

DOCTORAL DISSERTATION

**A study on vernacular architecture transformation  
using ethnography-based intensive architecture  
memory recollection method**

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This dissertation is dedicated to God Almighty, who has given me the strength, knowledge, insight, inspiration, and permission to conduct this research in a challenging time. It is also dedicated to all the kind people who let me into their houses, into their lives, and let me collect a piece of their history. To old and new friends and communities in Labuan Bajo who have helped collect historical data and connected me to the local network of history and cultural enthusiasts and preservationists. To my professor, who has guided and challenged me to become who I am now. To other researchers in this niche field, for lighting the flame and blazing the path. To my family, who have me in their prayers and who patiently and endlessly supported me throughout my journey from afar. To inspiring and insightful friends from and in every nook and cranny of Japan, Indonesia, Samoa, Mongolia, China, Taiwan, Sudan, France, Ukraine, Malaysia, Vietnam, the US, the UK, and the entire world. Last but certainly not least, to my ever-supporting and resourceful husband, Ersu. Thank you for joining me on this journey, and here's to more contributions for a better world for the people.



# ABSTRACT

This research explores the extent of memory recollection as a substitute resource of past houses for studies on vernacular architecture transformations when written records are limited. In culturally sensitive areas, understanding the local history, social context, and vernacular architecture of the past is essential, especially in the Indonesian national tourism agenda, where implementing local design elements is necessary. Unfortunately, not all places have sufficient written records of their past. The hypothesis is that the past houses are stored in the memory of the residents.

The overall method is based on the theory of transformation and memory recollection theory and uses an ethnographical approach to get past architectural data. The main actions are desk study, direct observation, and in-depth interviews. The ethnography-based intensive architectural memory recollection method is the details where the interviews were done in the existing houses, descriptions of the houses were sketched and confirmed with the informants, and data was verified by observations of existing houses in the neighborhood through the local researcher and adjacent records. The data was obtained from the informants of the four local ethnic groups and their current and past houses in Labuan Bajo, a rural area recently developed under the national government's tourism agenda.

The study reveals that the method can be used in the data-collecting process of vernacular architecture transformation studies. First, it started with the history and social context of the area and the sensitive issues according to the locals. It also examines the main factors behind the transformations: the construction time, the informants' ethnic identities and the power dynamic in their area, the proximity to tourism activities, and how it relates to the decisions behind their changes.

Then, the research gathered that most houses switch from stilt houses to landed houses, from natural materials to industrial materials, along with the details of those changes. However, their houses' adaptations relate to each house's context: the change in their livelihood, environment, and lifestyles. This insight on how and why they change can be used for design and historical references.

The informants shared their history of changes through oral recollection and demonstrated that memory systems amongst the informants, especially in their house memory, are predominantly oral. The informants' answers and willingness to share their history and heritage highlight the significance of the historic memory system in preserving architectural memories. Besides the memory system, this method succeeded for many reasons: the informants mainly were second or third-generation residents, the area did not change much, and there were unchanged houses to refer to in surrounding areas.

This research underscores the importance of considering historical and sociocultural influences in architectural practices and recognizing the impact of external factors on vernacular architecture. The study identifies opportunities for future research while acknowledging the current limitations, including potential biases in informant effectiveness and sample size constraints.



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**CHAPTER 1**  
**INTRODUCTION**



## 1. 1. Research background

*“As an architect, you design for the present, with an awareness of the past  
for a future which is essentially unknown” - Norman Foster*

What about architecture not prepared for the unknown future, nor is it aware of the past? Before architecture schools, architects or builders were aware of the past by default. The only way for them to learn how to build is from their direct environment: from older architects or builders and existing architecture. With the existence of architecture schools and the broad references from the internet and alien structures brought by tourism from faraway places, now there are different ways of learning how to design and construct.

The existence of architecture schools has made a distinction in the memory types a person can have. People educated in architecture schools can be certified architects and builders and are embedded in discipline memory (S. Anderson, 1999). In contrast, there are people embedded with social memory: the builders with no education in architecture schools, who are taught the skills to build by their seniors at the construction site, and the users of the buildings who are getting their design references from their past experiences or social influences (S. Anderson, 1999). Although certified architects are still a part of society, giving them discipline and social memory, people with no discipline memory usually only have social memory.

The term vernacular architecture is still a favorite pastime for academics to discuss. In agreement to lessen the energy for discourse and instead focus on its significance (Vellinga, 2011), it has led this research to use the term in the same frame as the classification proposed by Hourigan, which sticks to the boundaries of what it is not, it is not made by architects, not built for import or to impress a cultural elite (Hourigan, 2015). The proposition follows the term and boundaries coined by Rudofsky in 'Architecture Without Architects,' which casually describes the scope of architecture produced by people without an architectural educational background (Hourigan, 2015; Rudofsky, 1964). Anderson also used this definition to distinguish the architecture made by the people with disciplinary memory, in contrast to social memory (S. Anderson, 1999). Hence, the definition suits the research design, where the memory system of a social group will be assessed along with the transformation of their vernacular architecture, and the relation between them will be analyzed.

In the Indonesian context, the past generations have used various types of wood, bamboo, and palm families as their primary materials for construction. Wood is rarely used in modern Indonesian houses due to its limited availability or high price compared to reinforced concrete and lightweight concrete blocks (Mogul, 2022; Prasetyo, 2019; Rosary, 2020). Bamboo and palm families are also less preferred due to the required labor and time. This condition contrasts with the previous generations' experience, where they could go to the forest and get the wood without any modern monetary or bureaucratic

requirements (Rosary, 2020). The term vernacular architecture used in this paper also includes modern architecture, which uses reinforced concrete, lightweight concrete blocks, and other imported fabricated materials (Hanan, 2012). This modern vernacular in Indonesia, especially in rural areas or independently built residential houses, is still constructed by people without an educational background, thus allowing it to be called vernacular architecture.

Decades ago, the buildings were constructed by the builders' limited knowledge gained from their working experience in building in the local areas or neighboring areas if they had the chance. In some exceptional cases, especially houses of royal lineage or the sorts, some builders were imported from other areas due to their novel building-making knowledge. In these instances, their discipline memories were still close to their social memories because, in most parts of rural Indonesia, buildings were still built by the locals without the need for professional credentials. These buildings built by a predominant memory system will be gone soon as the following decades due to a government regulation that enforces the need for a certified architect in a building's design team to grant it its legal documents (Peraturan Pemerintah No 16 Tahun 2021 Tentang Peraturan Pelaksanaan Undang-Undang Nomor 28 Tahun 2002 Tentang Bangunan Gedung, 2021). In effect, the buildings in Indonesia built through the community's tradition and values stored in their memory will be fading soon. The increased gap between discipline and social memory will bring the end of the distinction of local vernacular architectures in Indonesia and perhaps in other places with a similar context.

This leads to the first hypothesis in this research, that vernacular architecture is a tangible record of the past social memory and its transformations until now. Based on this hypothesis, the object of this study is the vernacular architecture made by people with social memory, without architects, and without discipline memory. There is still limited study on this topic, however, the decline of these constructions raises concerns about the possibilities to conduct more research in the future. In 1969, Amos Rapoport approximated that 95% of all the buildings are vernacular architecture (A. Rapoport, 1969). However, in 2023, a study has estimated that the number has dropped to 75% (Pardo, 2023). The urgency to study this tangible record of past local knowledge passed down through generations is felt by many researchers and academics alike and the number of studies has shown an increase in the past years (Pardo, 2023).

In this study, current vernacular architecture and the memory system of the owner are seen as an alternative source to learning their past architecture. This is especially important for places with limited or no written records available. This goes back to the quote at the beginning of this page and the question that follows. This study suggests that there is a way to collect information of the past and it is through the current vernacular architecture and the information stored in the memories of the residents. This is the second hypothesis that frames this study, and it also embodies the main research questions: 1) How was the vernacular architecture transformation from the unknown past to the present forms we see today? 2) Can memory recollection be used as a substitute for past architecture when

written history is limited? The first question is to see how much we can know of the vernacular architecture transformations with limited or no records of the past, whether in their form, size, material transformations, to the reasons behind them. The second question is to see how memory recollection on people with social memory can be used as an alternative resource when written history is limited.

These questions came from cases where architects are required to implement local vernacular architecture in new designs but lack access to records of the past architecture in the area or the records simply do not exist. This is the case in many places in Indonesia. The government highlights the importance of reiterating the local architectural elements, especially for tourism purposes, and not all places have access to the records of past vernacular architecture, or the records are not available anywhere. However, vernacular architecture is often not seen as a source of design inspiration, and its transformation from its former shapes to the current modern ones is seen as a normal, inevitable, and generic phenomenon.

An indication of this point of view is that the only available record of architecture transformation in Indonesia is made by the Central Statistics Agency of Indonesia (BPS Statistics Indonesia) in their series entitled “Calculation and Analysis of Indonesia’s Macro Poverty” (Penghitungan dan Analisis Kemiskinan Makro Indonesia). This series aimed to categorize which neighborhood belonged to the poor population and which belonged to the non-poor population in urban and rural contexts. To reduce architectural features to characterize the economic status of the owner is problematic enough, and for this statistic to be the only available reference in nation-scale transformation shows how the government currently values vernacular architecture or residential architecture itself.

As the only point of reference in understanding the national phenomenon of architecture transformation, specifically residential buildings, this series is tabulated into graphs from their 2012 to 2022 data shown in Figure 1.1, Figure 1.2, Figure 1.3, and Figure 1.4 (Badan Pusat Statistik, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022). The charts are arranged to show the difference between poor and non-poor categories as well as urban and rural areas in the span of one decade and to see the perceived trend.

The first data in the series that relates to architectural transformation is the area per person of each household, shown in Figure 1.1. The three categories represent the levels of privacy in a residence. It is said to be one of the housing indicators that describes household welfare level and is calculated through the floor area of the house per capita ( $m^2$ ) (Badan Pusat Statistik, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022). This data from the Central Statistics Agency (BPS Statistics Indonesia) stated that “according to the Ministry of Health, one of the conditions for a house to be declared healthy is that the floor area of the house per capita is at least 8  $m^2$ ” (Badan Pusat Statistik, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022). Overall, there is an increasing tendency to be in the “8 to 15  $m^2$ ” and the “more than 15  $m^2$ ” categories. More people are expanding their houses to fit the healthy standard promoted by the government.

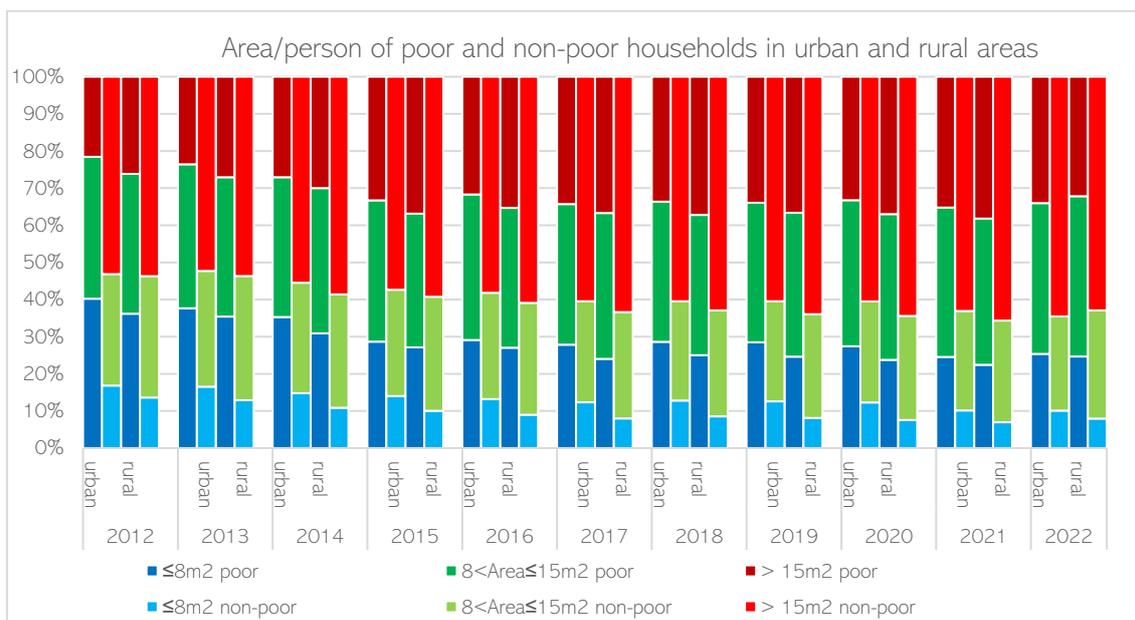


Figure 1.1 Area/person of poor and non-poor households in urban and rural areas in Indonesia 2012-2022

Then the transformations are seen through the material of the houses, from the floors, roof, and walls. The data from the last 11 years is seen in the next three figures and is calculated based on the most used material in a house. It is very possible that multiple materials are opted for in these houses.

The floor material transformation, shown in Figure 1.2, shows a binary option between a house having any flooring material other than soil or just bare soil. This is the only material where the options made by the Central Statistics Agency (BPS Statistics Indonesia) are binary. In both poor and non-poor households, more people were reducing the use of bare soil as their dominant flooring material. Interestingly, the use of bare soil in urban non-poor households is very small as suspected, but they do still have a sliver of existence there, which might lead to some preferences over affordability.

Roof material transformation is seen in Figure 1.3, and it shows how households in poor and non-poor communities have grown a preference for using more zinc sheets as their dominant roofing material. Even with a growing tendency to use zinc sheets, the number of households in both communities with concrete/terracotta tiles/bitumen is still the dominant group with the highest percentage especially in the urban areas. In the past 11 years, houses using thatched grass/palm fiber are commonly found in poor households, mostly in rural areas. The same trend is seen in both poor and non-poor communities and in both urban and rural areas. The 2022 analysis from the agency stated that the head count index of the households with thatched roofs are highest, meaning more poor households are found in thatched roof houses (Badan Pusat Statistik, 2022).

Lastly, the transformation of wall material in poor and non-poor households in the last 11 years is shown in Figure 1.4. In this graph, the overall tendency is to adopt brick-and-mortar walls. However, there is another phenomenon happening: the rural and urban areas show contrasting differences, and

the contrast is also shown in the poor and non-poor communities. There seems to be a trend where the rural follows the urban counterpart and where the poor households follow the non-poor population.

This last trend seen in the wall material transformation analysis gives a hint at why vernacular architecture transformation is often seen as inevitable. This trend might allow people to think that it is inevitable for a house to switch from natural to fabricated materials, from local to imported materials. Reviewing the earlier two graphs, this tendency of change is also seen in a more subtle pattern.

This leads to the first hypothesis on the factors behind the transformation: time. The transformation of vernacular architecture in Indonesia is seen as an unavoidable product of the advances in time and construction knowledge. The switch from natural to industrial materials is the only characteristic seen in this series. However this might also apply to the transformation of other design elements of a house and needs further investigation.

The second hypothesis on factors behind the transformation is it is a product of power dynamics. From this data series, the power dynamics are focused on the poor and non-poor populations in urban and rural contexts. By focusing on the terms poor and non-poor, the analysis can only be derived from the economic status of the owner and what houses they have. This enforces the influence of the non-poor population on the poor population, and it also enforces the idea that you should avoid some materials and characteristics just because it is related to being in the low economic status of the population. These power dynamics might also happen from other connections, such as ethnicities and castes, but not explored in the data series.

Although only just a few features were observed, the data gleaned from this macro analysis provide significant context for understanding broader trends in housing conditions and design across Indonesia, both in urban and rural settings. The patterns observed in these data align with the common experiences of Indonesian residents who have witnessed shifts from one house type to another in their family's history. In many cases, wooden or bamboo houses in rural areas are gradually being replaced by more durable brick-and-mortar structures, signifying the changing of architectural and construction practices. This switch is also seen as an inevitable byproduct of economic increase. These observations offer valuable insights into the dynamic evolution of vernacular architecture and underline the importance of studying vernacular architecture through different perspectives. By adhering to only one statistic, it represents how only one perspective is explored, and this perspective is where architecture is only seen as a symbol of economic status.

To look further, a growing industry where architectural identity is demanded is investigated: tourism. First, the Indonesian government adopted and developed tourism in an efforts to alleviate poverty as it has less extractive and negative impact compared to the previous options of natural resource mining and massive plantations. The ministry of tourism is utilizing this as an economic booster; accordingly, they aimed to push the number of tourists and develop destinations to support the huge number of visitors, driving the growth in the mass tourism direction.

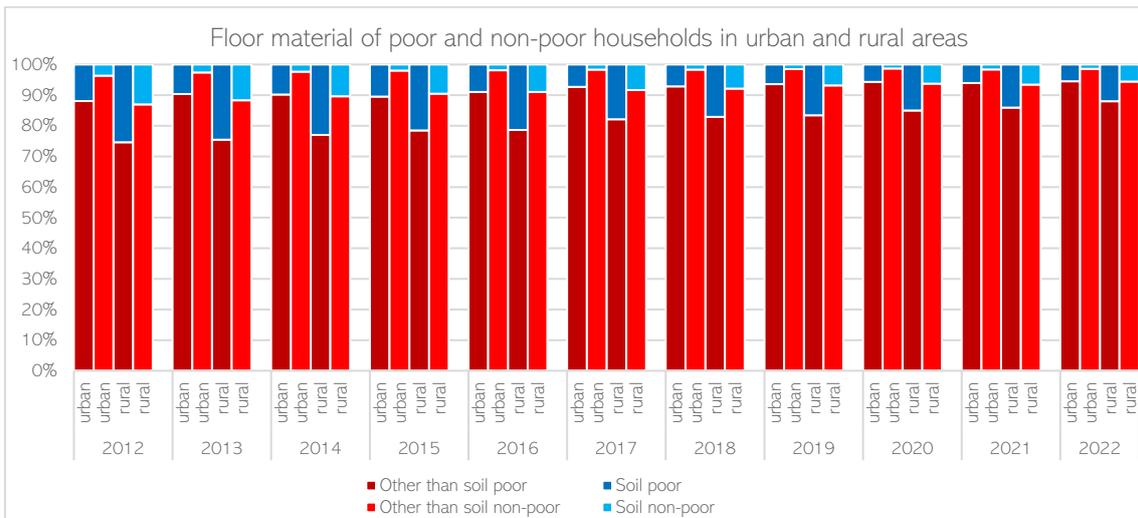


Figure 1.2 Floor material of poor and non-poor households in urban and rural areas in Indonesia 2012-2022

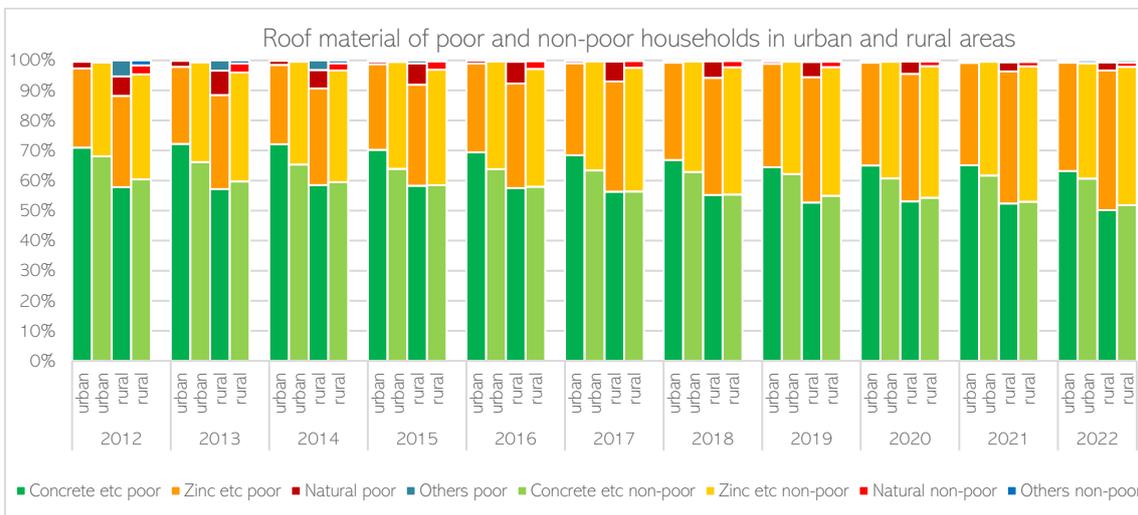


Figure 1.3 Roof material of poor and non-poor households in urban and rural areas in Indonesia 2012-2022

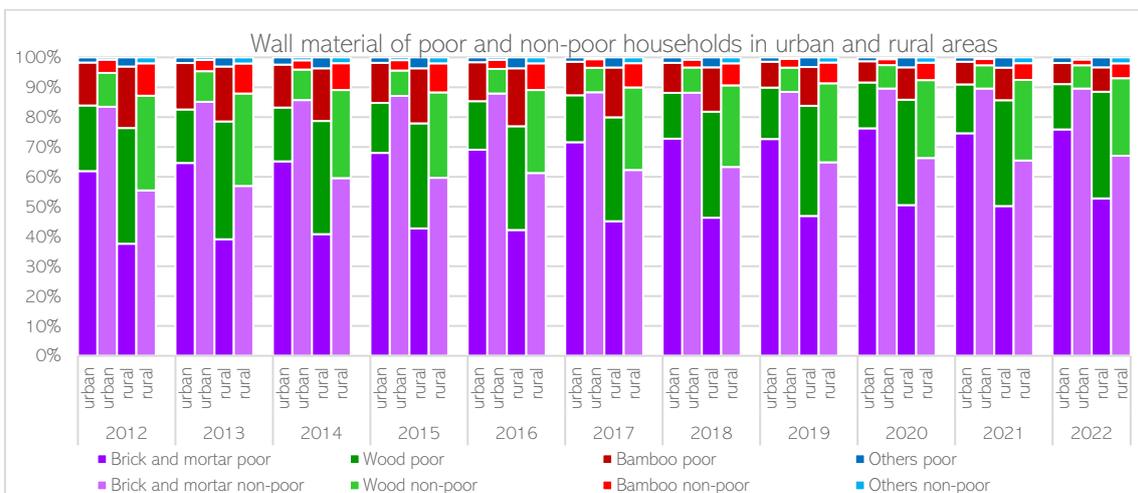


Figure 1.4 Wall material of poor and non-poor households in urban and rural areas in Indonesia 2012-2022

In the past decade, this has been implemented by assigning ten prioritized destinations in Indonesia with the intention of following the steps of tourism success achieved by the province of Bali. The locations of these ten destinations are shown in Figure 1.5. As a result, the number of poor populations has indeed decreased, as seen in Figure 1.6. In relation to the poverty analysis previously described, this may lead to the assumption that more houses have changed with the increase in the local economy.

