a dynamic reaction to the socio-cultural and environmental changes.

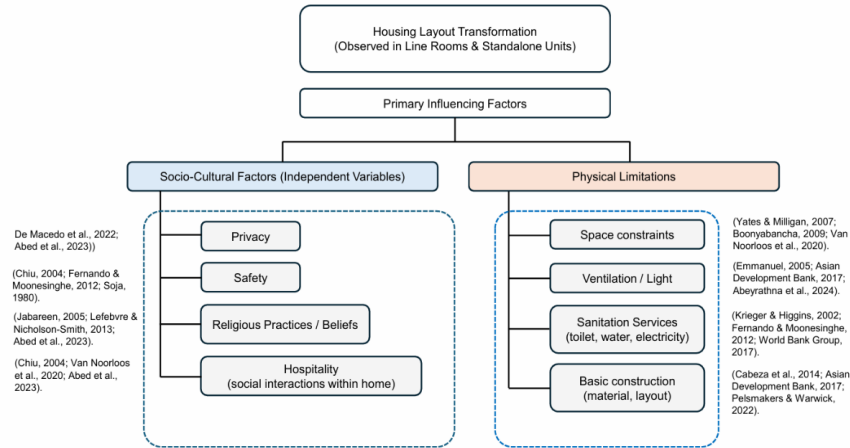


Figure 1: Framework of analysis

Based on the above literature, Figure 1 conceptualizes tea plantation-house adaptation as a result of two interrelated domains: socio-cultural factors and physical limitations (Lefebvre & Nicholson-Smith, 2013; Soja, 1980; Van Noorloos et al., 2020). Socio-cultural factors include privacy needs, perceptions of safety, religious practices and hospitality norms, (Abed et al., 2023; Chiu, 2004; De Macedo et al., 2022). Physical constraints include space constraints, light and ventilation, sanitation and basic services, thermal comfort, construction quality (Abeyrathna et al., 2024; Asian Development Bank, 2016; Cabeza et al., 2014; Emmanuel, 2005). This framework establishes the interaction between cultural practices and spatial constraints as the core driver of housing adaptation.

3. METHODOLOGY

3.1 RESEARCH DESIGN

This study adopted a mixed-methods case study approach to capture measurable trends and lived experiences. Semi-structured interview data were analysed using thematic analysis and household survey data were analysed using descriptive statistics.

Purposive sampling technique was used to select 40 households in government supported standalone housing units in Dunsinane Estate. Households were selected on occupancy status, willingness to engage, and representation of diverse spatial adjustments.

Data collection was conducted in parallel, allowing survey, semi structured interview and observations. Quantitative data from questionnaires were analysed using descriptive statistical methods. Qualitative semi-structured interview data were analysed using thematic analysis to identify recurring socio-spatial patterns. Field observations and photographic documentation were used to support and validate reported spatial practices.

3.2 CASE STUDY CONTEXT: DUNSINANE ESTATE

The study was conducted at Dunsinane Estate in the Nuwara Eliya District in the central Province of Sri Lanka. The estate represents a typical upcountry plantation settlement

transitioning from line houses to new government supported individual housing schemes. It was selected because of its recently constructed standardized housing units, the widespread emergence of informal spatial adaptations, and the culturally distinct Indian Tamil plantation community, where domestic space is closely linked to norms of privacy, hospitality practices, and religious rituals.

3.3 DATA COLLECTION METHODS

Table 1 shows the key data gathering methods and their respective analytical roles within the study.

Table 1: Data collection methods and analytical purpose

Factor	Data to Collect	Tool/Method	Reason for Method Use
Privacy	Perceptions of privacy, room use, shared spaces	Questionnaire survey, Semi-structured Interview	Understand subjective experience and spatial usage
Safety	Safety concerns (indoor/outdoor), design issues	Questionnaire survey, Semi-structured interview	Capture gendered risks and environmental conditions
Religious Practices	Prayer spaces, Vaastu orientation, ritual use	Questionnaire survey, Semi-structured Interview,	Cultural meaning is best captured through open dialogue
Hospitality	Use of veranda/yards, comfort with visitors	Questionnaire survey, Semi-structured interview, Photographic documentation	Reflects spatial needs for interaction & community ties
Spatial Constraints	Spatial layout modification ,room usage	Observation, sketches	To visually validate reported crowding/use
Light & Ventilation	Natural light, cross-ventilation, air quality	Observation, photographic documentation, Semi-structured Interview	Comfort and health perception must be observed + reported
Sanitation and infrastructure	Water, electricity, toilet access	Questionnaire survey, Field Notes, Semi-structured Interview	Mixed methods allow for reliability cross-checks
Basic Construction	Wall/roof/floor condition, maintenance issues,	Observation, Semi-structured Interview	Needs direct field observation and resident insight

