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DRIVERS OF TRANSFORMATION IN FRONT TRANSITIONAL SPACES: A STUDY OF LOW-INCOME HOUSING IN INDONESIA

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Abstract: This study examines the transformation of front transitional spaces in low-income housing within the Indonesian context, focusing on the Grand Boulevard Regency housing complex in Kendari City, Southeast Sulawesi Province. Previous research has indicated that residents frequently modify these spaces to accommodate their families' daily needs. However, such alterations often conflict with existing housing regulations, architectural designs, and may negatively affect the surrounding environment. The primary objective of this study is to identify the key drivers behind these transformations. A quantitative descriptive approach was employed, drawing on 208 responses, selected through proportionate random sampling, from a total population of 1,368 residents in Grand Boulevard Regency. The study identified three main groups of factors playing a role in the transformation of transitional spaces: a) physical factors, including an unattractive facade, property ownership status, space layout, and environmental conditions (such as air temperature and lighting); b) non-physical factors, including lifestyle, social interactions, and socio-cultural identity; and c) resident characteristics, with income being the most influential factor. The findings reveal that the physical characteristics of the building are the most significant drivers of changes to the front transitional spaces. In addition, non-physical factors and the socio-economic characteristics of the residents also contribute significantly to these transformations.

Keywords: transformation; front transition; low-income community housing; driving factors; Indonesia

1. Introduction

The Indonesian government has introduced housing programs targeting low-income households, commonly referred to as "Masyarakat Berpenghasilan Rendah" (MBR), which comprise families with limited purchasing power who require state support to access adequate housing. To meet the housing demands of MBR, several initiatives have been carried out: a) Housing acquisition subsidies; b) Self-help housing stimulants; c) Tax incentives; d) Simplified licensing procedures; e) Access to insurance, guarantees, land, land certificates, and infrastructure; and f) Provision of public utilities (Sururi et al., 2022). This initiative is implemented through various government programs, including public housing,

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the Simple Ownership Flats program (Rumah Susun Sederhana Milik or Rusunami), subsidized home ownership loans, and the Housing Finance Liquidity Facility (HFLF), all aimed at improving the housing conditions of low-income households (Kushendar et al., 2021).

These government efforts are grounded in Indonesia's constitutional and legal framework, particularly Article 28H paragraph (1) of the 1945 Constitution, which guarantees every citizen the right to a decent and healthy place to live (Government of Indonesia, 1945). This constitutional mandate is operationalized through Law No. 1 of 2011 on Housing and Settlement Areas which provides a comprehensive legal foundation for the planning, development, and provision of affordable and sustainable housing (Government of Indonesia, 2011). Additional implementation guidelines are stipulated in Government Regulation No. 14 of 2016, which defines standards for livable housing that reflect human dignity and serve as productive assets (Government of Indonesia, 2016). Furthermore, Ministerial Regulation No. 20/PRT/M/2014 institutionalizes the HFLF as a key financing instrument to facilitate subsidized mortgage schemes specifically targeted at MBR groups, thereby reinforcing the government's commitment to inclusive and equitable housing development (Sutrisno et al., 2024).

In low-income housing contexts, residents frequently undertake the transformation process of their houses involving structural or spatial modifications to better suit personal needs or preferences, often diverging from the original architectural intentions (Aduwo & Ibem, 2017; Avogo et al., 2017; Ngo et al., 2021; Shatwan, 2024). These transformations can range from minor renovations to significant structural alterations, thereby affecting both the function of interior spaces and the external character of the building (Aduwo et al., 2013). Empirical studies identify two dominant modes of transformation: restoration, which seeks to maintain the original model; and change, which introduces new design elements or reconfigurations of space (Bardhan et al., 2024; van-Tonder & Rwelamila, 2024). Such transformations are often driven by material constraints, lifestyle shifts, or evolving household needs. These changes are most commonly reflected in material elements such as the addition of fences, replacement of roofs and doors, enclosure of front terraces, or expansion of semi-private spaces—indicating a need for more adaptable and flexible housing designs in future low-cost housing developments (van Tonder, 2022).