Second, this national agenda birthed annual national design competitions, funded by a private company, to which the goal is for participants to create tourism facilities with the incorporation of local design elements from the local area. The tourism agenda is also applied in the housing subsidy program from the Ministry of Public Works and Public Housing, where local architects will help the subsidy recipients build or renovate their houses to support a kiosk or homestay in those ten priority areas. The hiring of local architects to design these subsidy houses is in effort to incorporate local design elements to the subsidy houses. All these efforts in embodying local design in the construction of new tourism infrastructure indicate the need for local representation in tourism in Indonesia. However, tourism is still a catalyst for globalization as it has enforced new designs to cater to mass international tourists with their international standards (Hartzell, 2008; Wall & Mathieson, 2006).

This leads to a thought to add to the previous hypothesis that the more drastic the economic improvement is, the more drastic and faster the architectural transformation. Following this hypothesis, by seeing the percentage of the poor population, which prioritized destination will have the most drastic and fast change. This is shown in Figure 1.7 where the percentage shows a very different story compared to the poor population graph in Figure 1.6. As a side note, in that graph, not all destinations start from 2002 because their current region was part of a larger region at that time, and the data tabulation only follows the statistics of their current region in 2022.

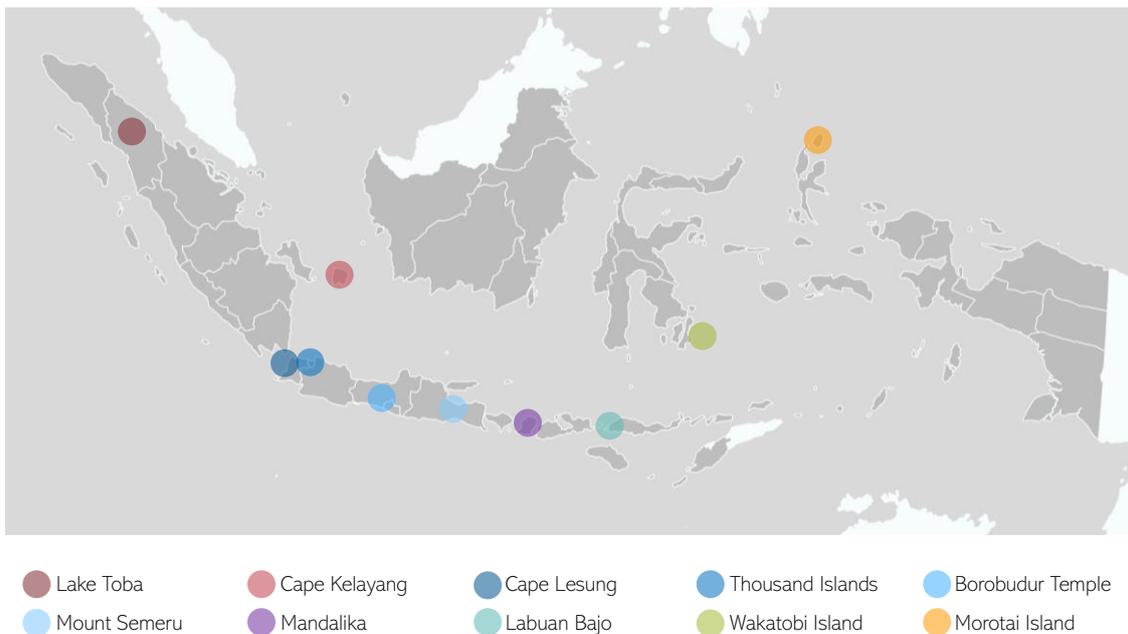


Figure 1.5 Map of the 10 Prioritized Destinations in Indonesia

Even though in Figure 1.6, Mount Semeru, a destination name, has the highest poor population, it is not a big chunk of the demography as seen in Figure 1.7. Labuan Bajo, on the other hand, has the highest percentage of the poor population from the start to the end of the graph in Figure 1.7, even though the number of the population is low compared to the other destinations. This is because Labuan Bajo is in the East Nusa Tenggara province, one of the poorest provinces in the history of Indonesia. This leads one to assume that the people of Labuan Bajo experience more economic change and transformations in their built environment, be it in their favor or in government instructions. Thus, this research will focus on documenting the changes in the houses in Labuan Bajo as an extreme case where the vernacular architecture unimpacted by tourism can fade sooner compared to other places.

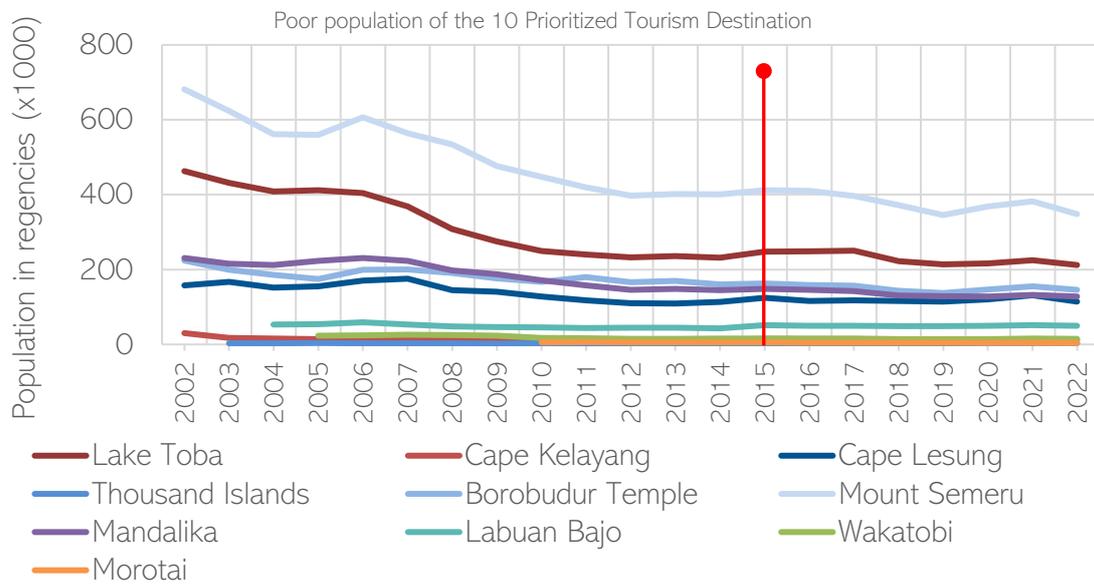


Figure 1.6 Poor population in the regencies of the ten prioritized tourism destinations

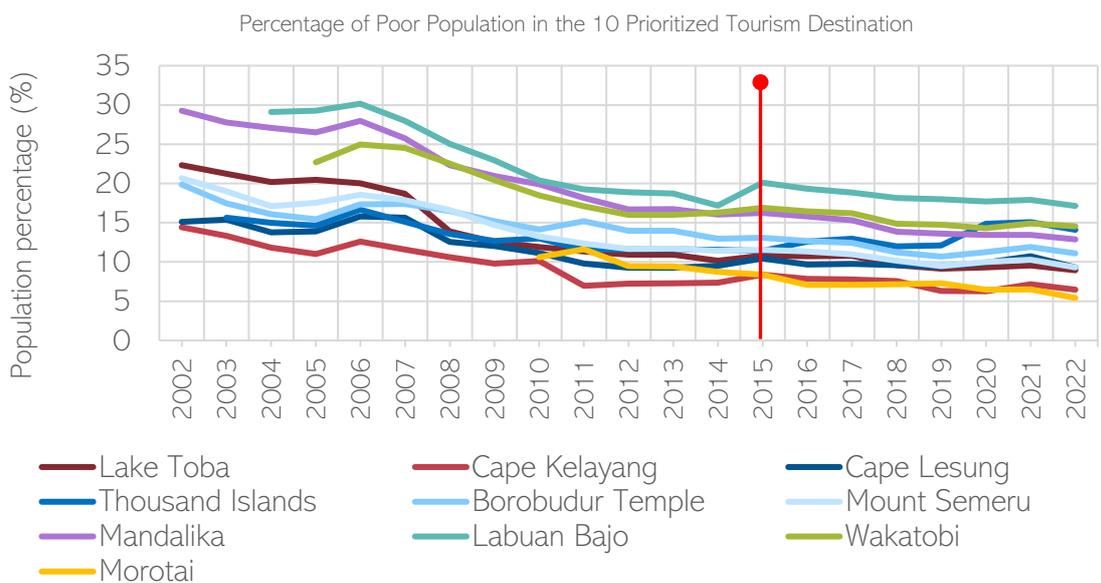


Figure 1.7 Poor population percentage in the regencies of the ten prioritized tourism destinations

Labuan Bajo is a former fishermen's town in Eastern Indonesia, located on the western tip of Flores Island in West Manggarai regency, Nusa Tenggara Timur Province, Indonesia. Figure 1.8 shows where Labuan Bajo is in Indonesia and the boundaries explored in this research. It extends beyond the administrative boundaries, but it is the colloquial geographical confines used by the locals.

The town itself is currently under a lot of attention from the national government and is being developed and prepared to be the next main destination after Bali, as previously mentioned. It was also the host of the 2023 Association of South East Asian Network (ASEAN) Summit, held on 9-11 May 2023 (ASEAN, 2023; ASEAN Indonesia 2023, 2023). Even though the town is still considered small and developing on its physical, economic, and infrastructure scale, its proximity to the Komodo Islands, the natural and endemic habitat of the Komodo dragons, is their powerful tourism magnet. Since the documentation of Komodo dragons by Western researchers in the 1910s (Murphy et al., 2015), Labuan Bajo has been the port from where most researchers and other sightseers would embark to see these endangered giant venomous lizard monitors. Recently the stunning views of the savannah-like landscape in contrast to the blue seas during sunrises are the highlight of many tours.

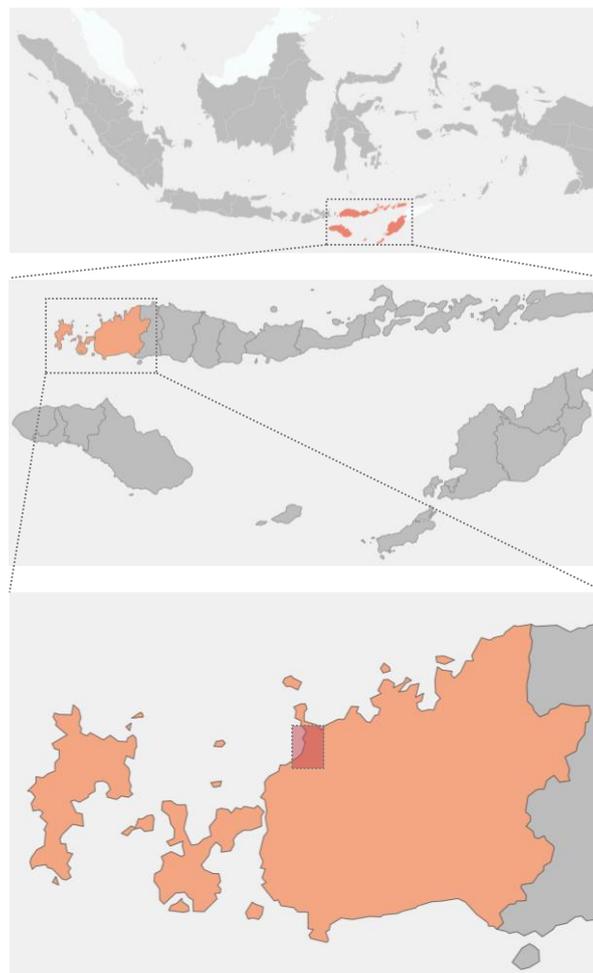


Figure 1.8 Study area in and around Labuan Bajo, West Manggarai Regency, Nusa Tenggara Timur Province, Indonesia

Like many melting pots in Indonesia, Labuan Bajo has many local languages. In a survey in 2010, Indonesia had more than two hundred million national citizens composed of more than 1300 ethnic groups, with almost 80% of the population speaking their local language daily (Ananta et al., 2018; Na'im & Syaputra, 2010). There is also a double amount of Indonesian language used daily at home amongst citizens five years and older in 2010 compared to 1990 (Na'im & Syaputra, 2010). These languages are built on different systems according to their society's values and lifestyle. Most of them are based on oral traditions, and as the languages are fading due to the use of the national language (Moseley & Nicolas, 2010), these oral traditions will inevitably fade as well. The lack of an archival system in oral communities has made many forget their history (Hartzell, 2008; Huston & Dastrup, 2020; Wall & Mathieson, 2006).

Most local languages spoken in Labuan Bajo are Manggarai, Bajo, Bugis, and Bima languages. Hence, the four ethnic groups related to these languages will be the focus of the research, and their differences and similarities will be analyzed by comparing one to another. This study will analyze their values and traditions, as well as their current geographical contexts and their memory system, to assess how they value and preserve their culture and how their architecture evolves.

Oral tradition is one of their historical preservation strategies, and it is seen in the story of how Labuan Bajo became a settlement. It was told by the locals through oral tradition as the trading port between the Bajo and Manggarai people, a meeting between people from the sea and the mountain (Ardhyanto et al., 2020, 2022; Kemdikbud, 2018). This mutual exchange shows the importance of their relationship and how they have assimilated and learned from one another (Kemdikbud, 2018; Verheijen, 1987). It is then assumed that this assimilation is also seen in their vernacular architecture. The transformation of their vernacular architecture should show how they have adjusted to other cultures living with them and found common ground. Though it will not inevitably lead to a Labuan Bajo architecture, per se, Manggarai or Bajo architecture in Labuan Bajo will differ in forms and values to their places of origin.

The waves of migration were already diversifying the locals, and then international exposure became a part of Labuan Bajo since the 15th century. Currently, Labuan Bajo is under the intense attention of the government to become an international premium tourist destination. Tourism has been known as a catalyst of globalization (Hartzell, 2008; Wall & Mathieson, 2006), and added with globalization and the ability to shift lifestyle and architecture through the economy increase and governmental programs, these rapid transformations are reinforcing the urgency of understanding vernacular architecture before it assimilates further.

The third hypothesis on the factor behind the transformations is that proximity to tourism activities plays a big role in changing the vernacular architecture of a place. The economic increase brought by tourism can indeed catalyze the change in the built environment, but places that are at the heart of tourism activities experience change faster than those far away, especially with the contours of Labuan

Bajo and the typical tourism activities there (island hopping, diving, snorkeling) which leads to three distinct zones: strategic, access and periphery areas. The strategic zone is in the coastal areas near the main port, where most of the tourists depart to go to the Komodo national park. The access areas are the places that are tangential to the strategic areas and the periphery areas are the farthest from the tourism activities. Along with time and ethnic groups, proximity to tourism will be used to analyze the transformations of vernacular architecture in Labuan Bajo.

Returning to the discussion on vernacular architecture, the nature of local materials and climate in Indonesia allows a simple house made with natural material like wood or bamboo to stand for at least ten years and will perhaps need a revitalization of its structure after 30 years. It suits the traditional way of building a new house when a person gets married, or one of their children gets married, as shown in Figure 1.9. Then, the assumption is that if the neighborhood and the social values in the neighborhood do not receive impacts from external forces, then the new houses will keep transforming according to the slowly and constantly changing values of the neighborhood. But if the changing values of the neighborhood receive impact from external factors, this power dynamic might change the values of the neighborhood in an unprecedented way. If a person builds a house 30 years ago and builds another one now, it is going to be a different house, but if a person builds a house in a changing environment, it is certain to be a different house with a different set of values.

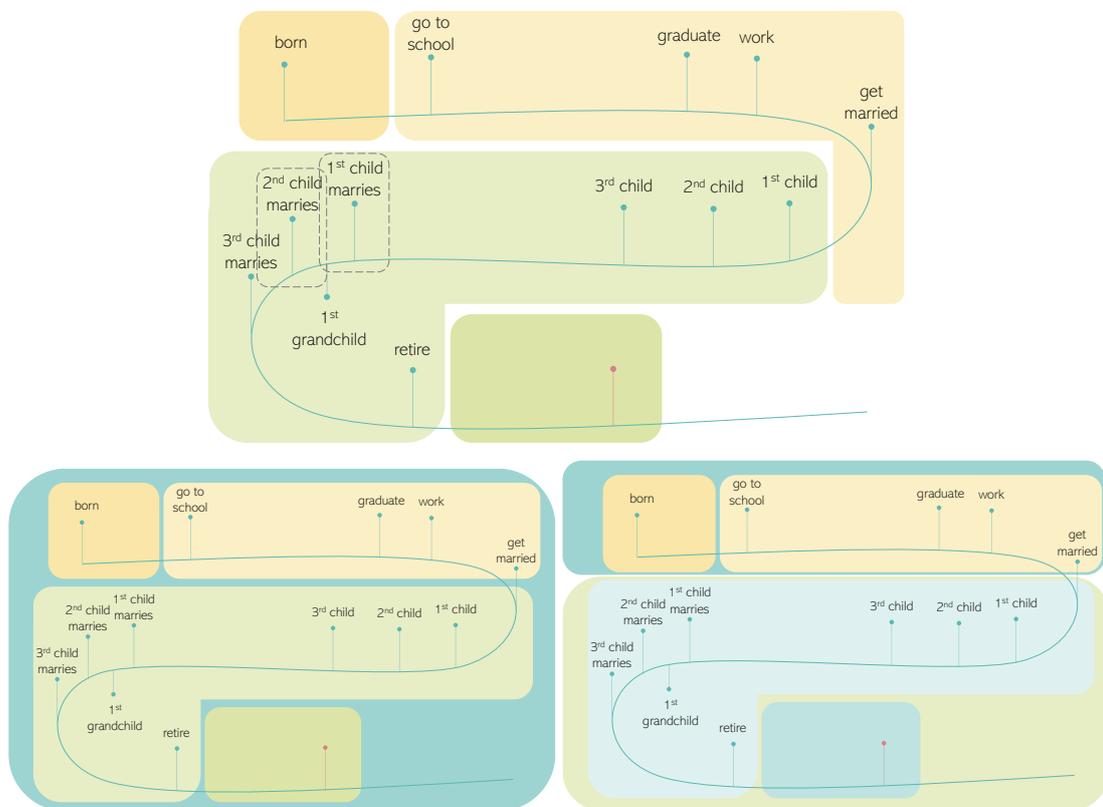


Figure 1.9 Scheme of house transformation and family milestones (top), the transformation scheme within a considerably constant environment (left), and the transformation scheme within a changing environment (right)

In relation to the connection between the growing of a house and the growing of a family, family milestones are assumed to be useful for the informants in recollecting their past vernacular architecture. In the example shown in Figure 1.9, a person's house might be their grandparents' house when they were born. When their parents have enough resources to build their own house, that time may be the time when the person starts going to school. Later, when they get married, they might build their own house and move out of their parents' house. After they receive many family milestones, like having children, having their children married, and having grandchildren, it might be time for a house renovation or the construction of a new house.

However, all these forces of transformation are inevitably pushing Labuan Bajo to change in the future. Change is imminent everywhere, but to recall the quote by Norman Foster, what about the places with limited remembrance of their history? Will their future be a disconnected dream from their past? Will there be social conflicts and loss of identity in the pursuit of a globalized future? Will their knowledge of how to make the most of the local materials and local values stay in the past, with no future generations to remember it? How do we, as designers, create buildings that are in the same vein as the existing environment when information on said environment is limited?

Some examples of architecture based on the existing limited records can be found in the infrastructures built under the national tourism agenda and the housing aid program specifically for the prioritized tourism destinations, which both highlight the need to incorporate local design elements. The implementation of both projects in comparison with the local vernacular architecture can be seen in Figure 1.10. The designs and quality differ extremely between these buildings. The buildings for the national tourism agenda are mostly designed by architects from the capital city of Indonesia, Jakarta, a city that has a very distinct history of transformation compared to the rural Eastern Indonesian areas. In contrast, the houses for the housing aid program hired "local" architects from the province capital, which is on a different island. Considering the ethnic diversity of eastern Indonesia (Cribb, 2000), it is important to make sure that the "local" design elements are indeed from the local area and do not give the power of narration to the person from the provincial capital city.

Are there other places in other countries with the same problems? Maybe not with the exact context and issues, but this might be a global concern, as seen in the increase of research on vernacular architecture in recent years (Pardo, 2023). Just like the birth of the interest in vernacular architecture heritage, it was born during the industrial revolution with the concern of the decrease of human craftsmanship and culture in design and construction (Asquith & Vellinga, 2005; Pardo, 2023). Gathered from the data in the Web of Science in July 2022, the top ten countries with the most published documents in vernacular architecture are China, the United States, the United Kingdom, Italy, Turkey, Spain, South Korea, India, Portugal, and Japan, with Australia and Indonesia running in the two positions after (Pardo, 2023). The case of Indonesia might not be the most popular in the field recently, but it might provide a perspective on how to improve research in other places.

