

Effects of Livable Housing on Community Quality of Life: A Macro-Micro Study

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Abstract

Starting from the issue that access to adequate housing had only reached 38.3% by the year 2019, as evaluated through four basic parameters in the Sustainable Development Goals (SDGs). This study investigates the extent to which the livable housing indicators in SDGs influence the overall quality of life. The quality of life is assessed at the macro level using the Human Development Index parameters and at the micro level through the outcomes of government assistance programs. The results of multiple linear regression indicate that most livable housing parameters exert a strong, significant influence on the community's quality of life at the macro level. Meanwhile, the micro-community's perception in the research sample confirms Bappenas's findings and the SDGs. Considering that all parameters of livable houses significantly influence quality of life at the macro level, the research sample unit at the micro level has provided adequate confidence in most aspects of livable housing. Through this study, the authors expect that the Government can maximize the program's effectiveness in expanding household access to adequate housing, thereby achieving the target of at least 74% accessibility by 2029.

Keywords: Human development index, livable house, quality of life, household, Sustainable Development Goals (SDGs)

Abstrak

Dimulai dari permasalahan bahwa akses terhadap perumahan yang layak huni hanya mencapai 38,3% pada tahun 2019, berdasarkan empat parameter utama dalam Sustainable Development Goals (SDGs). Studi ini mengevaluasi pengaruh indikator perumahan layak huni dalam SDGs terhadap kualitas hidup secara keseluruhan, dengan menilai di tingkat makro melalui Indeks Pembangunan Manusia dan di tingkat mikro berdasarkan hasil program bantuan pemerintah. Hasil regresi linier berganda menunjukkan bahwa mayoritas parameter perumahan layak huni memiliki pengaruh signifikan terhadap kualitas hidup masyarakat di tingkat makro. Sementara itu, persepsi dari masyarakat secara mikro dalam sampel penelitian mendukung temuan Bappenas dan SDGs. Mengingat semua parameter rumah layak huni secara signifikan memengaruhi kualitas hidup di tingkat makro, sampel penelitian di tingkat mikro memperlihatkan kepercayaan yang cukup terhadap kebanyakan aspek perumahan layak huni. Melalui penelitian ini, penulis berharap Pemerintah dapat meningkatkan efektivitas program guna memperluas akses rumah tangga terhadap perumahan layak huni, sehingga target minimal 74% akses tercapai pada tahun 2029.

Kata Kunci: Indeks pembangunan manusia, rumah layak huni, kualitas hidup, rumah tangga, Sustainable Development Goals (SDGs).

INTRODUCTION

Housing provision is based on the number of households to determine needs. Between 2015 and 2025, the number of Indonesian households rose steadily, from over 65 million in 2015 to more than 72 million in 2020 (BPS, 2021). According to the population projection equation in the recent government census, Indonesia is projected to have more than 74 million households by 2030 and over 83 million by the end of 2050 (BPS, 2023). By 2050, Statistics Indonesia (*Badan Pusat Statistik/BPS*) projected that approximately 60% of Indonesia's population will live in urban areas and 40% in rural areas. Moreover, 45.9% of Indonesian households still live in uninhabitable houses (Bappenas, 2020). The target is to reduce this number to 30% by 2024 and 26% by the end of 2029, in both urban and rural areas.

Sustainable Development Goals (SDGs), as defined by the United Nations (UN), are a set of global policy targets intended for local implementation by member states to eradicate extreme poverty and achieve sustainable development (Rassanjani, 2018). Adequate housing encompasses: adequate privacy; adequate space; physical accessibility; adequate security; security of tenure; structural stability and reliability; adequate lighting, heating, and ventilation; adequate basic infrastructure, including water supply, sanitation, and waste management facilities; suitable environmental quality and health-related factors; and an accessible location in relation to work and basic facilities (Golubchikov & Badyina, 2012). Furthermore, implementing sustainable housing is crucial for future benefits, as it offers a wide range of opportunities to promote economic growth, protect the environment, enhance quality of life, and ensure social equity.

Aini et al. (2024), for example, argue that housing livability, particularly in densely populated urban areas, strongly influences community quality of life. The main novelty of this research is that it is among the few Indonesian studies to assess the significance of meeting livable housing parameters for achieving the SDGs in terms of quality of life, as measured by the human development index (HDI) at the national level. This research uses the HDI as a proxy for quality of life, as it measures human development through improvements in subjective well-being, alongside other global indicators.

Housing challenges may include poor dwelling quality, housing unaffordability, and overcrowding (Winston, 2021). According to Setiawan and Nawangsari (2023), as cited in Harahap et al. (2024), a house serves as a place to live, a shelter, and a means of meeting the basic needs of individuals and their families. A house is considered livable (*Rumah Layak Huni*, RLH) based on four

basic parameters outlined in the SDGs. The term "livability" refers to the quality of life or living standards (Fouladi et al., 2024).

A house is generally considered uninhabitable if one or more of its components or materials are damaged, potentially damaged, or fail to meet building safety standards. This can also be determined by the size of the house and the health of its residents (Wicaksono et al, 2023). Besides building quality, having adequate living space is a key aspect of the Sustainable Development Goals (SDGs) related to decent and livable housing. According to Gholib (2019), the design quality of a house and the provision of adequate living space, adapted to healthy environmental conditions, shape residents' satisfaction in communities in dense urban areas.