3.4 ETHICAL CONSIDERATIONS

Ethical sensitivity was essential given the marginalized context of the tea plantation communities. Participation was entirely voluntary, and participants were informed of the

research purpose prior to data collection. All photographic documentation, observations, and interviews were conducted with consent.

The questionnaire was originally prepared in Tamil language to suit the participants, as they are comfortable reading and responding in Tamil. However, some individuals were unable to read or write. Therefore, verbal interviews were conducted in Tamil, each question was verbally asked and marked their responses accordingly. To ensure clarity and transparency, observations and photographs were recorded with appropriate consent, ensuring respectful engagement with the home environments.

3.5 LIMITATIONS OF THE STUDY

As a case study focusing on a single estate settlement, the findings may not be statistically generalizable to all plantation communities in Sri Lanka. However, the study provides transformative insights into broader patterns of socio-spatial adaptation within standardized low-income housing schemes. In addition, informal adaptations are dynamic and constantly evolving, meaning that documented adaptations reflect conditions at the specific time of fieldwork. The study is limited to analysing residential spatial modifications and will not cover macro level urban or economic transformations. Limited access to official housing documents and pandemic-related restrictions may pose minor limitations during fieldwork.

4. RESULTS AND ANALYSIS

Survey findings reveal quantitative trends relating to housing adaptation patterns, while interview data offer qualitative insights into residents' lived experiences, cultural practices, and views of domestic space.

4.1 SOCIO-CULTURAL DRIVERS OF HOUSING ADAPTATION

This section presents the findings of the sociocultural elements affecting home adaptation in Dunsinane estate. In order to explain how privacy, safety, religious practices, and hospitality influence household spatial alterations, it combines quantitative survey results with qualitative insights from interviews and field observations. Each sub-section first presents survey-based trends, followed by qualitative interpretations that explain residents' lived experiences and adaptive strategies.

4.1.1 Privacy and Gendered Domestic Boundaries

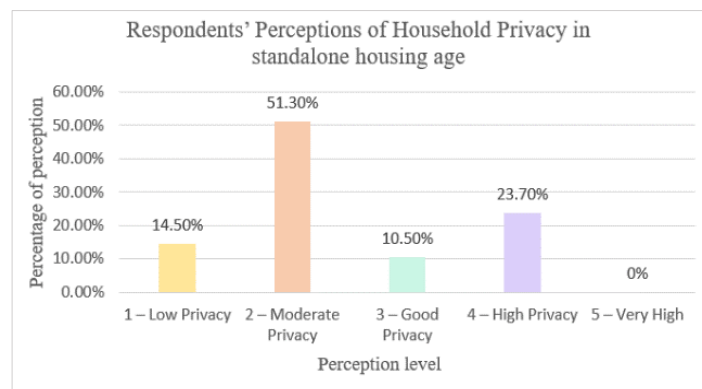


Figure 2: Respondents' perceptions of household privacy in standalone housing (n=40)

Survey results (Figure 2) show that 51% of households have moderate satisfaction with privacy, while approximately 15% reported low satisfaction, particularly among large families with 5-7 members and households with adolescent daughters or elderly members.

Interviews provide further context for these quantitative results. They demonstrate how family structures negotiate privacy both socially and spatially. As a result residents have introduced a number of informal spatial strategies. Common adaptations include the construction of timber/metal sheet partition walls. Sometimes they use curtain dividers, rearranging furniture, and installing internal doors to create separations within small interiors. Verandas and external corridors are often enclosed or partially screened to reduce visibility from neighbour houses and passing streets.