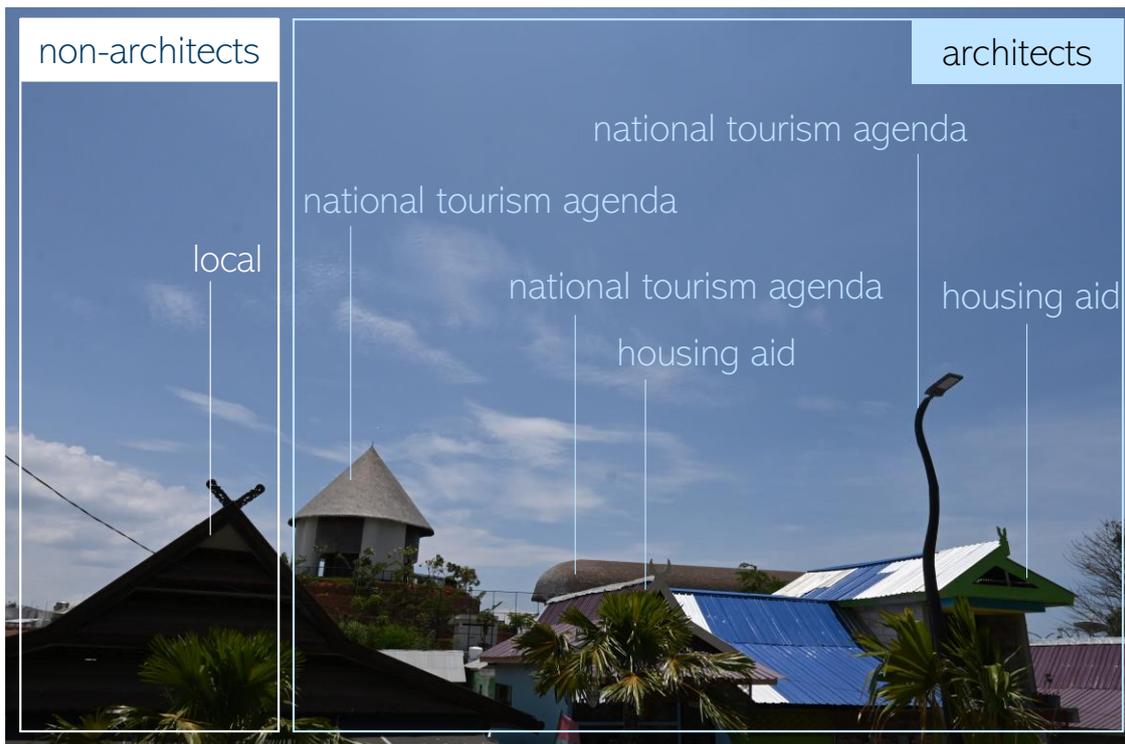


Figure 1.10 Photo illustration comparison of the local vernacular architecture and the local-inspired designs by architects

However, the strong oral tradition is seen as a great potential source of oral history to combat the lack of written records. The way that they orally shared the history of their town, as previously mentioned, with ease leads to the assumption that they have something called an oral-historic memory system. An oral memory system is where their history is preserved and shared orally from one generation to another (S. Anderson, 1999). On the other hand, a historic memory system is where they see the value in their history and believe in the efforts to preserve it and share it with other people (S. Anderson, 1999). A combination of oral and historic memory systems seems to be a good candidate for memory recollection to further explore past vernacular architecture, and the extent of data achievable under certain circumstances will be analyzed in this study.

Thus, the research will be positioned as if it was designed for this town with limited written records and aims to comprehend the vernacular architecture transformation to gain inspiration. Furthermore, the research will use an ethnography-based intensive architecture memory recollection method in substituting the non-existent records of past vernacular architecture and assess how it succeeded and failed in what conditions. The method will attempt to use approaches common in ethnography studies in an intensive short period of time while focusing on vernacular architecture transformations. Hopefully, future designers, architecture students, and historians as well, will see the importance of understanding the past vernacular architecture for design or historical references, especially in Indonesia with its stance on the preservation of cultural diversity in its architecture.

## 1. 2. Research purpose

This research aims to explore the answers to these questions. Regarding the transformation of a society or a location’s vernacular architecture, which levels of their houses are changed, and which are preserved? The hypothesis is that the materials have changed, but some functions or parts of the house still have traditional values and rules. Understanding these values from existing houses can be useful for designing houses or residential of places with limited historical texts or documentation to better suit the users and connect with their history.

The intersection of memory and vernacular architecture raises intriguing questions about the potential of memory recollection as a substitute for the absence of historical records documenting past architectural evolution. It hinges on the effectiveness of an oral memory system in preserving and passing down family information and history from one generation to the next. In the context of this study, the ability of a community to vividly remember and describe their houses and articulate the underlying values becomes a pivotal factor. The preliminary answer to this question suggests that memory recollection, as often applied in ethnographic studies, can indeed serve as a viable alternative to historical records, particularly when dealing with communities possessing oral memory systems that prioritize oral traditions as the primary medium of passing down knowledge.

Moreover, when delving into transformation studies, N.J. Habraken's concept of classifying the built environment into nominal classes according to the person’s scale of control offers a valuable framework for analysis (Habraken, 2000). Shown in Figure 1.11 are these nominal classes of built environment parts and the relation to the scale of control an individual can have that ranges from the most to the least. The resulting spatial hierarchy reflects the authority that an individual holds over the various classes, with the closest classes indicating a higher degree of control, as represented by darker shading. The hierarchical scale gradually widens as it moves towards the broader arterial categories, where classes become progressively more extensive. This configuration not only highlights the spatial dynamics of control but also provides a foundation for understanding the influence of individuals on their built environment at varying distances, revealing the intricate interplay of architectural transformation and human agency within a given context.

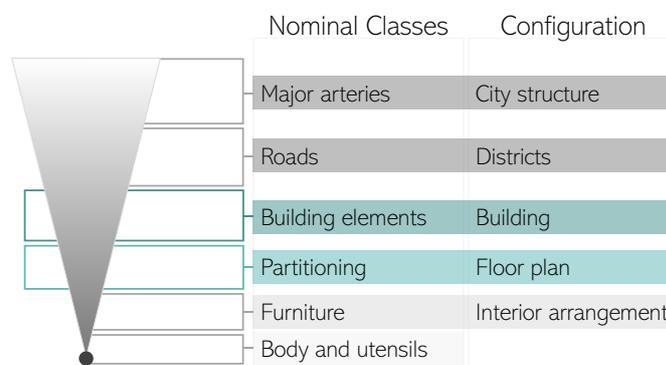


Figure 1.11 Built environment scale, adapted from N.J. Habraken

By using the same logic as the transformation studies in built environments, this scale is applied to analyze the compartmentalization of people’s memory. In Figure 1.12, the black circle, again, shows the person. The scale of their memories is divided into three categories: the family or personal memories, the personal living space memories, and the neighborhood or town scale memories. The scale acts in a similar way where the memories closer to them are more in their control, and the ones further away, like about their neighborhood or town, might be vaguer and less in their control. The control of their memories can be expressed in many ways; they can either remember or forget it by choice, they can share it with other people when given the chance, or shun it so that nobody can learn those stories. Yet, they have full authority over those personal memories.

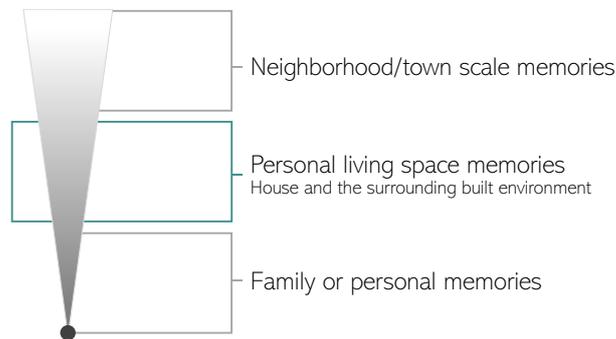


Figure 1.12 Scale of memory categories

The hypothesis is that the density of these memory categories decreases as the scale gets bigger, as seen in Figure 1.13. It leads to the assumption that this density can increase if the events have greater impacts on the person or if there are more people in those events to bolster the memories from time to time. The act of resharing stories of the past is one example of strengthening memories.



Figure 1.13 Memory category and density

Other than the density of the memories, the proportion of those categories also varies from one individual to another based on personal traits, cultural factors, and time. These proportions can shift from one end of the scale to the other depending on the activities of the person, their preferences at the time, or many other factors that may be internal or external. The variations of these proportions are shown in Figure 1.14, and this is why this research will try to examine the answers of different people from different ethnic backgrounds to gain a better depiction of the past houses and the transformation of Labuan Bajo’s vernacular architecture.

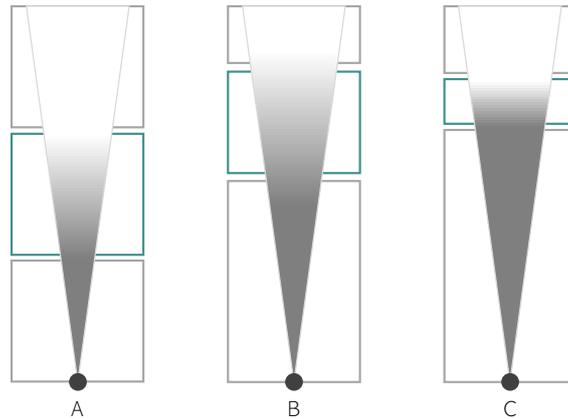


Figure 1.14 Memory category proportions vary amongst different individuals

The research aims to gain a collective image of the past vernacular architecture of the houses in Labuan Bajo by gathering data on many families' past houses. The collection of these memories with the variations of the scale is shown in Figure 1.15. The different depths everyone has in recollecting their houses will not be a problem as their answers will be collected with the answers of other individuals to gain a more common picture of their previously built environment.

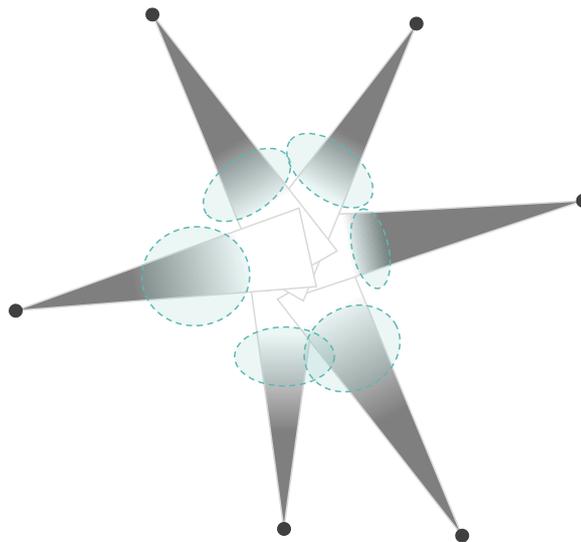


Figure 1.15 A collection of memories from different individual

This research will highlight the importance of documentation and the exercise of finding alternative sources of past vernacular architecture. This is because as time changes, the people in society will change as well. The memories stored in society will change, in addition to the environment's constant changing. This scheme is shown in Figure 1.16, where as time goes by, the density and proportions of people's memories will change, and the people in those environments will also change. The elders will pass, and the relayed information their children and grandchildren received is the only thing that survives. Architecture academia and historians should be aware of this issue and try to document these grassroots forms of adaptation, the instinctual way of surviving in a changing world.

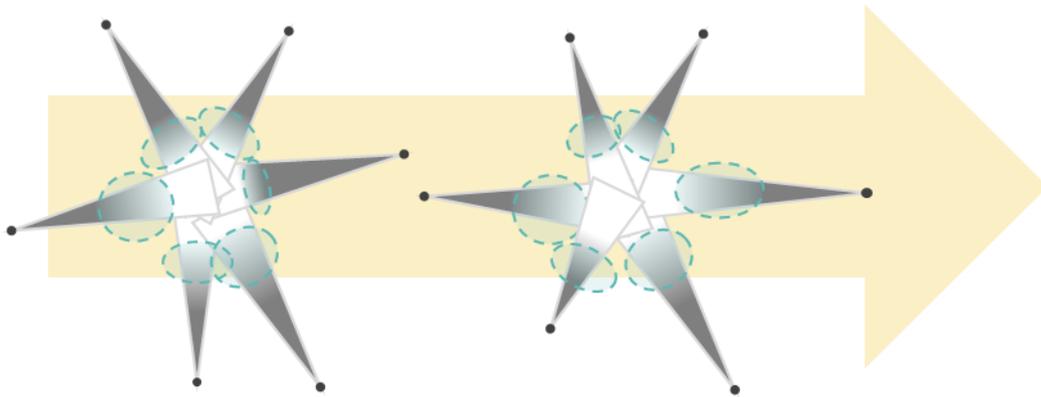


Figure 1.16 A collection of memories from different and changing individuals over time

This research will also highlight the transformation of Indonesian vernacular architecture. The consensus is most Indonesians have gone through different types of houses, from wood or bamboo stilt houses to brick-and-mortar houses. Did the elders/local figures experience many forms of past vernacular architecture as well? The hypothesis is that transformations are happening at a rapid pace and one lifetime can experience many forms of vernacular houses, especially in the older generation with the formerly geographically limited materials.

For the case of Labuan Bajo, the question is: are there any differences/similarities between Manggarai, Bima, Bugis, and Bajo architecture? Can the cases learned from Labuan Bajo be useful in the architectural practice of design or policy planning in other places in Indonesia or even other parts of the world? The hypothesis is that different cultures have different modern vernacular architecture forms, and the issues that Labuan Bajo is facing can be like issues other areas of the world are having on their table. Especially rural places with a lack of historical texts or documentation on their history and past architecture knowledge, mass tourism development, a sudden increase in economy, the exposure to international influence through tourism and residents of multiple ethnic groups.

### 1. 3. Research methodology

Overall, the basic theories, methodologies, and scope of research are shown in Figure 1.17. The two theories are the base of the research and are applied in the methodology and scope definition. By applying the two theories, this study aims to bridge the approaches commonly used in ethnography to be applicable to studies in architecture.

The methodology is implemented in the field surveys with in-depth interviews and observations and supporting desk studies before and after the field surveys. These methods are focused on retrieving communities' memories and the transformation of their houses. Field surveys and desk studies were required to recollect a community's memory. The desk studies took process before and after the survey to understand the cultural system, special events in and around the area, the local socio-political scene, and the local and neighboring areas' architecture.

Field surveys allowed us to see the current architecture and built environment and to interview the locals to gather the ones in the past. The transformation of vernacular architecture can be gathered during the observation and interviews by focusing on the built environment element's classification coined by Habraken, which is to classify the physical order and then later be further analyzed into territorial and cultural order (Habraken, 2000). The analysis can show how vernacular architecture can act as a historical record, an embodiment of the values of a community and their negotiations throughout time (Bukit et al., 2012; Habraken, 2000; Hanan, 2012; Setién, 2014; Yiwei & Beisi, 2015).



Figure 1.17 Theories, methodologies, and the scope of the research

An alternate resource is to recall and reify the community's memory. Memory recollection can be done in interviews or observations. This research has limited time when observing, so the interviews were conducted in the informants' houses, immersed in the environment. As a part of Southeast Asia, Indonesia is also prominent in its oral traditions, making memory recollection a potential tool for understanding transformations of vernacular architecture (Loh et al., 2013).

In this research, it is also noted when conducting interviews that a community's memory system might differ and result in different levels of detail. The memory system might be more literate in some aspects of their life and more oral in others (Anderson, 1999). This memory system operating behind memory recollection should be considered when resourcing past vernacular architecture, especially when assessing communities of different ethnic backgrounds.

This research will focus on analyzing the transformation and retrieving past the vernacular architecture of Labuan Bajo by recollecting the memories of the Manggarai, Bima, Bugis, and Bajo communities. Only a couple or more cases of each group will be analyzed, making the findings not represent the whole community in Labuan Bajo but a starting point for future

discussions and an exercise on using memory recollection. The informants selected to be included in the research are the elders or local figures of those groups. There will be a slight bias of men's and elites' perspectives, but the interviews were not an exclusive condition. Hence, other members of their family could chime in at their convenience. This inclusive nature of the interviews also accommodated corrections from other family members in the memory recollection process. On the other hand, these types of situations did not allow the recording of the interviews to be the documentation of an oral history record due to many background noises and other voices.

From the interviews, the memory system embedded in their community is observed to be different. The Manggarai community's oral tradition ensures transgenerational education (Allerton, 2012). While the Bajo people also have oral traditions, they do not have a specific system ensuring their continuation. The Bima and Bugis have their own traditions, although they are more like the Bajo community both in their oral traditions and akin to their position in the hierarchy of land ownership. The oral tradition can lead to recordings in the future of their oral history, while the lack of a system threatens its existence.

Combining a high historical tendency and a preserved oral tradition will be an ideal resource for retrieving past vernacular architecture and built environments in places with limited written records. This research is not seen through the historical presentism lens, in which the past is seen from our current perspective and experience. It does not forget or erase the historicity of the past. However, it is indeed explored to search for better solutions for our current problems (Dimock, 2018; Steinmetz-Jenkins, 2020). In learning the past vernacular architecture, a sustainable solution for future developments is hoped to be attainable (Hamza et al., 2021; Salman, 2016).

The in-depth interviews were unstructured and semi-structured (Bernard, 2006), with the levels of the built environment (Habraken, 2000) as the interview guide used with all the informants. The queries were about the informants' data: name, year and place of birth, marriage status, number of children; their ethnic identities: their own ethnic identity, their parent's or spouse's ethnic identity; migration history: how many generations of their family had been living in Labuan Bajo, their personal, their parents' or earlier ancestors' migration route, whichever is applicable; all the houses they have lived in since they could remember. Only the latter, regarding the house, was semi-structured to cover the levels needed for transformation analysis. This approach to investigating their broader history is adapted from a study of the link between memory and architecture in medieval York (Douglas, 2003).

This research hypothesized that residents in Labuan Bajo could provide knowledge from their memory of their experience living in different forms of vernacular architecture in one generation's lifetime. It also hypothesizes that the changes are perceived and responded to differently by other ethnic identities, following their values, rules, and systems, thus making the characteristics seen

in the former fishing town's urban fabric. Their memory system on this issue, which relies on oral tradition, will continue their values.

After observations were done under the varying definitions, most outcomes materialize themselves in the form of preservation or sanctification of tangible or intangible values which then contradicts the essence of vernacular architecture: transformation. Behind the cultural and geographical contexts that play the most part in the creation of vernacular architecture, transformation, as an effect of time, is now the dominant factor. It is true that people themselves change throughout time, yet time and the transformation that it brings were not always an active factor in the control of the design. Now in the information revolution era, the control of design and the agent behind it are influenced by many external parties at an unprecedented speed. Hence making this period a crucial time to study the transformation of vernacular architecture.

#### **1. 4. Research flow**

The research flow is shown in and shows how the highlights of the research are carried out through all the chapters. This research has complex elements as it combines the research of vernacular architecture transformations with memory recollection and the memory systems in operation. In addition, the four ethnic groups residing in the same proximity have different identities and traditions, which result in variations of memory systems and forms of vernacular architecture.

However, the research will return to the main research questions, which are: what are the transformations of vernacular architecture in Labuan Bajo; how far can memory recollection aid in the limited historical records; did the elders or locals experience many types of houses and can they describe them; are there differences between the houses and memory recollection experiences in the Manggarai, Bima, Bugis, and Bajo communities?

These questions will be queried in in-depth interviews with the informants, who are elders or local figures or owners of houses with significant changes observed, who are coming from different ethnic groups. Some of the answers will come from the observations made during the meeting with the informants. The milestones, events, and regulations mentioned by the locals were collected before the field surveys, and some were gathered later to reaffirm the statements from the interviews.

The interviews will include questions about their own family history, their identity, migration, and how they settled in Labuan Bajo in the first place. This will be used as a starting point to review their memory systems, and how it will later be used in recollecting their built environment. Then, the interviews will ask the informants to describe their past houses and also explain what has changed from their earliest memory until the decisions they made for their current residence.

These questions will give some room to reflect on how ethnic diversity and memory systems can be an endangered, valuable resource. The findings from the Indonesian context will also give different perspectives on similar cases from other parts of the world. This research will show how the different

memory systems can act as a resource in recollecting past vernacular architecture and how the shifts of the modern lifestyle may threaten it.

Moreover, the transformations of both memory systems and vernacular architecture will be evaluated through the impacting forces and what lessons can be taken from these analyses. In the end, the methods and findings of this study will display some limitations, as well as some notes and hopes for future research.

