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# A Cost Efficiency Study of the Housing Voucher Program as an Alternative Housing Policy for Low-Income Communities in Surabaya City

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**Abstract:** The Government of Indonesia has implemented public rental housing (Rusunawa) program to respond to the growing housing demand among low-income communities (MBR). However, in the city of Surabaya, this program is considered inefficient due to high construction, operational, and maintenance costs, as well as limited land availability and housing units. This study aims to compare the cost efficiency between the construction of Rusunawa and the provision of Housing Vouchers as an alternative housing policy, which is widely recommended and implemented in developed countries. The method used is cost-effectiveness analysis (CEA) with a 30-year time frame (2025–2054), covering three schemes: Rusunawa construction, Housing Vouchers for lower-middle-class apartments, and Housing Vouchers for landed houses of type 36–56. The results show that Housing Vouchers for landed houses are the most efficient option, with a projected total cost of IDR 1.29 billion per household and the capacity to support up to 144 families, compared to Rusunawa (IDR 1.93 billion; 96 families) and apartments (IDR 1.83 billion; 101 families). The main challenges of this scheme include the limited availability of decent rental units and the low participation of property owners. Meanwhile, the Housing Voucher scheme for apartments is considered promising, given the high vacancy rates in the private rental housing market. This study affirms that demand-side approaches are more fiscally efficient and allow for broader beneficiary coverage compared to supply-side approaches.

**Keywords**: Housing, Housing Voucher, Rusunawa, Surabaya, Low-Income Communities

## 1. Introduction

Housing is a fundamental human need and right that serves as a benchmark for a society's standard of living and indirectly reflects a country's socio-economic well-being (Henilane, 2016; Hamme, 2017; Ajayi et al., 2020). However, the continuous surge in formal housing market prices has pushed low-income communities (*Masyarakat Berpenghasilan Rendah* or MBR) to increasingly shift toward informal housing and land markets (Satterthwaite, 2020; Sunarti et al., 2021). As the policymaker, the government is expected to determine effective and efficient strategies, interventions, programs, or schemes to enhance the ability of low- to middle-income communities to access or own adequate housing (Odoyi & Riekkinen, 2022; Rahmawati & Rukmana, 2022; Wijaya et al., 2023; Mhlongo et al., 2024).

One of the current policies implemented by the Government of Indonesia to respond to the increasing housing demand among MBR is through a supply-side approach involving the development of Rumah Susun Sederhana Sewa (Rusunawa). Globally, Rusunawa represents a form of public rental housing, which aims to provide affordable rental accommodation to low-income communities unable to access the formal housing market (Gan et al., 2019; Septanaya et al., 2021). Nonetheless, rather than resolving housing challenges, this program has introduced new issues, particularly evident in Surabaya City, where the current waitlist for Rusunawa access has reached 10,709 applicants. This high demand stems from limited available housing units and the absence of new

Rusunawa developments initiated by the local government (Dinas Perumahan Rakyat dan Kawasan Permukiman serta Pertanahan Kota Surabaya, 2024).

The limited capacity of the Surabaya City Government and other local governments in Indonesia to provide Rusunawa is largely due to the substantial financial resources required for both construction and operational maintenance (Purwaningdyah et al., 2018; Alistanti & Ariastita, 2021; Setiyoningrum & Saleh, 2023). Budget constraints and heavy reliance on public funding hinder independent management and contribute to the decline in service quality and maintenance performance (Hwang et al., 2019; Safitri & Agustina, 2022; Setiyoningrum & Saleh, 2023). In addition, extended project timelines and limited land availability have also affected the effectiveness of Rusunawa implementation (Andisi et al., 2018; Ebekozien et al., 2020; Ebekozien et al., 2022). These challenges underscore the need for studies that explore more innovative policy strategies to support low-income housing in Surabaya.

In contrast, demand-side approaches involving the private housing market are increasingly emphasized in developed countries such as the United States, the United Kingdom, and the Netherlands (Colburn, 2021). The Housing Voucher Program has become one of the most widely recommended demand-side policy alternatives for supporting low-income households. Prior research shows that this program typically incurs lower public expenditure compared to supply-side schemes that involve direct housing construction (Shroder & Reiger, 2000; Olsen, 2003; DiPasquale et al., 2003 ; Wu et al., 2020). The program also supports housing market stabilization by accelerating the reduction of unused housing stock in the private sector, helping to lower vacancy rates (Leung et al., 2012; Wu et al., 2020).

Considering the documented success of Housing Voucher Programs in various countries, this model may serve as a viable strategy to address the affordable housing crisis in Surabaya. Moreover, the Housing Voucher Program has not yet been implemented in Indonesia, and no academic research has explored its potential application in major Indonesian cities. Therefore, this study aims to assess the cost-efficiency of implementing a Housing Voucher Program as an alternative housing policy for MBR in Surabaya. In this research, efficiency is measured based on the extent to which the program cost can be optimized to deliver adequate housing for low-income communities, as compared to the conventional Rusunawa development program.