The following aspects of a livable house are water and sanitation. Proper access to clean water and adequate sanitation are basic human needs that have a direct impact not only on health but also on social, economic, and environmental welfare (Pamungkas et al, 2022) and have broad implications for the quality of life of society (Harlin et al, 2024), as stated in Fatristya et al (2025).

Based on one of the strategic issues in the 2020-2024 National Medium-Term Development Plan (*Rencana Pembangunan Jangka Menengah Nasional – RPJMN*): Housing and Settlements, 61.7% of households occupy housing that meets at least one criterion of unfitness. According to the 2017 National Socio-Economic Survey (Bappenas, 2020), some of these households live in slum settlements, indicating that only 38.3% of households have access to adequate housing.

Within the framework of the latest 2025-2029 RPJMN, adequate housing is an integral component of fundamental human rights and remains a key indicator for achieving one of the Sustainable Development Goals (BPS, 2025). In line with the implementation of SDG indicators to measure the percentage of households with access to adequate housing, BPS data show that the rate declined significantly from 95.70% in 2018 to 56.51% in 2019 (Figure 1). This illustrates a situation in which the Government seeks more comprehensive data on households with access to adequate housing that meets all four parameters: physical durability of building construction, sufficient living space, access to clean drinking water, and access to proper sanitation, as depicted in the image below. Additionally, the SDGs define adequate housing as access to essential services such as electricity, heating, and clean cooking fuel, which improve living conditions and quality of life.

Each parameter is assigned a weight for assessing a house's suitability and includes its own technical

details, although these are not examined in depth in this study. The discussion of each parameter is at the level of general understanding of livable housing (RLH) achievement.

The target is increased to 74% for the 2025-2029 RPJMN period, up from 65.25% as shown in Figure 1. Various government interventions, implemented by the Ministry of Public Works and Housing in the last administration and now by the Ministry of Housing and Settlements, have addressed housing and residential areas through a series of programs and activities. One of these programs aims to address uninhabitable houses (*Rumah Tidak Layak*

Huni/RTLH) by transforming them into habitable houses (*Rumah Layak Huni*/RLH).

Examples of government programs include the Self-Help Housing Stimulus Assistance (*Bantuan Stimulan Perumahan Swadaya*/BSPS), Community Sanitation (*Sanitasi Masyarakat-Sanimas*), and the Drinking Water Supply Program (*Sistem Penyediaan Air Minum-SPAM*). These programs are the result of the Indonesian government’s calculation to support the achievement of the SDGs target for the proportion of households with access to adequate housing nationally.

Table 1 Percentage of Livable House Achievement Based on National Socio-Economic Survey of 2017. (Source: Bappenas, 2020)

	Parameters				Amount (%)
	Physical durability of Building Construction	Adequate Living Space	Access to Clean Water	Access to Sanitation	
RLH	√	√	√	√	38,30
	x	√	√	√	6,28
1 Indicator Less	√	x	√	√	2,03
	√	√	x	√	20,65
	√	√	√	x	8,62
	√	x	x	√	1,39
	√	√	x	x	6,90
2 Indicator Less	√	x	√	x	1,10
RTLH	x	√	x	√	4,07
	x	√	√	x	3,18
	x	x	√	√	1,07
	√	x	x	x	1,05
3 Indicator Less	x	√	x	x	3,09
	x	x	√	x	0,70
	x	x	x	√	0,78
4 Indicator Less	x	x	x	x	0,79
	TOTAL OF RTLH				61,70
	TOTAL OF RLH				38,30
	TOTAL PERCENTAGE OF HOUSEHOLD				100,00

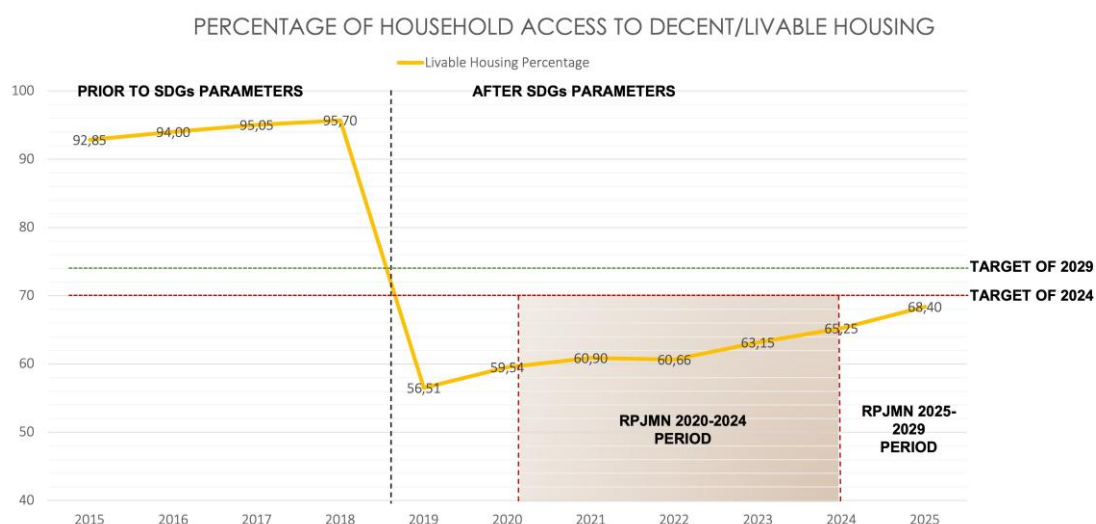


Figure 1 Percentage of Household Access to Livable Housing. (Source: BPS, 2025)

Houses or residential buildings that still lack at least one parameter will be assessed as unsuitable for sheltering, as illustrated in Table 1.

