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Post-Occupancy Evaluation of Relocation Housing in Labuha Village, South Halmahera Regency

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Abstract

This study was conducted to evaluate the performance of relocation housing as a whole through the *Post-Occupancy Evaluation* (POE) approach. The evaluation focuses on three main aspects: technical, functional, and behavioral. These three aspects were chosen to see the extent to which this relocation housing is able to meet the physical, functional, and social needs of residents according to the principles of decent and sustainable housing. This study uses a quantitative approach reinforced with qualitative data through observation, questionnaires, and in-depth interviews. The analysis was carried out by classifying the evaluation scores into good, adequate, and bad categories for each observed sub-variable. The triangulation method was applied to ensure the validity of the data, by comparing the results of technical observations in the field, residents' perceptions through questionnaires, and deepening issues through interviews. This approach allows for a holistic assessment of residential performance from various perspectives. The results showed that the technical aspect had the weakest performance, with many sub-variables being categorized as "poor", such as roof conditions, environmental roads, drainage, and fire protection systems. The functional aspect shows quite good performance even though there are still obstacles in public facilities such as playgrounds and security posts. In terms of behavior, the participation of residents in maintaining environmental cleanliness and residents' sense of security is still relatively low due to weak community leadership (RT) and lack of social facilities. Based on these findings, the main recommendations are addressed to local governments to improve infrastructure, strengthen local institutional capacity, and encourage citizen participation in environmental management. This research is expected to be the basis for housing policy making that is more adaptive and oriented to the needs of residents as a whole.

Keywords: Post Occupancy, Relocation Housing, Evaluation Relocation

1. Introduction

Relocation housing programs are frequently implemented by governments to provide safe and adequate housing for communities affected by natural disasters, infrastructure development, or land-use changes (Ronkainen et al., 2024). In Indonesia, particularly in outer island regions such as Labuha Village in South Halmahera Regency, relocation efforts are often challenged by geographic isolation, limited resources, and socio-cultural complexities. While the physical construction of houses may fulfill basic technical standards, the long-term success of relocation programs is largely dependent on how well these houses meet the actual needs of their inhabitants (Otsuyama, 2023). Post-Occupancy Evaluation (POE) has emerged as an effective method to assess the performance of built environments from the perspective of their users (Eriksson et al., 2022; Huang et al., 2020). POE allows planners and policymakers to gather valuable feedback on the functionality, livability, satisfaction, and adaptability of housing units after they have been occupied (Tharim et al., 2021). Despite its growing relevance, POE is rarely applied in the context of relocation housing in remote areas of Eastern Indonesia, where communities possess unique cultural habits, environmental constraints, and economic conditions (Sharmin & Khalid, 2022).

South Halmahera Regency is one of the areas in North Maluku Province which was expanded in 2003 based on Law Number 1 of 2003 concerning the expansion of the North Maluku Regency area. This district has geographical characteristics that are dominated by islands with a long coastline. Its territory consists of various large and small islands with varied topographical conditions, ranging from coastal lowlands to hills and mountains. As an archipelago, the area of South Halmahera Regency reaches 40,263.72 km², consisting of 8,779.32 km² of land (22%)

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and 31,484.40 km² of waters (78%). This condition makes the coastal area the main center of settlement and community activities. Most of the population lives in coastal areas, including in Labuha Village, which is one of the centers of economic and government activity in South Halmahera Regency.

Labuha Village, which is the center of economic activity, has its own attraction for the people of the surrounding islands such as Mandioli, Kasiruta and Botang Lomang to migrate in the hope of obtaining job opportunities and improving welfare. However, the high rate of uncontrolled migration has led to pressure on infrastructure and the environment. One of the most obvious impacts of this phenomenon is the emergence of slum areas inhabited by low-income people (MBR). These settlements generally develop spontaneously without careful planning, so access to basic facilities such as clean water, sanitation, and road infrastructure is very limited.

One of the areas that experienced this condition was the water catchment area in Labuha City. The people who occupy this area are generally fishermen's families, informal sector workers, and migrants from surrounding islands such as Mandioli Island and Botang Lomang. The choice of this location as a place to live is largely driven by its proximity to the main source of livelihood, namely the sea and markets, as well as relatively affordable land or building prices for people with economic limitations. Unfortunately, the environmental conditions in this area are quite concerning. The absence of an adequate drainage system makes the area vulnerable to waterlogging, especially during the rainy season. The low quality of residential buildings, as well as limited access to basic services such as clean water, sanitation, and road infrastructure, further worsen the quality of life of residents.

