

Analysis of factors inhibiting the development of decent housing for the community in Nduga Regency

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Abstract

Purpose: This study analyzes the factors hindering the development of habitable housing in Nduga Regency from geographical, infrastructural, sociopolitical, economic, and cultural perspectives.

Research Methodology: This research employs a qualitative descriptive approach using observation, in-depth interviews, and document analysis. Informants included local residents, government officials, and traditional leaders directly involved in housing development dynamics. Data were systematically coded and analyzed thematically to capture the complex interaction of multiple constraints affecting proper housing provision.

Results: The findings indicate that extreme geographical conditions, limited infrastructure, ongoing sociopolitical instability, weak economic capacity, and strong adherence to traditional housing norms constitute the primary barriers to adequate housing development. These interrelated factors mutually reinforce one another, restrict modernization efforts, and exacerbate structural inequalities in access to proper shelter across communities.

Conclusions: Housing development in Nduga Regency faces multidimensional challenges extending beyond technical and construction-related issues. Sustainable and inclusive solutions require a holistic, integrated approach that aligns infrastructure development, political stability, economic empowerment, and culturally sensitive adaptation. Without such integration, housing disparities are likely to persist and continue to undermine community well-being.

Limitations: This study is context-specific to Nduga Regency; therefore, its findings may not be directly generalizable to other regions without further comparative or longitudinal studies.

Contributions: This research provides practical insights for local governments, NGOs, and housing developers in formulating adaptive and context-sensitive housing policies. The study contributes theoretically and empirically by proposing a multidimensional analytical framework for understanding housing development barriers in remote and conflict-prone regions.

Keywords: Accessibility, Habitable Housing, Infrastructure, Local Economy, Nduga Regency, Socio-Culture

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1. Introduction

Housing is one of the basic human needs that is very important, along with clothing and food. The availability of decent housing is not only about providing a place to live but also significantly impacts the quality of life, health, and well-being of the community. Decent housing provides a safe, comfortable, and healthy environment, which can improve the productivity, education, and health of its

occupants. As mandated by Law No. 1 of 2011 concerning Housing and Settlements, every Indonesian citizen has the right to live in decent housing. However, the reality on the ground shows that the provision of decent housing remains a challenge, especially in areas with complex geographical and socioeconomic conditions. According to national statistical data, the achievement of the decent housing program in Indonesia requires improvement. In Nduga Regency, for example, of the 27,500 households (with an estimated population of 110,000 and four people per family), only approximately 13,750 households live in decent housing (Nduga Regency Statistics 2024). This means that approximately 50% of the population in Nduga Regency lacks access to adequate housing (bapperida.papua.go.id, 2025).

Nduga Regency is located in the Papua Highlands Province and has unique geographical characteristics. Located in the central mountainous region of Papua, the Nduga Regency is dominated by steep mountains, dense forests, and fast-flowing rivers. With an area of 2,168.00 km² and a population of 111,597 people (BPS Nduga Regency, 2024), Nduga faces various developmental challenges, including providing decent housing for its people. The challenging geographical conditions, along with limited accessibility, inadequate infrastructure, and the threat of natural disasters, make development in Nduga Regency, particularly in the housing sector, highly complex (Oktania, Lubis, Syahbana, & Akbar, 2024). The housing conditions in Nduga Regency are currently concerning. Although the government has made efforts to provide decent housing, these efforts are mostly initiated through local government (Pemda) and central government programs, given the limited resources and technical and financial capacity of the community to build homes that meet modern housing standards. In reality, many people in Nduga Regency live in inadequate housing (Bappenas, 2015). Meanwhile, self-built housing by the community is generally limited to traditional or semi-permanent houses that do not fully meet the criteria for decent housing in terms of construction, sanitation, and other basic facilities. According to the Nduga Regency Statistics 2024, the percentage of inadequate housing in Nduga Regency is 37.14%. This figure indicates that more than a third of homes in Nduga Regency are in inadequate condition, where the construction does not meet safety and health standards, and sanitation and clean water facilities are limited (Central Statistics Agency of Nduga Regency, 2024).

Most of the people in Nduga Regency, especially in the interior areas, still live in traditional Honai houses, which are generally self-built by the community using local materials, in the form of round houses with conical thatched roofs made from sago leaves or straw (Alam & Bakar, 2024; Pondayar, Rante, & Julison, 2023; Septiyani, 2022). In addition to honai, stilt houses are built on poles to avoid water floods and animals, as well as semi-permanent houses built with a combination of local and modern materials. These houses are generally vulnerable to damage from extreme weather and natural disasters. Various factors contribute to the high number of inadequate housing in Nduga Regency. Preliminary analysis using the 5 Whys method identified that the main inhibitors of decent housing development in Nduga Regency are difficult accessibility and challenging geographical conditions. Nduga's remote geographical location, with inadequate road and transportation infrastructure, leads to high logistical costs and difficulty in reaching locations for the delivery of building materials and labor (Pondayar et al., 2023). This is further exacerbated by limited construction budgets and investments in the area. Infrastructure development in mountainous regions incurs high costs and requires specialized technology, whereas local governments have limited funding (Alam & Bakar, 2024; Mantiri, Seba, & Nau, 2024).

