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# From Origin to Adaptation: A Typological Study of Translocated Joglo Houses in Ngloro Village, Gunungkidul, Yogyakarta

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*adaptive reuse; vernacular architecture; Joglo house; translocation*

**Abstract**

Translocation is a form of ex situ conservation that allows vernacular buildings to continue functioning in new locations while adapting to changing needs. This study aims to identify the physical adaptations that occur in translocated Joglo houses in Ngloro Village, Gunungkidul. A qualitative approach was employed, utilizing field observation, semi-structured interviews, and documentation. Physical changes were analyzed through the observing physical traces approach and interpreted using the Adaptive Building Exoskeleton framework. The study examined 13 translocated Joglo houses selected through purposive sampling. The results show that post-translocation adaptations include building mass additions, roof extensions, material replacements, and the renewal of deteriorated elements. These modifications were classified into addition and subtraction strategies, with addition emerging as the dominant form of adaptation. Residents generally preserve the principal architectural elements of the Joglo while accommodating new spatial requirements through integrated additions to the building. The findings suggest that translocation functions not only as a conservation practice but also as an adaptive reuse strategy that supports the continuity of vernacular architecture while maintaining its architectural identity.

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## 1. INTRODUCTION

Indonesia possesses a rich diversity of vernacular architecture that has evolved through adaptation to local environments, cultures, and community needs (Oliver, 1997; Turan, 2024). As an expression of local identity, vernacular architecture reflects the interaction between culture, environment, and social values (Harysakti et al., 2014; Oliver, 2006). One prominent example is the Joglo house, which embodies the cultural identity,

philosophical values, and social structure of Javanese society (Djono et al., 2012; Gaffara et al., 2021; Subiyantoro, 2011). As lifestyles and spatial requirements continue to evolve, the conservation of traditional buildings increasingly emphasizes not only the preservation of their physical fabric but also their continued use and relevance to contemporary needs (Plevoets & Van Cleempoel, 2011).

One form of preservation commonly found among vernacular houses is the translocation of buildings. As part of ex-situ conservation, translocation involves relocating a building from its original site to a new location (Yusran, 2016). Such processes often generate physical and spatial modifications as buildings adapt to new environmental and functional contexts (Bagaskara & Yusran, 2018; Dewani & Yusran, 2022; González Martínez, 2022). Consequently, translocation becomes not only a process of relocation but also a process of architectural adaptation. "Translocation"—from the Latin trans (across) and locus (place)—refers to moving a building from one site to another (Grafe, 2026). This is a centuries-old practice, particularly common for timber-framed structures.

This phenomenon can be observed in Ngloro Village, Gunungkidul, where some of the 58 existing Joglo houses have been relocated through family inheritance while continuing to serve as dwellings. Unlike cases commonly found in tourism-oriented or institutional conservation settings, translocation in Ngloro occurs organically within everyday community life, making the village a relevant context for examining the relationship between translocation, adaptation, and vernacular conservation.

Previous studies have examined the architectural characteristics, symbolic meanings, and cultural values of Joglo houses, while others have explored translocation and adaptation processes in vernacular and traditional dwellings (Chatterjee, 2022; González Martínez, 2022; Hanan, 2012; Idham, 2018; Novianto et al., 2024; Yusran & Hadinata, 2019). However, studies specifically addressing the physical adaptation of translocated Joglo houses in rural residential contexts remain limited. Therefore, this study aims to identify the forms of physical adaptation occurring in translocated Joglo houses in Ngloro Village, Gunungkidul, using an adaptive reuse approach and the Adaptive Building Exoskeleton framework (Scuderi, 2015).

## 2. MATERIALS AND METHODS

### 2.1 Theoretical Framework

Vernacular architectural translocation is a form of ex-situ conservation that involves relocating a building from its original site to a new location. This process may generate physical and spatial modifications as buildings adapt to new environmental conditions and occupants' needs (Bagaskara & Yusran, 2018; Dewani & Yusran, 2022; González Martínez, 2022; Yusran, 2016). Such modifications can be identified through the observing physical traces approach, which examines observable traces of change in existing buildings (Saputra & Purwantiasning, 2020).

This study adopts an adaptive reuse approach to understand post-translocation adaptation, as it enables traditional buildings to remain in use while preserving their historical, architectural, and cultural values (Bullen & Love, 2011; Douglas, 2006; Mohamed et al., 2017). Adaptive reuse may also provide environmental, social, and economic benefits

while maintaining local identity and accommodating contemporary needs (Fisher-Gewirtzman, 2016; Vafaie et al., 2023).