## 2. Method

### 2.1. Data Collection Methods

The data required in this study were obtained from secondary sources through literature review and institutional surveys. The literature review was conducted to assess and map previous studies, support the research objectives, and justify the research questions or hypotheses (Snyder, 2019). In this study, the reviewed literature served as a reference for determining the research foundation, methodology, and selection of variables and sub-variables, as presented in **Table 1**. Meanwhile, the institutional survey involved the collection of secondary data from relevant organizations and agencies associated with the research topic, including both governmental and private entities (Martins et al., 2018). Key contributors to the data sources in this research included the Housing, Settlement, and Land Affairs Office (Dinas Perumahan Rakyat dan Kawasan Permukiman serta Pertanahan or DPRKPP) of Surabaya City, as well as several housing developers operating in the city.

**Table 1. Research Variables and Indicators**

| Categories | | Variables | Sub-variables | Sources |
|---|---|---|---|---|
| Public Housing (Rusunawa) | Rental Policy | Investment Costs | Land Acquisition Costs | Schenk & Hague (2009); Awaliyah et al (2018); Mawardi et al (2023) |
| | | | Pre-Construction Costs | Schenk & Hague (2009); Awaliyah et al (2018); Kusriandono et al (2020); Mawardi et al (2023) |
| | | | Construction Costs | DiPasquale et al (2003); Schenk & Hague (2009); Awaliyah et al (2018); Troy et al (2019); Kusriandono et al (2020); Mawardi et al (2023); Nygaard, (2023) |
| | | | Supervision Costs | Mawardi et al (2023) |

| Categories | | Variables | Sub-variables | Sources |
|---|---|---|---|---|
| | | Management Costs | Operational Costs | DiPasquale et al (2003); Schenk & Hague (2009); Awaliyah et al (2018); Troy et al (2019); Troy et al (2019); Kusriandono et al (2020); Mawardi et al (2023); Nygaard, (2023) |
| | | | Maintenance Costs | Kusriandono et al (2020); Mawardi et al (2023); Nygaard, (2023) |
| | | | Repair or Upkeep Costs | Schenk & Hague (2009); Awaliyah et al (2018); Troy et al (2019); Kusriandono et al (2020); Mawardi et al (2023); Nygaard, (2023) |
| | | Cost of Adding New Buildings and Facilities | - | Schenk & Hague (2009); Awaliyah et al (2018) |
| | | Rental Subsidy Costs | - | Troy et al (2019); Mawardi et al (2023); Nygaard, (2023) |
| Housing Policy | Voucher | Rental Subsidy Costs | Rental Subsidy Assistance Proportion (30% of beneficiary's income) | DiPasquale et al (2003); Finkel et al (2003); Carlson et al (2010); Wu et al (2020); Congressional Research Service (2023); Abioye (2024); Sard (2024) |
| | | | Average Housing Unit Size | Finkel et al (2003); Wu et al (2020) |
| | | | Rental Price of Housing Unit | Finkel et al (2003); DiPasquale et al (2003); Wu et al (2020); Congressional Research Service (2023); Abioye (2024) |
| | | | Maximum Eligible Income of Beneficiary | Finkel et al (2003); Wu et al (2020); Congressional Research Service (2023); Abioye (2024); Sard (2024) |
| | | Administrative Costs | - | DiPasquale et al (2003); Finkel et al (2015); Sard (2024) |
| | | Market Risk Costs | Inflation Rate | DiPasquale et al (2003); Wu et al (2020); Finkel et al (2015); Congressional Research Service (2023); Sard (2024) |

***Source: Literature Synthesis, 2025***

## 2.2. Metode Analisis

To evaluate the cost-efficiency of the Rusunawa (Rumah Susun Sederhana Sewa) development policy and the Housing Voucher program for low-income communities, this study applies a Cost-Effectiveness Analysis (CEA) approach. CEA is an economic evaluation method that compares the ratio between total costs and the effectiveness of several alternative interventions, without converting outcomes into monetary value (The World Bank, 2005; Probandari, 2007; Shi & Nambudiri, 2017). Therefore, CEA is employed in this study as it is appropriate for comparing the magnitude of public expenditure to the resulting benefits, measured by the number of housing units provided or the number of low-income families served. The analysis is applied to three alternative housing policy schemes: (1) Rusunawa construction, (2) provision of Housing Vouchers for renting lower-middle-class apartments, and (3) provision of Housing Vouchers for renting landed houses. The cost-effectiveness ratio in CEA is generally formulated as follows:

$$Cost\ Effectiveness\ Ratio = \frac{Total\ Cost\ (Policy\ Budget)}{Total\ Outcome\ (Number\ of\ Low-Income\ Families\ Served)}$$

Total cost is defined as the projected annual budget required by the Surabaya City Government to implement each housing policy scheme, while total outcome refers to the number of low-income families that can be accommodated. To ensure comparability between schemes, input variables were standardized, including housing unit size (21–36 m² based on Ministry of Public Works and Housing Decree (Keputusan Menteri PUPR) No. 242/KPTS/M/2020), unit price (referring to the price range of lower-middle-class apartments in Surabaya), and location (considering proximity to urban centers, accessibility to public transportation, and disaster mitigation zones) (Dinas Perumahan Rakyat dan Kawasan Permukiman serta Pertanahan Kota Surabaya, 2022). A total of 33 mid-low-class apartments and 19 rental landed houses distributed across various areas of Surabaya City were identified and utilized as the sample in this study. The following map illustrates the spatial distribution of these housing units.