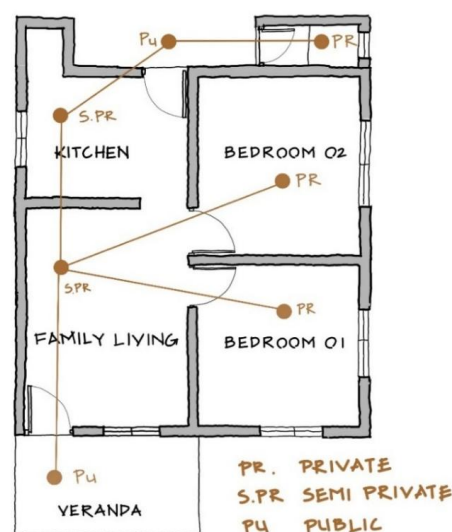


Figure 3: Typical Dunsinane standalone house unit

As shown in Figure 3 limited internal flexibility available in the initial home layout, emphasising the necessity for design adaptations that can retain culturally relevant privacy limitations without damaging informal rearrangements.

4.1.2 Safety Perceptions and Semi-Permeable Boundaries

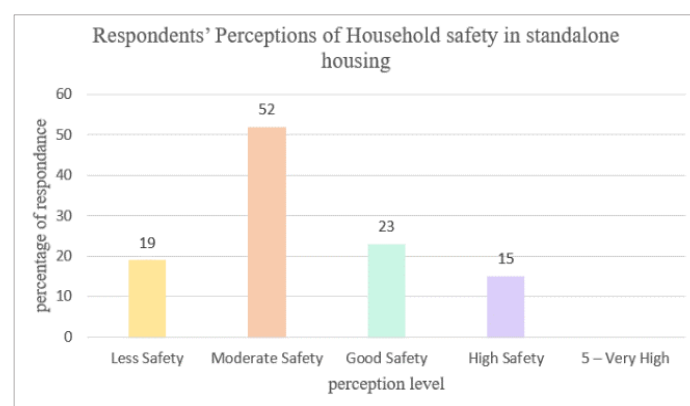


Figure 4: Respondents' perceptions of household safety in standalone housing (n=40)

Survey responses (Figure 4) indicates that no households reported full satisfaction with security conditions. Approximately 53% households expressed moderate satisfaction, while 17% reported low safety.

Traditionally, estate settlements have relied on communal living arrangements and informal community monitoring, which reduces the need for formal security barriers (Chiu, 2004). However, with the changing social conditions, individuals gradually begin to enclose areas by constructing fencing and claim them as partially private. Although these boundaries remain easily temporary, they indicate a growing necessity for personal privacy while preserving community connections.

4.1.3 Religious Practices and Ritual Space Production

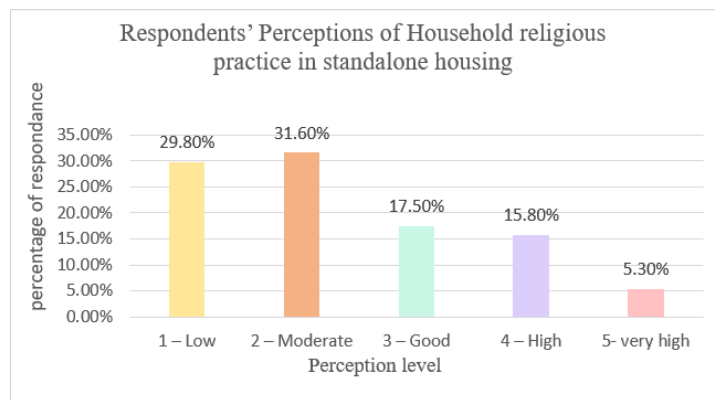


Figure 5: Respondents' perceptions of household religious practices and beliefs in standalone housing (n=40)

As shown in Figure 5, low satisfaction with religious spatial adequacy recorded in Dunsinane estate, with 31.6% indicating moderate satisfaction and 29.8% indicating low satisfaction.

Residents generally modify their home layout to incorporate prayer area (Poojai Arai), ritual objects, and spatial orientations based on Vaastu Shastra principles. Interviews found that most families prefer prayer areas located in the northeast corners (Easanya Moolai), and kitchen layouts are sometimes altered to correspond to traditional directional, facing southeast. Outdoor ritual behaviours, such as growing Tulsi (Holy Basil) plants at home entrances and preparing outdoor spaces before festival events like drawing kolam, further extend home space beyond the building envelope.