Spatial transformation practices in housing have been reported in various countries, with significant studies conducted in several regions. These transformations are commonly observed worldwide in both the interior and exterior spaces of homes, such as in Ghana (Asante & Ehwi, 2022; Avogo et al., 2017); Uganda (Mukiibi & Machyo, 2021); Nigeria (Aduwo & Ibem, 2017; Aduwo et al., 2013); Turkey (Egercioğlu, 2016); Sri Lanka (Gunathillaka & Coorey, 2014); Malaysia (Omar et al., 2012); Kenya (Makachia, 2011); and Tanzania (Ombeni & Deguchi, 2009). In Indonesia, similar cases of residential transformation have been documented by Sunarti et al. (2019) and Aryani et al. (2015). These studies show that residential transformations commonly occur within the interior living spaces of the house, as well as in transitional areas such as the front, side, and back parts of the dwelling.

Residential transformation refers to changes in how occupants use and adapt their living spaces, whereas housing transformation focuses more specifically on the physical or structural modifications to the built form of the house. Residential transformation is primarily influenced by two key factors: physical and non-physical (Sunarti et al., 2019). Physical factors include the location and environmental context of the residence, encompassing the

condition of the surroundings, environmental quality, and accessibility. These elements shape both the spatial opportunities and the constraints that influence how residents can adapt or modify their living environments. According to Reid (2023) and Barreira et al. (2019), such physical characteristics significantly support the transformation of residential spaces by enabling or limiting spatial reconfigurations or structural adjustments.

Non-physical factors, on the other hand, refer to changes in the behaviors, actions, and mindsets of the residents toward their homes. These factors reflect how occupants' perceptions and interpretations of space evolve over time, often prompting modifications to better align with shifting needs, preferences, or lifestyles. In summary, residential transformation is shaped by both the physical characteristics of the housing environment and the non-physical dynamics of resident behavior, while housing transformation tends to emphasize tangible changes to the structural aspects of the dwelling.

Housing transformation can be driven by multiple factors, including socio-economic characteristics, residents' expectations, existing housing conditions, and the adoption of new technologies (Sunarti et al., 2019; Yasmin & Nilufar, 2023). Furthermore, the act of transforming a home is a personal choice, but it is also influenced by certain "constraints" related to the environment (ecosystem) and the interactions between residents (social system) (Neuwirth, 2005; Tipple, 2000). These environmental and social factors can limit or shape the extent of residential transformation, demonstrating the balance between personal aspirations and external factors.

The phenomenon of transforming transitional spaces in low-cost subsidized housing for low-income communities has also been observed in Kendari City, specifically in the Grand Boulevard Regency housing development. The Grand Boulevard Regency housing covers 27 hectares of land and consists of 1,500 houses. Preliminary observations revealed that transformations had occurred in this housing area. These transformations highlight the changes residents made to their living spaces, particularly in the transitional areas such as the front, side, and back spaces of the houses.

If not properly managed, spatial transformation in residential areas can have detrimental effects. Research by Chakraborty et al. (2015), Gunathillaka and Coorey (2014), and Makachia (2011) indicates that uncontrolled transformations may result in overcrowding that surpasses the land's capacity. Additionally, such changes can disturb the environmental balance and harmony of the area. In terms of zoning laws, these transformations may breach housing spatial plans, exceed building coefficients, violate property boundaries, and alter the intended use of public and green open spaces. Ultimately, these alterations can lead to a decline in urban planning standards and a reduced quality of life in the community.

While other researchers, such as Bardhan et al. (2024), Fitria et al. (2022), and Asante and Ehwi (2022), have examined spatial transformation in housing, they have not clearly pinpointed the specific causes behind transformations in transitional spaces. Conversely, studies by Reid (2023), Sunarti et al. (2019), and Barreira et al. (2019) have explored the factors driving spatial transformation, but have not specifically addressed the changes occurring in front transitional spaces. This gap in the literature underscores the need for more focused research on the factors influencing transformations in these particular areas.

This study focuses on exploring the factors influencing the transformation of front transitional spaces in low-income housing. By targeting this specific aspect, the research seeks to bridge the existing gap in the literature and provide a deeper understanding of the drivers behind changes in these spaces.