Housing conditions significantly affect people's quality of life (Balestra & Sultan, 2013), providing individuals and families with a sense of privacy, security, stability, and control when adequate. On the other hand, poor-quality housing, inadequate access to basic sanitation, and overcrowding contribute to health problems. Studies have found that overcrowding is linked to physical illness, including infectious diseases such as tuberculosis and respiratory infections (Krieger & Higgins, 2002). As families with relatively fewer financial resources are more likely to experience unhealthy and unsafe housing conditions, they are also less equipped to address them, and uninhabitable housing contributes to widening health disparities across socio-economic groups (Dunn, 1999).

Ownership of a habitable house is a key factor in assessing quality of life (Streimikiene, 2015). Based on the approach taken by the Rural Alberta Development Fund (RADF) in measuring quality of life, the aspects used are: 1) Emotional Well-Being, 2) Interpersonal Relations, 3) Material Well-Being, 4) Personal Development, 5) Physical Well-Being, 6) Self-Determination, and 7) Social Inclusion (Appulembang & Dewi, 2017). In the Material Well-Being dimension, there are three leading indicators: sufficient income, the quality of the home one lives in, and expenditure (Howard Research & Management Consulting Inc., 2009). Furthermore, Streimikiene (2015) also explains that there are three important indicators for housing in improving the quality of life, namely: 1) housing quality; 2) housing environment; and 3) housing expenditure burden. In addition, Clapham et al. (2018) found that the physical condition of a house, housing tenure, and status influence subjective well-being.

Subjective well-being measures can be divided into three main categories that require independent measurement and explanation: life evaluations, positive emotions, and negative emotions (Helliwell & Barrington-Leigh, 2010). These can also be assessed by examining their correlations with other individual characteristics and their predictive validity (Kahneman & Krueger, 2006).

In the World Happiness Report 2020, Helliwell et al. (2020) compare various global indicators. These include the SDG Index, the Human Development Index (HDI), the Index of Economic Freedom (IEF), the Global Peace Index (GPI), the Global Competitiveness Index (GCI), and GDP per capita. The findings show that the HDI is the most strongly correlated indicator of welfare. From a quality-of-life perspective, the Human Development Index is an essential annual indicator, published both in Indonesia and globally.

Mahbub ul Haq (1995) believes that human development is the process of expanding choices, including political freedom, participation in community life, education, survival, health, and a decent standard of living. Furthermore, the United Nations Development Program (UNDP) defines human development as comprising three basic ideas: people, opportunities, and choices. Statistics Indonesia (BPS), through its publication of the 2024 (2025) Human Development Index, assesses the HDI across three dimensions. These three dimensions are as follows.

1. Longevity and a healthy life
2. Knowledge
3. Decent standard of living

The close relationship between the three HDI dimensions and the provision of livable housing to the community, as explained in the quality-of-life indicator, is that one of the objectives of such housing is to ensure the health and mental development of the inhabitants. This can also be described in terms of longevity and healthy living, as measured by the extent of household access to clean water and adequate sanitation. Beyond longevity and healthy living, knowledge acquisition is strongly influenced by residence size, which supports learning and experimentation (Streimikiene, 2015). The final dimension is a decent standard of living, measured in part by community income and expenditure indicators.

BPS (2025) reports that during the COVID-19 pandemic in 2020-2021, global HDI growth declined, primarily due to deterioration in human health and life expectancy. The decline was further exacerbated by restrictions on economic and educational activities, which contributed to a global recession. The decrease in average income and expenditure among most Indonesians limited their access to adequate employment, education, healthcare, and housing, resulting in a decline in the standard of living, particularly in urban communities, which, according to Checa-Olivas et al. (2021), negatively affects the HDI at higher rates of overcrowding. Following the crisis, Indonesia's HDI trended upward. However, growth stagnated after 2022, as shown in Figure 2. Based on the description of various conditions mentioned above, this research aims to determine whether the high number of uninhabitable houses affects the community's quality of life, as measured by the Human Development Index, by identifying the following problems:

1. How do the macro parameters of livable housing influence the Human Development Index as a measure of quality of life?
2. How do households perceive the quality of life index in their community after receiving assistance for livable housing?

By identifying these problems, this research aimed to analyze the significance of livable housing parameters for the Human Development Index, a measure of quality of life, at the macro level. At the micro level, it examined households' perceptions of the community quality-of-life index following receipt of assistance to make their housing livable.

Furthermore, this research expands on the role of livable housing in shaping people's quality of life from a different perspective. While many studies on human quality of life aim to identify the concrete dimensions that shape it, few have examined in depth the effects of livable housing on residents' quality of life at the micro level and on the general public at the macro level. The intended outcome is the positive implications of providing a livable housing environment that meets all applicable parameters, both nationally and globally.

METHOD

To achieve the research objectives and address the problems, this study employs two quantitative analytical approaches: macro-level analysis using secondary data and micro-level analysis using primary data. Secondary data analysis involves examining data collected by others for a different primary purpose and is a viable option for researchers with limited time and resources, as it uses existing data (Johnston, 2014).

Macro-level analysis of secondary data directly assesses the significance of habitable housing parameters in influencing quality of life, as measured by the human development index. Meanwhile, microanalysis examines household perceptions of attaining habitable housing attributes after receiving government assistance under a habitable housing program.