4.1.4 Hospitality Norms and Multi-Use Living Space

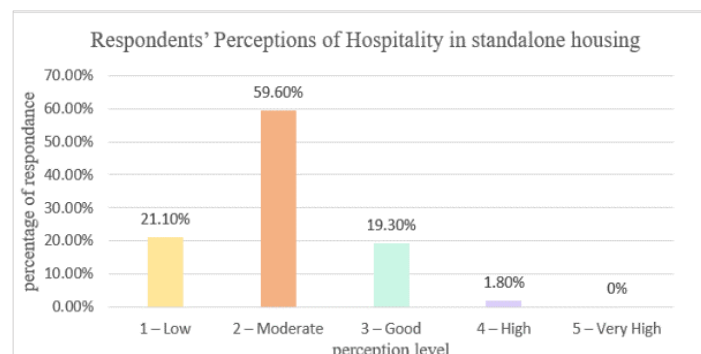


Figure 6: Respondents' perceptions of hospitality in standalone housing (n=40)

The survey results as shown in Figure 6 shows that 59.6% of households reported moderate satisfaction with entertaining guests, while 19.3% of households express low satisfaction. To preserve hospitality practices, residents commonly transform porches into semi-formal seating areas, reassign bedrooms for guest use, or create outdoor seating extensions. This reflects the continued cultural importance of hospitality in plantation communities despite limited and inadequate housing space.

4.2 PHYSICAL LIMITATIONS DRIVING INCREMENTAL RETROFITTING

This section discusses findings on physical and environmental constraints affecting housing modifications, differentiating them from socio-cultural factors. Key influences include infrastructure constraints, construction quality, environmental comfort, and spatial inadequacy. The results illustrate that physical limitations primarily drive incremental retrofitting habits, supported by survey data, field observations, and interview responses.

4.2.1 Space Constraints and Functional Inadequacy

Field observations and interviews reveal that housing units are generally comfortably adequate only for up to three occupants. Field observation indicates that kitchen is spatially inadequate for larger families, meal preparation and dining occur within the lobby or bedroom, and circulation zones become multi-purpose zones like study area, prayer zones. Similarly, bathrooms are poorly serviced, generally lacking internal toilet facilities, separate shower facilities, and proper storage. Such functional shortcomings encourage residents to undertake incremental extensions, albeit with limited means and insufficient technical assistance.

4.2.2 Thermal Comfort, Light, and Ventilation Challenges

Although most households report sufficient daylight for essential activities, climatic discomfort is a chronic problem in the upcountry household. The lack of insulation under the metal roof leads to cold indoor conditions during cold seasons. Interview responses and field observations revealed that many residents have used their own funds to install ceiling to improve thermal comfort. This also reduces rain noise. Toilets generally lack sufficient daylight and ventilation, and at night, outdoor street lighting is inadequate, contributing to discomfort and insecurity.

4.2.3 Sanitation and Infrastructure Deficiencies

Field observations show that there is no integrated sewage system, and wastewater often flows openly through informal canals. Toilets are small and poorly serviced, while kitchens suffer from inadequate drainage and maintenance limitations. Figure 7 shows how residents are forced into self-constructed sanitation changes, that can compromise health and environmental performance.

4.2.4 Construction Quality and Durability Issues

Construction related issues further encourage housing modifications. While units are generally constructed using cement block walls and reinforced concrete frames. Although interview participants frequently reported concerns regarding poor plastering quality, weak fittings, incomplete floor finishes poor material of penetrations and early cracking and settlement after completion in 2018. These durability issues create additional home

maintenance cycles and underscore the importance of improved construction standards within sustainable housing supply for these low-income people.