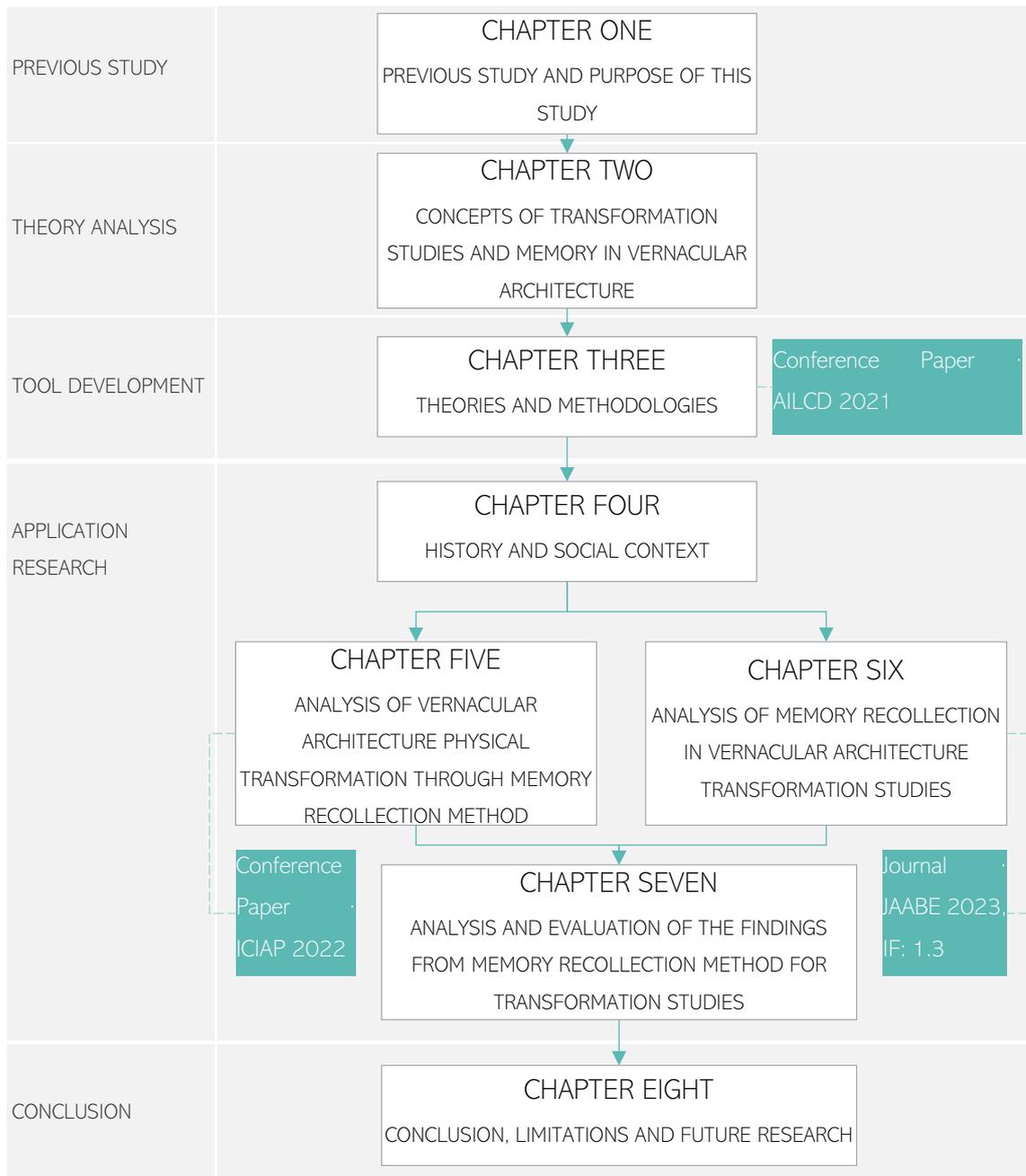


Figure 1.19 Research flow

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**CHAPTER 2**  
**LITERATURE REVIEW**



## **2. 1. Vernacular architecture**

The term vernacular architecture is still highly debatable. In agreement to lessen the energy for debate and instead focus on its significance (Vellinga, 2011) has led this research to use the term in the same frame as the classification proposed by Hourigan, which sticks to the boundaries of what it is not, it is not made by architects, not built for import or to impress a cultural elite (Hourigan, 2015). The proposition follows the term and boundaries coined by Rudofsky in 'Architecture Without Architects,' which casually describes the scope of architecture produced by people without an architectural educational background (Hourigan, 2015; Rudofsky, 1964). Anderson also used this definition to distinguish the architecture made by the people with disciplinary memory, in contrast to social memory (S. Anderson, 1999). Hence, the definition matches the needs of this research, where the memory system of a social group will be assessed along with the transformation of their vernacular architecture, and the relation between them will be analyzed.

This has been a global concern, as seen in the increase of research on vernacular architecture in recent years (Pardo, 2023). Just like the birth of the interest in vernacular architecture heritage, it was born during the industrial revolution with the concern of the decrease of human craftsmanship and culture in design and construction (Asquith & Vellinga, 2005; Pardo, 2023). Gathered from the data in the Web of Science in July 2022, the top ten countries with the most published documents in vernacular architecture are China, the United States, the United Kingdom, Italy, Turkey, Spain, South Korea, India, Portugal, and Japan, with Australia and Indonesia running in the two positions after (Pardo, 2023). The case of Indonesia might not be the most popular in the field recently, but it might provide a perspective on how to improve research in other places.

The collective consensus in the form of action is also portrayed in the vernacular architecture and the built environment (Holm & McEwan, 2020). This is a continuation of Rapoport's notion that vernacular architecture embodies traditions created by the community over generations and passed down by generations (A. Rapoport, 1969). By observing the built environment of a society, one can see the compromises and values the community chooses in negotiating their past values and the current lifestyles' needs (Habraken, 2000).

In the book *House, Form, and Culture* by Rapoport (Asquith & Vellinga, 2005; A. Rapoport, 1969), he explains the factors that have an important influence on the way a dwelling is constructed. They are socio-cultural factors as opposed to physical factors such as climate, technology, economy, and materials. The five factors are some basic needs, family, the position of women, privacy, and social intercourse. This research will focus more on physical factors, such as technology, economy, and materials, and also privacy and their exercise of control in the host-guest dynamic.

The dismantlement of culture to how it relates to the built environment showed how culture is later translated into world views, values, ideals/images/schemata/meanings, norms/standards/rules/

expectations, lifestyles, and activity systems (A. Rapoport, 2006). These aspects are in contrast to kinship, family structure, roles, social networks, status, identity, and institutions, which are more abstract and harder to observe in the built environment (A. Rapoport, 2006).

Similar concerns are now reemerging, starting from the beginning of the 19th century when industrialization progressed so that the cities lacked the space for vernacular artifacts, folklore, and oral traditions (Boyer, 1994). While architecture always shows a highly unique juxtaposition to the city, the built environment is a representation of how, as a society, our lived experiences take form in a memory building (Hennessy, 2021; Jo, 2003; Rossi, 1982). With the fading of one's memory and vernacular architecture, and with the additional force of tourism, the town might lose its identity in the mix of cherry-picked culture and tourism strategies (Wall & Mathieson, 2006; Xue et al., 2017).

The research on the issue has increased in recent years despite the many efforts to agree on the same definition to what is vernacular architecture (Pardo, 2023). In agreement to lessen the energy for debate and instead focus on its significance (Vellinga, 2011) has led this paper to use the term in the same frame as the classification proposed by Hourigan, which sticks to the boundaries of what it is not, it is not made by architects, not built for import or to impress a cultural elite (Hourigan, 2015). The proposition follows the term and boundaries coined by Rudofsky in 'Architecture Without Architects,' which casually describes the scope of architecture produced by people without an architectural educational background (Hourigan, 2015; Rudofsky, 1964). Anderson also used this definition to distinguish the architecture made by the people with disciplinary memory, in contrast to social memory (S. Anderson, 1999). Hence, the definition suits the research design, where the memory system of a social group will be assessed along with the transformation of their vernacular architecture.

## **2. 2. Theory of transformation**

N. J. Habraken elaborated in his book, *The Structure of the Ordinary: Form and Control in the Built Environment*, how built environments can be seen as physical artifacts delicately molded by the community and constantly adapting to the lifestyle changes of its inhabitants (Habraken, 2000). He added how the adaptability and transformability embedded within the built environment signifies how it is also an ever-evolving organism. If it is still inhabited, the built environment will continue to adapt, evolve, and thrive while still embodying the values within the community.

The changing of forms seen in built environments and their configurations gives insight into the values being prioritized by the people in control of said adjustments. By observing the transformation of these forms and configurations in everyday architecture, how a community interacts with one another can reflect the form or territorial negotiations and agreements that represent the evolution of values in their culture.

Habraken broke down his methods of inspecting the built environment into three main orders. The first order to be examined is from its form, or the physical order, which is an observation of how

people operate the physically seen objects in an environment. He generalized the levels and the scale of those levels as a group and is shown as a hierarchy of forms. The smallest unit, or nominal class, we can control in a built environment is our bodies and the utensils used daily. Above that, we can observe the furniture seldom moved around, then the partitioning, which differs from one room to another, and then to building elements level, roads, and lastly major arteries. A collection of the same nominal classes is considered from its configuration, starting from interior arrangement to floor plan, building, district, and lastly, a city structure. Lastly, the combination of items of different levels from either nominal classes or configuration is observed as 'wholes,' beginning from the place, a combination of furniture and body utensils; room, an interaction between furniture and partitioning or interior arrangement and floor plan; and so forth are built space, block, and neighborhood, as observations between two different levels directly neighboring the other. All these levels may vary to different cases and be adjusted to be more contextual.

Place, the territorial order, is the second order from which we can analyze the built environment. In this order, attention is given to the control of space, for it shows how territorial hierarchies are distinct yet related to those found in the physical form, the order previously explained. Although control of form is simply defined by the transformation of said form, the control of space is also to act on the material parts that define said space. Still, these two orders, the formal and the territorial hierarchies have reciprocal influence and interpretation towards one another. Yet, the act of inhabitation is the fundamental definition of territorial control. To observe the territorial structure and its transformation, one can comprehend the depth of the hierarchy, which resembles one of the intangible values of a community's settlement pattern.

Lastly, understanding of the cultural order: in this part, the values embedded within one community are understood by those who transform the built environment. The actors behind the transformations always intervene, inevitably, in a context of meaning and social understanding. The largely unspoken conventions a community adheres to are revealed in patterns, types, systems, and other regularities that can be seen in the environment in endless variety. These unspoken and unwritten rules are the key to understanding how a built environment functions within a culture and how it will always be found to be different from another culture.

The vernaculars of everyday architecture in Indonesia are rarely seen as something significant to be studied. The spectrum of architecture research is either future-forward or romantically traditional, yet the urgency to comprehend the 'now' is not felt by practitioners and researchers alike. But what if the now does not reflect from the past? What if it continues to not reflect the memories of the past? This resounds the concern from almost 30 years ago when the memories of the urban fabric threatened to disappear as Boyer saw a memory crisis (Boyer, 1994).

The national design competitions of tourism facilities in rural Indonesia aim to highlight the locality of the submitted designs, which ignites a sense of curiosity about what values are being upheld

in these areas. Can it be understood by the limited historical records of traditional buildings? Or can the seemingly average architecture, which at face value looks similar in many places in Indonesia, hold a different value that is dear to the locals' lifestyle? By grasping the unspoken laws behind the inevitable transformations, appreciation and understanding of the current everyday architecture in Indonesia are hoped to increase and be used as a reference for future design applications. Designs that fulfill the current and predicted lifestyle without alienating the future residents from their inherited dwelling culture (Stringer, 2017).

Table 2.1 Literature review of the theory of transformation

<i>Year</i>	<i>Author(s)</i>	<i>Title</i>
2012	Bukit, Hanan, Wibowo	Aplikasi Metode N . J . Habraken pada Studi Transformasi (Application of N.J. Habraken Method on Transformation Studies)
2012	Hanan	Modernization and Cultural Transformation: The Expansion of Traditional Batak Toba House in Huta Siallagan
2015	Yiwei, Beisi	Transformation of Territorial Spaces in Low-Rent Housing in Shenzhen, China
2017	Michiani, Asano	A Study on the Historical Transformation of Physical Feature and Room Layout of Banjarese House in the Context of Preservation

Furthermore, the transformation of control over territory according to the changing built environment will be assessed through the analysis of the public-private hierarchy in domestic spaces. Like space syntax, the built space will be analyzed through the depth and through the guest-host relationship. The guest-host relationship will provide insight into how they share their domestic realm with visitors from various connections. The literature review is summarized in Table 2.2.

In the previous research by Othman et al., they focused on how the Islam perspectives have divided the privilege of guests based on their genders (Othman, 2014; Othman et al., 2013; Othman, Aird, et al., 2014; Othman, Buys, et al., 2014). Other studies with Islam perspectives as their main factor have also differed between the genders both in the domestic spaces and the guests (Al-Kodmany, 1999; Alkhazmi & Esin, 2017; Hasan et al., 2021; Mortada, 2003; Sari et al., 2019). In this study, the Islam perspectives will be an insightful factor to review but will not be the focus. This also applies to the scope in which the Islam perspective focuses on other than privacy in dwellings, which is visual privacy. This research will highlight dwellings, with visual privacy as an added scope if applicable.

The territory divided in a house based on personality and psychological aspects is discussed by Vassilaki and Ekim (Vassilaki & Ekim, 2015). The exercise of privacy in a cultural sense in a vernacular environment within the changes from being traditional to a modern environment is discussed by Al-Jokhadar and Jabi (Al-Jokhadar & Jabi, 2016). The combination of privacy and hospitality seen from a psychological perspective in a vernacular environment is discussed by Sari, Nuryanti, and Ikaputra (Sari et al., 2019).

Table 2.2 Literature review on privacy, territory, and hospitality in domestic spaces

Domain	Author (Year)	Scope		Factors							Methods						
		Dwellings	Visual privacy/access	Activity-based	Cultural	Islam perspectives	Psychological	Personal	Hospitality	Vernacular	Traditional/modern	Sampled questionnaire	Structured interview	Semi-structured interview	Open-ended	Observation	Space Syntax
Privacy	ALKHAZMI, Hamza Mohamed, ESIN, Nur (2017)	•			•	•			•		•	•					•
Privacy	Al-Kodmany, K. (1999)	•	•		•	•	•	•		•	•		•	•	○		
Territory	Vassilaki, P., Ekim, E. (2015)	○	•	•			•	•							•		
Privacy	Al-Jokhadar, A., Jabi, W. (2016)	•			•					•	•						•
Privacy, hospitality	Othman, Z., Buys, L., Aird, R. (2013)	•	•		•	•	•	•	•	•	•		•				•
Privacy, hospitality	Othman, Z., Buys, L., Aird, R. (2014)	•	•	•	•	•	•	•	•	•	•		•				•
Privacy, hospitality	Othman, Z., Buys, L., Aird, R. (2014)	•	•	•	•	•	•	•	•	•	•		•				•
Privacy, hospitality	Othman, Z., Buys, L., Aird, R. (2014)	•	•	•	•	•	•	•	•	•	•		•				•
Privacy, hospitality	Hasan, M.I., Prabowo, B.N., Mohidin, H.H.B. (2021)	•	•	•	•	•	•	•	•	•	•						•
Privacy, hospitality	Sari, I.K., Nuryanti, W., Ikaputra (2019)	•			•	•		•	•	•					•		

The factors assessed in the previous research must be adjusted to be useful in this research. First, Labuan Bajo has an almost 50:50 composition of Muslims and Catholics, hence requiring the Islam values to be reviewed in contrast to the activities or cultural factors of the locals, which have undergone other assimilation to the diversity. Second, the psychological and personal views will be analyzed from one case to another in comparison to each respected societal, cultural, and religious identity. Third, hospitality factors play an important role in the daily life of the residents and are seen as a ritual in itself (Boudou, 2012) and are apparent in Labuan Bajo (Erb, 2015). This factor will play a major role in the assessment of the dwellings' privacy. Some previous research has also been concerned with the vernacular aspect of the dwellings observed, which is especially important in this research. The comparison between traditional and modern dwellings and the different ways the residents adjusted to the changes is also closely related to this study.

### **2. 3. Memory and vernacular architecture**

Considering the unanimous perception the residents have of the rapid growth of Labuan Bajo and the transformations the town experienced mentioned in the previous research (Ardhyanto et al., 2020), memory recollection is considered to be a good alternative in fighting the limited nature of the historical records. In addition, as mentioned earlier, ‘nunduk’ or spoken tales of the village's history is the method of intergenerational education in the Manggarai culture (Allerton, 2012). The hypothesis is that this form of informal education may also be helpful in the recreation of their past vernacular architecture, at least in the one to two generations above the informants.

Stanford Anderson defined the distinction between social memory and discipline memory, where the former is the collective memory of a society that is embodied in architecture, and the latter is the application of memory within the discipline of architecture itself (S. Anderson, 1999). He argues how vernacular architecture and its transformation may relate to the memory system of a society: preliterate or literate, oral or not, and to the society being historically conscious or not. This aligns well with Boyer’s perspective of how even the contemporary city has traces of history made by the collective experiences of the residents (Boyer, 1994).

In a preliterate and/or oral society, a collective memory is created over time, and it functions according to a generative reconstruction. It is an adaptation process throughout the generations where it aims to maintain the balance of their traditions or values to the change brought by time. Some meanings, customs, or forms will be eliminated or transformed in this process. Preliterate and/or oral society are pressingly focused on troubleshooting the problem that they may or may not note the transformations to their social practice or forms. This is due to the memory system behind the preliterate and/or oral society, where the social function of memory or collective memory is as important as forgetting. This choice to remember or forget is in the last stage of the homeostatic organization non-literature society go through in their adaptations, therefore unlikely to remain in the memory in the face of the new perceived reinstated balance. This is said to be the reason why an external observer is more likely to notice the differences in a non-literate society’s distinctions (S. Anderson, 1999).

In a literate society, they have records of every decision made when going through the adaptation process. The existence of these records of their every transformation makes the society more skeptical of change and innovation due to the nearness of their memory to their past [Anderson, 1999]. This might not be the case for all disciplines, as in most societies, architecture is not a discipline that is examined and documented rigorously.

Vernacular architecture may persevere in societies that are historically conscious. The continuation of the vernacular construction knowledge might be in the style of the traditional form, or it might be a reinterpretation with ‘vernacular usage’ in the design. It might even be an invented tradition applied to a similar context to the one they had in the past. The degrees of continued tradition might also be

on different spectrums of mentalities as written by Jacques Le Goff and quoted by Anderson: it is a meeting point of polarized distinctions between unconscious or intentional, individual or collective, marginal or general [Anderson, 1999].

The Manggarai society is mostly literate, oral, and historic. The oral and historic side of them are shown in the 'nunduk' and the many oral traditions that are continued. As mentioned before, the literate part of the Manggarai society, same with most of the societies in Indonesia, does not cover architectural documentation. Therefore, this ongoing research uses interviews with the owner or successor of the house to explore how their preliterate and oral memory system can help gather information regarding the transformations of their vernacular architecture.

Another research done in a different village in Flores, Indonesia, by Khambali and Lukito used memory recollection to reconstruct the lost architecture they once had (Khambali & Lukito, 2022). In their case, the Tazo traditional architecture was extinct and only one elder in the community had the chance of inhabiting it. They made a drawing from the descriptions from the memory of this elder and then asked the elder and other Tazo community members to confirm recognizing their past traditional architecture. Their research has shown how communities with intergenerational oral history education may preserve their built and natural environment in their memory (Allerton, 2012; Fox, 2006; H. Rapoport & Sardoschau, 2022).

Social identity theory states that people think, feel, and act as members of collective groups, institutions, and cultures. The social identity approach emphasizes the idea that individual social cognition is socially interpreted depending on their collective or group frame of reference. For example, immigrants who perceive themselves as negatively stigmatized because of their dark skin color or language accent may be reluctant to acculturate, believing that such negative views will not go away even if they are culturally competent in the dominant culture.

Social identity theory tries to explain the relationship between groups in general and social conflict. This theory covers three main points: 1) People are motivated to maintain a positive self-concept, 2) The self-concept is largely derived from group identification, and 3) People construct positive social identities by comparing their in-group and out-group. Thus, social identity theory assumes that processes of internal social comparison encourage conflict between groups, even though there is no competition or explicit competition between groups. Structural variables such as power, hierarchy, and scarcity of resources tend to lead to a more favorable view of the inside group than the outside group. In view of social identity theory, the desire to have a positive social identity is seen as an important psychological motor behind individual actions in every social interaction. This takes place through a process of social comparison, which is seen to determine the position and status of their social identity. The process of social comparison is a series of comparisons with other people or groups that subjectively help individuals make specific judgments about their social identity compared to other social identities (Michael Hogg and Dominic Abrams. 1988: 26-54).

There are always efforts to maintain a positive social identity and improve the image if it turns out that social identity is declining both on an individual and group scale. In the macro-social context, groups or societies, efforts to achieve a positive social identity are achieved through social mobility and social change. Social mobility is the movement of individuals from lower groups to higher groups. Social mobility is only possible if the opportunity to move is quite open. However, if opportunities for social mobility do not exist, the underclass will try to improve their social status as a group. The first option is to shift the status to a higher level. If the possibility of shifting to a higher position does not exist, then the effort to be made is to improve the image of the group so that the impression is not too bad. This theory is used to see the identity built by the four groups observed in this research.

Table 2.3 Literature study on memory recollection of vernacular architecture

<i>Literature</i>	<i>Highlights</i>
Lestariningsih, A. D. (2019). Oral History in Indonesian Contemporary Historiography: A Case Study of Female Political Prisoners in Plantungan Camp 1969--1979. <i>Indonesian Historical Studies</i> , 3(2), 86–95.	Oral history is needed as a resource when written sources are not obtainable. In the digging of oral history, a communicative relationship between the interviewer and the informants is required. In verifying the data, a distance between the interviewer and the informants is required. A data cross-check is required by using various sources.
Anderson, S. (1999). Memory without Monuments: Vernacular Architecture. <i>Traditional Dwellings and Settlements Review</i> , 11(Fall), 13–22.	In utilizing memory, the type of memory of an individual can be categorized into two: social and disciplinary memory. Social memory can operate on different systems in different communities; it can be oral-non-oral, literate-preliterate, historic-non-historic
Ardhyanto, A., Dewancker, B., Novianto, D., & Heryana, R. E. (2020). Townscape Transformation of Touristic Rural Labuan Bajo, Indonesia. <i>Journal of Asian Institute of Low Carbon Design</i> .	The residents of Labuan Bajo have an almost unanimous story of the rapid growth and the transformations the built environment of the town has experienced.
Allerton, C. (2012). Visible Relations and Invisible Realms: Speech, Materiality, and Two Manggarai landscapes. In A. Árnason, N. Ellison, J. Vergunst, & A. Whitehouse (Eds.), <i>Landscapes Beyond Land: Routes, Aesthetics, Narratives</i> (19th ed., Issue July, pp. 178–196). Berghahn Books. <a href="http://eprints.lse.ac.uk/id/eprint/41032">http://eprints.lse.ac.uk/id/eprint/41032</a>	Manggarai communities in Kombo and Wae Rebo have 'nunduk', an oral tradition to pass down family history and biblical stories.
Khambali, M. R., & Lukito, Y. N. (2022). Rebuilding Tazo Traditional House East Nusa Tenggara by Excavating Collective Memories. <i>Local Wisdom: Jurnal Ilmiah Kajian Kearifan Lokal</i> , 14(1), 32–47. <a href="https://doi.org/10.26905/lw.v14i2.6508">https://doi.org/10.26905/lw.v14i2.6508</a>	The survey team stayed for one month at Tazo Village to recollect their past traditional architecture. They interviewed the community leader and then asked other members of the community to confirm their sketches.
Douglas, M. (2003). <i>The archaeology of memory: an investigation into the links between collective memory and the architecture of the parish church in late medieval Yorkshire</i> [University of Durham]. <a href="http://etheses.dur.ac.uk/12601%0AUse">http://etheses.dur.ac.uk/12601%0AUse</a>	This approach to investigating their broader history is adapted from a study of the link between memory and architecture in medieval York.