To interpret post-translocation adaptations, this study employs the Adaptive Building Exoskeleton framework developed by Scuderi (2015), which classifies building interventions into two principal strategies: addition and subtraction. These strategies are used to identify and interpret the physical adaptations found in translocated Joglo houses.

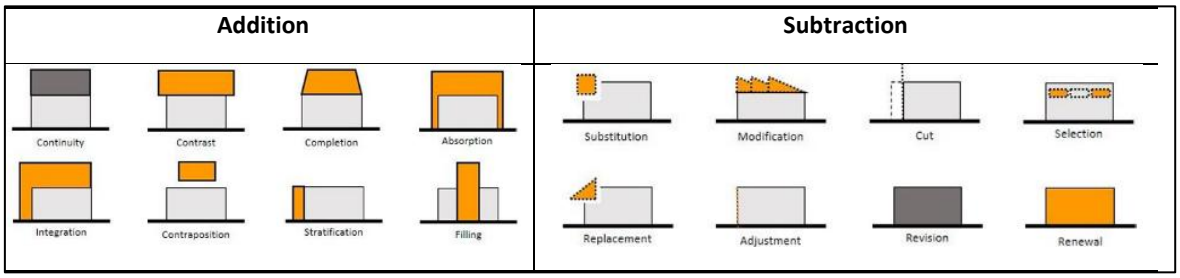



***Figure 1.*** Adaptive Building Exoskeleton Strategies by Scuderi
Source: Scuderi, 2015

## 2.2 Study area and observed units

The study was conducted in Ngloro Village, Gunungkidul Regency, Special Region of Yogyakarta, Indonesia. The village was selected because it retains a relatively large number of Joglo houses and a continuing tradition of translocation through family inheritance.

The study population consisted of 58 houses with Joglo structures, of which 30 had been translocated. Using purposive sampling, 13 study units were selected based on four criteria: (1) the Joglo had undergone translocation; (2) post-translocation physical modifications were identifiable; (3) information regarding the building history was available; and (4) interior spaces were accessible for observation. The locations of the study units are shown in Figure 3. Among the 13 study units, three properties (U3, U4, and U7) contained double Joglo buildings.

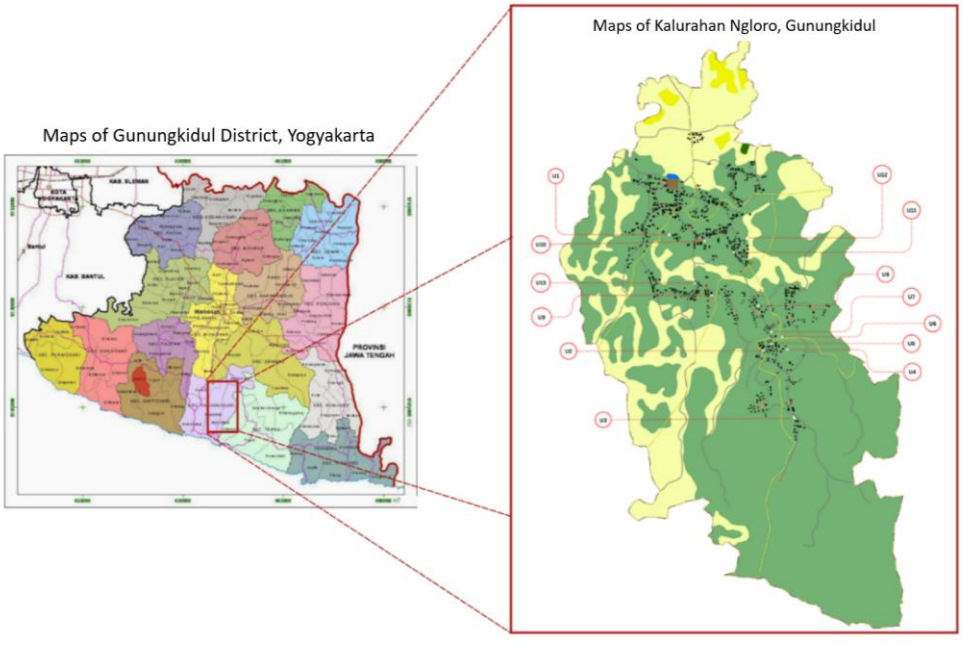


***Figure 2.*** Locations of the observed units
Source: Author, 2025


***Figure 3.*** Observed Units
Source: Author, 2025

## 2.3 Data Collection

This study employed a qualitative research method using field observation, semi-structured interviews, and documentation as the primary data collection techniques. Field observations were conducted to identify the physical characteristics of the buildings, including roof forms, structural elements, building materials, enclosure systems, and the spatial relationships between building masses. Documentation was carried out through photography, sketching, and recording existing building conditions. Semi-structured interviews were conducted with homeowners to obtain information regarding the history of the translocation process, modifications made after relocation, and the reasons underlying those changes.