2. Materials and methods

2.1. Study area

This research was conducted from October 2023 to March 2024, focusing on the transformation of the front transitional space in the Grand Boulevard Regency housing, located in Kendari City, Southeast Sulawesi Province, Indonesia. Administratively, the housing is situated in Mokoau Village, Kambu District (Figure 1)

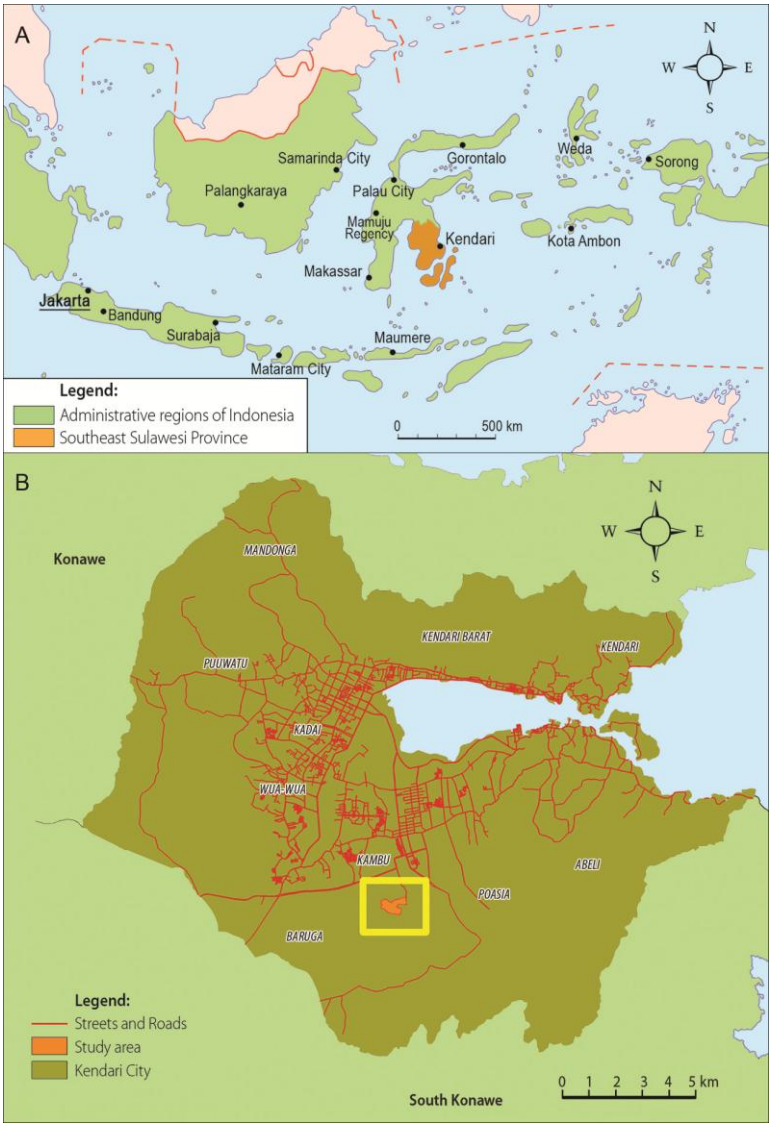

Figure 1. Location of Grand Boulevard Regency Housing.
Note: Map sourced from: A. Topographic map of Indonesia from Geospatial Information Agency, Indonesia. B. Spatial Planning Map, Kendari City 2010–2030, and GIS Analysis 2025.

The Grand Boulevard Regency housing complex began construction in 2018 and has experienced significant occupancy since 2020. The project was developed by Amanah Sultra Group Ltd. As of 2023, approximately 1,368 out of the planned 1,500 housing units have been completed. Each residential unit is built on a 7.5 m × 13 m plot, with a building area of 36 m^2. The original house design is illustrated in Figure 2, while examples of units that have undergone front transitional space transformations are presented in Figure 3. Initial observations, supported by interviews with several residents, indicate that modifications to the front transitional space began around 2020. The findings show that approximately 434 houses have undergone specific transformations in their front transitional spaces.