#### **2. 4. Transformation of Indonesian vernacular architecture**

N.J. Habraken, his close ones, and his followers are the few people who find the vernaculars of everyday architecture in Indonesia as something significant to be studied. The famous spectrum of architecture research is either future-forward or romantically traditional, yet the urgency to comprehend the ‘now’ is not felt by practitioners and researchers alike. But what if the now does not reflect from the past? What if it continues to not reflect the memories of the past? This resounds the concern from almost 30 years ago when the memories of the urban fabric threatened to disappear as Boyer saw a memory crisis (Boyer, 1994).

The national design competitions of tourism facilities in rural Indonesia aim to highlight the locality of the submitted designs, which ignites a sense of curiosity about what values are being upheld in these areas. Can it be understood by the limited historical records of traditional buildings? Or can the seemingly average architecture, which at face value looks similar in many places in Indonesia, hold a different value that is dear to the locals’ lifestyle? By grasping the unspoken laws behind the inevitable transformations, appreciation and understanding of the current everyday architecture in Indonesia are hoped to increase and be used as a reference for future design applications. Designs that fulfill the current and predicted lifestyle without alienating the future residents from their inherited dwelling culture.

Tourism has also impacted the way of living, especially in rural areas, changing the traditional way of personal relations in providing services to the cash-oriented value system (Hanan, 2012). This was observed in many villages in Indonesia, specifically Huta Siallagan in Batak Toba, one of the top ten prioritized destinations. The needs of the inhabitants then were hard to differentiate from their desire for consumption, allowed by their increasing economy and the changes in their standards of living. The traditional houses had additional rooms and even annexes behind them with the rooms’ functions diversified. The furniture and utensils have gone through drastic changes. The materials have changed to manufactured ones, such as ceramic tile and masonry, instead of bamboo and wood for the structure. The houses were also built on ground level instead of a traditional stilt house, and in the two-story expansions, the lower floor would imitate modern construction with a traditional wooden upper floor. The shape and inclination of the roof have also changed drastically, adjusting the ability of the modern material.

In the early 20<sup>th</sup> century, long before mass tourism, the exposure to new lifestyles was introduced through migration. Migration is a tradition in many Austronesian-speaking societies in both island South-East Asia and Oceania, familiar in Indonesian as the word ‘merantau’ (Waterson, 1997). The concept of migration will mostly be associated with the Minangkabau people of Sumatra Island, who have historical records to prove how they have been doing this for centuries. But there are other ethnic groups who also have a long-established migration tradition, such as the Bugis, Baweanese, and the Banjarese (Castles 1967; Lineton 1975; Persoon 1986 from Waterson 1998, Kemdikbud 2018), and in

the eastern Indonesian, there are circular or seasonal migration, as well as migration to outside of their area or even outside Indonesia (Allerton, 2013).

At the same time, colonization has also brought many foreign and novel materials and construction techniques. Since the 1910s, the Minangkabau ‘madrasah’ or Islamic school has used zinc sheets as their roofing material, raising the question of when a material change can be considered ‘traditional’ (Waterson, 1997). The material change brought by the colonies happened in many corners of Indonesia due to the ease of use and durable features of modernized material. Yet not all areas were able to afford it at the same time.

The rural areas that were becoming hosts to these tourists and colonies are also exposed to architects, who are often seen as out of place by the villagers (Stringer 2017, Ben. Architecture and culture: A villages and globalization issue). This can be seen as a power dynamic, especially with the Manggarai point of view of the foreign having a special aura of prestige (Allerton 2013). Therefore, the architects, usually from Java Island, have more influence and a stronger hold on the decision-making. This is the same threat brought by the existence of the internet and social media, where the outsiders’ houses are influencing the rural residents’ preferences. The vernacular architecture, organically crafted by a community honed down from generation to generation, may provide more design lessons for architects (Stringer 2017). The national design competitions are also furthering that impact by adding the national government’s power and legitimizing the top-down approach to be their green light for rural development (Purwaningrum 2018).

Archeological proofs of Indonesian civilization have dated from 2000 years ago, but the dense urban scenes have only emerged in recent centuries (Cribb 2000). The early Indonesian towns and cities seem to not have any administrative, political, commercial, industrial, or religious functions as they do in their European counterparts (Cribb 2000). These functions were mostly introduced in the recent centuries by the Dutch colonies and further continued by the national government by instructing the villages in remote areas to come nearer to the roads in the 1960s. This adds to the demand for the residents of rural areas to adapt to too many changes caused by external forces, making the transformations of their vernacular architecture seem to be something insignificant compared to other life changes. The demand to change, to move, to adjust, either to government demands, social pressure, or natural conditions, have made many Indonesian vernacular architectures an embodiment of pragmatic solutions that are still in accordance with the local aesthetics and standards.

This behavior is aligned with Rapoport’s hypothetical where each group has a starting point to which they will assimilate toward another group of the local proximity (Rapoport 2006). Group A might be more influenced to assimilate into Group B, and group B might see the advantage of assimilating back to Group A, with the same pattern and possibilities applied to the many other groups in the area. He also hypothesized how there is a specific expression of a constant, seen as universal. In the Indonesian case, this might be actualized as the landed house with reinforced concrete structure,

roofs with short eaves, glass windows with single awnings, and ceramic tiles flooring. This constant evolved from mostly elevated houses (from tree houses, stilts higher than the adult's head, or three-riser floor structure) with bamboo or wood structures, roofs with deep eaves and thatch as material, wooden or palm leaves weaving windowpanes, and slit bamboo as flooring.



Figure 2.1 Examples of Indonesian vernacular architecture in 2021-2022

This transformation happened in the span of less than 100 years and with many external forces acting as the guidelines for a developed lifestyle. Even though this is inevitable, and everyone has the right to improve their lives, how these shifts were decided should provide insight into the design preferences of the locals instead of spoon-feeding them the 'correct' way of living. The 'correct' design might be helpful for public facilities or in highly urbanized and globalized areas, but this might not work in all places.

Residential areas are especially not the place where outsiders should dictate how they live, and if they are still close to their history, it would be a waste to not listen to their preferences. Rapoport (2006) described how these traditional groups act differently from contemporary groups when confronted with another group of a similar nature. Traditional groups, on their own, tend not to deviate far from their many ideals, and contemporary groups will have 'ideals' with little rules where they will drift far and indefinitely. When traditional groups are assimilating with one another, they will have less space to negotiate due to the many values they have on their own, which limits their flexibility to improvise. In the case of contemporary groups, they will have a bigger space to adapt to one another as the two groups will have a larger range when defying their minimal ideals. In both cases, they will still have the deviant points that are not a form of conformity to the other group. The traditional groups will still be bound by their ideals and not depart far from them, while the contemporary groups are initially already far from each other and will have a further range of deviations from one another despite the big space for compromise.

This phenomenon can be easily seen in Indonesia, where many towns are melting pots with cases of both contemporary and traditional groups living aside another. Conflicts usually happen when the traditional meets contemporary groups. In the case of Bali, the traditional group is the locals, and the contemporary is the foreigners. Fortunately, the Balinese were already strong in their political position, and therefore, they could force the newcomers to follow their ideals. The hotels and resorts were built in accordance with their local customs, among many is to not build anything higher than the coconut

Table 2.4 Literature study on vernacular architecture transformation in Indonesia

<i>Literature</i>	<i>Highlights</i>
Boyer, M. C. (1994). <i>The city of collective memory: its historical imagery and architectural entertainments</i> . The MIT Press.	At every rupture point between the modernists and the traditionalists there occurs a memory crisis.
Hanan, H. (2012). Modernization and Cultural Transformation: The Expansion of Traditional Batak Toba House in Huta Siallagan. <i>Procedia - Social and Behavioral Sciences</i> , 50(July), 800–811. <a href="https://doi.org/10.1016/j.sbspro.2012.08.082">https://doi.org/10.1016/j.sbspro.2012.08.082</a>	Tourism has also impacted the way of living, especially in rural areas, changing the traditional way of personal relations in providing services to the cash-oriented value system.
Waterson, R. (1997). <i>The Living House: An Anthropology of Architecture in South-East Asia</i> (Paperback). Thames and Hudson Ltd.	Migration is a tradition in many Austronesian-speaking societies in both island South-East Asia and Oceania, familiar in Indonesian as the word 'merantau'. Bugis groups have long-established migration traditions. From the time of colonization in the 1910s, the Minangkabau 'madrasah' or Islamic school has used zinc sheets as their roofing material, raising the question of when a material change can be considered 'traditional.'
Kemdikbud. (2018). <i>Bugis dan Bajo di Labuhan Bajo Manggarai Barat Perspektif Sejarah dan Budaya</i> (1st ed.). Kepel Press. <a href="http://repositori.kemdikbud.go.id/23355/">http://repositori.kemdikbud.go.id/23355/</a>	Bugis and Bajo people have long-established migration and have had several waves of migration to Labuan Bajo, at least since the mid-1600s.
Stringer, B. (2017). Architecture and culture: A villages and globalization issue. <i>Architecture and Culture</i> , 5(1), 1–4. <a href="https://doi.org/10.1080/20507828.2017.1299434">https://doi.org/10.1080/20507828.2017.1299434</a>	Rural areas that are hosts to tourists are also exposed to imported architects. Vernacular architecture organically crafted by a community, honed from generation to generation, may provide design lessons for architects.
Allerton, C. (2013). <i>Potent Landscapes: Place and Mobility in Eastern Indonesia</i> . University of Hawai'i Press.	The increase of foreigners can be seen as a power dynamic, especially with the Manggarai point of view of the foreign having a special aura of prestige.
Purwaningrum, D. A. (2022). The Nusantara Architecture Design Competition: A 'Forced' Traditionalisation of Indonesia's Architectural Identity Translation? Proceedings of the 38th Annual Conference of the Society of Architectural Historians Australia and New Zealand, 38. <a href="https://doi.org/10.55939/a4011patat">https://doi.org/10.55939/a4011patat</a>	The national design competitions are furthering the imbalance of power dynamic by adding the national government's power and legitimizing the top-down approach to be their green light for rural development.
Cribb, R. (2000). <i>Historical Atlas of Indonesia</i> . In <i>Historical Atlas of Indonesia</i> . University of Hawai'i Press. <a href="https://doi.org/10.4324/9780203824610">https://doi.org/10.4324/9780203824610</a>	Archeological proofs of Indonesian civilization have dated from 2000 years ago, but the dense urban scenes have only emerged in recent centuries. The early Indonesian towns and cities seem to not have any administrative, political, commercial, industrial, or religious functions as they do in their European counterparts.
Rapoport, A. (2006). Vernacular Design as a Model System. In L. Asquith & M. Vellinga (Eds.), <i>Vernacular Architecture in the Twenty-First Century: Theory, education and practice</i> . Taylor & Francis.	This behavior is aligned with Rapoport's hypothetical where each group has a starting point to which they will assimilate toward another group of the local proximity. Traditional groups act differently from contemporary groups when assimilating with another similar group.

trees and to adorn them with Balinese architectural elements. This is why Bali was seen as a good example of tourism development, because the locals were in a great position to decide the space for negotiations with the foreigners. But recently Bali has been experiencing changes in their power dynamics with the external forces. More new buildings are not designed in alignment with their past values, perhaps signifying a new definition of Balinese architecture and the laws that bound it or the decrease in their leverage against the demands of current tourists.

Other prioritized destinations that are intended to follow Bali's footsteps are not as fortunate to have strong initial leverage. Many of these places have succumbed to the great powers of the central government and the demands of their aimed type of tourism. In the description made by Rapoport earlier, in this case, the locals have traditional values, but they do not have the ability to decide the area of negotiation. With the power being on the field of the contemporary group, then the traditional group must adapt to the unruly contemporary group with its wide range of deviations. This is what leads to top-down conflicts, where the local community is being oppressed by powerful foreigners.

This push and pull effect of two cultures clashing one against another is what can be solved by directing academia to understand the locals better and allow them to build their own base as their own leverage. This is what is practiced in community-based developments, and that field in architecture is not explored enough to be the basic principles applied in architecture education and practice.

## **2. 5. The context of Labuan Bajo as a national and international case**

As mentioned before, rural areas that are host to tourists are also exposed to imported architects (Stringer 2017, Ben. Architecture and culture: A villages and globalization issue). This potential power dynamic happened as well in Labuan Bajo, where the top of the power hierarchy is still held by the Manggarai people. The Manggarai has a point of view of foreigners or people who have traveled a far distance to have a special aura of prestige (Allerton 2013). Therefore, the architects, usually from Java Island, have more influence and a stronger hold on the decision-making. This is the same threat brought by the existence of the internet and social media, where the outsiders' houses are influencing the rural residents' preferences. This power dynamic obviously is not contained within the architecture realm but has also caused issues before the architecture can even be the main concern of the locals. There is land grabbing, disputes on land ownership, and deforestation, to name a few.

The Bugis people had resistance as well, but not to the land issues, but more to tourism. The Bugis were mostly very devout Muslims, and they opposed the idea of tourists bringing their culture to the town. The value they disagree with the most is the way tourists dress, but that is not to say that their other influences are welcomed. Regardless of the disapproval from the Bugis community, the tourism industry succeeded in infiltrating Labuan Bajo, and with the Bugis people having a lower power in the hierarchy compared to the Manggarai authority, they had to comply and make the most of their new dynamics and adapt.

On the other side of the locals' representations, Bima communities do not have any preferences towards these shifts of power dynamics. This might happen due to their history. The Bima kingdom was once said to rule over West Manggarai and sourced their slaves from this region. The sources are doubtful, but this might be what makes the Bima communities' position on the power dynamics more of a wallflower, just making sure they are able to survive and make the most of what they have.

Table 2.5 Literature review of Labuan Bajo's cultural diversity

Literature	Highlights
Stringer, B. (2017). Architecture and culture: A villages and globalization issue. <i>Architecture and Culture</i> , 5(1), 1–4. <a href="https://doi.org/10.1080/20507828.2017.1299434">https://doi.org/10.1080/20507828.2017.1299434</a>	Rural areas that are hosts to tourists are also exposed to imported architects.
Allerton, C. (2013). <i>Potent Landscapes: Place and Mobility in Eastern Indonesia</i> . University of Hawai'i Press.	The Manggarai have a point of view of foreigners or people who have traveled a far distance to have a special aura of prestige. This can become an unbalanced power dynamic.
Dain, J. (2023, January 18). Pantai Pede di Labuan Bajo : Dahulu ' Diambil ' dari Publik oleh Pemprov NTT , Sekarang Dibiarkan Telantar. <i>Floresa.Co</i> . <a href="https://floresa.co/2023/01/18/pantai-pede-di-labuan-bajo-dahulu-diambil-dari-publik-oleh-pemprov-ntt-sekarang-dibiarkan-telantar/">https://floresa.co/2023/01/18/pantai-pede-di-labuan-bajo-dahulu-diambil-dari-publik-oleh-pemprov-ntt-sekarang-dibiarkan-telantar/</a> 1/7	The sacred beach of Pantai Pede in Labuan Bajo was taken by the provincial government, due to a misunderstanding of land ownership being transferred from the regency's government to the provincial government. (First recorded found of vertical conflict with provincial government regarding public space)
Ministry of Foreign Affairs of The Republic of Indonesia. (2023, May 11). <i>ASEAN Summit 2023 : Labuan Bajo Strengthens MICE Destinations</i> . Embassy of The Republic of Indonesia in Hanoi The Socialist Republic of Viet Nam. <a href="https://www.kemlu.go.id/tripoli/en/news/24500/asean-summit-2023-labuan-bajo-strengthens-mice-destinations">https://www.kemlu.go.id/tripoli/en/news/24500/asean-summit-2023-labuan-bajo-strengthens-mice-destinations</a>	The locals were eager to see the developments and improvements of public facilities the government had in plan to support this MICE tourism.
Dain, J. (2022, December 4). Pembangunan Jalan untuk ASEAN Summit di Labuan Bajo : Tanah dan Rumah Warga Digusur Tanpa Ganti Rugi. <i>Floresa.Co</i> . <a href="https://sunspiritforjusticeandpeace.org/2022/12/04/pembangunan-jalan-untuk-asean-summit-di-labuan-bajo-tanah-dan-rumah-warga-digusur-tanpa-ganti-rugi/2083/">https://sunspiritforjusticeandpeace.org/2022/12/04/pembangunan-jalan-untuk-asean-summit-di-labuan-bajo-tanah-dan-rumah-warga-digusur-tanpa-ganti-rugi/2083/</a>	Vertical conflict with the central government regarding land acquisition for the ASEAN Summit infrastructure without fulfilling the promises of monetary compensation.
Kemdikbud. (1980). <i>Sejarah Daerah Nusa Tenggara Timur</i> . <a href="http://repositori.kemdikbud.go.id/7421/">http://repositori.kemdikbud.go.id/7421/</a>	The ethnic group identified in Manggarai was only the Manggarai.
Kemdikbud. (2018). <i>Bugis dan Bajo di Labuhan Bajo Manggarai Barat Perspektif Sejarah dan Budaya</i> (1st ed.). Kepel Press. <a href="http://repositori.kemdikbud.go.id/23355/">http://repositori.kemdikbud.go.id/23355/</a>	Research about documenting the perspectives of culture and history of the Bajo and Bugis groups diaspora in Labuan Bajo.
Adams, K. M. (2019). <i>The Manggarai by M. Erb</i> (Review). January 2002.	(Research on Bima migrants who came and settled in Labuan Bajo was not found)
Erb, M. (1999). <i>The Manggaraians: A Guide to Traditional Lifestyles</i> . Times Editions.	The only mention was that Manggarai was the contestation area between the Bima and Gowa sultanates and from where the sultanates imported slaves for their slave trade.
Erb, M. (2000). Work, consumption and the Indonesian crises in Western Flores. <i>Southeast Asian Journal of Social Science</i> , 28(2), 131–151. <a href="https://doi.org/10.1163/030382400X00082">https://doi.org/10.1163/030382400X00082</a>	
Williams, C. P. (2007). <i>Maiden voyages : Eastern Indonesian women on the move</i> (I. of S. A. Studies (ed.)). ISEAS Publishing ; KITLV Press. <a href="http://www.loc.gov/catdir/toc/fy0712/2007305888.html">http://www.loc.gov/catdir/toc/fy0712/2007305888.html</a>	Labuan Bajo and the province its in has a very low economy.

While the Bima people avoid political debates, Bajo communities are quite vocal about getting equal standing with the Manggarai voices. The name Labuan Bajo means the port of the Bajo people, as well as many places in the town translated from names given by the Bajo community with Bajo language. The Manggarai body of power, or 'kedaluan,' once also had a Kedaluan Bajo and was later changed by the Dutch to Bajo Gementee. This 'kedaluan' later broke into much smaller ones, which is the current Kedaluan Nggorang, which is responsible for Labuan Bajo and some surrounding areas. The Bajo people were given the right to settle by the Manggarai, which makes their power hierarchy position still lower than the Manggarai, but then again, the town, especially the coastal areas, was initially their area of governance. The Bugis and Bima newcomers, when settling in the coastal areas, can ask for land from the Bajo landowners, not the Manggarai 'daluh' or the leader of the 'kedaluan.'

The hierarchies of 'who was here first' and who gave permission to whom are the power dynamics that can be learned from to assess other places of the world. In this case, there was the Manggarai at the top, then the Bajo, Bugis and then Bima. Now, there are some new stakeholders on the top which are the central government, business investors, and tourists. The four local groups now need to cater to more people at the top, and this is a sensitive area to dredge on, requiring a careful strategy to avoid vertical conflicts.

The tourism industry and its related developments in Labuan Bajo have indeed brought many significant vertical conflicts and considerably way less, horizontal conflicts. The conflicts started before the town was nominated as a nationally prioritized tourism destination. The series of conflicts started as an issue between the locals with the provincial government of Nusa Tenggara Timur, then the regional government of Manggarai Barat, and then the Tourism Authority Agency of Labuan Bajo-Flores. The first one is a 'battle' against the provincial city, which locals have said are foreigners who always look down on their island (Labuan Bajo is on Flores Island, and the provincial city is on Timor Island). The second one is between the locals versus the regional government officers, who are mostly 'outsiders' from Ruteng, the neighboring region's capital city, 4 hours away by car. The last one is between the locals and the outsiders from the central government or from Jakarta.