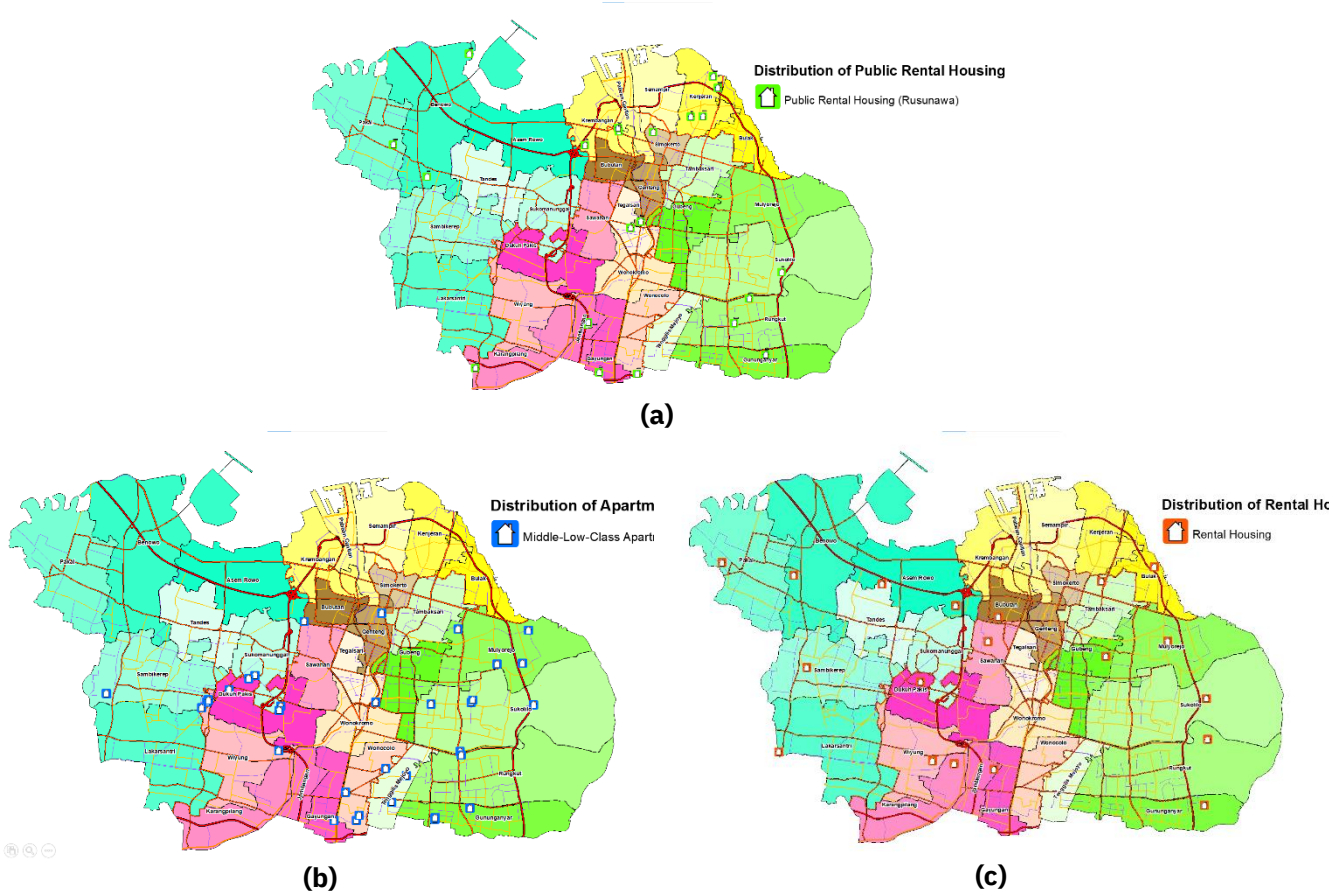


**Figure 1. (a) Distribution of Existing Rusunawa in Surabaya City, (b) Distribution of Lower Middle Class Apartment Samples in Surabaya City, (c) Distribution of Landed Houses Type 36 – 56 Samples in Surabaya City**
***Source: Author's Analysis, 2025***

This analysis also incorporates a 30-year time horizon from 2025 to 2054, with 2024 serving as the baseline year for budget projection. The 30-year period was selected based on the typical service life of residential buildings in accordance with the Life Cycle Cost Analysis (LCCA) approach, which generally ranges between 30 and 50 years (Liu et al., 2014; Ji et al., 2021; Andersen & Negendahl, 2023). For the Rusunawa policy, this estimate represents a realistic building lifecycle during which the housing is expected to function optimally without requiring major reconstruction.

The total projected fiscal requirement throughout the time horizon is calculated using the Future Value (FV) method, as the study aims to estimate nominal future budgetary needs rather than assess investment feasibility using Net Present Value (NPV). The annual inflation rate is set differently for each scheme: 4% for Rusunawa and 10% for the Housing Voucher program, reflecting distinct financing characteristics and volatility in the housing market. The formula used for estimating projected costs in each of the three housing policy schemes is adapted from HDR Alaska Inc (2001) dan Oktavia et al (2023).

$$FC_t = PC_0 \times (1 + i)^t$$

Where:

- **$FC_t$** : Future Cost, or the projected expenditure required to implement each policy scheme in year t
- **$PC_0$** : *Present Cost* or the initial expenditure required to implement each policy scheme in the baseline year (year 0)
- ***i*** : Annual inflation rate (4% or 0.04 for the Rusunawa scheme, and 10% or 0.10 for the Housing Voucher scheme)
- **t** : Target year in the projection period

## 3. Results and Discussion

### 3.1. Public Rental Housing Policy (Rumah Susun Sederhana Sewa or Rusunawa)

In this study, the cost estimation for the implementation of the public rental housing policy (*Rumah Susun Sederhana Sewa* or Rusunawa) adopts a low-rise twin block typology consisting of five floors and approximately 96 residential units. This model reflects the typical design implemented in existing Rusunawa projects in Surabaya, with particular reference to the Rusunawa Pakal Benowo, which is considered a representative precedent. The cost estimation in this scenario includes all major cost components and the projected total lifecycle cost over a 30-year period.