The government's Self-help Housing Stimulant Assistance (BSPS) program, used as the primary data source in this study, aims to regulate and stimulate self-built housing and housing improvement. This is a common strategy to improve the affordability of the housing supply (Golubchikov & Badyina, 2012) through funding and community empowerment. The research framework is depicted in Figure 3.

The HDI was selected not only because it has the strongest correlation with aspects of global well-being, but also because of its dimensions. It is beneficial for contextualizing micro-level quality-of-life outcomes within broader structural conditions. While individual quality of life is shaped by household-level factors (such as housing quality or access to services), these factors are embedded within macro-level development environments characterized by differing levels of health infrastructure, educational systems, and economic opportunity. HDI therefore functions as a structural control, helping explain why similar household conditions may produce different quality-of-life outcomes across regions. The macro and micro data analysis approaches within this research framework each have distinct transmission routes, as described in Figure 4, based on related prior studies and findings.

The chart illustrates a situation in which government policies in the housing and residential areas sector are implemented extensively to improve the achievement of each livable/ house (RLH) parameter. It is assumed that each parameter influences at least one HDI dimension, thereby increasing the dimension's value at the macro level.

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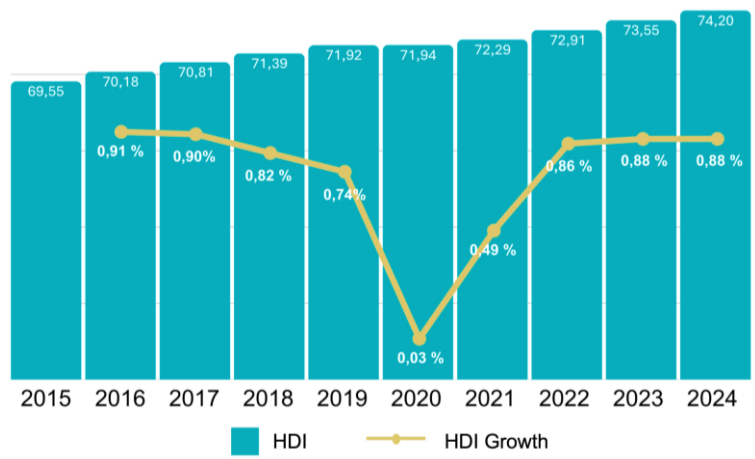


Figure 2 Indonesia's HDI, 2015-2024. (Source: BPS, 2025)

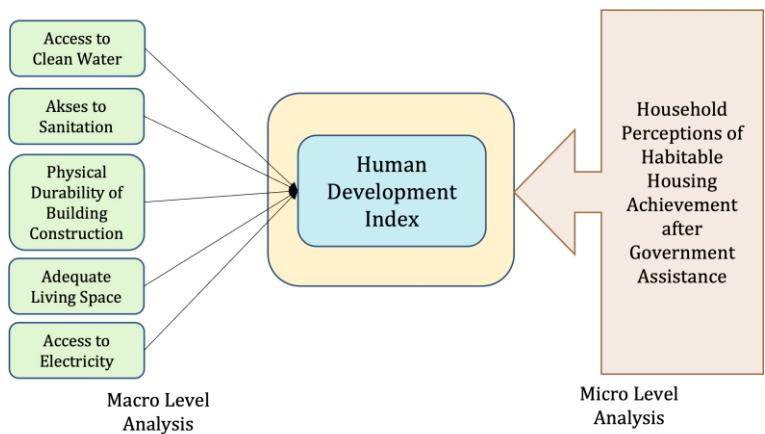


Figure 3 Research Framework.

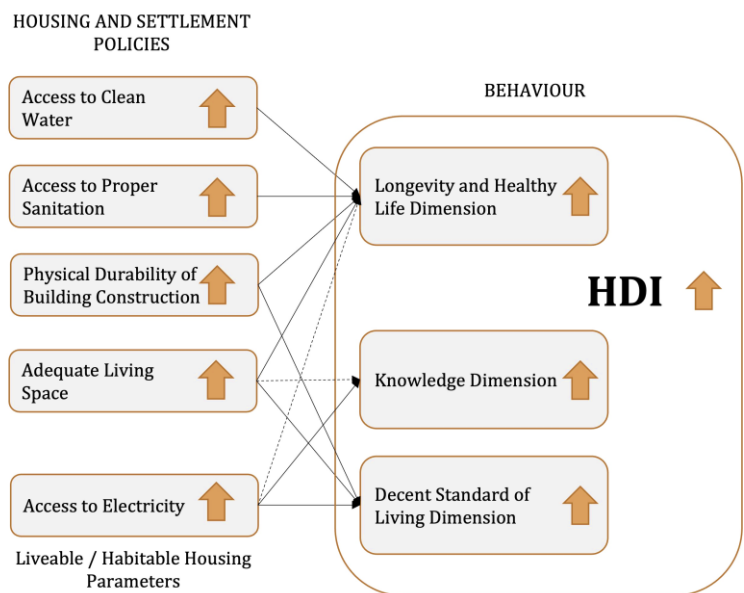


Figure 4 Macro Policy Transmission Process to Human Development Index.