The earliest point of tension with the provincial government that could be found in news articles was an issue in 2015 with their sacred beach of Pantai Pede being taken by the provincial government, a misunderstanding of land ownership being transferred from the regency's government to the provincial government (Dain, 2023). This was one of the first vertical conflicts where the locals arranged many protests and other initiatives to reverse the one-sided decision from the foreign authorities, also relating to the built environment (Dain, 2023). The issue was that a person from the provincial government wanted to make a resort there without any assessment of the locals' needs, especially since that strip of beach is the only public beach for the residents of Labuan Bajo.

In 2003, the Great Manggarai Regency (Kabupaten Manggarai Raya) was expanded into three regencies: West Manggarai, Manggarai, and East Manggarai Regency (Pembentukan Kabupaten

Manggarai Barat Di Provinsi Nusa Tenggara Timur, 2003). Labuan Bajo was designated as the capital city of the regency, and government staff from Ruteng, the capital city of Manggarai Regency, and the former Great Manggarai Regency were migrated to fill in new government positions in Labuan Bajo. In the early years of the West Manggarai Regency government was dominated by the people from Ruteng, and the locals felt like they were not given an equal chance to oversee their own territory, even with the independent regency expansion.

Ten years later, in 2023, Indonesia became the president of the ASEAN Summit 2023, where the leaders of the ten countries in South-East Asia had their annual meeting, and their main meeting was held in Labuan Bajo. The locals had great enthusiasm for the country leaders to visit their small town. They were eager to see the developments and improvements of public facilities the government had in plan to support this MICE tourism (Ministry of Foreign Affairs of The Republic of Indonesia, 2023a, 2023b). Even with the events the central government made in the coming years, the ASEAN Summit is on a very different level. There were the developments of a sterile tourism destination in Golo Mori, road constructions to Golo Mori, and in and around the town, and on the days of the event, the traffic circulation was also adjusted in reverse. However, not all were gold and glory, as some residents have claimed that they were not reimbursed for the land they gave for the road expansion in Nanga Nae on the way to Golo Mori. In the hilly areas, the residents near the forest of Bowo Sie protested the deforestation of the land in plans for a plant nursery. This forest is believed to be the water catchment area of the town and the source of livelihood of the residents there. There are a lot of mixed reactions from residents, as some felt acknowledged and grateful for the developments and attention, and others feel at a loss in this new unjust game.

In the 1980s, the government launched a great expedition to document, research, and study each province and its cultural identities. In this project, the ethnic group identified in Manggarai was only the Manggarai (Kemdikbud, 1980). In recent years, more research about the diversity of Labuan Bajo has been done. In 2018, research was done to document the perspectives of the culture and history of the Bajo and Bugis groups' diaspora in Labuan Bajo (Kemdikbud, 2018). Yet research and documentation regarding Bima communities in Labuan Bajo have not yet been found during this research. The only mentions found were regarding the era of the Bima Sultanate and how Manggarai was the contestation area between the Bima and Gowa sultanates and from where the sultanates imported slaves for their slave trade (Adams, 2019; Erb, 1999, 2000). In addition to the limited documentation of most parts of Eastern Indonesia, the power dynamics of each group also restrained their records in Labuan Bajo or West Manggarai.

Power dynamics are not the only shifts experienced by the locals. They also have gone through alterations of livelihood, a sudden increase in the economy, and the new opportunities it brings. The town, as part of the province, was one of the lowest economies in the 2000s (Williams, 2007). Walpole and Goodwin explained how, even in 2000, the residents already had a positive perspective on the

conservation of the national park and the promise of tourism. The observed economic boost since the announcement of the prioritized tourism destination has attracted more people in the last five years, and now the town has more groups from both traditional and contemporary backgrounds. The government has shown how tourism can act as a poverty alleviation tool, and it is one of Indonesia's biggest potentials. This is backed by the UNWTO with their program in 2016. Hence, the phenomenon of the recent migration of both contemporary and traditional groups to a traditional group area as impacts of mass tourism might also be the context seen similarly in other places.

In this research, the question asked for the context of Labuan Bajo: are there any differences or similarities in the vernacular architecture between the four ethnic groups? And in recollecting their memory, will there be any different experiences or findings between them? As stated before, it is hypothesized that traditional groups will indeed adjust to one another, yet they will still stick to their own reserved ideals, which means the vernacular architecture and memory system will be different from one another and their places of origin. In proving this, another question might be answered: are the groups there still a traditional group or have they compromised enough in the modern developments and have become contemporary groups?

## **2. 6. Literature review conclusion**

From the previous subchapters, some main questions and their following queries were concluded. The flow of each literature study, main research questions and hypothesis is shown below in Figure 2.2. Vernacular architecture is not included in the flow as it is the object of the research. The literature study of that topic was done to describe the boundaries and definitions adhered to in this investigation.

By studying vernacular architecture through the theory of transformation, this study will find out which levels and orders are changed and which are preserved. The hypothesis is that the materials have changed due to economic and practical reasons, but some traditional values are kept. The cultural and territorial orders and agreements behind the decisions on how they alter their built environment will also be queried. The assumption would be that they are consciously or subconsciously assimilating to one another due to the shared geographical boundaries.

Memory recollection of vernacular architecture has been explored in the past, but how far can it be helpful in recovering past vernacular architecture that has defied the traditional forms, which have more rules and standards, is the question asked in this research. The premise would be that memory recollection can be a significant resource in describing past vernacular architecture, especially if they are asked to describe their houses. This is why the levels of the built environment must also be in the scale of their daily activities, minimizing the gap between them and their environment.

After gathering the data of the houses and how effective the memory recollection was, this research will take a step back and evaluate in the context of Labuan Bajo as a part of Indonesia. The rapid changes the country went through in recent generations have made it possible for one generation to

experience at least two forms of houses in their lifetime. In finding the answer to that question, the literature study has led to the presumption that that is indeed highly likely. This is why it is better if the informants are of the elderly group so that they have a longer range of experience and have more stored in their memory.

Labuan Bajo, as a case study, provides its own story of diversity, and the question is, are there any differences or similarities between Manggarai, Bima, Bugis, and Bajo architecture? According to the previous subchapters, much literature indicates that there will be different modern vernacular architecture forms from different ethnic groups. They will have different ideals and deviate from them according to their individual priorities. The result will also be reflected in their memory system to see how the trend might be in the future.

All these research questions need to be proven by direct observation and in-depth interviews. Hence, direct observation and in-depth interviews as the best methodology for this research if they utilize the theory of transformation and the memory recollection principles. This will be discussed in the next chapter.

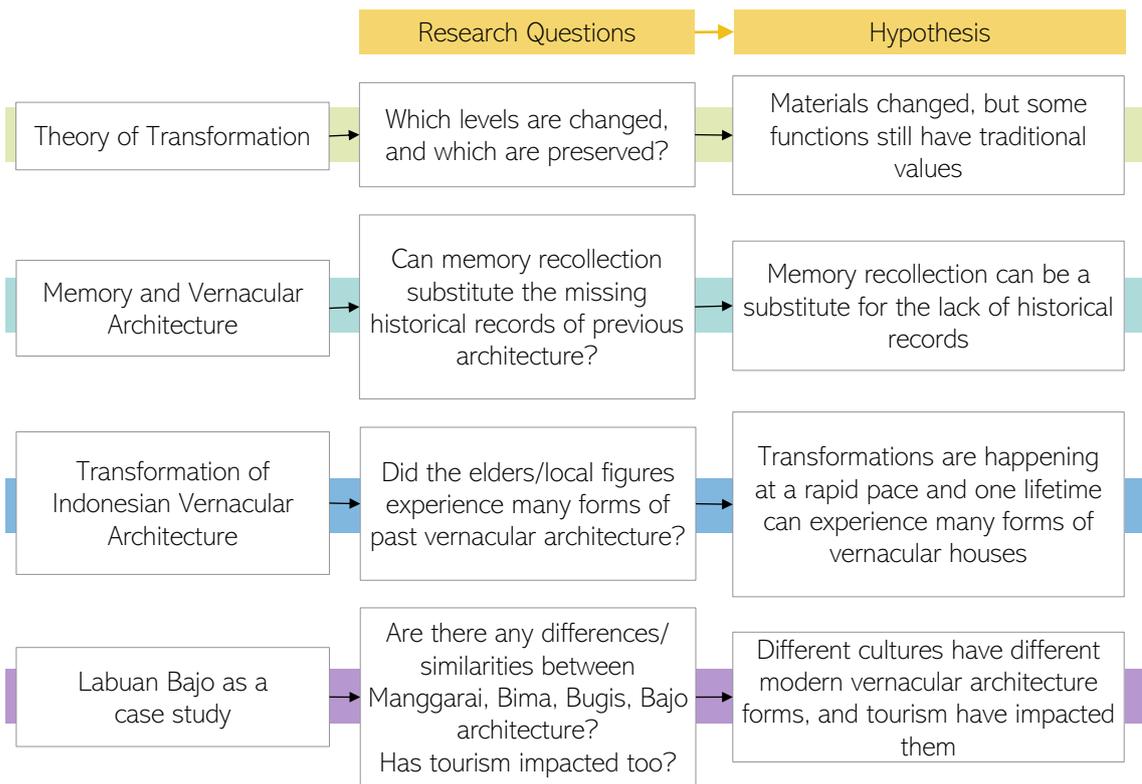


Figure 2.2 Literature study, the questions, and hypothesis of this study

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**CHAPTER 3**  
**METHODOLOGY**



### 3. 1. Methodology flow

The overall methodology will be based on two main theories, which are the theory of transformation and the theory of memory recollection. The application of these theories will be applied to tangible actions, which are divided into three categories: direct observation, in-depth interview, and desk study and analysis. Furthermore, this research is bound by the geographical boundaries of Labuan Bajo in the colloquial sense, and the informants are limited to elders, local figures, or owners of houses with significant changes observed, with cultural identities from Manggarai, Bima, Bugis, and Bajo communities. This is seen in the previous chapters in Figure 1.18.

The method flow and division of the theory supporting the tools in this research are portrayed in Figure 3.1. Direct observation is done with the theory of transformation in mind, while the memory recollection theory is the base of the in-depth interview desk study and data analysis. Direct observation will analyze the current house. The in-depth interview will assess the memory of the interviewees and compare their recollection ability in different scales: family/individual, town/neighborhood, or their past houses' memories. Family/individual memory should be the easiest to recollect and share as it is inherently a person's responsibility to remember their own history.

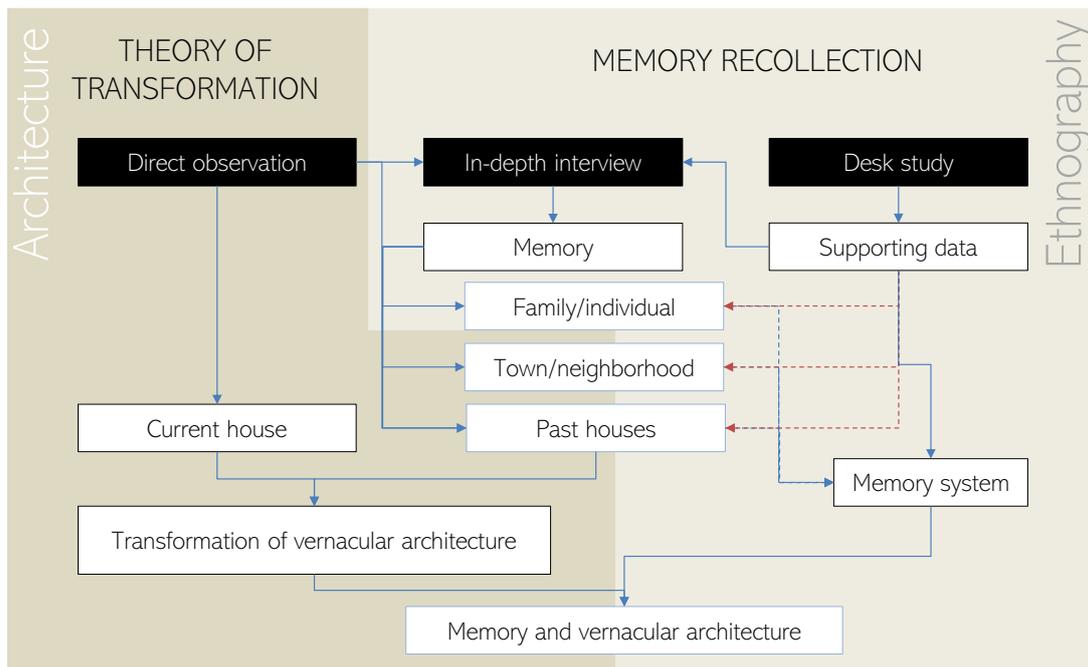


Figure 3.1 Methodology flow used in this research

In some other places, this might be hard to probe, but Indonesians, as a communal and oral society, have a tendency to be open in sharing family history, thus making the process easy in most cases. The memory recollection of the town/neighborhood history is to compare the milestone events to their own individual milestones, and then to the past houses' history of transformation. Cross-checking with data gathered from desk study will help get a bigger picture of how the memory system works.

Desk studies were done before the direct observation and interviews to collect the regional milestones, events, and social values available in written records. After the observation and interviews, another desk study was conducted to confirm the findings on the field and act as supporting data for the interviews. The supporting data will be referred to the three categories of memory recollection, and from there they will be analyzed back in the post-observation desk study. The findings from the analysis of different categories of memory will be assessed through the theory of vernacular architecture and memory systems. This will provide insight into how the theory applies in different groups in Labuan Bajo in the form of memory systems. This may be applicable to their counterparts in different parts of Indonesia and other communities in other parts of the world. The history and social context behind these transformations will help explain the power dynamics behind the factors of the built environment transformation and how similar places in the world may benefit and learn from them.

After analyzing the past houses with the supporting data from the desk study, the changes in houses experienced by one person to another will be assessed to gain an understanding of the transformation of vernacular architecture in the area and the reasons behind it. The priorities and needs of a community from time to time can be assessed. The use of memory recollection and the memory system of a community can also be analyzed further, whether it can be a useful resource in vernacular architecture studies or which parts need to be tweaked more for it to be useful.

### **3. 2. Theory of transformation**

The collective consensus of society in the form of their daily actions is portrayed in their vernacular architecture and the built environment (Holm & McEwan, 2020). This is a continuation of Rapoport's notion that vernacular architecture embodies traditions created by the community over generations and passed down by generations (A. Rapoport, 1969). By observing the built environment of a society, one can see the compromises and values the community chooses in negotiating their past values and the current lifestyles' needs (Habraken, 2000).

Therefore, architecture and the built environment are ever-evolving organisms as they adapt to new people, demands, functions, settings, and survival strategies. To understand how it evolves and the reasons, one needs to look at its different features. These features are governed by sets of values, rules, and systems adhered to by the users and understood under the general agreement (Habraken, 2000).

In this rural coastal town in East Indonesia, these different values, rules, and systems come from different ethnic groups living in the same geographical boundaries and are embodied in their built environment. By analyzing the changes in their physical, territorial, and cultural orders, one might understand the characteristics of the organic vernacular architecture and built environment built together over generations (Habraken, 2000). To another extent, it is built by social memory, making it a social artifact (S. Anderson, 1999). This leads to the vernacular architecture of Labuan Bajo as artifacts with the history of the changing values of different ethnic groups.

To understand the values more easily, the built environment needs to be broken down by their denominations and understood through three different orders that define them. Shown in Figure 3.2 are the three orders, the physical, territorial, and cultural orders as reinterpreted from *The Structure of Ordinary* (Habraken, 2000). The smallest order with tangible features is the physical order, in which the physical transformations are understood. Behind those physical transformations is the territorial order in which the negotiation takes place between one individual and another in a shared space. Beyond those is the cultural order in which the sociocultural factors play in the decision of both the physical and territorial decisions.

The physical order, as categorized by Habraken, starts at the smallest unit that may be organized in the built environment, followed by groups of elements with an ascending order of mobility or difficulty to move or reorganize (Habraken, 2000). From there, one can analyze the grouping of said units, and then the wholes of two closely related configurations can be interpreted as an entity of themselves. An ensemble of body and utensils with the interior arrangement is a place, an assemblage of interior elements and floor plans is a room, a combination of floor plans and buildings is built space, et cetera. These levels were applied in the previous research on the transformations of traditional settlements in Indonesia (Bukit et al., 2012; Hanan, 2012). Another previous study assessed the transformation from the building elements to the major artery levels in Labuan Bajo and gave a neighborhood-scale depiction of the strip of Soekarno-Hatta Street (Ardhyanto et al., 2021). For this research, the levels are focused on the personal scale: partitioning and building elements. The more minor levels, like utensils and furniture, are not explicitly discussed but are noted when the informants mention them. These levels of physical orders are shown in Table 3.1.

Through an assessment of the changes in the physical order, one can continue to understand the transformation happening in the territorial order and how one agent of control negotiates with other agents in compromising their modifications in a shared built environment (Bukit et al., 2012; Habraken, 2000; Hanan, 2012; Setién, 2014; Yiwei & Beisi, 2015). The interpretations gained from the comprehension of territorial order, the agreement between different agents of control embodied in the built environment, can be furthered into an analysis of the cultural order of an area. These steps in perceiving the transformations in the built environment may provide insight into the signifying characteristics of an area (Habraken, 2000; Setién, 2014; Yiwei & Beisi, 2015).

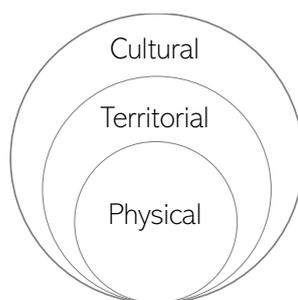


Figure 3.2 Orders of understanding the built environment, adapted from Habraken

Table 3.1 The physical identifying levels by Habraken with highlights of the previous research

	A. Nominal Classes	B. Configuration	C. Wholes
6	Major arteries	City structure	Neighborhood
5	Roads	District	
4	Building elements	Building	Block
3	Partitioning	Floor plan	Built space
2	Furniture	Interior arrangement	Room
1	Body and utensils		Place

During the interviews, informants were asked about the floor plan of their houses. Their descriptions were immediately sketched on an iPad Pro or a notebook. The team would then ask the informants for confirmation and explain the drawing if unclear. The team would then sketch the elevation and perspective of the houses to note the material and roof shape and again ask them to confirm. When describing local materials or techniques of construction, the informants often would gesture and describe in a detailed manner, prompting the team to sketch or search them on the internet to confirm what they were explaining. When confirming, some informants would ask to sketch the houses themselves directly on the iPad or notebook, and some even procure their own sheets of paper to help explain better. The sketches focused on the partitioning and building elements level, but if mentioned, some furniture and utensils also.

The sketches were then made into 3D models on SketchUp by estimated measurements with the scales found on site. For the 3D perspective, the models are then rendered with the described materials. The floor plans were made by exporting the SketchUp models to AutoCAD and the material rendering in SketchUp Enscape. Other supporting graphics were made in Adobe Photoshop.

Territorial depth analysis was then applied to the floor plans, and territorial hierarchy analysis based on inclusion was applied to the changes in the neighborhood (Habraken, 2000). These steps provide insight into the territorial changes in their own houses and around their houses in compromising with the needs of their neighbors and the built environment of the neighborhood.

The change of materials from time to time can be analyzed into many things, such as the assembly hierarchy in construction, the dominance hierarchy in spatial control, and the characteristics of buildings at a specific time and place (Habraken, 2000). In this research, the material change is used to visually show the differences in the houses and how they shaped and reflected the neighborhood

during specific periods. Visually it can also show the construction system passed down to them from earlier generations, from different places of origin (Habraken, 2000).

The study conducted on Labuan Bajo's townscape transformation is of significant importance, especially in understanding the changing dynamics of the city's urban fabric (Ardhyanto et al., 2021). The study focused on the buildings situated on the coastal part of Soekarno-Hatta Street, which is a busy commercial area of the city. The research analyzed the building elements and building configuration levels of the physical order, including the building's architectural design, materials used, and spatial arrangement. The study also provided insights into the road network and major arteries, as well as the district and city structure, which were analyzed as the configuration counterparts. It is noteworthy that the findings of the research did not extend beyond the analysis of the functions of reclaimed coastal areas found in 2019, as shown in Figure 3.3. Nonetheless, the study provides an excellent foundation for future research on the city's urban landscape and its evolution over time.



Figure 3.3 Functions of the reclaimed coastal areas in Labuan Bajo in 2019

Levels of nominal classes that are observed in this paper are from building elements and above and only from the surface level of the exterior. This is done to test how deep the analysis of the dynamics between actors can be done without permeating every single building in the hopes that this type of observation can also be applied to bigger-scale neighborhoods.

Materials of buildings have shifted from the locally found materials commonly used in earlier forms of Bajo, Bugis, and Manggarai communities to the fabricated ones, which are often found in the modern vernaculars' of Indonesian architecture even outside of Labuan Bajo. Structures are traditionally made of wood in the form of stilt foundations, which sit upon large stones, encapsulated by wood or weaved bamboo walls, wooden floors, and thatch roofs; currently, structures have also adopted reinforced concrete and the combination of it with wood, brick and mortar walls, ceramic and concrete floor, and zinc roof. These modern materials are favored due to their cheaper price and faster assembly time which leads to cheaper construction prices, even though they had to be imported from other places in Indonesia. The changes seen in the materials used signify pragmatism and practicality, which is understandable considering the economic and geographic restrictions.

Two- and one-story buildings dominated the street, followed by three-story buildings, and some four- to six-story buildings. For the more detailed building elements, almost all buildings use landed foundation structure, in comparison to stilt foundation found in earlier forms of Bajo, Bugis, and Manggarai architecture; the roof shapes vary greatly with a combination of hip and gable roof holding a quarter of all the buildings on that street with some traditional forms seen on some buildings; more than half of the buildings still have terraces; more than half have no balconies; more than half are without ventilation holes; the analysis on colors used in the buildings' exterior found that the environment had a wide variety.