## 2.4 Data Analysis

Data analysis was conducted using the observing physical traces approach combined with the Adaptive Building Exoskeleton framework. The first stage involved identifying physical traces of change in each study unit based on field observations and documentation. The second stage compared the existing condition of each building with its condition immediately after translocation, using information obtained from interviews with homeowners. The third stage classified the identified changes into the categories of addition and subtraction strategies according to Scuderi, (2015). The final stage involved interpreting the emerging adaptation patterns to identify the dominant forms of physical adaptation occurring in relocated Joglo houses in Ngloro Village.

# 3. RESULT AND DISCUSSION

## 3.1 Joglo Translocation

The Joglo houses represented by the 13 study units in Ngloro Village are relocated buildings that were moved from their original locations to new sites. The translocation process was carried out either as part of family inheritance practices or to reuse buildings

that still had functional value. Based on interviews and field observations, two translocation methods were identified: the knock-down system and boyong Joglo.

The knock-down system was the most commonly used method and was identified in eleven study units (U1, U3, U4, U5, U6, U8, U9, U10, U11, U12, and U13). In this method, all building components are dismantled, labeled, relocated, and subsequently reassembled at the new site. The relocated components include the umpak foundations, saka guru, tumpang sari, columns, roof structures, and gebyok walls. In contrast, the boyong Joglo method was found in U2 and U7. Under this method, the building is only partially dismantled. At the same time, the main structural frame, particularly the saka guru, remains intact and is collectively transported to the new location by members of the local community.

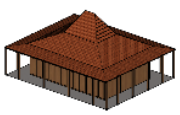
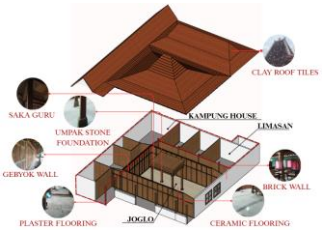
In all study units, the translocation process was followed by the building's reconstruction at its destination. Although major architectural elements, such as the saka guru, tumpang sari, and the Joglo roof form, were generally preserved, several non-structural components were renewed due to deterioration or material availability. The components most frequently replaced were floor finishes, roof battens, and rafters. In addition, several buildings underwent modifications to accommodate site conditions and occupants' needs after the translocation process was completed.

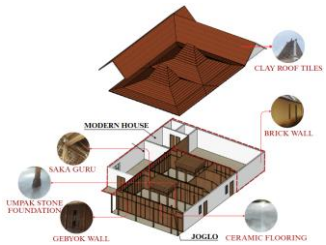
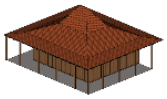
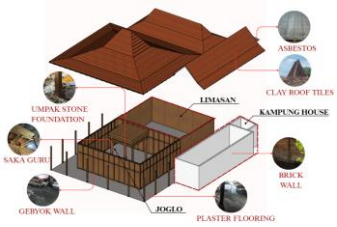
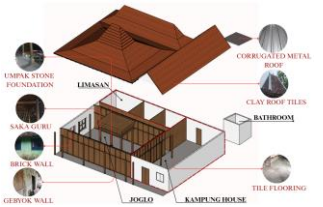
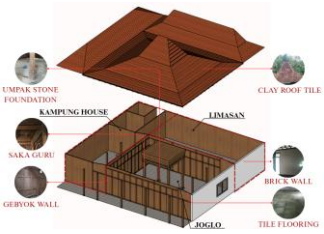
These findings indicate that translocation is not merely the physical relocation of a building from one location to another, but also marks the beginning of a series of transformations affecting the building. Such changes emerge as responses to new environmental and functional conditions and form part of the post-translocation adaptation process, which is discussed in the following section.