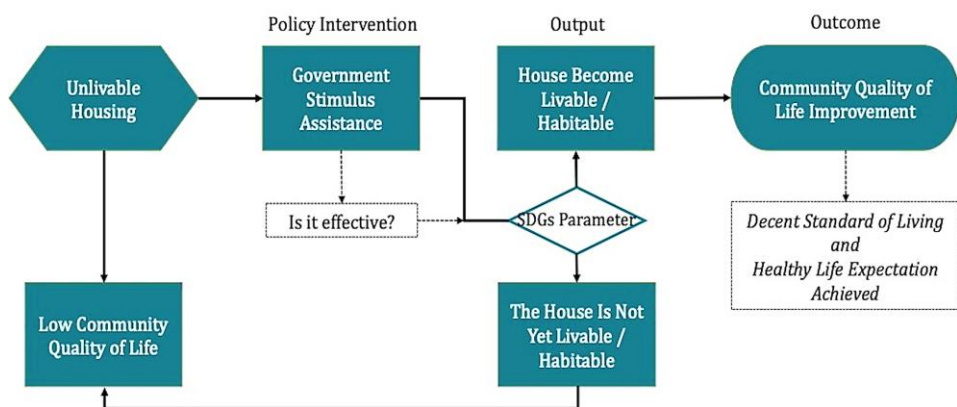


Figure 5 Micro Transmission Process of the RLH Assistance Program.

At the micro level, the effectiveness of implementing programs or activities within housing and settlement policy is reviewed, as illustrated in Figure 5.

The chart above illustrates the condition of the community/households occupying uninhabitable houses (RTLH) that, in the context of this research,

have not fulfilled the four parameters of the Sustainable Development Goals (SDGs), tend to have a low quality of life, particularly in terms of health, and have not fulfilled a decent standard of living.

To transform RTLH into livable/habitable housing (RLH), the government is intervening through

policies and stimulus assistance programs to improve their quality and facilitate their conversion to RLH. The effectiveness of these government interventions will be assessed against the SDGs.

If the RTLH object receiving government stimulus assistance meets the four RLH parameters of the SDGs, the government program intervention can be considered adequate. However, if, after receiving the RTLH program intervention, it does not fully meet the four parameters, the government stimulus assistance program cannot be considered adequate. It may continue to contribute to a low quality of life in the community.

This research will analyze the influence of RLH aspects on quality of life, providing a reference for stakeholders in maximizing the effectiveness of the RLH provision policy. The independent variable in this study is the achievement of aspects of livable housing, measured by four SDGs parameters: adequate living space, physical durability of building construction, access to clean water and sanitation, and access to electricity, as shown in Table 2. The dependent variable is quality of life, measured by the Human Development Index (HDI).

In addition to the livable housing aspects, which serve as independent variables, this study employs control variables. These variables, which can be observed or estimated, help eliminate heterogeneity and ensure the independence of treatment when conditioning on them (Newey & Stouli, 2021). This approach avoids biased estimates and preserves the causal relationship between the independent and dependent variables, ultimately yielding a better empirical model, as summarized below. Based on the research variables

outlined above, the empirical model for macro data analysis in this study is illustrated in the following equation.

$$\begin{aligned}
 HDI_{it} = & \alpha + \beta_1 CleanWater_{it} \\
 & + \beta_2 Sanitation_{it} \\
 & + \beta_3 PhysicalDurability_{it} \\
 & + \beta_4 AdequateSpace_{it} \\
 & + \beta_5 Electricity_{it} \\
 & + \beta_6 GDP_PerCapita_{it} \\
 & + \beta_7 Poverty_{it} \\
 & + \beta_8 Unemployment_{it} + \varepsilon
 \end{aligned} \tag{1}$$

- This research uses balanced panel data, least squares (OLS) processing
- Time interval used: 2015-2020
- Using secondary data sourced entirely from publications of Statistics Indonesia (BPS)
- The number of cross-sectional observations in the study was 34 provinces throughout Indonesia
- The estimate of the coefficients of all independent variables is $\beta > 0$

This study's microdata analysis uses primary data from a direct survey of decent housing assistance program recipients, which involved a questionnaire with the following instruments:

- A 2020 sample of RTLH Program Recipients with a size of 74 respondent units
- Randomly distributed to represent regions in Sumatra (3 provinces, four regents/cities), Java (2 provinces, four regents/cities), Kalimantan (2 provinces, three regents/cities), and Sulawesi (1 province, one regent).
- Questions/statements refer to research variables
- Responses based on a Likert scale

Table 2 Research Variables.

Variable List	Description	Source
Dependent Variable		
Human Development Index (HDI)	The measure of quality-of-life achievement built using a basic three-dimensional approach includes: 1) longevity and healthy life; 2) knowledge; and 3) decent standard of living.	BPS, 2021
Independent Variables		
Access to Clean Water	Percentage of households using clean water services (drinking water) that are managed safely	BPS, 2021
Access to Sanitation	Percentage of households that have access to adequate and sustainable sanitation services	BPS, 2021
Physical durability of Building Construction	Percentage of households that have houses with roof-floor-wall material quality that falls into the decent category	BPS, 2021
Adequate Living Space	Percentage of households occupying residential houses with a size of ≥ 7.2 m ² per capita	BPS, 2021
Access to Electricity	Percentage of households occupying residential houses that have been connected to electricity facilities by PLN (additional RLH variable outside the SDGs parameters)	BPS, 2021
Control Variables		
GDP per Capita	Gross regional domestic product value at constant prices by expenditure (Base Year 2010) divided by the projected population	BPS, 2021
Poverty Rate	Percentage of poor population (P0) by province and region	BPS, 2021
Unemployment Rate	Percentage of open unemployment rate by province	BPS, 2021

Table 3 Robust Test Output.