The roads and the major artery in Labuan Bajo are simple as found in many rural and developing areas, and have little differences between them. In this case study, Soekarno Hatta is used as a major artery, and the supporting roads (such as Jalan Reklamasi, Jalan Reklamasi Pantai, Jalan Mutiara, Jalan Bidadari, Gang Cempa, Gang Napoleon, etc.) were put into the roads nominal class. The physical differences between the roads and a major artery in this neighborhood are only defined by the existence of a sidewalk in the major artery. Even though the width of the streets might not differ that much, the major artery has one-way traffic, allowing more vehicles to pass by, and the supporting roads, which have less traffic, have two-way traffic granting more flexibility. The alleys do not count as roads as they have different materials and are more likely portions of someone's land given as access to buildings with no direct contact to the Soekarno Hatta Street. Figure 3.4 shows how some part of the dirt road in 2002 was leveled up into a major artery to turn Soekarno Hatta Street into a looping street and the rest of the dirt roads has transformed as well into official supporting roads in 2019.

The whole of the built environment in this case study can be observed from the block level and then the neighborhood. The block-level is examined by seeing the whole of the buildings and districts as a group. Concerning the four districts earlier mentioned when observing the configuration of roads, there are four blocks with four different relationships between districts (the configuration of roads) and buildings (the configuration of building elements). As seen in Figure 3.6, the footprints and the functions found in each district can be easily distinguished from one another.

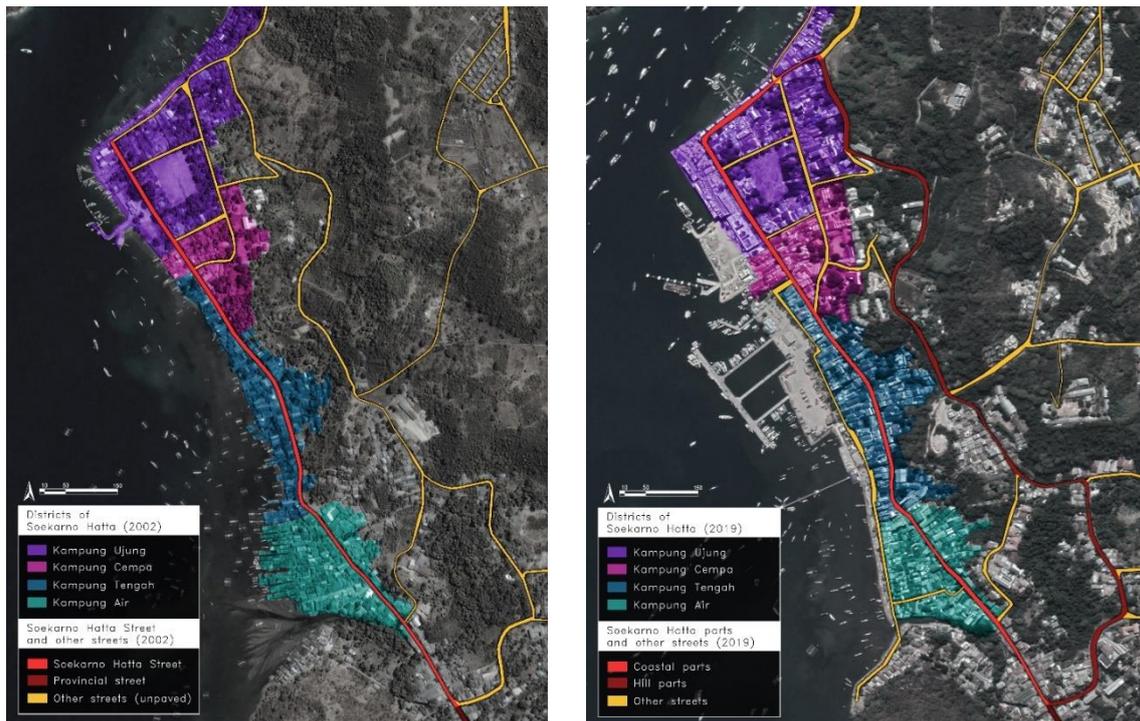


Figure 3.4 Soekarno Hatta Street parts and districts in 2002 and 2019 (Ardhyanto et al., 2021)

Kampung Ujung, with two coastlines, has more widely spaced arrangements of buildings, with some buildings not perpendicular to Soekarno Hatta Street. Traditional vernaculars of the Bajo, Bugis, and Manggarai architecture all have perpendicular building orientations, with Bajo and Bugis buildings having the narrow side of the rectangular building layout facing the road. This irregularity of building footprints found in Kampung Ujung signifies how top-down development is disconnected from the traditional built environment by the pattern of the configurations and the scale of the buildings. The higher number of single-use buildings, moreover of office and public use functions shows how top-down changes are experienced more in this district.

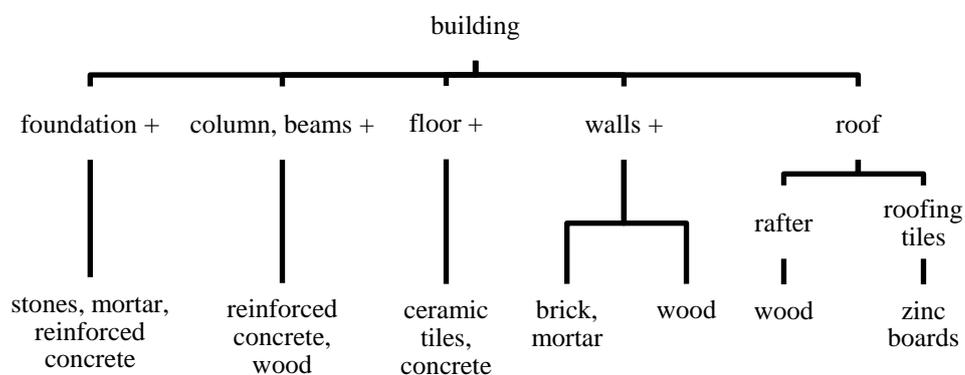


Figure 3.5 Assembly hierarchy of most buildings on Soekarno Hatta Street, Labuan Bajo, according to the survey conducted in 2019 (Ardhyanto et al., 2021)

Kampung Cempa, in direct comparison, is the smallest district in the neighborhood, yet it is the only one with direct access to the Marina Port, the ferry port, and the old port. Even though it has an unobstructed connection to the ports, this district seems to experience fewer changes. The buildings that are outliers are indeed top-down interventions, as the public use is a school, and the compound with a circle-like pattern is a hotel built from an empty lot. The other buildings have changed functions, as they used to be originally residential buildings. Despite most of the buildings now having mixed functions, there are no big adjustments found in this district, as seen from the materials used, which still resemble traditional vernaculars.

Kampung Tengah is claimed as the hotspot for the tourism industry by the locals, at least on this street. More and more businesses are introduced in this block, which leads the block to pertain to a high-density building layout commonly found in Bugis and Bajo traditional settlements. Kampung Tengah has been sought out greatly by business owners, and the locals have affirmed how the price of land has rocketed so high in this block. One of the most desired features of this block can be seen from the proximity to the port, the main channel where tourists come from or depart to other islands, and the sense of authenticity deemed greatly appreciated in the tourism industry. Indeed, some buildings went through major renovations while maintaining the traditional configuration pattern and footprint, yet it seems that tourists and business owners alike still consider it enticing.

Another combination is seen in Kampung Air entirely. This block briefly looks like Kampung Ujung, only with a smaller area. Nevertheless, this block is home to more local people targeted business. Tourism facilities are still found in this block, but compared to other blocks, this block has more small businesses that do not rely on the bigger money brought by tourists and foreigners. The configuration pattern of the buildings is also quite like the traditional settlements of Bajo and Bugis communities found in their places of origin. A further observation of the block outside of the confines of Soekarno Hatta Street might give a better description and understanding, as this block was the only block that shrunk in size due to the coastline reclamations.

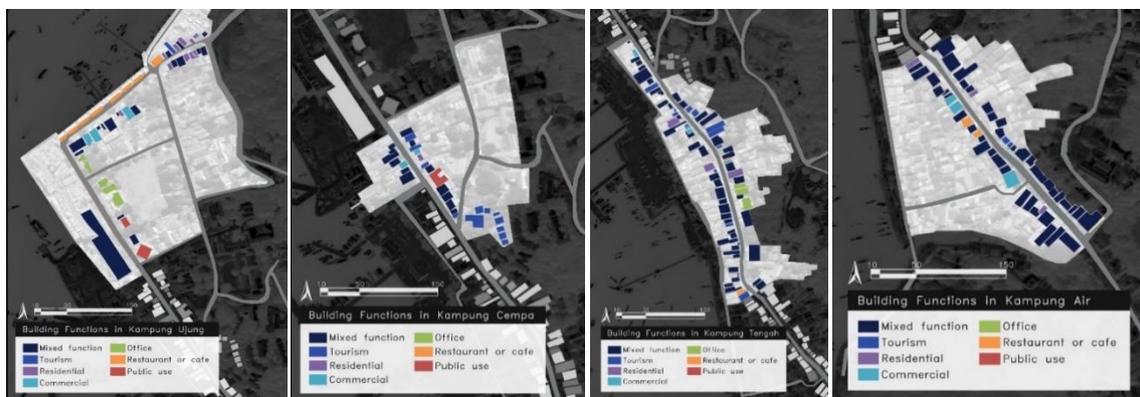


Figure 3.6 Building functions and footprints in Kampung Ujung, Kampung Cempa, Kampung Tengah, and Kampung Air

In this context, the Soekarno Hatta neighborhood is currently characterized by its concentration of buildings positioned directly along the sides of the street, particularly in the coastal regions of the street. It's essential to note that the evaluation conducted thus far has been confined to this specific area, warranting the need for future inspections to encompass a more expansive view of the greater Soekarno Hatta neighborhood. A comprehensive examination of the broader neighborhood holds the promise of providing richer and more nuanced insights inherent in its complex built environment.

Furthermore, the observed functions of the existing buildings in this locality reveal a predominant emphasis on leveraging the economic potential of the street. This focus on economic maximization is visually depicted in Figure 3.7, offering a snapshot of the urban landscape. The alignment of these structures along the street, particularly in coastal segments, signifies a strategic orientation geared towards harnessing economic opportunities. Future investigations beyond the current scope could unveil additional layers of complexity, shedding light on the multifaceted dynamics shaping the built environment within the Soekarno Hatta neighborhood.

Transformations of territorial structure in this case study are found from building to road levels. In the building levels, the existence of terraces is observed to see how many buildings still have private territory that is easily accessible from public territory. From the survey, 64% of the buildings still have terraces, which signifies that the welcoming culture is still well maintained, yet it might decrease in time. For 81% of the buildings they do not use fences, which still resemble the traditional settlements of Bajo, Bugis, and Manggarai communities. Most of them also do not provide parking spaces and this results in on-street parking. This dynamic reveals how the relationship between the private and public sectors is still trying to find common ground, and for now, they are postponing great physical transformations for these simpler necessities. The territorial structure of the road level transforms as the dirt road made for locals is then paved for more public access.

The understanding behind these findings is merely on a surface level as the observation was also done on the exterior of the buildings and upon the hierarchy of the levels. It is understood how some of the buildings still maintain their traditional values, and why some do not. Some are maintained as a selling point for tourists who are looking for a sense of authenticity or simply an otherness to the built environment which they are used to in their daily lives. Some are maintained due to economic reasons. The others are built as something new because they were built from an empty plot or maybe to be an accent that stands out in the middle of similar-looking buildings.

The Bajo, Bugis, and Manggarai architecture vernaculars might be perceived as very different from one another, yet they have similarities in the materials used and building scales. The settlement patterns or the building orientations might differ from one to the other, moreover the ornaments and the shape of the roof. The welcoming nature of their traditional vernaculars is also on the same frequency and is tested with the introduction of new actors in this environment. Therefore, the levels of adjustments made to these buildings on Soekarno Hatta Street are interesting to examine.

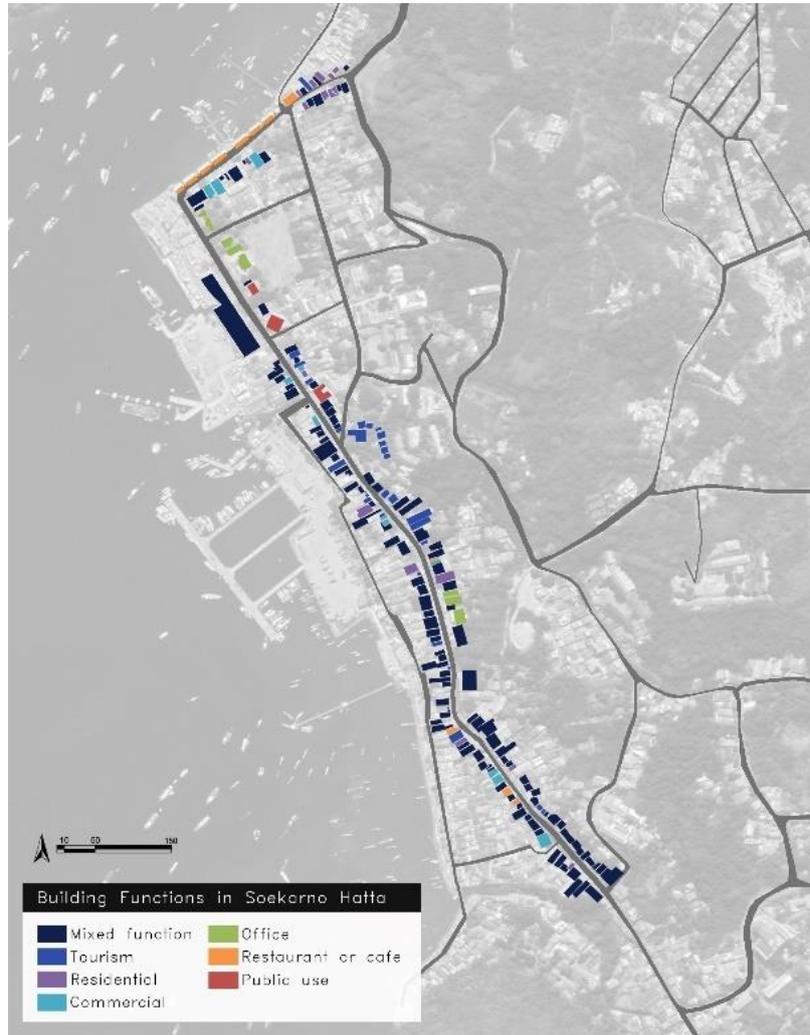


Figure 3.7 Building functions in Soekarno Hatta in 2019

A better understanding of the adaptability of the built environment in Soekarno Hatta Street, Labuan Bajo, is crafted into a preview of more profound comprehension. Even though the observation was quite meticulous on the nominal level, the reasons behind these transformations can be pushed to attain more depth. This requires a greater inspection of the whole Soekarno Hatta neighborhood on the other levels not examined in this paper or to interview the actors behind these changes to gather more profound explanations of the values being preserved in the current built environment conditions.

The observation through the transformation theory did not provide in-depth findings in this case study, though it is all because of the limitations of the research. The scope of the study was too thin in the hierarchal structure of the order of forms and too narrow for the goal of understanding a wider neighborhood or even a town as its whole. Moreover, the findings might be proven otherwise if the buildings in the whole Soekarno Hatta neighborhood are also included in the analysis and more levels are analyzed with the same theory.

This research will dive into a more personal level to inspect the effectiveness of memory recollection. These levels are in the partitioning and building elements of nominal classes, as seen previously in Table 3.1. In the configuration levels, the observation will focus on the building and floor plan. Then, continue to the whole of the configuration levels and observe the built space. The smaller scales, such as furniture and utensils, are not observed due to their level of detail, which will require a longer observation period. In this research, the aim is to collect as much data from as many informants as possible within the strict time limit. Thus the limitation on observed levels is decided.

### **3. 3. Memory and vernacular architecture**

On rare occasions, everyday routines get recorded; the same goes for vernacular architecture. In *Memory without Monuments: Vernacular Architecture*, Anderson wrote about how oral or preliterate societies use collective memory when dealing with present issues with logic and reasoning based upon their cultural traditions (Anderson 1999). With this system of collective memory, they can distance themselves from the past while maintaining their tradition in the present. This system allows their actions to convey the practices they are preserving and the ones they have eliminated, although the preserved ones have sometimes undergone alterations. These alterations result from a collective consensus and are a form of their tradition's continuity.

The memory system of a society plays a significant role in historical inquiry (Anderson 1999). A preliterate community will be distant from its past as it needs to adjust to the present. In contrast, a literate society will have their past close to their memory as they record to revisit when necessary. Hence, a particular memory system can provide an alternative resource for reconstructing the image of past vernacular architecture and the built environment.

Even if any material can be used as historical studies material (Anderson 1999; Le Goff 1985), this research acknowledges the limited time and resources it has and has followed some of the newest principles and best guides upheld by the Oral History Association (Oral History Association 2009). Not all principles were conducted in the research, and disclaiming the nature of this research is not to be used as official oral history documentation. However, it is more of a practice to use oral history to understand architectural transformation with scarce physical records of the previous vernacular architecture.

During the pre-interview phase, this research selected potential informants based on their age and position in the community with the help of the local researcher, who also assisted in the background research on the person, topic, and larger context. The local researcher helped send introductory letters in person, and by doing so, this gesture acted as a non-recorded pre-interview session to build rapport and explain the exchange of information. This fits well with the Indonesian custom of in-person visits when introducing oneself and requesting a favor. Due to the unstructured strategy used in the interview design, only three categories were prepared: personal, migration, and built environment history.

After the interviews, the records and all the information deemed relevant for interpretation are carefully stored within the team. The preparation and methods were documented, including the condition of the interviews, for further interpretation. The transcript and interpretation of the interviews attempted to avoid misrepresentation and manipulation of the informants' words and strived to maintain intellectual honesty and retain the integrity of their perspectives. The data is not shared with other parties. It is also not stored in an institutional archive. This research does not claim the findings to be an official oral history record; instead, it acts as a steppingstone for similar research in memory recollection or oral history in historically culturally diverse sites like Indonesia, especially in Labuan Bajo. It also highlighted the importance of hearing stories directly from the locals.

On the social memory framework, it is argued that Halbwachs' theory on the topic is more relevant today concerning the overwhelming social and political changes (Bilsel, 2017; Halbwachs, 1952). In reifying past architecture from memory, collective memory is considered one of the best tools, albeit needing a more empirical approach to be explored further (Gensburger, 2016). This research does not intend to reconstruct a perfectly accurate depiction of past vernacular architecture and focus more on the transformations.

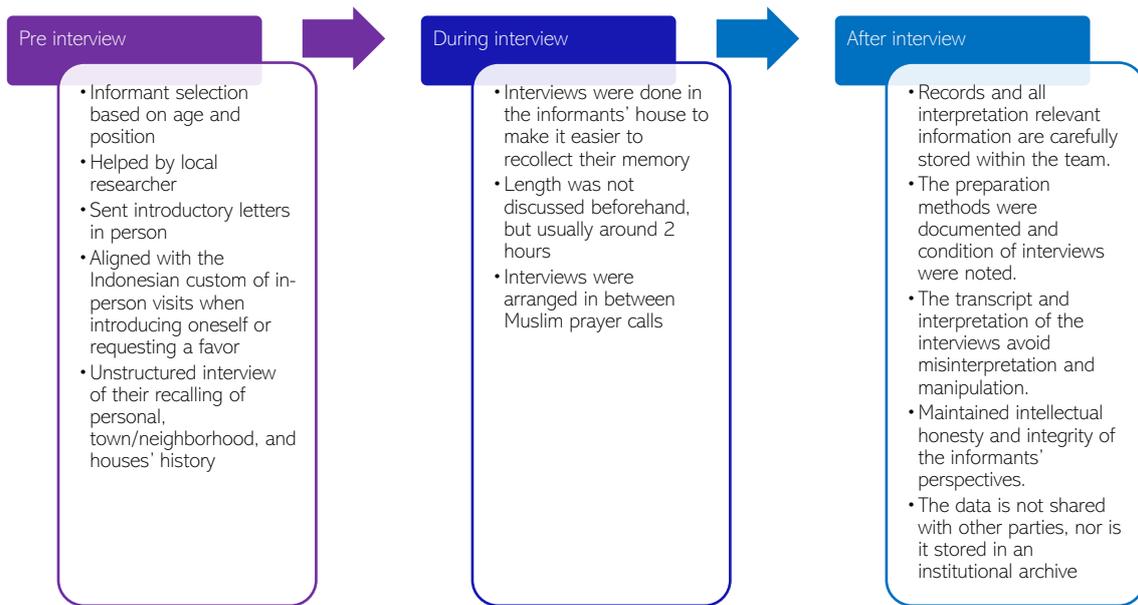


Figure 3.8 Guidelines for oral history applied in the interviews.

In studying the vernacular architecture of an area, resources can vary from the existing architecture to various types of literature (University of Wisconsin-Madison, n.d.). Like most places in Indonesia, Labuan Bajo has limited records of its history. There are documents about Manggarai architecture in the neighboring area and old pictures of some houses in West Manggarai without further descriptions or details. Some houses currently still exist, which can be observed.

### **3. 4. Ethnography-based intensive architecture memory recollection method**

The key method used in this research is a proposed method that is hypothesized to be able to gain significant amounts of data on past houses. The method flow is seen in Figure 3.9 and is comprised of three main actions. The first two actions are interview and direct observation. This is conducted with a team of an architectural researcher, a social researcher, and a local researcher. This team is chosen to operate differently, with the architectural researcher collecting data on architecture and sketching, the social researcher focused on reading and understanding the social context, and the local researcher becoming the guide and verifier of the information shared by the informants if it is synchronized to his own experience. These different issues that were gathered during the interviews and direct observations are often discussed in between the meetings to ensure the exchange of information between the team members and how each issue connects with and impacts one another.