Figure 7: Inappropriate sewage

5. DISCUSSION

5.1 ADAPTATION AS SOCIO-CULTURAL RESILIENCE

The findings from Dunsinane Estate reveal that resident-led change is a continuous process of incremental renewal shaped by everyday socio-cultural needs rather than physical inadequacy. Adaptations related to privacy, hospitality, religious practice and security reveal how households deliberately alter domestic space to maintain dignity, identity and functional living within limited housing situations. These findings align with socio-spatial theories that interpret housing as a socially produced environments shaped via everyday actions, cultural values, and lived experience rather than as a permanent architectural product. Consistent with the socio-spatial theories of Henri Lefebvre, residents actively reshape domestic space through privacy negotiations, ritual practices, and social interaction, demonstrating that housing transformation is embedded within everyday social life.

At the same time, these developments often reflect a form of communal resilience achieved through informal means. While people demonstrate greater agency, the burden of improvement is directed at the home, often without expert supervision, increasing vulnerability to safety risks and material inefficiencies. Cultural appropriateness therefore emerges as a key prerequisite for sustainable housing. When privacy standards, hospitality customs and ritual practices are not supported in design, change is inevitable.

5.2 LIMITS OF STANDARDISED HOUSING AND WHOLE-LIFE IMPACTS

The ongoing pattern of reconfigurations within newly constructed independent units highlight the limits of uniform housing models. Despite improvements over colonial line houses, standardized plans sometimes fail to address culturally expected separations between public and private areas, leading people to rearrange interiors, add verandas, and extend dwellings beyond the original layout.

Unplanned modifications in housing design lead to long-term performance problems throughout the life cycle. Temporary alterations and poor thermal performance point to gaps in the original design in terms of flexibility and thermal comfort. Consequently, tea estate housing challenges continue after occupation, necessitating whole life housing strategies that allow for safe incremental changes over time.

5.3 TOWARDS REGENERATIVE AND PARTICIPATORY UPGRADING

The results emphasize the need for regenerative housing frameworks that allow for intentional adaptation rather than treating change as informal. Policies should lead to flexible design, incremental expansion capacity, and climate-responsive built envelopes that are suitable for healthy environments. Collaborative planning and post-occupancy evaluation are essential for aligning formal provision with modern realities, reducing hazardous rebuilding phases, and promoting sustainable livelihoods.

6. CONCLUSIONS AND POLICY RECOMMENDATIONS

6.1 CONCLUSIONS

The study demonstrates that adaptation is significantly shaped by interaction between socio-cultural expectations and physical housing limitations. Resident-led spatial adjustments related to privacy, safety, hospitality, religion, and thermal comfort demonstrate that plantation housing functions as a socially generated living space rather than a fixed physical construction. Recent standalone housing schemes have improved living conditions compared to colonial line rooms, the persistence of informal adaptation illustrates the limitations of standardised housing forms that poorly react to current household requirements and cultural realities.

The findings suggest that sustainable plantation housing evaluation requires more than just quantitative measures of housing delivery or physical upgrades. Long-term resilience relies on flexibility, climate responsiveness, cultural adequacy, and the ability for safe incremental adaptation. Housing transformation in plantation communities highlights the agency of residents and the need for participatory and context-sensitive housing strategies.

The study on a Sri Lankan plantation settlement gives insights into housing adaptation for marginalized communities in the Global South, highlighting how standard low-income housing often overlooks socio-spatial needs. It argues for future plantation housing policies to adopt participatory planning, adaptive architecture, and climate-responsive solutions to create dignified, resilient, and culturally relevant living conditions.

6.2 POLICY AND DESIGN RECOMMENDATIONS

This study emphasises the need for a full review of housing plans for plantation communities, calling for alternatives that are culturally sensitive and responsive to occupant needs. Key recommendations include the introduction of community spaces such as prayer areas, kitchens for socializing, guest rooms, and considerations for family privacy in dwelling designs. Current difficulties such as overcrowding and insufficient activity spaces must be addressed in future plans, which should also feature critical facilities like kitchens, dining areas, and dedicated study spaces for youngsters.

Moreover, improvements in sanitation, drainage, wastewater management, and water availability are necessary. The home designs must take into account climatic factors, ensuring proper insulation, ventilation, and natural light. Outdoor public areas should be created deliberately, combining streetlights and buildings that preserve privacy while stimulating community connection. Importantly, plantation communities should be actively involved in planning and construction processes to ensure the housing meets their ambitions and requirements. Such involvement can increase community stability and well-being, ultimately generating healthier living environments that prioritize the cultural and social requirements of plantation communities. Policy and design recommendations are summarized in Figure 8.