VARIABLES	(1) HDI (OLS)	(2) HDI (FE)	(3) HDI (RE)	t-Statistic (Prob)	T Statistic in Parentheses	Conclusion
Access_Clean_Water	0,02657 (0,1556)	0,02656*** (0,0000)	0,02977*** (0,0000)	0,0000		Very Significant
Access_Sanitation	0,04675* (0,0191)	0,01774** (0,0011)	0,01805*** (0,0007)	0,0007		Very Significant
Physical_Durability	-0,09327* (0,0105)	-0,03628*** (0,0001)	-0,03709*** (0,0001)	0,0001		Very Significant
Adequate_Space	0,04433 (0,1834)	0,12015*** (0,0000)	0,11469*** (0,0000)	0,0000		Very Significant
Access_Electricity	0,18972*** (0,0000)	0,06544*** (0,0000)	0,07517*** (0,0000)	0,0000	* p<0,05 ** p<0,01 *** p<0,001	Very Significant
LogGDP_PerCapita	1,85255*** (0,0000)	3,36594*** (0,0000)	2,83090*** (0,0000)	0,0000		Very Significant
Poverty_Rate	-0,17311*** (0,0000)	-0,32087*** (0,0000)	-0,28307*** (0,0000)	0,0000		Very Significant
Unemployment_Rate	-0,02738 (0,7444)	-0,01949 (0,5507)	-0,00242 (0,9370)	0,9370		Not Significant
Constant	29,68683*** (0,0001)	1,41550 (0,8868)	6,96219 (0,3893)	0,3893		-
Observations	204	204	204			
R-Squared	0,759652	0,995148	0,893739			
Adj. R-Squared	0,749792	0,993920	0,889380			
Prob (F-Statistic)	0,000000	0,000000	0,000000			

Each question is answered on a Likert scale from 1 to 10. The higher the scale value, the more the respondent agrees with or is certain of each statement or question. The questions in each variable complement one another, providing the basis for examining the micro-impact of the RTLH support program on quality of life with respect to SDG parameters. Due to the author's limited resources for obtaining research samples, the interpretations of the microdata processing results to date reflect only the characteristics of the sample obtained. They may not yet represent the entire 2020 RTLH assistance/BSPS program recipient population, potentially introducing bias.

RESULTS AND DISCUSSION

After ensuring that the regression model meets classical assumptions, we develop a community quality-of-life model that incorporates the Human Development Index (HDI) as a parameter. This resulted in the following hypotheses:

H0 = The parameters of livable/habitable housing do not impact the quality of life of the community

H1 = The parameters of livable/habitable housing have a positive influence on the quality of life of the community

The Random Effect Model (REM) was selected as the best model after conducting the Chow, Hausman & Breusch, and Pagan Lagrangian Multiplier tests to analyze the results of the macro impact estimation of the influence of SDGs parameters on the provision of livable/habitable housing on the quality of life of the community, as measured by the Human Development Index. The regression result

depicted in the robust test output table, which shows three scenarios: (1) without control variables, (2) with two control variables, and (3) with three control variables, as shown in Table 3.

In the HDI estimation model, the adjusted R-squared with a random effect is 0.889380 (approximately 88.93%). This means that, at the macro level, 88.93% of the variation in the Human Development Index (HDI) is explained by variation in the five independent variables related to livable/habitable housing.

The remaining 11.07% of the variation in the HDI is attributed to other factors outside the model. With an F-statistic (P-value) less than the α level of 0.05, the independent variable, in the form of habitable housing parameters, has a significant simultaneous effect on the community's quality of life at the macro level. From the table above, it is clear that, at the macro level, all independent variables of RLH parameters significantly influence the community's quality of life, specifically access to clean water, access to sanitation, adequate living space, the physical durability of building construction, and access to electricity. Among the control variables, only the unemployment rate has no significant effect on the community's quality of life. The output of the multiple linear regression equation of the HDI model is as follows.

$$\begin{aligned}
 HDI_{it} = & 6,962186 + 0,029769CleanWater_{it} \\
 & + 0,018046Sanitation_{it} \\
 & - 0,037090PhysicalDurability_{it} \\
 & + 0,114692AdequateSpace_{it} \\
 & + 0,075175Electricity_{it} \\
 & + 2,830901GDPperCapita_{it} \\
 & - 0,283069Poverty_{it} \\
 & + 0,002423Unemployment_{it}
 \end{aligned} \quad (2)$$

The magnitude of the coefficient follows the magnitude of the T statistic. The larger the T statistic, the larger the coefficient. Thus, at the macro level, the variables with the most significant coefficients, in order, are adequate living space, access to PLN electricity, access to clean water, and access to adequate sanitation. Meanwhile, the physical durability of building construction has a negative coefficient. However, the coefficient on this variable has the lowest p-value, indicating that its effect is smaller than that of the other independent variables.

In HDI model estimation, all parameters of livable/habitable housing (RLH) aligned with the SDGs significantly influence the quality-of-life value measured by the HDI. Among RTLH parameters aligned with the SDGs, those with the most significant positive influence (Prob. ≤ 0.001) are adequate living space, access to electricity, access to clean water, and access to sanitation. Each 1-level increase in the achievement of adequate living space, access to electricity, access to clean water, and access to sanitation increases the quality of life (HDI) by 0.1147, 0.0752, 0.0298, and 0.0181 points, respectively. This underscores the importance of fulfilling RLH parameters to improve quality of life. In the HDI model, the RLH dimension plays an essential role in the Health, Education, and Decent Standard of Living dimensions.