## 3.2 Post-Translocation Changes in Joglo Houses

The translocation process was followed by various physical interventions intended to accommodate new spatial requirements, functional needs, and site conditions. Using the observing physical traces approach, the changes identified in the study units were documented and categorized according to the building elements affected. These modifications provide the basis for analyzing adaptation strategies through the Adaptive Building Exoskeleton framework. Table 1 summarizes the physical changes identified in each study unit after translocation.

***Table 1.*** Comparison Between Initial and Post-Translocation Conditions of Joglo Houses

| Initial condition | Post-Translocation Condition | Initial condition | Post-Translocation Condition |
|---|---|---|---|
| **U1** | | **U2** | |
|  |  |  |  |
| **U3** | | **U4** | |

| Initial condition | Post-Translocation Condition | Initial condition | Post-Translocation Condition |
|---|---|---|---|
|  |  |  |  |
| **U5** | | **U6** | |
|  |  |  |  |
| **U7** | | **U8** | |
|  |  |  |  |
| **U9** | | **U10** | |
|  |  |  |  |
| **U11** | | **U12** | |
|  |  |  |  |
| **U13** | | | |

| Initial condition | Post-Translocation Condition | Initial condition | Post-Translocation Condition |
|---|---|---|---|
|  |  | | |

Source: Author, 2025

***Table 2.*** Post-Translocation Modifications in Joglo Houses

| Unit | Description | | | | |
|---|---|---|---|---|---|
| | **Building Mass Modification** | **Joglo's Structure Modifications** | **Wall Modifications** | **Floor Modifications** | **Roof Modifications** |
| U1 | Addition of Limasan and Kampung houses integrated with the Joglo | n/a | Renewal of the front *gebyok* wall with similar form and materials to maintain continuity;<br>Replacement of several *gebyok* wall sections with brick walls, creating contrast with the original *gebyok* elements. | Partial replacement of plaster flooring with ceramic tiles, creating contrast with the original plaster floor. | Addition of Limasan and gable roofs integrated with the original roof while maintaining continuity through the use of traditional Javanese roof forms. |
| U2 | Addition of Limasan and Kampung houses integrated with the Joglo | n/a | Replacement of several *gebyok* wall sections with brick walls, creating contrast with the original *gebyok* elements. | Partial replacement of plaster flooring with ceramic tiles, creating contrast with the original plaster floor. | Addition of Limasan and gable roofs integrated with the original roof while maintaining continuity through the use of traditional Javanese roof forms. |
| U3 | Addition of a modern house integrated with the Joglo. | n/a | Replacement of several *gebyok* wall sections with brick walls, creating contrast with the original *gebyok* elements. | - | Addition of roofs integrated with the original roof, maintaining continuity through roofing materials similar to the original building. |
| U4 | Addition of Limasan and Kampung houses integrated with the Joglo. | n/a | - | Replacement of plaster flooring with ceramic tiles, creating contrast with the original plaster floor. | Addition of Limasan and gable roofs integrated with the original roof, maintaining continuity through traditional Javanese roof forms. |
| U5 | Addition of Limasan and Kampung houses | n/a | Replacement of several *gebyok* wall sections with | n/a | Addition of Limasan and gable roofs integrated with the |

| Unit | Description | | | | |
|---|---|---|---|---|---|
| | **Building Mass Modification** | **Joglo's Structure Modifications** | **Wall Modifications** | **Floor Modifications** | **Roof Modifications** |
| | integrated with the Joglo. | | brick walls, creating contrast with the original *gebyok* elements. | | original roof while maintaining continuity through the use of traditional Javanese roof forms. Some Kampung houses use asbestos roofs, creating a visual contrast. |
| U6 | Addition of Limasan and two Kampung houses integrated with the Joglo. The Kampung houses are placed on both sides of the Joglo, creating a balanced composition (contraposition). | n/a | Replacement of several *gebyok* wall sections with brick walls, creating contrast with the original *gebyok* elements. | n/a | Addition of Limasan and gable roofs integrated with the original roof while maintaining continuity through the use of traditional Javanese roof forms. |
| U7 | Addition of two Limasan integrated with the Joglo and a bathroom detached from the main mass. The placement of two Joglos creates a balanced composition (contraposition). | n/a | Replacement of several *gebyok* wall sections with brick walls, creating contrast with the original *gebyok* elements. | Replacement of plaster flooring with ceramic tiles, creating contrast with the original plaster floor. | Addition of Limasan roofs integrated with the original roof, maintaining continuity through traditional Javanese roof forms. |
| U8 | Addition of Limasan and Kampung houses integrated with the Joglo, as well as a bathroom detached from the main mass. | n/a | Replacement of several *gebyok* wall sections with brick walls, creating contrast with the original *gebyok* elements. | n/a | Addition of Limasan and gable roofs integrated with the original roof while maintaining continuity through the use of traditional Javanese roof forms. The bathroom's roof uses a corrugated metal roof, creating a visual contrast. |
| U9 | Addition of Limasan and Kampung houses integrated with the Joglo, as well as a bathroom detached from the main mass. | n/a | Replacement of *the gebyok wall sections in the bathroom with brick walls to create* contrast with the original *gebyok* elements. | Replacement of plaster flooring with cement tiles. | Addition of roofs integrated with the original roof, maintaining continuity through roofing materials, forms, and colors similar to the original building, with partial replacement of clay roof tiles by |