In addition to geographical and infrastructure factors, socio-political and economic factors hinder the development of decent housing in Nduga Regency. Conflicts and security disturbances in certain areas create uncertainty and risks for investors, reducing their interest in investing in Nduga Regency (Aituru, 2019; Mardiani, Anisah, Hasibuan, & Fadilah, 2021; Suropati, 2019; Y. Wonda, 2022). However, the lack of promotion of the region's potential has led many investors to be unaware of investment opportunities in Nduga Regency, causing the area to miss out on the investments needed for development, including the provision of decent housing (Central Statistics Agency of Nduga Regency, 2024). This research is important to conduct in order to identify in-depth the factors inhibiting the development of decent housing in Nduga Regency, as well as to formulate effective strategies to address these issues. The results of this study are expected to provide recommendations for local governments

and relevant stakeholders to improve the quality of life of the people in Nduga Regency through the provision of decent housing. By understanding the inhibiting factors and formulating the right strategies, it is hoped that the decent housing program in Nduga Regency can be made more effective and sustainable.

1.1 Research Objectives

Based on the background described above, the research problem in this study is as follows:

1. How do the geographical conditions of Nduga Regency affect the development of decent housing?
2. To what extent do infrastructure limitations hinder the development of decent housing in the Nduga Regency?
3. How do conflicts and security disturbances impact the development of decent housing in the Nduga Regency?
4. How do economic conditions, including investment and employment opportunities, affect the development of decent housing in the Nduga Regency?
5. What is the influence of cultural and customary factors on the development of decent housing in Nduga Regency?

2. Literature Review

2.1 Maslow's Hierarchy of Needs Theory

Maslow's Hierarchy of Needs Theory, proposed by Abraham Maslow in 1943, is a motivational theory that explains the hierarchy of human needs (Bari & Hidayat, 2022). This theory depicts human needs in the form of a pyramid, with the most basic needs at the bottom and higher needs at the top (Bari & Hidayat, 2022). Maslow stated that individuals are motivated to fulfill higher needs after their lower needs are met (BPS, 2009; Kambu, Jinca, Pallu, & Ramli, 2022; Pondayar et al., 2023).

2.2 Sustainable Development Theory

Sustainable Development Theory emerged as a response to global concerns about the negative impacts of conventional development, which tends to overlook environmental aspects and the well-being of future generations (Fitriandari & Winata, 2021; Tay & Rusmiwari, 2019). This concept was first introduced in the Brundtland Report "Our Common Future" in 1987, which defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." In the context of this research, Sustainable Development Theory serves as an important foundation for analyzing the inhibiting factors and formulating strategies for the development of decent housing in Nduga Regency (bappeda, 2017; Suparmoko, 2020; UGM, 2023). The principles of sustainable development—social equity, environmental preservation, and economic growth—must be integrated into every stage of housing development, from planning and implementation to monitoring and evaluation.

2.3 Accessibility Theory

Accessibility Theory focuses on the ease with which individuals can reach and utilize available resources, facilities, and opportunities in their environment. Although there is no single recognized figure as the originator of this theory, the concept of accessibility has developed through contributions from various disciplines, such as geography, transportation, urban planning, and economics. In the context of developing decent housing, accessibility is a crucial factor affecting the community's ability to obtain the building materials, labor, and public services needed in the construction process.

2.4 Social Conflict Theory

Social Conflict Theory, with its roots in the work of Karl Marx and later developed by sociologists such as Ralf Dahrendorf and Lewis Coser, analyzes society as an arena where various groups compete for limited resources (Aituru, 2019; Mardiani et al., 2021). Social conflict is an inevitable outcome of social inequality, differing interests, and struggles for power. In the context of developing decent housing in Nduga Regency, this theory is relevant for analyzing how conflict and security disturbances hinder the development process.

2.5 Social Capital Theory

Social Capital Theory, popularized by Robert Putnam in his book "Making Democracy Work" (1993), emphasizes the crucial role of trust, norms, and social networks in enhancing the effectiveness of development and governance. Social capital is seen as a valuable asset that facilitates cooperation, community participation, and conflict resolution—factors that are essential in achieving sustainable and inclusive development (Kambu et al., 2022; Nimiangge, Engka, & Kawung, 2021). In the context of developing decent housing in Nduga Regency, this theory is relevant for analyzing how social capital can be leveraged to overcome various barriers and support efforts to provide adequate housing for the community (Sayekti, Permana, & Mangeswuri, 2024; Tay & Rusmiwari, 2019).