#### 3.1.1. Cost Estimate for One Rusunawa Twin Block

To estimate the construction cost for one twin block of *Rumah Susun Sederhana Sewa* (Rusunawa), a comprehensive cost estimation was conducted for three main components: (1) Planning Costs (pre-construction), (2) Supervision Costs, and (3) Physical Construction Costs. This estimation refers to the precedent of Rusunawa Pakal Benowo in Surabaya, assuming a five-story building with 96 units built on government-owned land. The Planning Costs include the preparation of detailed engineering design, feasibility studies, licensing, surveys, environmental and traffic impact assessments, and technical consultancy. The estimated value for this component is IDR 283,415,000. Meanwhile, the Supervision Costs, which include fees for supervision consultants, field inspections, and monitoring of the construction process, are estimated at IDR 498,695,472, based on the cost ratio from similar physical development projects with a construction value of IDR 22 billion.

**Table 2. Estimated Construction Costs for One Twin Block of Public Rental Housing (Rusunawa)**

| No. | Cost Components | Amount |
|---|---|---|
| 1 | Planning Costs | IDR 283,415,000 |
| 2 | Supervision Costs | IDR 498,695,472 |
| 3 | Physical Construction Costs | IDR 27,422,065,422 |
| | Total | **IDR 28,204,175,894** |

***Source: Author's Analysis, 2025***

The largest cost component is the Physical Construction Cost, which includes the entire construction process until the housing units are ready for occupancy. This covers structural work, architectural elements, infrastructure, and utility installations. The estimated cost for the physical construction component reaches IDR 27,422,065,422. Accordingly, the total estimated construction cost (initial investment) for the Rusunawa project amounts to IDR 28,204,175,894. This figure is used as the baseline value for Year 0 in the life cycle analysis of the Rusunawa development policy, with a projected time horizon of 30 years.

#### 3.1.2. Operational, Maintenance, and Rental Subsidy Costs for One Twin Block Rusunawa

Once the construction of the Rusunawa is completed and the facility becomes operational, the government must allocate an annual budget to ensure the continuity of its functions and the affordability of rent. There are two main cost components: operational and management costs, building maintenance, and rental subsidies. The operational component includes cleaning services, security, building repairs, utility expenses, and maintenance of public facilities (PSU). According to data from the Dinas Perumahan Rakyat dan Kawasan Permukiman serta Pertanahan (DPRKPP) of Surabaya City in 2024, the total operational and management budget for 21 Rusunawa buildings was IDR 20,266,176,130. Assuming equal distribution, the estimated operational and management cost for one twin block Rusunawa is IDR 965,056,006 per year. In addition, the budget for building repair and maintenance in 2024 was IDR 21,198,948,458. If evenly distributed across 21 Rusunawa buildings, the estimated annual maintenance cost for one twin block is IDR 1,009,473,736.

Rental subsidies are provided to maintain affordability for the target group. Referring to Article 25 of Surabaya City Regional Regulation Number 2 of 2010, the maximum rental tariff is set at 3% of the total investment cost per year, divided by 12 months and the number of housing units. With an investment value of IDR 28,204,175,894 for 96 units, the fair monthly rental rate per unit is IDR 734,484. In comparison, the actual rent paid by tenants at Rusunawa Pakal Benowo is IDR 121,600, resulting in a subsidy amount of IDR 612,884 per unit per month, or IDR 7,354,605 per year. For one twin block (96 units), the total annual rental subsidy amounts to IDR 706,042,077. Thus, the total annual budget required for managing one twin block Rusunawa is IDR 2,680,571,819. This figure is used as the reference data for the projection of annual operating costs in the life cycle analysis of the policy.

**Table 3. Estimated Operational, Maintenance, and Rental Subsidy Costs for One Twin Block Public Rental Housing (Rusunawa)**

| No. | Cost Component | Amount |
|---|---|---|
| 1 | Operational and Management Costs | IDR 965,056,006 |
| 2 | Building Repair and Maintenance Costs | IDR 1,009,473,736 |
| 3 | Rental Subsidy Cost | IDR 706,042,077 |
| | Total | **IDR 2,680,571,819** |