Furthermore, the existence of settlements in this region is contrary to the ecological function of the area. Based on the Regional Spatial Plan (RTRW), the area should function as a water catchment area that has an important role in maintaining environmental balance, especially in preventing flooding and maintaining the availability of groundwater. The conversion of catchment land functions into dense settlements not only reduces the quality of the environment, but also increases the risk of ecological disasters such as floods and a decrease in the carrying capacity of the soil for water.

Housing planning and development must consider aspects of sustainability, social welfare, and environmental quality to ensure decent housing for the community. Alpi & Nasution (2019) states that housing and settlement development by the government or developers must pay attention to aspects of safety, comfort, flexibility, and accessibility in order to create an ideal housing environment. However, the condition of the relocated housing in Labuha Village shows a different reality (Franco et al., 2021). Housing development often only focuses on the provision of housing units without paying attention to the aspects of construction, facilities, and infrastructure that support the quality of life of its residents. For this reason, the author is interested in conducting research on the performance of relocation housing in Labuha Village, which is approximately eight years old in providing the needs needed by its residents through a post-settlement evaluation process.

Post-Occupancy Evaluation (EPH) is an evaluation process used to look at the performance of a design after a building has been built and operated by occupants over a period of time with a focus on the building and its needs. Post-Residential Evaluation (EPH) has the advantage of identifying and finding solutions to problems from house buildings and facilities in residential areas. Research on post-residential evaluation has been carried out many times before, both in vertical housing such as flats and landed housing. In the context of flats, studies conducted by Aisy & Windiarti (2022); Prasesti et al. (2021); Rahman (2023); Runtuwene et al. (2022) generally used a quantitative approach to evaluate the physical comfort of buildings, spatial layout, and access to public facilities. These studies focused on residents' perceptions of the post-use apartment environment, with satisfaction indicators as the benchmark.

On the other hand, on site housing, the focus of research is more diverse. Jiwane (2021); Setiadi et al. (2020) examined residents' satisfaction with residential units and environments, while Alpi & Nasution (2019) emphasized technical evaluation of construction and the availability of housing infrastructure. Natalia & Tisnawati (2019) highlighted the change in the use of residential space by residents, while Wulandari & Marsoyo (2019) assessed the extent to which the residential environment can meet the social and functional needs of its residents. Other studies such as those conducted by Nur Aulia (2020) used a quantitative approach to assess MBR (low-income community) satisfaction with subsidized housing, emphasizing economic, location, and facility aspects. Meanwhile, Nugroho & Marsoyo (2021) used mixed methods to examine the sustainability factors of low-cost housing for civil servants, and Luthfie & Marsoyo (2024) raised the issue of the health of post-relocation residents in fishermen's housing with a quantitative approach.

Based on various previous studies, this study has a number of significant differences, both in terms of the methods and approaches applied, the purpose of the research, and the location of the study. The focus of this research is to evaluate the feasibility and performance of relocation housing in Labuha Village in the context of providing a sustainable residential environment for the relocation recipient community. To obtain a comprehensive and contextual understanding, this study combines three main dimensions of post-residential evaluation, namely technical aspects, functional aspects and behavioral aspects. The approach used in this study is integrative and interdisciplinary, combining quantitative and qualitative data collection techniques, such as surveys, field observations, and in-depth interviews. Thus, this study not only measures occupant satisfaction or the physical condition of the building, but also presents a holistic picture of social, technical, and behavioral sustainability.