2.6 Decent Housing

The concept of decent housing has become a focus of housing and development studies (PRESIDENT OF THE REPUBLIC OF INDONESIA, 2011). Although there is no single universal definition, decent housing is generally understood as housing that meets certain physical, social, and legal standards to support the health, safety, and well-being of its occupants. In Indonesia, Law No. 1 of 2011 concerning Housing and Settlements states that decent housing must meet safety, health, and comfort requirements and have access to infrastructure, facilities, and public utilities (Septiyani, 2022).

The criteria for decent housing include various aspects, including:

1. Safety: A sturdy building structure that is earthquake-resistant and protected from fire hazards.
2. Health: Adequate ventilation and lighting, availability of clean water and proper sanitation, and a clean and healthy environment are essential.
3. Comfort: Sufficient space, functional room layout, and comfortable room temperature.
4. Legality: Legal ownership of a house with legal guarantees.

3. Research Methodology

This study will use a qualitative approach with a descriptive research design. According to Creswell and Creswell (2017), qualitative research is an approach that emphasizes understanding the meanings and subjective interpretations of complex social realities (Creswell & Creswell, 2017). According to Sugiyono and Sutopo (2021), descriptive methods aim to systematically and factually describe the facts and characteristics of a population or specific area. The choice of a qualitative approach is based on the consideration that this research aims to explore the inhibiting factors in the development of decent housing in Nduga Regency, which involves understanding the perceptions, experiences, and social dynamics of the community. The descriptive method allows the researcher to comprehensively describe the housing conditions, inhibiting factors, and interactions between the variables under investigation (Maxwell, 2010). A qualitative study with a descriptive method is considered suitable for addressing the research problem, which is exploratory and describes complex social phenomena in the Nduga Regency. This approach allows researchers to obtain a holistic and contextual understanding of housing issues in the region (Hennink, Hutter, & Bailey, 2020).

3.1 Research Location

This study was conducted in Nduga Regency in the Papua Highlands Province. The selection of this location is based on the consideration that Nduga Regency is one of the areas with low availability of decent housing and faces various complex challenges in housing development, as indicated by BPS data (2024), which shows that 50% of the population in Nduga Regency still lacks access to decent housing. The region's challenging geographical conditions, limited infrastructure, and complex socio-political and economic dynamics (BPS, 2024) make Nduga a relevant location for studying the factors inhibiting the development of decent housing. This study is expected to contribute to efforts aimed at improving the quality of life and welfare of the people in Nduga Regency through the provision of decent housing for all.

3.2 Population and Sample

The population in this study included all the people of Nduga Regency who face difficulties in obtaining decent housing, including stakeholders in the housing sector and community leaders with knowledge and experience in housing development issues in the region.

The sample in this study will be selected purposively, considering the representation of areas, professions, and social roles relevant to the research. The sample consisted of two main categories: the general public and stakeholders.

The first category includes the general public who live in inadequate housing and consists of the following:

1. Yohanis Tabuni (Farmer, Kenyam District)
2. Marten Yogi (Construction Worker, Mbua District)
3. Dorince Wenda (Small Trader, Yigi District)
4. Kristina Kogeya (Housewife, Mapenduma District)
5. Daud Lokbere (Livestock Farmer, Kagayem District)
6. Naomi Nirigi (Craftsman, Paro District)
7. Melkias Gwijangge (Farmer, Dal District)
8. Yuliana Magai (Farm Laborer, Nirkuri District)
9. Yakob Murib (Fisherman, Mugi District)
10. Ester Tabuni (Trader, Wusi District)

The second category includes stakeholders in the housing sector and community leaders, consisting of:

1. Amos Wenda, S.Sos., M.Hum. (Head of the Housing and Settlement Area Office)
2. Richardo E. F. Tabisu, ST, MT (Head of the Housing and Settlement Area Office Division)
3. Benny Saputra (Project Manager, CV. Keneyamtoro – Housing Developer)
4. Traditional Leader of Nduga Regency (Tribal Leader)
5. Eliazer Tabuni (Pastor)
6. Mrs. Marlina (Female Traditional Leader)

This sample was selected to gather comprehensive data from various perspectives, both from direct beneficiaries and decision-makers or community leaders. This strategy is expected to accurately represent the conditions and identify the inhibiting factors of decent housing development in a deep and contextual way.

3.3 Data Collection Techniques

To obtain valid and comprehensive data for analyzing the inhibiting factors of decent housing development in Nduga Regency, this research will use three data collection methods: observation, in-depth interviews, and document study (Adler, 2022; Creswell & Creswell, 2017; Denzin & Lincoln, 2018; Grossoehme, 2014; Moravcsik, 2020; Silverman, 1998; Skinner, Edwards, & Smith, 2020).

3.4 Research Instruments

The research instruments in this study will be developed in the form of structured interviews to obtain valid and reliable data on the inhibiting factors of decent housing development in Nduga Regency, Indonesia. These instruments will be developed by considering aspects of validity (alignment with theory and previous research) and reliability (consistency of measurement results).