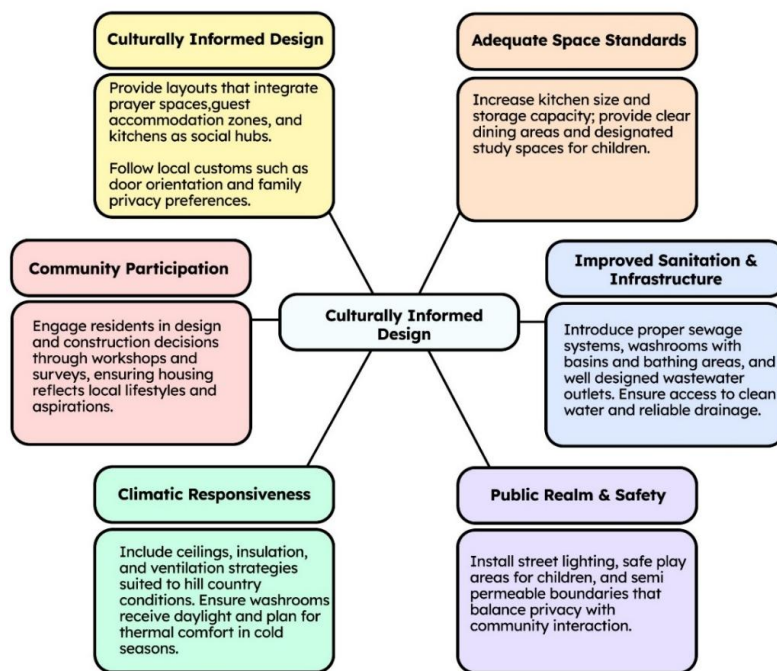


Figure 8: Policy and design recommendations

7. REFERENCES

- Abed, A., Obeidat, B., & Gharaibeh, I. (2023). The impact of socio-cultural factors on the transformation of house layout: A case of public housing - Zebdeh-Farkouh, in Jordan. *Journal of Asian Architecture and Building Engineering*, 22(3), 1195–1208. <https://doi.org/10.1080/13467581.2022.2074021>
- Abeyrathna, W. P., Ariyaratna, I. S., Halwatura, R. U., Arooz, F. R., Perera, A. S., & Kaklauskas, A. (2024). ANN prediction model to improve employees' thermal satisfaction in tropical green office buildings. *Asian Journal of Civil Engineering*, 25(1), 343–358. <https://doi.org/10.1007/s42107-023-00779-y>
- Asian Development Bank. (2016). *Sri Lanka: Plantation Development Project* (PPE:SRI 2016-06). Asian Development Bank. https://www.adb.org/sites/default/files/evaluation-document/167392/files/in74-16_6.pdf
- Azami, A. S., & Razavian, M. (2013). Analysis Moving Towards Sustainable Development of a City with Emphasis on the Quality of Urban Life: The Case of Noor. *Environment and Urbanization ASIA*, 4(1), 31–56. <https://doi.org/10.1177/0975425313477725>
- Boonyabancha, S. (2009). Land for housing the poor — by the poor: Experiences from the Baan Mankong nationwide slum upgrading programme in Thailand. *Environment and Urbanization*, 21(2), 309–329. <https://doi.org/10.1177/0956247809342180>