These four RLH parameters collectively have a significant macro-level impact on the community's quality of life. In the macro impact analysis, the government program is relevant if it aims to increase RLH and growth in the Human Development Index, a measure of quality of life. Consistent with Indayani & Sadriah's (2020) findings, government assistance was positively correlated with poverty eradication. As for the micro impact analysis, the government program in the form of RLH stimulus assistance (BSPS) in the research sample units produced findings that confirmed the results of the Bappenas evaluation regarding the achievement of RLH parameters of the SDGs nationally, which indicates that the existing housing programs need to be remodeled to contribute maximally to the achievement of all SDGs indicators.

Adequate living space and access to electricity, as parameters added to support RLH, are the most significant variables in driving the quality of life (health dimensions, knowledge dimensions, and decent living standards in the HDI) of the community at the macro level, and have a level of confidence in government programs that is adequate at the micro level. Therefore, this is in line with the findings of the Rural Alberta's Development Fund survey in Howard Research &

Management Consulting Inc. (2009) where a decent and comfortable home is one of the determinants of the Material Well-Being aspect in the components that form quality of life and with Streimikiene (2015) where the main element of a decent house is the availability of sufficient space because it has a significant impact on the quality of life, especially in terms of health and education. These findings are also consistent with Checa-Olivas *et al.* (2021), who hypothesize that living in overcrowded conditions limits people's ability to achieve the life they want and directly influences a country's human development.

The implication also extends to public health. Adequate living space facilitates healthier living conditions, including better sleep quality, reduced exposure to communicable diseases, and greater opportunities for physical activity within the home. During periods of crisis, such as pandemics or natural disasters, the importance of adequate living space becomes even more pronounced, as people spend extended periods indoors and rely on their homes to support work, education, and social life.

Although a family is classified as a Low Income Community (*Masyarakat Berpenghasilan Rendah/MBR*), the need for a house with sufficient area and adequate electricity connections has become a primary priority. Lower prices for essential electronic devices mean that low-income families can also afford them, supporting their daily activities. Moreover, internet access is necessary, particularly during and after the 2020-2021 pandemic, when the Government of Indonesia issued a school digitalization policy to expand access and improve learning quality.

According to the T-test results for the HDI multiple linear regression model, the third- and fourth-position parameters correspond to access to clean water and access to sanitation, respectively. According to the community, clean water is a fundamental necessity. Bathing, washing, and cooking are crucial to people's quality of life. These parameters, although they have a significant macro-level impact on quality of life (as dimensions of health and decent living standards in the HDI), have only reached a "sufficient" level of confidence in government programs at the micro level in the research sample units.

This result indicates that some respondents believe the government assistance program still has shortcomings and hope that this assistance also addresses adequate sanitation and access to electricity to maximize outcomes. In line with Sekarningrum *et al.* (2023), explaining that environmental sanitation conditions in their study area indicate that particular factors, such as the

physical environment, are determining factors in the level of public health.

At the macro level, the sanitation access parameter is less significant than clean water access in driving the HDI. According to community members, limited access to sanitation can be addressed through alternative solutions, such as shared toilets with neighboring houses or conducting these activities in unsuitable locations, even though this is unhealthy. However, the lack of access to clean water in the house cannot be addressed together with other issues, such as toilets and bathrooms. Each home has its own clean-water needs, so there is no alternative to providing clean water access for all RLH that will be built.

The significant influence of access to clean water and proper sanitation on people's quality of life underscores the foundational role of basic infrastructure in human well-being. Reliable access to safe water and adequate sanitation directly supports physical health by reducing exposure to waterborne diseases, improving hygiene practices, and preventing chronic health conditions. As health status is a core component of quality of life, these services contribute to overall well-being both directly and indirectly.

Regarding the RLH aspect, although physical durability in building construction is also highly significant in influencing quality of life, this study found a negative relationship. This result may be due to the primary data used in this macroeconomic analysis being the BPS composite, which comes

from various sources. However, the building's physical durability is supported by sufficient confidence in the government program at the micro level within the research sample units.

These findings align with those of Grimes et al. (2024), who found that housing quality, particularly reduced dampness and cold, influenced tenants' subjective well-being. Also, as reported in Harahap et al. (2024), Muta'ali and Nugroho (2019) explain that improving housing quality to enhance livability is often the lowest priority for low-income families. Nevertheless, enhanced living environments positively impact health and increase life expectancy by reducing exposure to health hazards, promoting healthy behaviors, and improving access to healthcare. Factors like clean air and water, access to sanitation, and safe housing directly reduce disease transmission and exposure to toxins (Carp, 1977).

From a subjective well-being perspective in health, well-constructed houses are better at preventing dampness, mold growth, pest infestations, and exposure to extreme temperatures, all of which are associated with respiratory illness and other adverse health outcomes. By reducing health risks,

durable housing indirectly enhances quality of life by lowering medical expenses, reducing sick days, and improving daily functioning.

Based on microdata analysis from primary questionnaires in this study, the collective field conditions across the research sample units corroborated the findings of Bappenas and the SDGs. This is reflected in general confidence in the implementation of the livable/decent housing assistance program, which is considered reasonable by the community receiving assistance, in this case, the research sample units. However, there are still aspects of RLH that require improvement.