| Unit | Description | | | | |
|---|---|---|---|---|---|
| | **Building Mass Modification** | **Joglo's Structure Modifications** | **Wall Modifications** | **Floor Modifications** | **Roof Modifications** |
| | | | | | asbestos roofing to create visual contrast. |
| U10 | Addition of Limasan and Kampung houses integrated with the Joglo. | n/a | Replacement of a section of *gebyok* wall with a brick wall, creating contrast with the original *gebyok* elements. | Replacement of plaster flooring with cement tiles. | Addition of Limasan and gable roofs integrated with the original roof while maintaining continuity through the use of traditional Javanese roof forms. |
| U11 | Addition of a modern house integrated with the Joglo. | n/a | Replacement of a section of *gebyok* wall with a brick wall, creating contrast with the original *gebyok* elements. | n/a | Addition of roofs integrated with the original roof, maintaining continuity through the use of roofing materials similar to the original building. |
| U12 | Addition of Limasan and Kampung houses integrated with the Joglo. | n/a | Replacement of a section of *gebyok* wall with a brick wall, creating contrast with the original *gebyok* elements. | n/a | Addition of Limasan and gable roofs integrated with the original roof while maintaining continuity through the use of traditional Javanese roof forms. |
| U13 | Addition of Limasan and Kampung houses integrated with the Joglo, as well as a bathroom detached from the main mass. | n/a | Replacement of a section of *gebyok* wall with a brick wall, creating contrast with the original *gebyok* elements. | n/a | Addition of roofs integrated with the original roof, maintaining continuity through roofing materials, forms, and colors similar to the original building, with asbestos roofing creating visual contrast. |

Source: Author, 2025

Based on Table 2, post-translocation modifications were predominantly characterized by the addition of new building masses and roof extensions, while alterations to the original building fabric remained relatively limited. Although material replacements were identified in all units, the principal architectural elements of the Joglo were generally preserved. This pattern suggests that adaptation was primarily achieved through expansion and integration rather than extensive modification, providing an initial indication of the adaptive reuse strategies discussed in the following section.

## 3.3 Adaptation Strategies Based on the Adaptive Reuse Framework

According to the Adaptive Building Exoskeleton framework proposed by Scuderi (2015), the post-translocation modifications identified in the 13 study units can be classified

into two main adaptation strategies: *addition* and *subtraction*. Addition refers to interventions that expand or integrate new elements into the existing building, whereas subtraction involves replacing or renewing existing elements while maintaining the building's functionality.

Using the observing physical traces approach, the existing condition of each translocated Joglo house was compared with its condition immediately after translocation to identify physical changes. These changes were subsequently interpreted using the Adaptive Building Exoskeleton framework. Building mass additions and roof extensions were classified as addition strategies, while the replacement and renewal of building elements were classified as subtraction strategies. The adaptation strategies identified in each study unit are presented in Table 3 and discussed in the following sections.

***Table 3.*** Adaptation Strategies Identified in Translocated Joglo Houses in Ngloro Village

| Unit | Addition Strategies | | | | Subtraction Strategies | |
|---|---|---|---|---|---|---|
| | **Continuity** | **Contrast** | **Integration** | **Contraposition** | **Replacement** | **Renewal** |
| U1 | ✓ | ✓ | ✓ | - | ✓ | ✓ |
| U2 | ✓ | ✓ | ✓ | - | ✓ | - |
| U3 | ✓ | ✓ | ✓ | - | ✓ | - |
| U4 | ✓ | ✓ | ✓ | - | ✓ | - |
| U5 | ✓ | ✓ | ✓ | - | ✓ | - |
| U6 | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| U7 | ✓ | ✓ | ✓ | ✓ | ✓ | - |
| U8 | ✓ | ✓ | ✓ | - | ✓ | - |
| U9 | ✓ | ✓ | ✓ | - | ✓ | - |
| U10 | ✓ | ✓ | ✓ | - | ✓ | - |
| U11 | ✓ | ✓ | ✓ | - | ✓ | - |
| U12 | ✓ | ✓ | ✓ | - | ✓ | - |
| U13 | ✓ | ✓ | ✓ | - | ✓ | - |