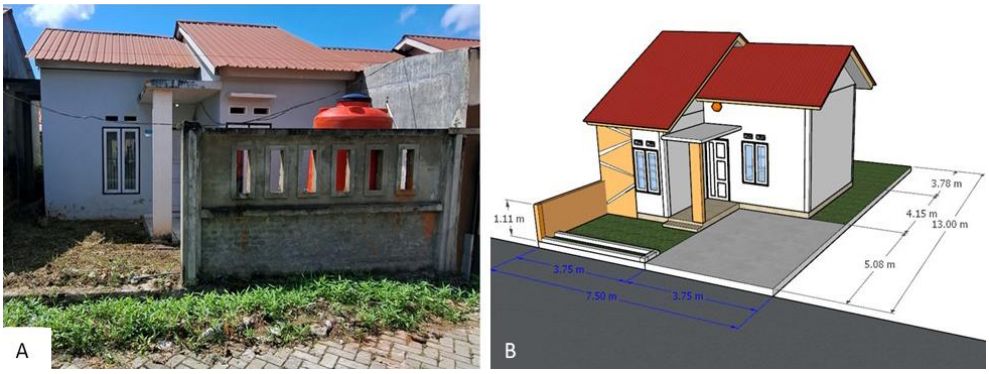

Figure 2. Illustration of the original house design in Grand Boulevard Regency prior to the transformation of the front transitional space.
Note: A) House that has not undergone transformation, photographed in 2019. B) The original house design, redrawn by the author based on data from Amanah Sultra Group Ltd.

Figure 3. Transformation of the transitional space at the front of the house in Grand Boulevard Regency.
Note: A) The transformation of space is driven by concerns for security. B) The transformation involves adding space to accommodate family members and to reduce the impact of direct sunlight. Image taken by Researcher in October 2024 during field observation.

Grand Boulevard Regency is the largest low-income housing development in Kendari City. It was developed under Indonesia's FLPP subsidized housing scheme to support homeownership among low-income families. Initiated by Amanah Sultra Group Ltd. in collaboration with the Ministry of Public Works and Housing, the project targeted eligible households based on national income criteria. Most residents are formal homeowners who received subsidized mortgage loans.

The site was purposively selected for its scale, high occupancy rate, and active resident–developer engagement. Sustained communication regarding housing maintenance and neighborhood management has fostered residential stability, making it an ideal context to explore how front transitional spaces are adapted and transformed in low-income housing environments.

2.2. Research design

This study adopts a mixed approach, which focuses on presenting and interpreting data through numerical representation without testing specific hypotheses. According to Creswell and Creswell (2018), this approach is well-suited for studies that aim to describe trends or patterns within a population based on measurable variables. In this study, the data collection process involves: a) gathering data through questionnaires, observations, and interviews; b) analyzing the data by describing the information obtained; and c) supporting the descriptions with numerical data that reflect the actual situation. This approach enables an in-depth exploration of the factors influencing the transformation of front transitional spaces in low-income housing.

2.3. Population and sample

The study population consisted of low-income houses in the Grand Boulevard Regency housing complex, specifically 434 out of 1,368 houses that were identified as having transformed their front spaces. These 434 houses are distributed across various housing blocks, from Block A to Block I, as shown in Figure 4 and Table 1.

Figure 4. Distribution of research population blocks in Grand Boulevard Regency.
Note: Based on the results of researcher analysis (Google Earth & GIS data), scale 1:5,000.

Given the total population of 423 housing units in the study area, a sample of 208 units was selected using the Slovin formula at a 95% confidence level and 5% margin of error (Tejada & Punzalan, 2012). This approach ensured that the sample was statistically representative of the overall population. The sample represents approximately 48% of the total population, exceeding the minimum recommended threshold of 20% for adequate representativeness in social research (Memon et al., 2020).

Table 1. Sampling determination calculation

Block	Population (Person)	Proportionate Random Sampling	Sample (Person)
Block A	69	208/434*69	33
Block B	83	208/434*83	40
Block C	22	208/434*22	10
Block D	52	208/434*52	25
Block E	53	208/434*53	25
Block F	41	208/434*41	20
Block G	25	208/434*25	12
Block H	20	208/434*20	10
Block I	69	208/434*69	33
Total	434		208

This study employed proportionate stratified random sampling, a type of probability sampling technique in which each housing block contributes samples in proportion to its size within the overall population. This approach ensures that every housing unit has an equal chance of being selected while maintaining representativeness across different blocks.

2.4. Variables

The study focuses on three primary variables to determine the factors driving the transformation of front spaces in low-income housing: resident characteristics, physical elements, and non-physical aspects. Each variable is paired with specific indicators and coding to facilitate data organization. The construction of variables and indicators was informed by an extensive review of prior studies. Table 2 provides a detailed overview of each variable along with its respective indicators.