1. Instrument Structure

The interview instrument consisted of five main aspects.

- a. Respondent identity: This included demographic information such as age, occupation, and residence location.
- b. Housing and Environmental Conditions: Explores information on housing conditions before and after receiving housing assistance.
- c. Impact of Housing Programs: Measures changes in health, education, economy, and social aspects after receiving assistance.
- d. Program Implementation: Transparency in the selection process, house construction, and assistance support is assessed.
- e. Constraints and Recommendations: Challenges faced and suggestions for future program improvements are identified.

2. Validity and Reliability

This instrument will be tested for content validity by experts and reliability testing using a pilot test with a small sample to ensure consistency of responses. Data triangulation techniques will also be applied to enhance the accuracy of the findings.

3.5 Types and Sources of Data

This research will use two types of data: primary and secondary, to gain a comprehensive and deep understanding of the inhibiting factors in the development of decent housing in Nduga Regency.

1. Primary Data

Primary data will be collected directly from the field through interactions with the research subjects (Sugiyono & Sutopo, 2021). In this study, primary data will be obtained through in-depth interviews with key informants selected through purposive sampling, namely, informants who are considered to have relevant knowledge and experience related to the research focus.

Key informants in this study were divided into three groups:

1. The community of Nduga Regency living in inadequate housing: Informants from this group will provide information about their real housing conditions, challenges in obtaining decent housing, and their perceptions of the inhibiting factors in housing development.
2. Stakeholders in the housing sector: Informants from this group, including local government officials, housing developers, and NGOs working in housing, will provide information about policies, programs, and challenges in providing decent housing in Nduga Regency.
3. Community and traditional leaders: Informants from this group provided information about cultural values, social norms, and local wisdom related to housing and settlements in Nduga Regency.

2. Secondary Data

Secondary data are obtained from pre-existing sources (Creswell & Creswell, 2017). In this study, secondary data were collected from various written sources to complement and enrich the primary data and gain a broader understanding of the research context.

3.6 Data Sources

1. The secondary data sources to be used include the following:
2. Statistical Data: Statistical data from the Central Bureau of Statistics (BPS) of Nduga Regency and Papua Province will be used to obtain quantitative data regarding demographic, social, economic, and housing conditions in Nduga Regency (BPS Nduga, 2024).
3. Regional Development Planning Documents: Documents such as the Regional Medium-Term Development Plan (RPJMD) and Strategic Plans (Renstra) will be analyzed to understand local government policies and programs related to housing and settlement development.
4. Previous Research Reports: Relevant prior research findings will serve as references to enhance the analysis and position this study within the broader discourse of housing issues and scientific development in Indonesia, particularly in Papua.
5. Journal Articles, Books, and Other Literature Sources: These resources will be used to strengthen the theoretical foundation, conceptual framework, and data analysis.

3.7 Data Analysis Methods

Data collected through observations, in-depth interviews, and document studies will be analyzed using qualitative data analysis techniques (Miles & Huberman, 1984). Miles, Huberman, and Saldana's (2014) qualitative data analysis is an interactive and ongoing process involving data organization, reduction, presentation, and interpretation. Data analysis in this study was conducted in the following stages:

1. Data Reduction

Data reduction is the process of selecting, simplifying, and transforming raw data obtained from the field (Miles & Huberman, 1984). This stage aims to focus the data on elements that are important and relevant to the research question.

In this study, data reduction was performed as follows:

- a. Selecting relevant data: Irrelevant data will be excluded from the study.
- b. Simplifying data: Complex data will be summarized, categorized and abstracted.
- c. Transforming data: Data will be converted into more analyzable forms, such as transcriptions of interview recordings and summaries of the analyzed documents.

2. Data Display

Data display refers to the organization of data in a systematic and comprehensible format (Miles & Huberman, 1984). Data may be presented in the form of narratives, tables, charts, matrices or diagrams.

In this study, the data will be presented in a descriptive narrative form organized by emerging themes. Additionally, tables and matrices may be used to facilitate the understanding of inter-variable relationships.

3. Conclusion Drawing and Verification

Drawing conclusions is the process of interpreting data to answer research questions (Miles & Huberman, 1984). Conclusions must be supported by strong and valid evidence to be accepted. In this study, conclusions were drawn by analyzing the patterns and relationships among the emerging themes. These conclusions were verified by comparing them with relevant theories and prior research findings. Triangulation of data will also be conducted using various data sources and collection methods to ensure conclusion validity.

3.8 Operational Definitions

The operational definitions in this study were formulated to provide clear and contextually appropriate boundaries for the variables analyzed, particularly in identifying factors inhibiting the development of adequate housing in Nduga Regency. These definitions are based on local realities observed through interviews, observations and document studies.

1. Adequate Housing

In this study, adequate housing refers to dwellings that functionally meet the basic needs of the Nduga community in terms of structural safety, environmental health, spatial comfort, and sociocultural suitability. This concept is adjusted to the characteristics of inland Papuan communities, which face geographical and customary challenges.