Relocation housing programs are essential in providing decent living conditions for communities affected by natural disasters or large-scale development projects. However, many government-initiated relocation efforts fail to address the actual needs, cultural context, and daily practices of the affected residents. In Labuha Village, South Halmahera Regency, relocation has become a critical issue due to both disaster risks and ongoing development pressures. Conducting a Post-Occupancy Evaluation (POE) is crucial to assess whether the provided housing meets the expected standards of livability, functionality, and social acceptability. Without such evaluation, there is a significant risk of repeating past planning failures, misallocating public resources, and exacerbating social dislocation and dissatisfaction among the relocated populations. This study introduces a context-specific approach to evaluating relocation housing in a remote island region by integrating spatial, socio-cultural, and functional dimensions through the Post-Occupancy Evaluation (POE) method. It is the first known research conducted in South Halmahera that not only assesses technical building aspects but also incorporates the lived experiences and perceptions of residents after relocation. Furthermore, this study contributes to the development of a participatory evaluation model for relocation housing in underrepresented regions of Eastern Indonesia. The findings are expected to inform more adaptive and sustainable housing policies and practices in similar geographic and socio-cultural contexts.

2. Research Method

The research approach used is evaluation research with a quantitative deductive approach. Data collection is through two methods, namely primary data and secondary data. Primary data were obtained directly from the research location through observation, questionnaire distribution, and interviews. Observations were made to observe conditions in the field, while questionnaires were distributed to respondents related to the research. In conducting observations, researchers use several tools to collect data effectively. One of them is an Android-based application, such as a lux meter, which measures indoor lighting levels (in units of lux). In addition, sound measurement applications are also used to assess indoor noise levels (in dB). The determination of resource persons was carried out through a combinative approach using *accidental sampling* and *purposive sampling methods*.

3. Results and Discussions

Labuha Village with an area of 2.40 km² is the capital of Bacan District, South Halmahera Regency, North Maluku Province. Geographically, Labuha Village is located on the South Coast of Bacan Island and is bordered by Amasing Village of North City on the north side, Tomori Village on the east side, Mandaong Village on the south side and Teluk Labuha Village on the west side.

3.1. Post-Occupancy Evaluation

Post-Occupancy Evaluation is a systematic approach to assess the performance of a residential environment after being used by its occupants for a certain period of time (Preiser et al., 1988). This evaluation is important to ensure that the Labuha Village Relocation housing built is not only physically feasible, but also able to meet the functional and social needs of its residents. This research was conducted by reviewing three main aspects, namely technical, functional, and behavioral aspects.

One of the crucial aspects of this evaluation is the technical aspect, which includes an assessment of the quality of the building's construction, environmental comfort, and utility systems and supporting infrastructure. An evaluation of technical aspects was carried out to determine the extent to which the physical elements of the building and environment in the relocation housing in Labuha Village were able to meet the standards of comfort, safety, and sustainability of residential functions. In this context, several technical variables that are focused on include construction quality (exterior walls, roofs, and building floors), visual comfort (natural lighting and air circulation),

acoustic comfort (noise level), and environmental infrastructure such as road networks, hydrant systems, clean water networks, drainage systems, and waste management. A thorough evaluation of these variables not only provides information about the existing condition of the residence, but also becomes the basis for decision-making in the repair, maintenance, and development of better housing in the future.

The infrastructure variable revealed that most sub-variables received a "poor" rating. Of the five sub-variables evaluated, four—namely, road networks, hydrants, drainage systems, and waste management—were categorized as poor. Only one sub-variable, the clean water network, received a "good" rating. These findings indicate that the quality of infrastructure in the post-resettlement housing environment still does not meet the comfort and safety standards expected by the residents.

Table 1. Evaluation of the Technical Aspects of the Relocation Housing in Labuha Village

Variable	Sub-Variable	Evaluation Result
Construction	Floor Quality	Good
	Exterior Wall Quality	Good
	Roof Quality	Poor
Visual Comfort	Lighting Inside the Unit	Fair
	Ventilation	Fair
Acoustic Comfort	Noise	Good
Infrastructure	Road Network	Poor
	Hydrant	Poor
	Clean Water	Good
	Drainage	Poor
	Waste	Poor

Based on the evaluation results, it can be concluded that the technical performance of the relocation housing in Labuha Village is still below optimal levels. This is reflected in the high proportion of sub-variables that received a "poor" rating, accounting for 45.45%. This percentage indicates a significant gap between the initial physical planning and the technical implementation on the ground.

The disparity is evident in the imbalance of quality across building components, where some major structural elements, such as the roof, have seen a decline in quality, directly affecting the comfort and safety of the residents. On the other hand, the condition of basic infrastructure also shows inadequate performance, particularly in the sub-variables of road networks, drainage systems, waste management, and fire protection.