Source: Author, 2025

### 3.3.1 Addition Strategies

Addition was the dominant adaptation strategy identified in all translocated Joglo houses in Ngloro Village. Based on the Adaptive Building Exoskeleton framework (Scuderi, 2015), four additional strategies were observed: *continuity, contrast, integration*, and *contraposition*.

Continuity, contrast, and integration were identified in all 13 study units. Continuity was reflected in the preservation of the original Joglo roof form and the use of additional buildings that maintained traditional Javanese architectural characteristics. Integration was expressed through the physical connection between new building masses and the original Joglo, allowing additional spaces to function as part of a unified spatial system. Meanwhile, contrast emerged through the use of new materials, such as brick walls, ceramic flooring, and asbestos roofing, which created visual distinctions between original and modified elements.

Contraposition was identified only in U6 and U7, where the arrangement of additional building masses created a relatively balanced architectural composition. Overall, addition strategies indicate that post-translocation adaptation was primarily

achieved through expansion and integration while preserving the main architectural identity of the Joglo house.

### 3.3.2 Subtraction Strategies

Compared with addition strategies, subtraction strategies were identified less frequently, as only two subtraction strategies were observed: *replacement* and *renewal*.

Replacement was found in all units and mainly involved substituting deteriorated building elements while maintaining their original functions. Common examples included replacing gebyok walls with brick walls, plaster floors with ceramic tiles, and traditional roofing materials with asbestos sheets. These modifications were generally undertaken to improve durability, practical maintenance, and occupant comfort. Renewal was identified only in U1, where the front gebyok wall was repaired using forms and materials similar to the original condition. Unlike replacement, renewal aimed to restore the building's physical condition without introducing significant visual changes.

These findings indicate that subtraction strategies were generally conservative, focusing on non-structural elements while preserving the principal architectural components of the Joglo, including its roof form and primary structural system.

## 3.4 Adaptation Patterns of Translocated Joglo Houses

The findings indicate that post-translocation adaptation in Joglo houses is characterized by the coexistence of multiple adaptation strategies within a single building. While addition strategies were identified in all study units, subtraction strategies were generally limited to the replacement or renewal of deteriorated non-structural elements. This pattern suggests that adaptation was primarily achieved through expansion and integration rather than through major alterations to the original building.

The dominance of continuity and integration strategies demonstrates that new spaces were commonly accommodated by adding building masses connected to the original Joglo while maintaining traditional Javanese architectural characteristics. At the same time, contrast strategies emerged through the introduction of new materials, reflecting occupants' efforts to improve functionality, durability, and comfort. Similar adaptation patterns have been observed in vernacular dwellings, where spatial and material modifications are introduced to accommodate changing needs while preserving significant architectural elements (Marindhra, 2018; Hanan, 2012; Chatterjee, 2022; Novianto et al., 2024).

Overall, the adaptation pattern observed in Ngloro Village reflects an adaptive reuse approach, in which translocated Joglo houses continue to function as dwellings while retaining their architectural identity. Rather than replacing the original structure, residents tend to preserve the principal elements of the Joglo and accommodate new requirements through carefully integrated additions. This demonstrates how translocation can support the continuity of vernacular architecture by enabling traditional buildings to remain relevant within contemporary living contexts.

## 4. CONCLUSION

This study reveals that the relocation of Joglo houses in Ngloro Village prompts various physical adaptations, including additions to building mass, roof extensions, material replacements, and the renewal of deteriorated elements. Grounded in the Adaptive Building Exoskeleton framework, these modifications were classified into addition and subtraction strategies, with addition emerging as the dominant approach.

The findings indicate that residents tend to preserve the principal architectural elements of the Joglo while accommodating new spatial requirements through integrated structural expansions. This pattern of modification reflects an adaptive reuse approach that enables translocated Joglo houses to remain functional without losing their architectural identity. Ultimately, translocation serves not only as a conservation practice but also as a mechanism that supports the continuity of vernacular architecture through ongoing functional evolution.

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