- Bruyns, G. (2018). The Social and the Spatial, Urban Models as Morphologies for a 'Lived' Approach to Planning. *Cubic Journal*, (1), 52–73. <https://doi.org/10.31182/cubic.2018.1.003>
- Cabeza, L. F., Rincón, L., Vilariño, V., Pérez, G., & Castell, A. (2014). Life cycle assessment (LCA) and life cycle energy analysis (LCEA) of buildings and the building sector: A review. *Renewable and Sustainable Energy Reviews*, 29, 394–416. <https://doi.org/10.1016/j.rser.2013.08.037>
- Chiu, R. L. H. (2004). Socio-cultural sustainability of housing: A conceptual exploration. *Housing, Theory and Society*, 21(2), 65–76. <https://doi.org/10.1080/14036090410014999>
- De Macedo, P. F., Ornstein, S. W., & Elali, G. A. (2022). Privacy and housing: Research perspectives based on a systematic literature review. *Journal of Housing and the Built Environment*, 37(2), 653–683. <https://doi.org/10.1007/s10901-022-09939-z>
- Denaldi, R., & Cardoso, A. L. (2021). Slum Upgrading beyond incubation: Exploring the dilemmas of nation-wide large scale policy interventions in Brazil's growth acceleration programme (PAC). *International Journal of Urban Sustainable Development*, 13(3), 530–545. <https://doi.org/10.1080/19463138.2021.1958336>
- Emmanuel, R. (2005). Thermal comfort implications of urbanization in a warm-humid city: The Colombo Metropolitan Region (CMR), Sri Lanka. *Building and Environment*, 40(12), 1591–1601. <https://doi.org/10.1016/j.buildenv.2004.12.004>
- Fallah Tafti, F., Rollo, J., & McGann, S. (2026). Conceptualising a model for understanding socio-cultural and spatial factors in housing: Insights from a systematic scoping review. *Frontiers of Architectural Research*, 15(1), 119–143. <https://doi.org/10.1016/j.foar.2025.05.005>
- Ferguson, B., & Navarrete, J. (2003). New approaches to progressive housing in Latin America: A key to habitat programs and policy. *Habitat International*, 27(2), 309–323. [https://doi.org/10.1016/S0197-3975\(03\)00013-4](https://doi.org/10.1016/S0197-3975(03)00013-4)
- Geels, F. W. (2002). Technological transitions as evolutionary reconfiguration processes: A multi-level perspective and a case-study. *Research Policy*, 31(8–9), 1257–1274. [https://doi.org/10.1016/S0048-7333\(02\)00062-8](https://doi.org/10.1016/S0048-7333(02)00062-8)
- Hapuarachchi, S. P., & Kariyawasam, S. S. (2021). An Evaluation of National Housing Policy Related to Plantation Housing in Sri Lanka. *Cities People Places: An International Journal on Urban Environments*, 5(1), 94. <https://doi.org/10.4038/cpp.v5i1.55>
- Hollup, O. (1993). Caste Identity and Cultural Continuity Among Tamil Plantation Workers in Sri Lanka 1. *Journal of Asian and African Studies*, 28(1–2), 67–87. <https://doi.org/10.1177/002190969302800105>
- Jabareen, Y. (2005). Culture and Housing Preferences in a Developing City. *Environment and Behavior*, 37(1), 134–146. <https://doi.org/10.1177/0013916504267640>
- Krieger, J., & Higgins, D. L. (2002). Housing and Health: Time Again for Public Health Action. *American Journal of Public Health*, 92(5), 758–768. <https://doi.org/10.2105/AJPH.92.5.758>
- Lefebvre, H., & Nicholson-Smith, D. (2013). *The production of space* (33. print). Blackwell Publishing.
- Pelsmakers, S., & Warwick, E. (2022). Housing adaptability: New research, emerging practices and challenges. *Buildings and Cities*, 3(1), 605–618. <https://doi.org/10.5334/bc.266>
- Periyasamy, N. (2018). Update on the health status of plantation community in Sri Lanka. *Journal of the College of Community Physicians of Sri Lanka*, 23(4), 135. <https://doi.org/10.4038/jccpsl.v23i4.8135>
- Soja, E. W. (1980). The socio-spatial dialectic. *Annals of the Association of American Geographers*, 70(2), 207–225. <https://doi.org/10.1111/j.1467-8306.1980.tb01308.x>
- Van Noorloos, F., Cirolia, L. R., Friendly, A., Jukur, S., Schramm, S., Steel, G., & Valenzuela, L. (2020). Incremental housing as a node for intersecting flows of city-making: Rethinking the housing shortage in the global South. *Environment and Urbanization*, 32(1), 37–54. <https://doi.org/10.1177/0956247819887679>
- World Bank Group. (2017). *Multisectoral Nutrition Assessment in Sri Lanka's Estate Sector*. Washington, DC: World Bank. <https://doi.org/10.1596/26328>
- Yates, J., & Milligan, V. (2007). Housing affordability: A 21st century problem. *Australian Housing and Urban Research Institute*. <https://www.ahuri.edu.au/research/final-reports/105>