Functional elements accommodate the residents' needs for effective and efficient activities. In line with this, Loli et al. (2022) explain that functional performance elements are related to the functionality and efficiency level of building features.

Overall, the results of the evaluation of the post-residential function aspect of the relocation housing in Labuha Village show performance in the good category. Of the eleven sub-variables analyzed, 60% received a rating in the good category. This achievement reflects that most indicators in the functional aspect meet the basic feasibility criteria and contribute positively to the comfort and functionality of the residence, particularly regarding accessibility and the physical feasibility of the building.

Nonetheless, it is worth noting that about one-third of the total sub-variables were rated in the poor category, which significantly highlights the inequality in the environmental facilities aspect. These findings indicate that there is still a serious gap between expectations for residential function and the realities faced by residents, especially regarding the availability and quality of environmental support facilities.

The behavioral aspect in this study refers to the way residents interact with the physical environment, social conditions, and daily life dynamics formed in the relocation residential area of Labuha Village. Residents' behavior is a reflection of how they respond to the design of the space, the quality of the available environment, as well as the patterns of social relationships that develop during their occupation of the area.

Understanding this behavioral aspect has an important role in assessing the extent to which the residential environment is able to meet the functional and psychological needs of its residents. In other words, the behavior of the occupants not only shows adaptation to the space, but also reflects the level of comfort, sense of security, and social connectedness they experience in the new environment. The behavioral aspects reviewed in this study consisted of security variables, spatial variables and social variables.

Table 2. Evaluation of the Technical Aspects of the Relocation Housing in Labuha Village

Aspect	Variable	Sub-Variable	Evaluation Result
Function	Accessibility	Ease of Access to Health Facilities	Good
		Ease of Access to Educational Facilities	Good
		Ease of Access to Trade and Entertainment Facilities	Good
Environmental Facilities	Availability of Street Lighting	Fair	
		Availability of Playgrounds	Poor
		Availability of Security Posts	Poor
		Availability of Worship Facilities	Good
Building	Satisfaction with Housing Unit	Good	
	Satisfaction with Bathroom	Good	
	Satisfaction with Kitchen	Poor	

The evaluation of safety and comfort in this study includes an assessment of the sense of security and comfort from physical disturbances such as crime, potential conflicts between residents, and security of the physical environment such as the condition of buildings and supporting infrastructure. In addition, the variables of safety and comfort also include the psychological dimension, namely feelings of peace and freedom from anxiety when doing activities in and around the residential environment. There are three sub-variables in evaluating Labuha Village relocation housing (security level, comfort level and theft rate). The level of security and comfort is measured based on the perception of residents, while the level of theft is measured using the indicator of the number of theft incidents in the last three months.

Based on the results of the evaluation obtained from the residents' responses, the level of security in the residential environment was recorded at 67%. This percentage indicates that the safety aspect is in the "adequate" category, which means that most residents feel protected in carrying out their daily activities in the neighborhood, although there is still room for improvement. More information can be found in the following table;

Table 3. Evaluation of the Security Level in Labuha Village Relocation Housing

Aspects	Variable	Sub-Variable	Indicators	Housing Conditions	Evaluation Results
Behaviour	Level of Safety and Comfort	Security Level	1. It is good if 76-100% of the occupants feel safe. 2. It is enough if 51-75% of the residents feel safe. 3. It is bad if 0-50% of the residents feel safe.	67%	Enough

An evaluation of the level of comfort based on what the occupants felt showed a figure of 65%. This value also falls into the "adequate" category, which reflects that the majority of residents feel quite comfortable with the conditions of their living environment, although there are still some aspects that need to be improved to achieve a better level of comfort. More details can be seen in the following table;

Table 4. Evaluation of the Level of Comfort in Labuha Village Relocation Housing

Aspects	Variable	Sub-Variable	Indicators	Housing Conditions	Evaluation Results
Behaviour	Safety and comfort	Comfort Level	1. It is good if 76-100% of the occupants are comfortable. 2. It is enough if 51-75% of the occupants feel comfortable. 3. It is ugly if 0-50% of the occupants feel comfortable.	65%	Enough

The evaluation of the theft rate reviewed in this study is the number of theft incidents in the last three months. Based on the results of interviews conducted by researchers, it was recorded that there had been one case of theft in July in the residential environment studied. Taking into account that the incident was the only incident in the last three months, the theft rate was also categorized as "moderate/adequate". This shows that despite the existence of crime cases, the frequency is still relatively low.