One improvement that needs to be addressed is assessing the house's physical durability: not only should the materials (walls, floors, and roof) be evaluated, but structural issues should also be considered. A frequent problem in obtaining microdata is that most respondents wanted their houses in the best possible condition, especially regarding brick walls and steel/iron structures. In line with Wuryanti (2012) and Esariti et al. (2020), who find that panel houses and brick wall houses with standard reinforced concrete frame construction are the designs most expected by the Indonesian public. An overview of the research findings from macro- and micro-data analyses, addressing the research questions, is presented in Table 4.

The HDI model, as discussed previously, has several determinants: variables that are positively correlated with HDI and have a high explanatory power for the Y variable (HDI). There are four determining variables as parameters of an RLH in total in this model, as follows:

1. Adequate Living Space
2. Access to Electricity
3. Access to Clean Water, and
4. Access to Proper Sanitation

The four variables above are macro-determinants of the HDI in a region. The HDI is constructed using the indicators described in the previous paragraph. The relationships and justifications between the HDI indicators and the determinants are presented in Table 5.

CONCLUSION

Residential houses that meet SDG parameters at the 95% confidence level significantly affect community quality of life, particularly in terms of adequate living space, which strongly influences well-being at both macro and micro levels. For households receiving assistance, physical durability and perceived space adequacy are key determinants, emphasizing the importance of minimum space standards in housing regulations. Satisfaction with

living space often depends more on layout and design than size alone, reflecting subjective perceptions of control, comfort, and functionality.

Durable housing, constructed from strong materials and with environmental resistance, enhances physical security and long-term stability, thereby reducing stress and promoting well-being. Access to clean water and sanitation, vital for health, often

remains insufficient in assistance programs and requires greater focus to improve the quality of life. Policies should prioritize water and sanitation infrastructure as integral to housing, urban development, and poverty alleviation, particularly in rapidly urbanizing areas and informal settlements, to prevent health disparities and reduce multidimensional poverty.

Table 4 Macro and Micro Analysis Data Pairing.

Measurement Aspects	Macro Data Analysis	Micro Data Analysis
Sustainable Access to Clean Water	Has a significant positive impact on quality of life (HDI)	The average level of confidence of the research sample units falls into the "Quite Confident" category.
Proper Access to Sanitation	Has a significant positive impact on quality of life (HDI)	The average level of confidence of the research sample units falls into the "Less Confident" category
Physical durability of Building Construction	Has a significant negative impact on quality of life (HDI)	The level of confidence of the average research sample unit falls into the "Confident" category.
Adequate Living Space in a House Building	Has a significant positive impact on quality of life (HDI)	The level of confidence of the average research sample unit falls into the "Confident" category.
Access to Electricity from PLN	Has a significant positive impact on quality of life (HDI)	The average level of confidence of the research sample units falls into the "Less Confident" category
Human Development	Significantly influenced by the achievement of SDGs livable house parameters	The level of confidence of the average research sample unit falls into the "Confident" category

Table 5 Determining Variables in the Formation of the HDI Indicator.

Determining Variables (RLH Parameters)	Justification of RLH Parameters Relation with HDI Indicators
Adequate Living Space (positive impact)	Adequate space per capita house building area ($\geq 7.2 \text{ m}^2$ according to the SDGs mandate or $\geq 9 \text{ m}^2$ according to the mandate of Law No. 1 of 2011) is considered to play a very important role in human growth and development and health from early childhood to adulthood because it supports sufficient space for movement and circulation for activities, creativity, and expression. Adequate living space also contribute a positive influence for resident's psychological needs such as privacy, territory, and stress minimizing that might caused by limited space crowding effect. Apart from that, the health factor of a building can also be determined by the amount of light that enters and the circulation of air through ventilation (something that is minimal for houses/buildings with inadequate space to achieve).
Access to Clean Water (positive impact)	Public health based on the existence and continuity of clean water is highly positively correlated. Proper bathing, washing and cooking activities can support public health through body cleanliness and adequate nutrition.
Access to Proper Sanitation (positive impact)	The availability of access to proper sanitation, whether in the form of hand washing facilities, domestic wastewater management, or defecation facilities, is highly correlated with the health requirements of both individuals and communities. With the availability of a good sanitation system, the community can reduce the risk of disease and improve the quality of life.
Access to Electricity from PLN (positive impact)	A decent standard of living is described through the balance between people's expenditure and income. Access to electricity in a livable house is considered to be able to support community productivity in the form of utilizing technology that makes daily activities easier so that a decent standard of living can be achieved.
Physical durability of Building Construction (negative impact)	One of the important roles of residential buildings, apart from being a place of shelter from hot weather, rain and cold temperatures, is how the building can protect the lives of its residents during natural disasters such as earthquakes and floods. Furthermore, the strength of the building structure of a RLH greatly influences the health and longevity of the people living in it also can be determined by the amount of light that enters and the circulation of air through ventilation. However, these two components will be difficult to create without a solid building structure.

Despite minor shortcomings in interpreting macro-level data, the results indicate that the government has substantial potential to meet the expected targets for providing people with access to adequate, livable housing. These outcomes will be feasible, especially if accompanied by greater effectiveness through improvements in areas that remain amenable to change.

This research has limitations that warrant further study. First, conduct a calculation using a specific weighting scheme for the physical durability of building construction parameters, accounting for their composite nature. Second, if similar research is planned, a larger sample will yield a more accurate and comprehensive picture of public perception of the government's RLH program's achievements. Finally, conduct similar research using more comprehensive quality-of-life measures beyond the Human Development Index, or employing alternative analytical methods.

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