***Source: Author's Analysis, 2025***

### 3.1.3. Projected 30-Year Life Cycle Cost for One Twin Block Rusunawa

The projected total cost over the 30-year functional life cycle of a twin block Rusunawa in Surabaya consists of two main components: the initial construction cost and the annual costs for operations, maintenance, and rental subsidies. The construction cost is incurred only in the first year (2025), with a baseline value of IDR 28,204,175,894 (based on 2024 figures), adjusted to IDR 29,332,342,930 using a 4% annual inflation rate calculated through the future value formula. Meanwhile, the operational, maintenance, and rental subsidy costs are recurring annually over the 30-year period, starting from an initial estimate of IDR 2,680,571,819 (base year 2024), which increases annually in line with a 4% inflation rate. The cumulative future value of these annual costs over 30 years is calculated using the following formula:

$$\text{Total RS} = C \times \frac{(1+i)^{n+1} - (1+i)}{i}$$

Where, C is the value in the first year, $i$ = 0.04 (inflation rate), and n = number of years – 1. Thus, the total projected cost for operations, maintenance, and rental subsidies over 30 years is:

$$\text{Total RS} = \text{IDR } 2{,}787{,}794\backslash{,}692 \times \frac{(1+0.04)^{31} - (1+0.04)}{0.04} = \text{IDR } 156{,}353{,}291{,}755$$

By adding the two components, the total fiscal requirement for one twin block Rusunawa over 30 years amounts to IDR 185,685,634,685. When divided by 96 housing units, the average cost per unit over its functional lifespan reaches IDR 1,934,225,361.

## 3.2. Housing Voucher Policy for Lower-Middle-Class Apartments

In this study, the Housing Voucher policy scheme for renting lower-middle-class apartment units is represented by studio-type and one-bedroom (1 BR) units in the private housing market. This section presents an estimate of the annual subsidy requirement and a 30-year cost projection (2025–2054) for implementing the Housing Voucher scheme.

### 3.2.1. Rental Market Analysis for Lower-Middle-Class Apartments in Surabaya

The rental price analysis for lower-middle-class apartments in Surabaya serves as the basis for determining an appropriate Housing Voucher subsidy aligned with actual market conditions. A survey of 33 studio and 1 BR apartments in the private rental market—selected based on comparable facilities, locations, and conditions to those of Rusunawa—produced a median annual rental rate of IDR 22,000,000, with an additional annual maintenance fee (*Iuran Pengelolaan Lingkungan*/IPL) of IDR 6,000,000. Thus, the total annual rental cost

amounts to IDR 28,000,000 or IDR 2,333,333 per month. This figure forms the foundation for calculating a proportional rental subsidy under the Housing Voucher policy.

3.2.2. Estimated Cost of Providing Housing Vouchers for Lower-Middle-Class Apartments

The estimated annual Housing Voucher subsidy per apartment unit for one low-income family (*Masyarakat Berpenghasilan Rendah or MBR*) in Surabaya is based on the prevailing market rental prices for studio to 1 BR lower-middle-class apartments. The calculation is made by estimating the gap between the total annual rental cost (including maintenance fee or IPL) and the maximum rental payment capacity of low-income communities, assumed to be 30% of the 2025 Surabaya Minimum Wage (Upah Minimum Kabupaten/Kota or UMK), which is IDR 4,961,753 per month. A breakdown of the cost components is presented in **Table 4**.

**Table 4. Estimated Annual Housing Voucher Cost for One Lower-Middle-Class Apartment Unit per Household**

| No. | Cost Component | Amount |
|---|---|---|
| 1 | Annual Rental and Maintenance Fee for Studio–1 BR Apartment | IDR 28,000,000 |
| 2 | Annual Rental Payment Capacity of Low-Income Communities (30% of 2025 UMK Surabaya) | IDR 17,862,311 |
| Required Annual Housing Voucher Subsidy per Unit (Component 1 - 2)<br>**Amount of Subsidy to be Provided by the Government per Unit per Year* | | **IDR 10,137,689** |

***Source: Author's Analysis, 2025***

The amount of IDR 10,137,689 represents the annual subsidy that the government must allocate for each family receiving a Housing Voucher in the base year (Year 0 or 2024), prior to adjustments for inflation and long-term rental market dynamics.

3.2.3. Projected Cost Requirements for the Provision of Housing Vouchers for Middle-Low-Class Apartments Over 30 Years

The projected subsidy requirement for Housing Vouchers for middle-low-class apartments for low-income communities in Surabaya is calculated using an initial subsidy value of IDR 10,137,689 in Year 0 (2024) as the baseline for the 30-year period (2025–2054). This projection assumes an annual inflation rate of 10%, reflecting the increase in rental costs and service charges (Iuran Pengelolaan Lingkungan/IPL) in the commercial property sector. Using an exponential growth formula, the estimated subsidy in Year 1 (2025) is IDR 11,151,458, rising to IDR 176,896,617 by Year 30 (2054). Furthermore, the total accumulated cost over the 30-year period is calculated using the future value formula for annual growth series:

$$\text{Total HV} = C \times \frac{(1+i)^{n+1} - (1+i)}{i}$$

Where *C* is the first-year value, $i = 0.1$ (inflation rate), and $n$ = number of years - 1. Therefore, the total projected cost for providing Housing Vouchers to rent one unit of a middle-low-class apartment over 30 years is calculated as follows:

$$\text{Total HV} = \text{IDR } 11{,}151{,}458 \times \frac{(1+0.1)^{31} - (1+0.1)}{0.1} = \text{IDR } 1{,}834{,}348{,}205/\text{unit}$$

This result shows that the total fiscal burden required for providing a Housing Voucher to rent one unit of a middle-low-class apartment over 30 years amounts to IDR 1,834,348,205 per unit. This figure represents the cumulative cost that must be prepared by the government for long-term implementation.