The security level sub-variable shows that 67% of residents feel safe living in a residential environment. This number puts the security condition in the "adequate" category according to the evaluation indicators. Although the majority of residents express a feeling of safety, there is still a third of the population who do not yet have full confidence in the security conditions. This reflects the need to improve the environmental monitoring system and strengthen social interaction as a collective effort to create a more equitable sense of security.

The evaluation of space in the study is assessed based on the perception of the occupants to understand how the occupants interact with their residential environment in real terms. Space is not only a matter of form and size, but also about how it supports daily life, shapes behavior, and affects comfort and social relationships. In this study, the evaluation of space was focused on three sub-variables (quality of territory, privacy, and level of ease of interaction). All three represent how space plays a role in building a sense of belonging, maintaining personal boundaries, and opening up opportunities to build healthy social relationships. By examining these three sub-variables, the research seeks to capture the dynamics between spatial design and the actual experience of residents, as well as how space is actually interpreted and used in everyday life.

Territorial evaluation includes how residents claim, manage, and maintain space within their residential environment. The results of the evaluation showed that the residents' perception of the quality of the territory was in the good category, with a percentage gain of 77%. This achievement shows that in general residents feel comfortable and satisfied with the physical and social boundaries in the environment where they live. Good territorial quality reflects clarity of space ownership, social control, and a sense of security, which are important elements in creating a healthy and sustainable living environment. Factors Affecting the Results of the Bad Category Evaluation

Post-occupancy evaluation of Labuha Village Relocation Housing identified a number of sub-variables that are in the bad category. This category is given to aspects that do not meet the minimum technical standards, suffer significant damage, or are not available at all. This assessment is based on quantitative and qualitative parameters that refer to national regulations such as SNI 03-1733-2004, the Minister of Public Works and Housing, and the Minister of Health of the Republic of Indonesia. Here is an in-depth description of these factors:

The roof of a building is an important element in a residential structure because it serves as the main protector from weather factors such as rain, heat, and wind. However, the results of the evaluation show that the quality of the roof in the Labuha Village relocation housing is relatively poor and is included in the bad category. Roof damage is caused by the use of materials that have been exposed to seawater during the distribution process before installation. The roofing material, which has shown signs of corrosion from the beginning, did not receive adequate anticipatory treatment from the contractor, even though it was previously promised to be repainted with an anti-rust coating. The reality on the ground shows that the promise was not kept, and there was no follow-up on maintenance after the construction was completed.

This failure reflects the weak supervision from the government and the contractor's lack of seriousness in ensuring post-construction quality. Roofs that do not meet standards also mark negligence in the process of quality control of building materials, which should be the main concern in the project of housing development based on basic human needs.

This condition indicates that there are structural problems in the integration of planning between sectors, especially between clean water system managers (PDAM) and technical services related to fire management. To ensure the safety of residents and comply with safety standards, a cross-sectoral approach is needed in the planning and development of basic residential infrastructure. The integration between PDAM as a water distribution system provider and the fire department is an important prerequisite so that residential areas can be equipped with fire protection systems that meet standards and can function properly in times of emergency.

3.2. Drainage

A poorly functioning drainage system is one of the main indicators of an unhealthy residential environment and is prone to disaster risks, especially floods and inundation. Based on the results of the post-settlement evaluation in the relocation housing area of Labuha Village, the condition of the drainage system is categorized as *poor*.

This assessment is based on three main factors. First, weaknesses in technical planning. The initial design of the drainage channel was not directed towards the main channel which should flow water to a centralized drainage system, but only flowed into open land around settlements. This causes the water flow to not be handled effectively and triggers inundation. Second, low public awareness in maintaining the function of the channel. Residents have also worsened the situation by closing the channel for the expansion of private buildings or turning it into a household garbage dump. This action causes continuous blockage and physical damage to the duct. Third, there is no supervision and guidance from the government. The evaluation showed that there was no routine supervision program or environmental education from the village government or related technical offices. This lack of institutional intervention results in a lack of responsibility in the management of drainage systems at the local level.