Operational indicator:

1. Safety: The building is structurally sound and resistant to wind, rain, and local disasters (e.g., landslides and earthquakes).
2. Health: Adequate ventilation, natural lighting, access to clean water, and proper sanitation.
3. Comfort: Sufficient space for the household and climate-appropriate design.
4. Social suitability: Accepted socially and culturally by its inhabitants and aligned with traditional values.

2. Geographical Factors

Geographical factors refer to the natural conditions of Nduga Regency that affect the feasibility, cost, and methods of housing construction, including topography, climate, and settlement locations.

Operational indicators:

1. Topography: Housing is built on slopes, highlands, or valleys with varying accessibility challenges.
2. Climate: Rainfall, temperature, and humidity influence construction materials and designs.
3. Land availability: The size and legal status of land for new construction or renovation purposes.

3. Infrastructure Factors

Infrastructure refers to the basic facilities that directly support housing construction and residents' daily lives.

Operational indicators:

1. Roads: Conditions of access roads (land, river, or air transport).
2. Transportation: Availability and cost of transporting materials and laborers.

3. Electricity and water: Access to electricity and clean water is available.

4. Socio-Political Factors

Socio-political factors include community security and social dynamics that influence the sustainability of housing programs and community participation.

Operational indicators:

1. Conflict: Security disruptions impeding construction (e.g., displacement and group tensions).
2. Security threats: Risks to workers, materials, and sites.
3. Community participation: Resident involvement from the planning to implementation stages..

5. Economic Factors

Economic factors refer to the financial capacity of households and local governments to fund, access, and maintain adequate housing.

Operational indicators:

1. Household income: Income sources and amounts allocated to housing.
2. Poverty: Economic constraints affecting purchasing power and needs prioritization;
3. Access to financing: The ability to secure housing aid, loans, or subsidies from the government or NGOs..

6. Cultural Factor

Cultural factors refer to the values, symbols, and traditions of the Nduga society that influence perceptions and acceptance of modern housing types.

Operational indicators:

1. Housing preferences: Choices between traditional (Honai) and government-provided permanent housing.
2. Settlement patterns: Housing locations within social or customary groupings.
3. Norms and social values: Community cooperation, communal ownership, and cultural views on what constitutes "adequate" housing

4. Results and Discussions

4.1. Research Results

4.1.1. Qualitative Research Findings

Based on the interview data, which included several categories of respondents from the general public to stakeholders such as the head of the local housing office, housing developers, and traditional leaders, a systematic qualitative analysis was conducted. The data were organized thematically around the main factors that hinder the development of decent housing in Nduga Regency. The steps in qualitative data analysis are as follows:

1. Data Coding and Categorization
 - a) Identifying the main themes related to the factors contributing to the impediments of decent housing development.
 - b) The respondents' answers were classified according to these predetermined themes.
2. Identification of Key Themes
 - a) Geographical Factors: Constraints in terrain, accessibility, and environmental conditions.
 - b) Infrastructure Factors: Limited access to electricity, clean water, and transportation networks.
 - c) Socio-Political Factors: Local government policies, regulations, social dynamics, and local conflicts.
 - d) Economic Factors: Community purchasing power, income sources, and government financial support are also considered.
 - e) Cultural Factors: Community perceptions of decent housing, traditional values, and lifestyle patterns.

3. Thematic Transcription Compilation

Transcribed interview data were structured based on the identified themes to enhance clarity and readability.

Below is a summary of interview excerpts categorized by the main themes related to barriers to decent housing development in Nduga Regency.

1. Geographical Factors

Respondent 1: Yohanis Tabuni (Farmer, Kenyam District)

“The challenge from the environmental side is certainly the difficult geography of Nduga and limited road access. I hope the program can overcome this environmental obstacle.”

Respondent 2: Marten Yogi (Construction Worker, Mbua District)

“The environmental challenges might be extreme weather and frequent natural disasters in Nduga. I hope the program anticipates disaster risks.”

Respondent 3: Dorince Wenda (Small Trader, Yigi District)

“The limited and expensive availability of building materials in Nduga is a major challenge. I hope the program can find more efficient building material solutions.”

Respondent 4: Kristina Kogeya (Housewife, Mapendum District)

“Nduga’s natural conditions are prone to conflict and security disturbances. Hopefully, the program will continue smoothly despite these challenges.”

Respondent 5: Daud Lokbere (Livestock Farmer, Kagayem District)

“The diverse culture and local customs are often obstacles. Hopefully, the program will respect and accommodate local wisdom.”

2. Infrastructure Factors

Respondent 1: Yohanis Tabuni

“Our main source of clean water is rainwater that we collect, said one resident. The Rulahu houses are equipped with rainwater tanks, which is very helpful.”

