

The densification Q^2 value of 0.330 explains that the two latent variables of exogenous densification, namely spatial transformation and physical transformation of the residential, have a strong influence, namely 33%. The physical transformation of residential Q^2 value of 0.307 explains that the two latent variables of exogenous physical transformation of residential, namely spatial transformation, economic transformation, and sociocultural transformation, have a strong influence of 30.7%. The Q^2 value in the combined model between transformation and densification theory has a positive coefficient value with a strong value of (>0.3).

The dimensions of land use changes and building characteristics affect a physical spatial transformation characterized by a large-scale housing development phase driven by the Perumnas VII/South Sulawesi Project for the Bumi Tamalanrea Permai location. The area's development was marked by an increase in residential units in 1991–1996, with phase 1 of the handover of land management rights (HPL) from the government to Perumnas developers starting in single blocks, namely Blocks A, B, C, and L. The second phase, 1996, handed over Land Management Rights (HPL) land covering an area of 67,691 hectares. Then, in 1997/1998, the 3rd phase of land handover was carried out with a land area of 91.77 hectares. In the construction of single and multiple dwelling units, namely Blocks J, K, G, H, I, E, F, AA, AC, AF, AD, and AB, in the period 2001–2011, occupancy increased with the growth of cluster or gated community housing, rental flats (Rusunawa Kodam), and shophouse complexes with 2-story building characteristics by private developers utilizing Perumnas' commercial land lot purchase policy. This finding is in line with Giyarsih [16] finding of transformation due to densification and contradicts Bibby et al. [17] finding that densification results in physical changes to the neighborhood. The findings of this study reveal that physical spatial transformation has a direct positive effect and an indirect effect on settlement densification (see Fig. 2). This means that densification is determined by the economic transformation process, with an emphasis on the magnitude of the physical changes in residential and commercial buildings that occur.

This finding also shows that physical spatial transformation positively affects economic transformation. This is in line with the results of Surya et al. [18]. The findings of this study reveal that spatial transformation from initial and new spatial conditions encourages economic changes in the economies of migrant communities, especially local communities, with changes in work structure and increased revenue.

The change in land use from non-built areas to built-up housing is the initial factor in changing the structure of work, especially in the primary sector, which initially dominates, and there is an increase in the tertiary sector. The development of the area also encourages changes in family income through side businesses, both run by the husband or wife and supported by the income of family members. The economic transformation also encourages an increase in the intensity and activity of the formal and informal economies found along main roads and neighborhood roads for 24 hours. This means that the economy in the Bumi Tamalanrea Permai area encourages changes in the economic structure and eventually becomes a growth magnet for suburban areas.

This means that physical spatial transformations contribute to and cause changes in social status characterized by increased economic functions. Changes in the social system are highly dependent on changes in social status and can occur both before and after settling in a place due to changes in livelihoods, affecting community income. Increased migration and settlement eventually formed a modern social structure as an urban industrial society. With the growth of gated communities developed by Perumnas (government) as strategic sales and the private sector, rental flats (Rusunawa Kodam), the process of spatial change with the growth of gated communities eventually evolved towards spatial segregation. Changes in the social structure within the BTP area and its surroundings eventually changed the social order. In open settlement communities, spatial changes encourage changes in the social system from being conflict-prone due to heterogeneous communities to social segregation based on ethnic, religious, and regional groups.

There is social mobility between local communities and migrants, as measured by economic and social capital mobility. Changes in mobility in local communities move to vertical mobility with the support of economic capital and intergenerational capital that prioritize good education, which certainly encourages changes in the income of local communities. However, the cultural capital of the Kampung community passes on culture to children and grandchildren, which means that social mobility from the cultural aspect moves to horizontal cultural mobility. Furthermore, the shift in social status formed by the form of residential space arrangements for the upper middle class in gated community housing makes a difference to the process of sociocultural transformation in suburban residential areas, which leads to the development of spatial segregation. Social mobility is a change in social processes that involves vertical and horizontal mobility between migrants and residents. In Surya et al. [38], the development of an increasingly complex social order impacts population mobility, population composition, and the separation of groups of people based on ethnicity and economic ability.

Sociocultural transformation is characterized by changes in the social system where there are changes in the social structure of the community both before and after spatial changes that encourage socioeconomic changes and improve the quality of life in the environment and residence, and ultimately encourage the need for change, adjustment, and physical transformation of the residential, which is characterized by changes in form, space, elements, the building complements, and function of residential buildings.

Spatial transformation has a direct and indirect effect on the physical transformation of residential areas. This finding aligns with Forouhar et al. [19] and Lien [22]. The findings of this study reveal that socio-spatial, socioeconomic, and spatial-economic factors can determine the physical transformation of residential areas. Physical residential transformation is a process of socio-spatial changes in the settlement environment that begins with changes in land use and building characteristics that encourage sociocultural changes and ultimately encourage the intensity of household economic changes and cause changes in the form, elements, and functions of housing.

Furthermore, it was also found that the economic transformation directly influences the residential-physical transformation but does not directly relate to densification. These findings are in line with Lien [22], and this finding contrasts with the fact that formal private sector-driven densification strengthens social and economic life in affluent neighborhoods, according to Scheba et al. [21]. The findings of this study illustrate that economic transformation does not directly affect densification but contributes through the process of physical residential transformation. This means that socioeconomic factors are a driver of the increasing growth of densification of economic service space in residential areas through the physical transformation of residential areas. This physical change in housing is closely related to changing the structure of employment for the better by increasing household income and the number of formal and informal economic activities.

Physical spatial transformation, directly and indirectly, influences the residential physical transformation. This finding aligns with Forouhar et al. [19] and Lien [22]. The findings of this study reveal that physical spatial transformation is a determinant of changes in the house's form, element, space, and function. These changes are also influenced by several factors: (a) the potential for increasing the value of space and weak spatial control; and (b) the need for changes in the expansion of territory and the use of residential space; changes in environmental adaptation due to flooding and road improvements; changes in form and space; elements; and changes in the culture of the residential community.

The suburban development model in Indonesia, especially in Makassar City, is uncontrolled and unsustainable. Hence, this research becomes a model of suburban development in the spatial aspect, namely control through regulation and utilization of spatial aspects, physical control of buildings and houses in residential units, and urban development sectoral policy aspects.

IV. CONCLUSION

The suburban development of Makassar is growing rapidly and transforming uncontrollably. This has an impact on the value of suburban sustainability integration. The impact of this unsustainability is due to the weakness of the spatial plan, which has not become a benchmark for controlling spatial development and building in residential areas.

The concept of the relationship model is that spatial-physical transformation has a positive and significant effect on densification, and spatial transformation indirectly affects densification through the physical transformation of housing. Furthermore, the physical transformation of housing has a positive and significant effect on densification. Another relationship is that socioeconomic transformation has a positive and significant effect on the physical transformation of housing. The determining factor for the physical transformation of housing is the process of spatial and socioeconomic transformation and the need for changes desired by the community, government, and developers for buildings and their spaces to encourage increased land use activities, socioeconomic spatial interactions, and the process of sustainable integration of residential areas.

Urban development illustrates that the suburban development model results from the spatial and physical transformation of residential areas, and the settlement transformation model results from spatial, economic, and social changes encouraging increased activity and interaction in new socioeconomic spaces. Therefore, settlement densification is the growth of residential units among local settlements with the intensity of continuously increasing units both on a small scale and through periodic large-scale development with the determination of the spatial and physical transformation of residential. The results of this research will help formulate urban development policies.

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