This condition shows that drainage management requires an integrated approach that includes technical improvements, increased public awareness, and active involvement of the government in continuous monitoring and education.

3.3. Garbage

The results of the post-settlement evaluation show that waste management in the relocation residential area of Labuha Village is in the bad category. This assessment is based on three main factors, namely the unpreparedness of supporting infrastructure, weak waste management governance, and low community participation in maintaining environmental cleanliness.

The absence of Temporary Shelters (TPS) makes residents have to manage waste independently. Some residents choose to burn garbage around their homes, while others throw it into vacant land around settlements. This practice poses a risk to the environment and reflects the absence of a structured waste management system. On the other hand, the available garbage transportation services have not been able to reach all housing units, especially because most residents consider the levy cost too high. The limited access to these services shows that there is an inequality in proper waste management, and shows that the institutional function in ensuring basic residential services is still not running evenly.

3.4. Playground

Playground facilities in the relocation housing area of Labuha Village received a poor assessment in the post-occupancy evaluation. This assessment is influenced by several main factors, one of which is the conversion of playground land that has been designed in the early stages of development. This change of function occurred when residents began to use the area as gardening land, even to the point of fencing part of the area for personal interests. This change in function indicates violations of the use of public space and the absence of a protection mechanism for shared facilities.

The second factor that contributes is the low public awareness of the importance of playgrounds as a space for interaction and physical activity, especially for children. This lack of understanding is exacerbated by the absence of guidance and supervision from the government or related technical institutions. The absence of institutional control causes public facilities to become abandoned and lose their function as part of the social infrastructure of housing. The *poor* assessment of the playground in the relocation housing of Labuha Village can be understood as a result of a combination of institutional failures, low citizen participation, and lack of control over the available public space.

3.5. Security Post

The *poor assessment* of the existence of security posts in the residential area of Labuha Village is the result of a combination of various structural and social factors. The first factor that stands out most is the absence of physical facilities in the form of patrol posts or guard posts that can function as environmental monitoring centers. The absence of these facilities makes the area more vulnerable to security disturbances, because there is no control point that is able to supervise activities in and out as well as potential threats around the residential environment.

The second factor that reinforces negative assessments is the lack of citizen participation in community-based security systems, such as night patrol activities or collective incident reporting. This low level of involvement reflects the lack of collective awareness to maintain environmental order together. The absence of a functional security system also affects the perception of security among citizens. This has a great impact on vulnerable groups such as women, children, and the elderly, who feel that they do not have adequate protection in the relocation housing environment of Labuha Village.

3.6. Satisfaction Levels With The Kitchen

The *poor assessment* of the level of satisfaction of residents with the kitchen in the Labuha Village relocation housing is influenced by several basic factors, especially those related to the design and function aspects of the household. One of the main factors is the absence of a clear separation between the kitchen area and the living room in the initial design of the residence. This condition creates discomfort in cooking activities and interacting in the house, especially for families with a large number of members. The absence of separation of spatial functions not only interferes with the smooth running of daily activities, but also reduces efficiency in managing spatial planning in the house.

The poor assessment of the participation variable in maintaining environmental cleanliness reflects the weak aspect of collective behavior in the relocation residential area of Labuha Village. As the only indicator of social behavior that gets a bad score, this shows that there is a fundamental problem in community dynamics. One of the main factors influencing this condition is the lack of active leadership at the local level (RT chairs). Passive leadership has a direct impact on the non-implementation of environmental initiatives, including the organization of regular cleaning activities.

In addition, the absence of joint programs such as community service or environmental monitoring systems makes residents lose motivation and a sense of collective responsibility for environmental cleanliness. When the space for participation is not actively facilitated, individual awareness weakens, and citizen participation becomes minimal. This condition shows that participation in environmental cleanliness does not only depend on personal awareness, but is also strongly influenced by the existence of social structures that are able to move the community systematically and sustainably. According to Pretty et al. (2001), success in environmental management is highly dependent on social capital built through reciprocal relationships, trust, and support from strong local organizational structures. In this context, institutional structures such as RT serve as formal containers to create shared norms, facilitate collective action, and build a sense of belonging to the common environment. When these institutions are inactive, the process of social capital development is disrupted, which leads to public apathy towards environmental responsibility.