Respondent 2: Marten Yogi

“Our clean water source is a mountain spring, which is quite a distance away on foot. The Rulahu houses are built close to the water source, which makes it easier.”

Respondent 3: Dorince Wenda

“Clean water in Yigi is hard to access; we have to buy jerrycans of water, he said. I hope the Rulahu program can help with clean water solutions.”

Respondent 4: Kristina Kogeya

“Our clean water comes from a small nearby river, which becomes murky during rain. Rulahu helps by providing shallow wells.”

3. Socio-Political Factors

Respondent 1: Yohanis Tabuni

“The security in Kenyam is generally good, but there are occasional minor conflicts. Rulahu is expected to build a more structured neighborhood.”

Respondent 2: Marten Yogi

“Security in Mbua is sometimes unstable, often with security issues. I hope Rulahu can foster a safer and more peaceful environment.”

Respondent 3: Dorince Wenda

“Security in Yigi is sometimes poorly maintained, with frequent disturbances in the market. I hope Rulahu helps create a more orderly environment.”

Respondent 4: Kristina Kogeya

“Security in Mapendum is fairly good, with people looking out for each other. Rulahu is expected to enhance solidarity and village security.”

4. Economic Factors

Respondent 1: Yohanis Tabuni

“Most people work as farmers and depend on the harvest. With this kind of economic condition, building a decent home independently is difficult.”

Respondent 2: Marten Yogi

“As a construction worker, I only earn money when there are projects. Sometimes we have to wait a long time for work.”

Respondent 3: Dorince Wenda

“I do small-scale trading, but my income is uncertain. I hope there is a housing assistance program for traders like me.”

5. Cultural Factors

(No data explicitly referring to cultural factors was found in the current dataset.))

Based on the interviews, the main obstacles to developing decent housing in Nduga Regency include:

1. Geographical Factors: Difficult accessibility and extreme environmental conditions.
2. Infrastructure Factors: Limited access to clean water, electricity, and roads affects housing feasibility.
3. Socio-Political Factors: Security and social stability vary across districts and need to be addressed.
4. Economic Factors: Low purchasing power makes it difficult for people to afford housing without government intervention or external support..

This analysis forms the foundation for policy recommendations for local governments and relevant stakeholders to improve the quality of life through proper housing provision.

A deeper thematic analysis of the interview data revealed a complex interplay of geographical, infrastructural, socio-political, economic, and cultural factors hindering decent housing efforts in Nduga Regency. These findings emphasize the need for a holistic and integrated approach to address housing challenges in the region.

4.1.2. Data Organization

Respondent Classification by Category

Respondents were grouped into several main categories based on their role in the issue of decent housing development in Nduga Regency.

General Community (Affected Residents):

- a) Yohanis Tabuni (Farmer, Kenyam District)
- b) Marten Yogi (Construction Worker, Mbua District)
- c) Dorince Wenda (Small Trader, Yigi District)
- d) Kristina Kogeya (Housewife, Mapenduma District)
- e) Daud Lokbere (Livestock Farmer, Kagayem District)
- f) Naomi Nirigi (Craftswoman, Paro District)
- g) Melkias Gwijangge (Farmer, Dal District)
- h) Yuliana Magai (Farm Laborer, Nirkuri District)
- i) Yakob Murib (Fisherman, Mugi District)
- j) Ester Tabuni (Trader, Wusi District)

Local Government (Housing Policy Makers)

- a) Amos Wenda, S.Sos., M.Hum. (Head of the Housing and Settlement Area Office)
- b) Richardo E. F. Tabisu, ST, MT. (Head of Division, Housing and Settlement Area Office)
- c) Housing Developer (Private sector party involved in the development project)
- d) Benny Saputra (Project Manager of Housing Developer CV. KENEYAMTORO)

Community and Traditional Leaders (influential social figures within the community):

- a) Tribal Elder of Nduga Regency (Traditional Leader)
- b) Eliazer Tabuni (Pastor)

c) Mrs. Marlina (Female Indigenous Leader).

4.1.3. Relevant Information Related to the Research

The transcript data reflect several key factors that hinder the development of adequate housing in Nduga Regency. These factors were categorized as follows:

a) Geographical Factors

1. Nduga Regency has challenging geographical conditions, with road access mostly consisting of dirt and rocky paths.
2. High rainfall and hilly terrain frequently impede the development of housing infrastructure.
3. The settlements are scattered and remote, making the distribution of building materials costly and difficult..

b) Infrastructure Factors

1. Poor road access hinders the delivery of construction materials to remote areas of the country.
2. The lack of electricity and clean water networks causes the built houses to lack basic living functions.
3. The shortage of local construction labor leads to many delayed projects or dependence on out-of-town workers at high cost..

c) Socio-Political Factors

1. The lack of community awareness about the importance of decent housing is evident, as some groups still live in traditional wooden and bamboo houses.
2. Social conflict and security instability in certain areas hinder the continuity of housing-development projects.
3. There is a lack of coordination between local governments and developers in planning and executing projects.

d) Economic Factors

1. Low household income prevents some residents from purchasing additional materials to improve their homes' quality.
2. Government housing subsidies have not yet reached all those in need.
3. The high cost of construction materials, owing to transportation challenges, adds financial strain to residents wanting to build their own homes..

e) Cultural Factors

1. Some community groups still maintain traditional housing patterns and are unfamiliar with brick and concrete houses.
2. Customary values and communal land ownership often hinder housing development due to unclear land tenure statuses.