Table 2. Research variables

Variable	Indicator	Code
Residents' characteristics (Aduwo, 2013; Aduwo & Ibem, 2017; Asante & Ehwi, 2022; Avogo et al., 2017; Gunathillaka & Coorey, 2014; Sunarti et al., 2019)	Marital status	RC1
	Occupation	RC2
	Education	RC3
	Income	RC4
	Age of head of household	RC5
	Length of residence	RC6
	Number of people living	RC7
Physical (Asante & Ehwi, 2022; Makachia, 2011; Mukiibi & Machyo, 2021; Sunarti et al., 2019)	Unattractive facade	PS1
	Dimension of room size	PS2
	Division of interior space (room)	PS3
	Ownership status	PS4
	Transformation of previous residence	PS5
	Air temperature and lighting	PS6

Table 2. Research variables (*continued*)

Variable	Indicator	Code
Non-physical (Makachia, 2011; Sunarti et al., 2019)	Social interaction	NP1
	Institutional involvement	NP2
	Architectural involvement	NP3
	Materials available	NP4
	Workforce resources	NP5
	Security	NP6
	Lifestyle	NP7
	Socio-cultural identity	NP8
	Cost	NP9

2.5. Data and analysis

The research data were derived from both secondary and primary sources. The secondary data were obtained from Amanah Sultra Group Ltd. (locally registered as PT. Amanah Sultra Group), the developer of the Grand Boulevard Regency housing project. These data include: land area, number of housing units, number of residents, and block divisions within the housing complex.

The primary data collected in this study aimed to identify the factors driving spatial transformation, organized by dimensions and indicators, as presented in Table 2. Data were obtained through participatory observation and a structured survey using a questionnaire as the main data collection tool. The questionnaires were completed directly by heads of households. Each item was rated using a three-point scale, with values ranging from 1 (not influential) to 3 (highly influential), based on the respondents' experiences and perceptions.

This study utilizes Confirmatory Factor Analysis (CFA) as the data analysis method, which helps measure the dimensions constituting the latent variables in the research model. CFA is conducted using Structural Equation Modeling (SEM). The goal of this phase is to assess the validity of the dimensions that define the latent variables (Hair et al., 2021). CFA, as a multivariate analysis technique, helps ensure that the measurement model aligns with the hypothesis. In CFA, latent variables are considered as causal (independent) variables that underpin the indicator variables (Sarstedt et al., 2019). If the construct is unidimensional, First Order CFA is used, whereas Second Order CFA is applied for multidimensional constructs. To assess the model's validity, Convergent Validity (CV) is tested by examining the factor loading values for each indicator. A factor loading value above 0.5 indicates acceptable CV (Hair et al., 2020).

In this study, Second Order CFA is used, with the analysis conducted using Smart PLS 4 software. The analysis involves three dimensions that form the causal factors of spatial transformation: a) residents characteristics (7 indicators); b) physical (6 indicators); and c) non-physical (9 indicators) (See Table 2 for the details).

3. Result and discussion

A total of 208 participants completed the survey, resulting in a valid dataset that met the minimum requirement of 200 entries for SEM, as specified by Hair et al. (2021) and Sarstedt et al. (2019). The questionnaire contained 22 indicators to assess the model constructs, with each construct being evaluated using at least three indicators. The sample was largely composed of male respondents, who accounted for 96.63% of the participants, while female respondents made up 3.37%. The results of the analysis are shown in Table 3.

Table 3. Summary of respondents' demographic profile

Demographic Profile		Frequency (n = 208)	Percent (%)
Gender	Male	201	96.63
	Female	7	3.37
Age	<30 years	35	16.83
	31–45 years	110	52.88
	>45 years	63	30.29
Education	Elementary/Junior Middle School	58	27.88
	Senior High School	95	45.67
	Higher education (Bachelor's degree)	55	26.44
Occupation	Private sector employee	42	20.19
	Self-employed	97	46.63
	State Civil Apparatus	69	33.17

The demographic profile of the 208 respondents revealed the following key details: 52.88% were in the age group of 31–45 years, those above 45 years were 30.29%, and those below 30 years were about 16.83% of the total respondents. In terms of educational background, 45.67% of the respondents completed senior high school, while 27.88% attained only elementary or junior high school education. Meanwhile, 26.44% of the respondents hold a higher education degree (Bachelor's). Despite their academic qualifications, most of the university graduates are self-employed with relatively low income. Then 46.63%, work as self-employed, followed by those who work as state civil apparatus (33.17%), and private employees (20.19%).

To assess the consistency of the constructed constructs, Cronbach's Alpha (CA) was used, with all constructs surpassing the recommended threshold of .7, demonstrating strong reliability. As presented in Table 4, the constructs for occupant characteristics (α = .867), physical factors (α = .902), and non-physical factors (α = .914) all demonstrated strong reliability. These values suggest that the constructs used in the study are consistent and dependable.