Post-occupancy evaluation carried out on the relocation housing in Labuha Village showed that the technical aspect was the weakest point in overall performance. Of the eleven technical sub-variables analyzed, as many as 45.5% were in the bad category. Several variables such as the quality of building roofs, environmental road networks, drainage systems, waste management, and the absence of hydrant systems indicate a low level of infrastructure readiness. One of the prominent cases is roof damage due to the use of materials that have been exposed to seawater (rust) and promised by the contractor to be repaired, but this has never been heeded. This condition reflects the weak supervision of the fulfillment of post-construction responsibilities. As stated by Celina Skalska (2020), decent housing is highly determined by the integrity of construction implementation and the sustainability of post-occupancy technical maintenance. In line with that, Nugroho & Marsoyo (2021) also highlighted the many cases of technical failures in assisted housing units in Indonesia, which forced residents to make repairs independently so that houses became livable.

Meanwhile, the functional aspect shows better performance than the technical aspect. Of the nine sub-variables, 60% were considered good, reflecting that residents found it quite easy to access health, education, and trade facilities, especially after road repairs were carried out by the Public Works Office. However, two of the four variables of

environmental facilities (playgrounds and security posts) are in the bad category due to the non-realization of development as planned and low participation and lack of social participation. Talen (2002) emphasized the importance of public facilities as a crucial element in creating a residential environment that supports quality of life and social sustainability. In line with that, Setiawan et al. (2015) emphasized that the limitations of public space can cause social isolation and weaken cohesion between citizens.

The functional aspect also shows significant variations in the quality of the building. Satisfaction with the bathroom and residential units received good scores, but the kitchen received a bad score because there was no separation of space between the kitchen and the living room, which had an impact on the discomfort of residents, especially in a house with a large number of family members. Many residents then added buildings independently. This indicates that the initial design of the house is not sufficiently responsive to the functional needs of the household as suggested by Al-Homoud & Al-Otaibi (2004) that the design of the dwelling must be flexible and can adapt to the dynamics of family needs. In the context of relocation housing, Charlesworth (2020) emphasize that residential design should not be uniform, but rather provide room for long-term adaptation and modification by its residents.

From the behavioral aspect, it was found that the majority of sub-variables (66.7%) were in the sufficient category, with only one sub-variable, namely environmental cleanliness participation, obtaining a poor assessment. The low participation of residents in maintaining cleanliness is caused by the absence of community service programs or routine supervision. Pretty et al. (2001) assert that effective environmental management requires high social participation and is supported by an active organizational structure. Furthermore, the post-occupancy evaluation of the relocation housing in Labuha Village revealed that a number of sub-variables occupy the bad category, which describes failure to meet minimum technical standards, incompatibility of spatial functions, and weak collective behavior practices of residents. This condition not only reflects the shortcomings of the physical side of the building, but also indicates the absence of integrative and sustainable governance in the residential system.

4. Conclusion

The post-occupancy evaluation of the relocation housing in Labuha Village, it can be seen that the performance of the housing still faces a number of challenges, especially in the technical aspect. Various technical elements such as roof quality, drainage system, environmental road conditions, and the absence of a fire protection system received a poor assessment. These findings reflect a discrepancy between the initial planning and implementation on the ground. In addition, the weak maintenance system after construction also worsened the physical condition of the residence. In the functional aspect, housing shows performance that still needs to be improved. Limited access to public facilities and lack of completeness of environmental facilities are obstacles in creating comfort and supporting the daily activities of residents. This indicates the need for improvement efforts in the provision of supporting infrastructure. Meanwhile, in the behavioral aspect, several problems were found related to the low participation of residents in maintaining the cleanliness of the environment and the lack of security among residents. This condition indicates the need for more intensive social coaching and the importance of forming an active and well-functioning community leadership structure. Overall, the results of this evaluation highlight the importance of integrated efforts that include technical improvements as well as strengthening social aspects. This kind of approach is needed so that the relocation residential environment is truly able to support the sustainability of life, improve the quality of housing, and promote the well-being of its residents in the long term.

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