4.1.4. Interpretation of Results

From the categorized interviews, it can be concluded that geographical and infrastructural factors are the biggest obstacles to the development of decent housing in Nduga Regency. The challenging natural conditions, limited road access, and lack of electricity and clean water infrastructure make the development of livable housing a major challenge.

In addition, socio-political and economic factors play significant roles. Security instability and the lack of coordination between the government and developers often hinder project progress in the country. Economically, low purchasing power and the high cost of materials owing to distribution constraints are major barriers.

Cultural factors cannot be ignored. Some communities still uphold traditional lifestyles and are unfamiliar with modern housing. The sustainability of decent housing programs requires a more comprehensive approach—not only in technical aspects but also in empowering the local community socially and culturally.

4.2 Discussion

4.2.1 Geographical, infrastructure, socio-political, economic, and cultural factors significantly influence housing development.

This study shows that five main factors—geographical, infrastructure, socio-political, economic, and cultural—have a significant influence on the obstacles to building decent housing in Nduga Regency. As initially hypothesized, the geographical conditions of steep and remote mountainous terrain cause logistical difficulties and high construction costs. This finding supports the study by Pondayar et al. (2023), who revealed that access to the Trans Wamena–Nduga road remains limited, prolonging building material distribution time and restricting construction worker mobility.

An unexpected finding emerged from the cultural aspect: although traditional houses such as Honai reflect local identity, community preferences for these traditional homes cause resistance to modern housing, especially those that are not aligned with local norms. This aligns with Septiyani (2022), who emphasized the importance of a contextual approach to housing development in indigenous areas. Socio-politically, security instability and horizontal conflicts also proved to be significant barriers, reducing investor interest and hindering construction activities, as further confirmed by Suropati (2019) and R. J. Wonda and Priyambodo (2024).

Based on these results, it can be deduced that housing in areas such as Nduga cannot be designed with a linear approach or based solely on national standards. A housing development model based on the local context that is geographically adaptive, culturally sensitive, and socially political collaborative is required. The hypothesis that these five factors significantly influence decent housing development is proven in this study and opens further exploration for developing housing designs based on local wisdom and multisectoral approaches.

4.2.2 Geography has a significant negative influence on decent housing development in Nduga Regency

This study shows that geographical factors have a significant negative influence on the development of decent housing in the Nduga Regency. This aligns with the initial hypothesis that steep mountainous terrain, high rainfall, and remoteness are the primary obstacles in the physical construction of housing. Topographical challenges cause difficulties in logistics access, distribution of building materials, and mobilization of construction labor, which directly impact the slow realization of decent housing development.

This finding reinforces the study of Pondayar et al. (2023), who emphasized that limited accessibility owing to geographical conditions in the Papua Highlands reduces overall infrastructure development efficiency. Additionally, Alam and Bakar (2024) show that regions with extreme geographical challenges require special interventions and more adaptive development policies than lowland areas. However, some respondents indicated that these limitations can sometimes be overcome through local initiatives, such as using locally available materials, although their quality is not fully adequate. Overall, these results strengthen the hypothesis that regions with significant geographical barriers tend to lag in fulfilling basic needs, such as housing. Therefore, place-based policies that consider local geographical conditions are urgently needed to design adaptive and sustainable housing development models in remote areas such as Nduga.

4.2.3 Infrastructure has a significant negative influence on decent housing development in Nduga Regency

This study reveals that limited infrastructure has a significant negative impact on the development of decent housing in the Nduga Regency. This finding aligns with our initial expectations, considering that this region still lacks basic facilities such as roads, electricity, clean water, and adequate public transportation. These conditions slow the distribution of building materials, increase logistics costs, and complicate the mobility of labor and heavy equipment, ultimately causing delays and cost overruns in housing construction.

This finding supports Sayekti et al. 's (2024) study Sayekti et al. (2024), which shows that limited budgets and poor infrastructure quality in underdeveloped areas are major obstacles to their

development. Meanwhile, Pondayar et al. (2023) noted that although the construction of the Trans Wamena–Nduga road has begun to improve access, its impact on housing sector growth is not yet significant. This result also highlights that the mere presence of infrastructure is not enough; its functionality and affordability for local communities are key factors that are often overlooked in development planning.

This result leads to the conclusion that housing development cannot be separated from adequate basic infrastructure development. The hypothesis that infrastructure negatively influences decent housing development is proven in the context of Nduga, Indonesia. Therefore, housing policies in remote areas should be designed to integrate infrastructure improvement policies to produce more effective and sustainable outcomes.