## 3.3. Housing Voucher Policy for Landed Houses

The Housing Voucher scheme for rented landed houses involves providing rental subsidies in the form of vouchers that beneficiaries can use to rent landed houses of type 36 to 56 available on the commercial housing market. This section outlines three main aspects of the implementation of the Housing Voucher policy for landed houses in Surabaya: rental market analysis, initial cost estimation, and projected cost over 30 years.

### 3.3.1. Rental Market Analysis for Landed Houses in Surabaya

A rental market analysis for landed houses in Surabaya was conducted to establish a relevant Housing Voucher subsidy amount based on current market conditions, specifically for landed houses of type 36 to 56 that remain within the purchasing capacity of low-income communities. A survey of 19 rented landed house units across various city areas was conducted, focusing on commercial housing that is relatively affordable in terms of facilities, location, and physical conditions, and comparable to Rusunawa specifications. Data collected included monthly and annual rental fees and unit locations. The results showed that the median annual rental cost for type 36–56 landed houses was IDR 25,000,000, or approximately IDR 2,083,333 per month. This figure is used as the reference in calculating a proportional subsidy for Housing Voucher recipients in the context of rented landed housing.

### 3.3.2. Estimated Cost for the Provision of Housing Vouchers for Rented Landed Houses

The cost estimation for the Housing Voucher scheme for rented landed houses in Surabaya aims to project the government's required budget if the subsidy is implemented. Based on a survey of 19 units of type 36–56 landed houses, the average annual rental cost was found to be IDR 25,000,000. Assuming that the payment capacity of low-income communities is 30% of Surabaya's 2025 minimum wage (UMK), which is IDR 4,961,753 per month, the estimated annual contribution from low-income families is IDR 17,862,311. Thus, the remaining balance of IDR 7,137,689 becomes the subsidy that the government must provide per unit per year. This figure represents the baseline cost (Year 0) before adjusting for projected inflation or annual rental increases. The detailed cost breakdown is presented in **Table 5**.

**Table 5. Estimated Cost of Providing Housing Vouchers for One Rented Landed House Unit (Type 36–56) per Low-Income Family per Year**

| No. | Cost Component | Amount |
|---|---|---|
| 1 | Annual Rental Cost of Landed House (Type 36–56) | IDR 25,000,000 |
| 2 | Annual Rental Payment Capacity of Low-Income Communities (30% of 2025 UMK Surabaya) | IDR 17,862,311 |
| Required Annual Housing Voucher Subsidy per Unit (Component 1 – 2)<br>**Amount of Subsidy to be Provided by the Government per Unit per Year* | | **IDR 7,137,689** |

***Source: Author's Analysis, 2025***

### 3.3.3. Projected Cost Requirements for Providing Housing Vouchers for Rented Landed Houses Over a 30-Year Period

To estimate the long-term fiscal requirements of implementing an alternative policy in the form of Housing Voucher subsidies for rented landed houses (Type 36–56) for low-income communities (MBR), a 30-year projection was conducted based on the initial subsidy value (baseline cost) of IDR 7,137,689 in Year 0 (2024). This projection uses an exponential growth model assuming an average annual increase of 10% in rental costs, reflecting inflation trends in the residential and commercial property sector. Based on this calculation, the estimated subsidy in Year 1 (2025) is IDR 7,851,458, while in Year 30 (2054) it is projected to reach IDR 124,548,410. The total accumulated cost of subsidies over the 30-year period is calculated using the future value formula for a growing annuity, as follows:

$$\text{Total HV} = C \times \frac{(1+i)^{n+1} - (1+i)}{i}$$

Where *C* is the first-year value, $i = 0.1$ (inflation rate), and $n$ = number of years - 1. Therefore, the total projected cost for providing Housing Vouchers to rent one unit of a landed house type 36–56 over 30 years is calculated as follows:

$$\text{Total HV} = \text{IDR } 7{,}851{,}458 \times \frac{(1+0.1)^{31} - (1+0.1)}{0.1} = \text{IDR } 1{,}291{,}517{,}930 \text{ /unit}$$

The results indicate that the total projected cost for providing Housing Vouchers to rent one landed house unit (Type 36–56) over a 30-year period will amount to approximately IDR 1,291,517,930. This figure represents the cumulative fiscal burden per low-income household that must be borne by the Surabaya city government to ensure access to decent rental housing through the voucher scheme under a long-term implementation scenario.

## 3.4. Comparative Cost Efficiency of Public Rental Housing (Rusunawa) and Housing Voucher Schemes

As part of the policy analysis on housing provision for low-income communities (MBR) in Surabaya, this study projects the fiscal requirements for the 2025–2054 period across three alternative schemes: the development of public rental housing (Rumah Susun Sederhana Sewa or Rusunawa), the provision of Housing Vouchers for renting apartment units, and Housing Vouchers for landed houses. The estimation indicates that the Rusunawa scheme requires a total of IDR 1,934,225,361 per household over 30 years. In contrast, the Housing Voucher scheme for apartment rentals results in a lower cost of IDR 1,834,348,205, reflecting cumulative rental subsidies under the assumption of a 10% annual increase in rent. The Housing Voucher scheme for landed houses represents the most economical option, with a total cost of IDR 1,291,517,930 per household. Accordingly, over the long term, the Housing Voucher scheme for landed houses demonstrates the highest level of cost efficiency among the three policy alternatives analyzed.