Table 4. Convergent validity and construct reliability analysis outcome

Factors	Indicators	Outer Loading	AVE	CR	CA
Residents characteristics	RC1	.728	.556	.874	.867
	RC2	.723			
	RC3	.710			
	RC4	.801			
	RC5	.771			
	RC6	.755			
	RC7	.724			
	Average	*.745*			
Physical	PS1	.913	.673	.932	.902
	PS2	.709			
	PS3	.836			
	PS4	.912			
	PS5	.700			
	PS6	.825			
	Average	*.816*			
Non-physical	NP1	.826			
	NP2	.706			
	NP3	.726			

Table 4. Convergent validity and construct reliability analysis outcome (*continued*)

Factors	Indicators	Outer Loading	AVE	CR	CA
	NP4	.726			
	NP5	.741			
	NP6	.757			
	NP7	.841			
	NP8	.818			
	NP9	.779			
	Average	*.769*			

Note: Average Variance Extracted – AVE; Composite Reliability – CR.

Convergent and discriminant validity were evaluated using CFA. The outer loading values for all indicators ranged from .700 to .913, exceeding the .5 threshold, thereby confirming the validity of the measurement model. Furthermore, the AVE for each construct was above the recommended minimum of .5, further validating the model.

Moreover, the CR values, ranging from .874 to .932, surpassed the minimum threshold of .7, affirming the reliability of the constructs. As shown in Table 4, CV is supported since all loading factor values exceed .50, ensuring that all indicators meet the required criteria. A construct is deemed reliable when both CR and CA values exceed .70. Additionally, all constructs exhibited CA values between .867 and .914, well above the acceptable threshold of .7. Consequently, each questionnaire item is deemed valid and suitable for further analysis.

Discriminant validity is demonstrated when the square root of the AVE for each construct exceeds the correlation between that construct and the other constructs. The square root of the AVE values, derived from the CV analysis, is shown in Table 5. These values confirm the establishment of discriminant validity, as the square root of the AVE for each construct is greater than its correlations with other constructs.

Table 5. Analysis result of discriminant validity analysis – Fornell-Larcker criterion

Constructs	Resident Characteristics	Physical	Non-Physical
Residents Characteristics	.745		
Physical	.048	.820	
Non-Physical	.087	.095	.770

All AVE values in this study are greater than the correlation between the corresponding sets of components, confirming that the measurement model demonstrates high discriminant validity. This supports the suitability of the model for further data analysis, as it indicates that each construct is distinct from the others.

The final results of this study reveal several significant findings regarding the driving factors behind the transformation of front transitional spaces in Low-Income Community Housing in Grand Boulevard Regency, Kendari City. Based on the average values of Outer Loading derived from the Partial Least Squares Structural Equation Modeling analysis, the physical aspect of the building emerged as the most influential variable, with an average score of .816. This suggests that physical elements such as facade conditions, spatial layout, and environmental comfort play a dominant role in prompting spatial transformations among residents. The second strongest factor is the non-physical aspect, which recorded an average Outer Loading value of .769. This indicates that social and cultural influences,

including lifestyle and interaction patterns, significantly contribute to spatial changes. Lastly, the characteristics of the residents, while still influential, presented a slightly lower average score of .745. These values reflect the varying degrees of influence among the three constructs, positioning physical conditions as the most compelling driver of spatial adaptation in this low-income housing context.

Within the dimension of residents' characteristics, income (RC4) stands out as the most influential factor contributing to spatial transformation, achieving a value of .801. This suggests that economic capacity plays a central role in shaping how occupants modify and utilize their front spaces.

As for the physical aspects of the building, the most dominant indicators—all with calculation values above .8 include an unattractive facade (PS1), which recorded the highest value at .913, followed closely by ownership status (PS4) at .912. Other notable contributors are the division of interior space (PS3), with a value of .836, and environmental comfort aspects such as air temperature and lighting (PS6), which scored .825. These results highlight the importance of both structural conditions and perceptions of property ownership in prompting residential modifications.

In the non-physical domain, lifestyle (NP7) emerged as the leading factor, scoring .841, followed by social interaction (NP1) with a value of .826, and socio-cultural identity (NP8), which achieved 0.818. These findings underscore the interplay between everyday practices, social dynamics, and cultural values in shaping residents' decisions to alter transitional spaces.