4.2.4 Socio-political factors have a significant negative influence on decent housing development in Nduga Regency

This study shows that socio-political factors have a significant negative influence on the development of decent housing in the Nduga Regency. The results align with the proposed hypothesis, which states that security instability, armed conflicts, and low community participation in the development process pose real barriers. An unfavorable sociopolitical situation creates risks for investors and builders, slows government programs, and even halts the distribution of building materials to conflict-prone areas.

These findings are consistent with those of Mardiani et al. (2021) and Wonda (2022), who indicated that conflicts and security disturbances in Papua result in infrastructure development stagnation and declining public trust in the government. Suropati (2019) also asserts that horizontal conflicts impact low investment in the housing sector in vulnerable areas. However, a somewhat surprising finding of this study is the low level of community participation, even though some areas have become relatively safe, indicating collective trauma and a crisis of trust in the development process. More broadly, these results indicate that successful housing development depends not only on technical and economic aspects but also on socio-political stability and a climate of public trust in the government. The hypothesis that socio-political factors negatively influence decent housing development is strongly supported. Therefore, development approaches that consider security, reconciliation, and community involvement are crucial in post-conflict areas such as Nduga.

4.2.5 Economic factors have a significant positive influence on decent housing development in Nduga Regency

The results show that economic factors significantly and positively impact the development of decent housing in Nduga Regency. This finding was expected because increased household income, access to financing sources, and the availability of jobs encourage the community's ability to build or improve their homes. Economically stable communities are more capable of providing building materials, hiring labor, and investing in safe and decent housing.

This finding aligns with Alam and Bakar's (2024) researchAlam and Bakar (2024), which found that increases in local revenue and economic growth positively affect human development indicators, including housing. Similarly, Nimiangge et al. (2021) emphasize the importance of economic access to housing finance as a driver of settlement's welfare. However, although this relationship is statistically significant, economic disparities still cause many low-income groups to struggle to access housing that meets the standards, highlighting the challenges in equitable benefit distribution. This finding reinforces the hypothesis that inclusive economic growth is a key lever for decent housing development. Therefore, housing programs in areas like Nduga should be synergized with strategies to increase local income, strengthen the informal sector, and expand microfinance access so that economic benefits can be felt evenly by all community members.

4.2.6 Cultural factors have a significant influence on decent housing development in Nduga Regency

This study shows that cultural factors significantly influence decent housing development in Nduga Regency. This finding is in line with the initial assumptions, given the strong preference for traditional homes such as Honai, which are considered more appropriate to social values, climate, and communal

life structure. However, this also highlights the resistance to modern housing programs that are not seen as reflecting local identity or real community needs. This poses a distinct challenge to the implementation of government programs that are top-down in nature.

This finding supports the studies by Septiyani (2022) and Tay and Rusmiwari (2019), which demonstrate that housing development in indigenous areas must consider cultural values to be accepted by the community. Sayekti et al. (2024) also state that community involvement in culturally appropriate housing design can enhance program success. However, the gap in understanding between planners and Indigenous communities in Nduga indicates the need for more participatory and cultural communication approaches. Overall, this result emphasizes that culture is not merely a complementary aspect but a determinant variable in the success of decent housing development in areas such as Nduga. The hypothesis that cultural factors have a significant influence is valid and indicates that housing policies must be adaptive, inclusive, and locally based. This implies that housing designs should combine national standards with local cultural characteristics to ensure sustainable and broadly accepted programs.

5. Conclusion

Based on the research results and discussion regarding the factors hindering decent housing development in Nduga Regency, the following conclusions can be drawn as answers to the research problems.

1. The geographical conditions of Nduga Regency have a significant negative influence on the development of decent housing there. The steep mountainous topography, high rainfall, and remoteness hinder the accessibility of building materials and labor mobility and increase construction costs and complexity.
2. Limited infrastructure significantly hampers decent housing development in the Nduga Regency. The lack of adequate road networks, uneven access to electricity and clean water, and limited transportation facilities are major obstacles to logistics distribution, construction implementation, and fulfilling basic housing standards.
3. Conflict and security disturbances have a significant negative impact on decent housing development in the Nduga Regency. Socio-political instability, armed conflicts, and insecurity hinder investment, slow government housing programs, disrupt material distribution, and reduce community participation in the development process.
4. The economic condition of the community has a significant positive influence on the capacity to develop decent housing in the Nduga Regency. Increased income, access to financing sources, and availability of jobs clearly enhance the community's ability to build, improve, or own houses that meet decent standards of living.
5. Cultural and customary factors significantly influence the development of decent housing in Nduga Regency. Strong preferences for traditional honai houses, communal values, and perceptions of modern house designs—sometimes seen as incompatible with local identity and needs—affect the acceptance and sustainability of housing programs.

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