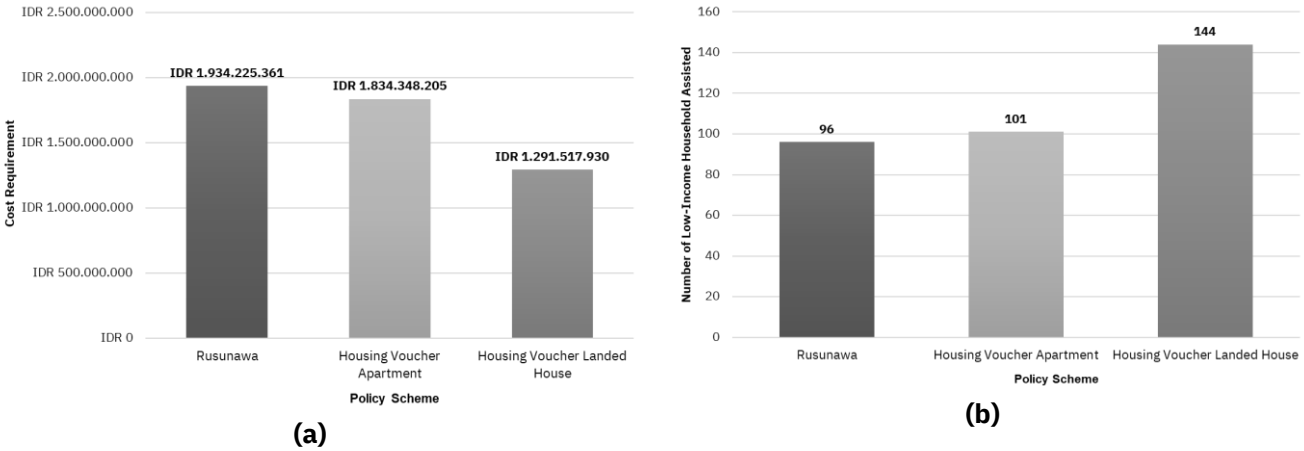


**Figure 2. (a) Projected Cost of Providing Housing for One Low-Income Household Under Three Policy Schemes (2025–2054), (b) Comparative Number of Low-Income Households in Surabaya Reached by Each Scheme with an Equivalent Budget Based on Rusunawa Costs (2025–2054)**
***Source: Author's Analysis, 2025***

To further assess the relative efficiency of each scheme, a cost-effectiveness simulation was conducted using an equal budget allocation of IDR 185,685,634,685, which represents the total fiscal requirement of the Rusunawa scheme over the 30-year period. The simulation results show that the Rusunawa scheme can accommodate 96 households, while the apartment Housing Voucher scheme can reach 101 households. In comparison, the Housing Voucher scheme for landed houses can facilitate up to 144 households over the same period. These findings suggest that the Housing Voucher for landed houses not only offers the highest cost efficiency but also delivers the greatest effectiveness in reaching beneficiaries. Therefore, considering fiscal constraints and the need for efficient public spending, the Housing Voucher scheme for landed houses should be regarded as a more cost-effective policy alternative to meet the housing needs of low-income communities in Surabaya.

## 3.5. Discussion

The findings of this study indicate that the housing policy scheme involving the provision of Housing Vouchers for landed houses of type 36–56 has the highest cost-efficiency compared to the construction of Rusunawa and the provision of Housing Vouchers for lower-middle-class apartments. The projected cost over a 30-year period for one low-income household shows that the provision of Housing Vouchers for landed houses requires only IDR

1.29 billion, significantly lower than Rusunawa at IDR 1.93 billion and apartment Housing Vouchers at IDR 1.83 billion. This finding strengthens arguments in various studies that demand-side approaches, such as Housing Vouchers, tend to be more efficient than supply-side approaches like public housing (DiPasquale et al., 2003; Olsen, 2003; Leung et al., 2012; Ross et al., 2012; CBPP, 2016; Ellen, 2020; Wu et al., 2020). Housing Vouchers do not require initial capital investment, long-term maintenance costs, or physical construction by the government, thereby reducing the fiscal burden, in this study represented by the Regional Revenue and Expenditure Budget (Anggaran Pendapatan dan Belanja Daerah or APBD) of Surabaya City. Moreover, as stated by Olsen (2003), Olsen & Zabel (2015), and Wu et al (2020), this scheme is more flexible because it allows funding collaboration from various sources, including the central government, private sector, and non-governmental organizations, without requiring direct government involvement in physical housing construction.

In terms of fiscal effectiveness, the cost-effectiveness simulation using an equivalent budget of IDR 185.68 billion shows that the Housing Voucher scheme for landed houses can reach up to 144 households, compared to only 96 households for the Rusunawa scheme and 101 households for the apartment voucher scheme. This finding aligns with the perspectives of Sard & Rice (2016), Mazzara & Knudsenz (2019), Pogossian (2020), and CBPP (2024) who argue that Housing Vouchers are more effective in expanding the reach of assistance programs under limited budgets while also enabling greater geographic and socioeconomic mobility for recipients. This advantage is particularly relevant in the context of Indonesia, where local government budget capacity is limited, while the demand for adequate housing continues to rise. The provision of rental subsidies adjusted to the payment capacity or purchasing power of low-income communities, set at a maximum of 30% of the regional minimum wage (UMK) in this study, and the flexibility to choose housing within the private market allow this scheme to reach a broader range of beneficiaries without placing excessive pressure on the APBD.