Overall, the single most significant driving factor across all categories is the unattractive facade (PS1), which holds the highest recorded value at .913. This reinforces the conclusion that visual dissatisfaction with building exteriors is a key impetus for spatial transformation within low-income housing environments.

Figure 5 presents the conceptual model of the research findings, illustrating the key factors driving the transformation of the front transitional space in low-income community housing. This model visually represents the key factors identified in the study, such as the physical, non-physical, and occupant characteristics, along with their respective influences on the transformation process. It serves as a clear representation of the relationships between the different variables driving the changes in the front transition space within the context of low-income community housing.

Previous research, including studies by Reid (2023), Sunarti et al. (2019), and Barreira et al. (2019), has identified that the transformation of transitional spaces in residential areas is influenced by both physical and non-physical factors. Physical aspects involve the housing unit's location, the condition of the residential area, environmental quality, and accessibility to surrounding facilities, while non-physical factors relate to resident behavior, preferences, and socio-cultural dynamics. In this context, transitional spaces play a pivotal role in housing adaptation, serving as intermediaries between private and public spheres. These studies provide critical insights into how the functions and forms of transitional spaces evolve in response to the changing needs of urban populations, particularly among low-income communities.

This study reinforces and extends previous findings by highlighting that the transformation of front transitional spaces in low-income housing is significantly influenced by three main categories: physical building attributes, residents' socio-economic characteristics, and non-physical motivations such as personal preferences and perceived needs. The most prominent findings show that unattractive facades (PS1 = .913) and

homeownership status (PS4 = .912) are major triggers for physical transformation, while income level (RC4 = .801) stands out as the dominant determinant from the socio-economic perspective. These results underscore that inflexible housing design and a mismatch between original spatial structures and the dynamic needs of residents act as catalysts for informal spatial modifications. Often, such modifications are pragmatic responses to spatial limitations and unmet demands for additional functional areas, which were not addressed in the original housing schemes designed by developers or government housing policies.