Nevertheless, the fiscal efficiency advantage of the landed house Housing Voucher scheme in Surabaya is challenged by the availability of adequate and affordable rental units, particularly in high-accessibility areas. Field findings reveal that the supply of rental landed houses meeting minimum habitability standards and priced comparably to Rusunawa is relatively limited, potentially hindering the effective implementation of this policy. In addition, the heterogeneity of rental prices and unit specifications in the local housing market makes it difficult to formulate a fair and proportional subsidy standard. This situation is further complicated by previous studies indicating that the success of such policy schemes heavily depends on the participation of property owners or landlords. Several studies have shown that landlords are often reluctant to participate in Housing Voucher programs and may discriminate against prospective tenants who are voucher recipients *voucher* (Turner, 2003; Graves, 2016; Cunningham et al., 2018). As there is no obligation for landlords to accept vouchers, they tend to prefer renting their units to non-subsidized families at higher rates (Varady & Walker, 2003; Graves, 2016; Garboden et al., 2018).

Although the Housing Voucher scheme for landed houses in Surabaya demonstrates superior fiscal efficiency, its implementation effectiveness remains constrained by the limited availability of adequate and affordable rental units, particularly in highly accessible areas. Field data indicate that the supply of rental landed houses that meet basic standards and are comparably priced to Rusunawa is still significantly limited. The variability of rental prices and unit characteristics in the commercial rental market also complicates the establishment of proportional subsidy benchmarks. This challenge is exacerbated by earlier research findings which assert that the success of such programs depends on landlords' willingness to participate. However, such participation is often hampered by discrimination against voucher recipients and landlords' preference to lease units to unsubsidized tenants at higher rents, given the absence of any legal obligation for landlords to accept vouchers (Turner, 2003; Graves, 2016; Cunningham et al., 2018; Garboden et al., 2018).

On the other hand, both field observations and previous studies related to the Surabaya property market indicate that the vacancy rate for lower-middle-class apartments in the city remains relatively high. The average absorption rate for this segment is recorded at 21.39%, reflecting a seller’s market with high demand for housing units. Simultaneously, the vacancy rate reaches 21.68%, indicating an unbalanced market condition where many

apartment units remain unoccupied or unused by their owners (Colliers, 2023 dalam Andrakayana & Septanaya, 2024). Meanwhile, Rusunawa continues to offer advantages as a government-owned asset that can be administratively controlled and function as a platform for social community development (Wardrip et al., 2011; Cai et al., 2017; Hricová & Urban, 2021). However, this policy also faces significant challenges including high construction and maintenance costs, limited land availability, and issues of targeting accuracy (Purwaningdyah et al., 2018; Alistanti & Ariastita, 2021; Setiyoningrum & Saleh, 2023). Therefore, from the perspective of fiscal efficiency and in an effort to expand the coverage of beneficiaries, the Housing Voucher scheme for lower-middle-class apartments can be considered a more responsive policy alternative. It leverages existing unabsorbed housing stock, aligns with market dynamics, and provides greater flexibility for recipients to choose housing types and locations that suit their specific needs.

## 4. Conclusion

Based on the analysis, it can be concluded that the Housing Voucher scheme for rental landed houses (type 36–56) is the most fiscally efficient and effective policy in reaching low-income communities in Surabaya, compared to the construction of Rusunawa and the provision of Housing Vouchers for lower-middle-class apartments. With the lowest projected cost and the highest number of beneficiaries reached over a 30-year period, this demand-side approach offers clear advantages in optimizing the use of the Regional Revenue and Expenditure Budget (APBD) and promoting cross-sector collaboration. However, the effectiveness of this policy remains constrained by the limited supply of rental housing that meets minimum habitability standards at affordable prices in strategic locations, as well as by potential vulnerability to market discrimination by property owners. On the other hand, the apartment voucher scheme for lower-middle-class units also demonstrates relevance as an adaptive policy response to current market imbalances, particularly the high vacancy rate of available units. These findings underscore the importance of designing housing policies that are not only fiscally efficient but also aligned with local housing market dynamics, institutional capacities, and community preferences. Therefore, the integration of demand-side approaches with market regulation and the strengthening of the government's role as a facilitator is crucial to formulating more effective and efficient housing policies for low-income communities.

## 5. Recommendation

Based on the findings of this study, it is recommended that the Surabaya City Government, as well as other local governments in Indonesia, consider adopting the Housing Voucher scheme as an alternative housing policy for low-income communities, given its higher fiscal efficiency and broader beneficiary coverage compared to the public rental housing (Rusunawa) development program. To ensure effective implementation, the government must formulate regulations that encourage landlord participation through fiscal incentives, market risk protection schemes, and anti-discrimination policies for voucher recipients. Moreover, private housing developers should be optimized as strategic partners in providing rental units that are both adequate and affordable, particularly in highly accessible areas, to ensure market sustainability. From an academic perspective, this study advocates for the development of policy evaluation models that assess effectiveness not only in terms of fiscal output and the number of beneficiaries served but also by incorporating community preference dimensions as part of a public interest-based approach, thereby strengthening the social relevance and long-term legitimacy of housing policy.

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