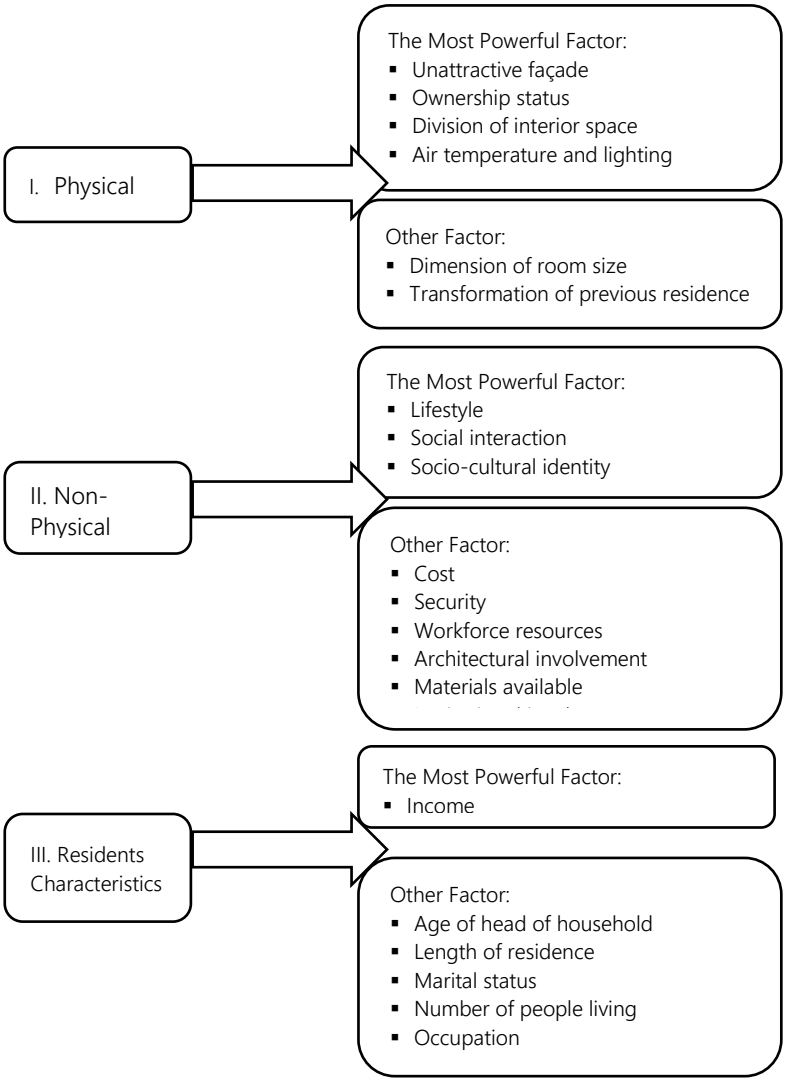

Figure 5. Conceptual model of driving factors causing the transformation of the front transition space in MBR Changes.
Note: The author's analysis results used CFA with SEM.

Nevertheless, the transformation process does not merely alter the morphology of individual housing units but also carries significant implications for the overall quality of the residential environment. Additions such as extended roofing, enclosed porches, and altered facades typically implemented without formal planning disrupt natural ventilation, reduce daylight penetration, and interfere with stormwater runoff patterns, thereby compromising local drainage systems (Gunathillaka & Coorey, 2014; Makachia, 2011). Furthermore, such individually driven spatial interventions degrade the visual coherence and spatial order of the settlement, contributing to reduced thermal comfort and exacerbating micro-urban heat island effects in densely populated areas (Barreira et al., 2019; Reid, 2023).

These findings emphasize a fundamental mismatch between residents' evolving needs and top-down design approaches in formal housing programs. In line with observations by Egercioğlu (2016) and Omar et al. (2012), this condition reflects a regulatory gap in housing policies that fail to account for long-term spatial adaptability. Consequently, there is an urgent need for adaptive and participatory policy frameworks that accommodate household-level spatial transformations without undermining ecological performance at the neighborhood scale. Climate-responsive and context-sensitive planning approaches are essential to ensure that spatial adaptations in transitional spaces not only fulfill resident needs but also support environmental sustainability and overall living comfort (Asante & Ehwi, 2022; Sunarti et al., 2019).

4. Conclusion

This study examines the driving factors behind the transformation of front transition spaces in low-income housing in Indonesia, with particular attention to the case of Grand Boulevard Regency in Kendari City. The findings reveal that physical aspects of the buildings are the primary drivers of transformation, with unattractive facades identified as the most influential element. Other contributing physical factors include ownership status, spatial layout, and environmental conditions such as air temperature and lighting. Regarding occupant characteristics, income emerges as a significant factor, while non-physical aspects such as lifestyle, social interaction, and socio-cultural identity also contribute meaningfully to the transformation process.

The study's novelty lies in its emphasis on the pivotal role of architectural aesthetics particularly facades in shaping resident behavior in low-income housing contexts. These findings offer valuable insights for urban planners, architects, and policymakers by presenting a conceptual framework that integrates both physical and social dimensions of housing transformation. Future research may build upon this framework to explore design interventions that better align with residents' evolving needs and socio-cultural dynamics.

The weaknesses of this study lie in several aspects that can then be used as guidelines or roadmaps for future research. First, it only focuses on physical, non-physical, and occupant characteristics, but does not take into account external environmental or community-wide factors, such as local policy changes, economic shifts, or regional infrastructure development. These factors can also play an important role in shaping the transformation of transitional spaces.

Second, although it is in-depth, this study may overemphasize physical factors and ignore the complex interactions between physical and non-physical elements. A deeper

exploration of how these factors are interrelated can provide a richer understanding of the transformation process.

Third, this study appears to be cross-sectional, only capturing a snapshot of the driving factors at a specific point in time. A longitudinal approach would allow for observation of how the transformation of the front transitional space evolves over time and how various factors may gain or lose influence over time, especially as community and housing conditions change.

Fourth, related to the limited generalizability of the findings, this study is context-specific to low-income community housing in Grand Boulevard Regency, Kendari City. While the findings provide valuable insights for this particular setting, they may not be easily generalizable to other regions or types of low-income housing. A broader study that includes more diverse geographic and cultural contexts could strengthen the applicability of the findings.

Finally, regarding potential measurement bias, this study relies on calculated values (AVE, factor loadings) to assess the importance of each factor. While this statistical method is useful, it may not fully capture the subjective experiences of residents, which are particularly important when analyzing non-physical factors such as lifestyle, social interactions, and socio-cultural identity. A more holistic approach, incorporating qualitative data, could provide a deeper understanding of these aspects.

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