The interview and the direct observations are where the key part of the ethnography-based intensive architecture memory recollection method takes place. During the interview, which was conducted in the informants' homes, the informants were asked to recollect the images of their past houses. Almost all the informants did not have any written records and must resort to oral recollection, that is to share the details orally through conversations. The memory recollection process starts here, and the audio of the interview process is recorded with important details written down. The interview process was conducted in a casual manner to gain rapport and trust from the informant, this allows the informant to switch freely from one question category to another according to their comfortable pace.

Then when they were recollecting their past houses, the second step in the ethnography-based intensive architecture memory recollection method takes place, which is the oral-to-sketch process. In this step, the descriptions they shared were sketched down immediately and accordingly. Oral recollection is somewhat unreliable data due to its abstract nature. Hence, this step is paired with and goes back and forth with the last step in the interview and observations phase, which is memory verification. During the sketching process, the sketches were shown to the informants to get direct confirmation. They verified the sketches as correct or incorrect, either through oral instructions or their own sketches, as freely as possible. This is the first part of memory verification to reduce the unreliability of the data.

In furthering the verification process, triangulation of data was done to check the truth of the information the informants relayed. The data triangulation is comprised of three parts, with two conducted during the interview and observation and another during desk study. The first part of data triangulation is through the local researcher. At times, the local researcher would also step in to verify or describe some local materials and sometimes reference pictures were searched on the internet. This is to improve the reliability of the data by gauging whether the information was a common phenomenon or common opinion in the area or whether it is categorized as a special case.

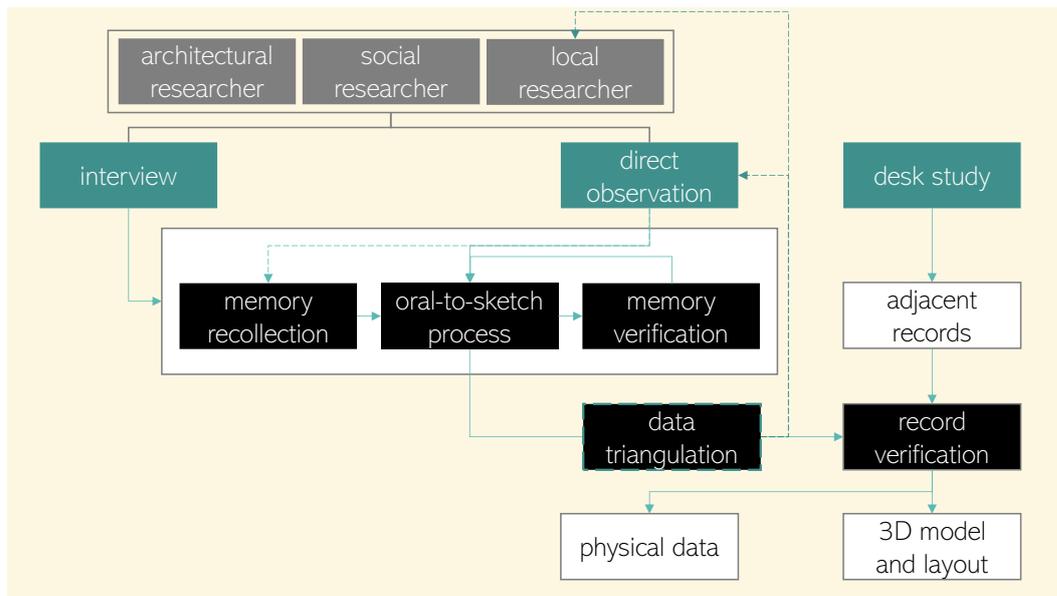


Figure 3.9 Ethnography-based intensive architecture memory recollection method

The second part of data triangulation is direct observation. Most of the interviews were held in the informants' houses, and after or during the interview process, some informants gave permission to observe directly. The fact that the interviews were conducted immersed in the house encouraged the oral recollection process, and the team to observe directly helped confirm the information shared. Details confirmed through observation were dimensions, materials, and room functions of the house. Direct observation also plays a part in improving the reliability of the data.

The third part of the data triangulation is in the third main action of the methodology, which is desk studies. The desk studies were done before and after the interview, and direct observation and is conducted to gather adjacent records. These records comprised photographs, written histories, and regulations of the area, the neighboring area, the greater region, or on a national scale. These adjacent records were not the exact houses of the informants but were references to further verify the details shared during the interviews, hence further improving reliability.

After the data was verified at the final step with the limited existing records, the data was tabulated and analyzed. Then, the 3D models were created. The two main outcomes can be useful to understand the vernacular architecture transformation of the area and then provide visual inspirations for future designs. These two outcomes will be described further in CHAPTER 5.

#### 3. 4. 1. Direct observation

The first observation was conducted on 11-25 October 2021, and the second on 15-22 October 2022. The details of the investigation period are shown in Table 3.2. The survey team included an experienced social researcher on the first observation, and both observations were helped by a local researcher. The local researcher helped to get to know the area, select most of the informants, navigate through the local social customs and contexts, and translate some local languages (Figure 3.10).

Table 3.2 Details of the investigation period

Day	Date	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00~
Mon	2021-10-11	Arrived at Labuan Bajo												
Tue	2021-10-12	Team discussion and orientation with local community members												
Wed	2021-10-13			UI			SU		RA	AH*			DR	
Thu	2021-10-14									MS				
Fri	2021-10-15		TU							AA				
Sat	2021-10-16				AH (2)									
Sun	2021-10-17		ES		SA					SA (2)				
Mon	2021-10-18		UL				SU (2)		SY	AN				
Tue	2021-10-19			RA (2)						RI				
Wed	2021-10-20			RL						RI (2)				
Thu	2021-10-21						DP			DR (2)				
Fri	2021-10-22			YU										
Sat	2021-10-23							RH	FH				SB	
Sun	2021-10-24	SB (2)	HJ											
Mon	2021-10-25	Left Labuan Bajo												
Sat	2022-10-15	Flight rescheduled												
Sun	2022-10-16	Arrived at Labuan Bajo				Team and local community discussion				AA (2)				
Mon	2022-10-17			Gov. 1	Gov. 2	AH (3)								
Tue	2022-10-18	Gov. 3		AA (3)								MT		
Wed	2022-10-19	Gov. 4		Gov. 5					Gov. 6					
Thu	2022-10-20	MT (2)		SB (3)	TU (2)					SU (3)				
Fri	2022-10-21	Gov. 7	Gov. 8		AH (4)									
Sat	2022-10-22	Left Labuan Bajo												

During the observation, some events and issues were affecting the research in both direct and indirect ways. The events happening during the observation were the national meeting of governments, preparations for Labuan Bajo becoming the host of G20 in 2022, and mawlid, or the Islamic observation of the birthday of Prophet Muhammad (PBUH). The issues the locals were facing were land certificate fraud and contestations, the covid-19 pandemic, the road expansion to Golo Mori Strategic Tourism Area, and deforestation in the water retention forest of Bowosie in the southwest of Labuan Bajo. The last two issues were some of the many issues the locals have with the Labuan Bajo-Flores Tourism Authority Agency, an agency working separately on direct instructions from the president. In comparison, the COVID-19 pandemic was more of a strain to the travelers coming to and leaving from Labuan Bajo, making the tourist destination still lacking the number of tourists.



Figure 3.10 Strategizing with the local researcher before the observations

Labuan Bajo has been the name of a ward or subdistrict (Indonesian: kelurahan) in Komodo District (Indonesian: Kecamatan Komodo) since 1965 (further explained in Chapter 7). The administrative boundaries are gathered from Google Maps and some older documents, shown in Figure 3.11 in the

yellow dotted lines. These boundaries were not confirmed by the ward officials, as these boundaries are still under many contentions, especially with the recent problems with land certificates. The geographical boundaries of Labuan Bajo used in this research are defined by the boundaries used by the locals, shown in Figure 3.11 by the white dashed line. This area is a flat, uphill area surrounded by a range of rugged terrain, extending to the coastal area and continuing to a hilly peninsula in the north. The locals and the neighboring residents refer to this greater area as Labuan Bajo. When they say they are going to Labuan Bajo, this area is what they refer to. This research is an effort to record the locals' perspective. Therefore, the boundaries are the ones used in this research when describing Labuan Bajo.

The observation was conducted both on the town scale and the personal scale. Observation on the town scale is done in between the in-person meetings and interviews, while the observations on a personal scale are done after or during the in-depth interviews and the memory recollection process. The town scale observation only made notes on how the houses look from the outside like the previous study explained in the earlier subchapter (page 47). Furthermore, not all informants were comfortable giving access to the team to observe their houses, and without their oral consent, the observations of their houses were not done. The details of which informants did not permit the observation will be listed in the next subchapter.

On the town scale, the observations were inevitably affected by the events happening at the time, as the daily activities, as well as the built environment, were transformed rapidly to prepare for the sudden influx increase of central and provincial government employees, media, and other related professionals visiting from all corners of Indonesia. International tourism and domestic tourists were still very strained due to travel restrictions under the covid-19 pandemic. Domestic travelers needed to do a PCR test to travel into or from some provinces in Indonesia, including Nusa Tenggara Timur province. The residents claimed to be fully vaccinated by the time of the first observation, and even though the team wore masks at the beginning of the meetings, most of the locals were no longer strict.

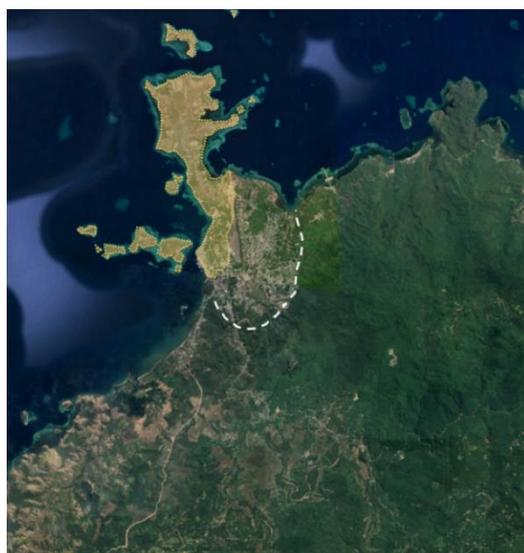


Figure 3.11 Geographical boundaries of Labuan Bajo

The tools used during the direct observations were basic visual documenting items, such as the team's smartphone cameras, an iPad Pro to sketch, and DSLR and pocket cameras. The mode of transportation for these observations was motorbikes. This proved suitable for the streets and terrain of Labuan Bajo and the surrounding areas, especially with the congested streets filled with rented cars for the government employees during the time of observation.

During these observations, the focus was on the shape, material, and floor plan of the house, with an estimated measurement if available. Aside from measurements, these aspects of the house were discerned to be the easiest to recollect from the informants during the interviews and observed during a short interaction. None of the informants were from an architectural background, and only a few were experienced builders. In these immersed interactions, the material, shape, and floor plan of their current houses were easy to recollect in the span of an average two hours interview and some extra time after the interview, too. The direct observation made their stories easier to tell as they were able to point out the material, shape, or room function mentioned during the interview.

The area of the house, even though hard to measure within a limited time, is needed to get a glimpse of the simplest transformation: the addition of space. This is to measure the increasing or decreasing needs of the owners of the houses and to later assess the phenomenon in this society. During the observations, an estimated measuring using parts of the body for scale was conducted as seen in. Later on, the reasons behind the changing size of the area will be analyzed to understand the trend forward.

For the shape of the houses, it will be categorized according to the structure type and the roof type. The structure type is to categorize whether the house is a stilt house with an elevated stage-like floor structure or a landed house with an infill for the floor structure. The roof types are to categorize whether the houses had, as they describe it, a Bajo roof, a Bugis roof, a Bima roof, a Manggarai hipped roof, or others. The structure of the house can show the preferences of the people, while the roofs are usually symbols of their identities.

The floor plan is used to analyze the difference between the past and present houses. From simple floor plans with an estimated scale of physical measurements, this research analyzed the private hierarchy of the rooms in hopes of understanding their hierarchy in their room layout and analyzing the changes they have gone through. Every person has their own perception of personal space, and as a result, privacy is understood in different ways by each individual. The concept of privacy is typically regarded as the foundation of one's personal and familial space, dictating who has access and who does not (Chemers & Altman, 1977; Othman et al., 2013; Sari et al., 2019). The management of privacy, including the use and allocation of space, is a significant aspect that distinguishes cultural differences and influences the design of homes worldwide. Privacy is generally considered to be the essence of a home and personal/familial needs, which determines and controls accessibility between a person and others. Privacy needs, the use of space, and how privacy was regulated is one of the outstanding ways in which cultures differ, resulting in different house forms around the world.

In a simple dwelling, the scale of privacy is limited compared to a bigger dwelling. As a dwelling expands, the scale of control that relates to the privacy of a room or space diversifies accordingly. For example, a simple dwelling might consist of three different rooms: the living room, kitchen, and bedroom. The living room will have to accommodate both family gatherings and guest entertaining. If they need to have an internal family meeting that is separate from the guests, the kitchen might be their best option. If the kitchen is packed with other activities, then the bedroom would be their only option. In a more complex dwelling, there are more rooms to cater to more specific privacy preferences. However, a more diverse privacy hierarchy does not mean less flexibility. The process of controlling and compromising between the ideal and the result is always ongoing in a dwelling where the owners have full control (Chemers & Altman, 1977; Habraken, 2000). The flexibility found in a simple dwelling might also happen in a complex one. Hence, there would be many overlappings of different privacy scales, which depend on the conditional circumstances (Figure 3.12). These overlappings may increase or decrease. They might be permanent or temporary.

These levels may be tied to the room functions and the guest's relationship with the host. First, the rooms will be accessed through observation to determine the frequency patterns of the host inviting the guest to enter said room or the frequency of the host asking for permission to enter said room. These frequencies are categorized into four levels, shown in Table 3.3. The first level is usually where the invitation, permission, or access happens often in their daily lives. Situational will only happen on certain occasions, such as annual or religious events or family celebrations. Rarely signifies events that fall under special circumstances and depend more on the status or relationship of the person, such as the sister of the parents staying in the daughters' bedroom. At the same time, the almost never scale will signify the events that are under extreme conditions and depend on the person, such as a doctor coming into the main bedroom to inspect the patient in the main bedroom.

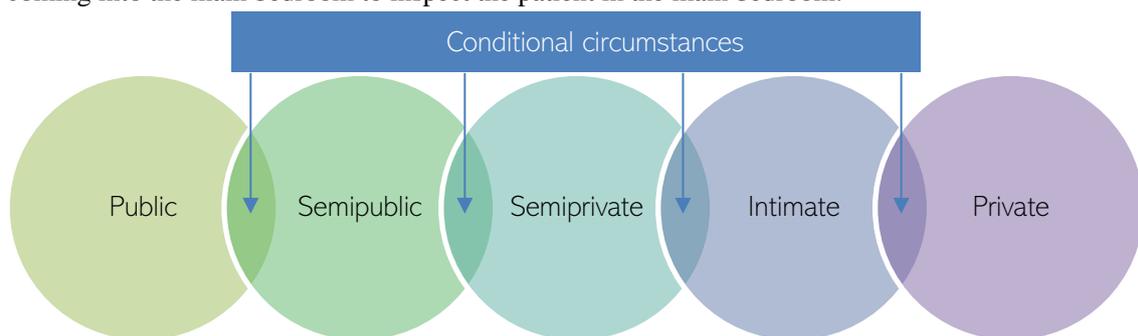


Figure 3.12 Privacy levels and the overlapping levels

These levels are used in assessing the probabilities of invitation from the host and permission from the guest, as well as the access given to said guests. Shown in Table 3.4 is the table of probabilities between the host inviting a guest into a part of their house and the guest asking for permission to access parts of their house. The highlighted squares are likely probabilities to happen in a normal Indonesian context, as observed and in literature (Aulia & Syafikri, 2020; Hasan et al., 2021; Sari et al., 2019).

Table 3.3 Frequency distinction

Frequency	Definition
● Usual	Daily lives, frequent but inconsistent (e.g., a friendly visit)
▲ Situational	Certain occasions, repeated circumstances (e.g., annual religious events, family celebrations)
○ Rarely	Special circumstances and depending on the person (e.g., sister of the parents staying in the daughters' bedroom)
x Almost never	Extreme condition and depending on the person (e.g., doctor coming to inspect the patient in the main bedroom)

The probabilities of access towards the permission-invitation pairings, as shown in Table 3.5, are derived from the seven likely probabilities which were further simulated to reflect the dynamics of invitation and permission. To ensure adherence to common Indonesian norms, the table of probabilities was carefully filtered to arrive at 10 likely probabilities. It is worth noting that the last three probabilities were clustered into the same class, as it was deemed very unlikely that they could be classified as one distinct type. Finally, it was established that there are 8 levels of public-private distinction within a house, which underscores the complexity of the access control system and the need for careful management.

Indonesia is well-known for its hospitality and warmth, and this is reflected in the way guests are treated in a traditional Indonesian house. The public-private distinction in a house is divided into eight levels, which are then assessed based on the guest's relationship to the host. These levels range from the most easily accessible area to the most private area, and each one has a specific designation known as API-1 to API-8. The most accessible areas might not require permission or invitation, depending on the relationship of the guest to the host.

Table 3.4 Permission and invitation probability

Guest (Permission) \ Host (Invitation)		I-1	I-2	I-3	I-4
		Usual ●	Situational ▲	Rarely ○	Almost never x
P-1	Usual ●	●●	●▲	●○	●x
P-2	Situational ▲	▲●	▲▲	▲○	▲x
P-3	Rarely ○	○●	○▲	○○	○○
P-4	Almost never x	x●	x▲	x○	xx

Table 3.5 Permission-invitation and access probability

Access \ P/I	PI-1		PI-2		PI-3		PI-4		PI-5		PI-6		PI-7	
	●●		▲●		▲▲		○▲		○○		X○		XX	
A-1	●	● ●	●	▲ ●	●	▲ ▲	●	○ ▲	●	○○	●	X○	●	XX
A-2	▲	▲ ●	▲	▲ ●	▲	▲ ▲	▲	○ ▲	▲	○○	▲	X○	▲	XX
A-3	○	○ ●	○	▲ ●	○	▲ ▲	○	○ ▲	○	○○	○	X○	○	XX
A-4	X	X ●	X	▲ ●	X	▲ ▲	X	○ ▲	X	○○	X	X○	X	XX

Table 3.6 provides a clear overview of this public-private distinction, with a specific focus on the relationship between the guest and the host. The guest's status and relationship with the host is divided into four categories: stranger, close acquaintance, female neighbor, and extended family. The stranger category is for people who have just met the host for the first time or at an introductory level. Close acquaintances are individuals who work or participate in events together with the host. Meanwhile, female neighbors have a distinction on their own due to the tradition in rural areas of Indonesia, where they usually help hosts make food for certain or special circumstances. They are treated as somewhat extended family members with access to the kitchen and prep room for these feasts. Lastly, extended family members are those who are outside of the nuclear family structure and have more access compared to the others.

Table 3.6 Public-private distinction in a house

		<i>Stranger</i>			<i>Close acquaintance</i>			<i>Female neighbor</i>			<i>Extended family</i>		
		Access	P Guest	I Host	Access	P Guest	I Host	Access	P Guest	I Host	Access	P Guest	I Host
Public	API-1		▲	●	●	●	●	●	●	●	●	●	●
	API-2		▲	▲	●	●	●	●	●	●	●	●	●
	API-3		○	▲	▲	▲	●	●	●	●	●	●	●
	API-4		○	○	○	▲	▲	●	●	●	●	●	●
	API-5		X	X	X	○	▲	▲	●	●	●	●	●
	API-6		X	X	X	○	○	▲	▲	●	●	●	●
	API-7		X	X	X	X	X	X	○	▲	▲	▲	▲
Private	API-8		X	X	X	X	X	X	X	X	○	○	○

In rural areas of Indonesia, transportation between cities can take days or at least half a day. Therefore, it is not uncommon for family members living far away to stay over for an extended period, ranging from several days to months. As a result, it is not uncommon for special events to be celebrated for more than one day to cherish the visiting family members as well as the main celebrations. This kind of hospitality sometimes also extends to strangers, although it happened more often in the past compared to recently. In addition, it is also not unusual to have bigger public spaces within a house or a flexible room that can accommodate guests when they are staying over. All in all, the public-private distinction in a traditional Indonesian house is an essential aspect of the culture of hospitality in the country. It reflects the value placed on relationships and the importance of making guests feel welcome. Understanding this distinction can help visitors appreciate the traditional Indonesian homes and the special relationships that exist between hosts and guests.

During the interviews and visits, several aspects were examined, including the room function and number. The room functions were analyzed based on the public-private distinctions and how they relate to the probability of access, permission, and invitation. This assessment provides valuable insights into how the spaces are being utilized and the level of privacy associated with each function. Additionally, the room number data was used to gain a better understanding of the changing needs, activities, and public-private distinctions within the space. The number of rooms also gives an indication of the communal or individual lifestyle within each house and how it has evolved over time. By analyzing the room function and number, we can identify patterns and trends that shed light on the purpose and usage of each space, enabling us to make informed decisions about how to optimize them for maximum efficiency and comfort.

The interviews were done in the informants' residences for an immersed environment to allow them to better recall the past houses. Furthermore, this has helped the research to gain access to observe the houses directly, although not all informants gave permission. From the 23 informants interviewed, only 15 were allowed to do direct observation as shown in Table 3.7. The reasons behind them not giving permission vary, such as 1) the informant has gotten senile and his former customary title has been in the spotlight for the land issues, his daughter declines further observation, and the interview was also limited, 2) the informants' perception that their houses are not interesting enough for research hence insisting on sharing the rules and values behind traditional customary houses, 3) the informants have had experience where their houses were visited by some people claiming to be researchers or students, to only use the photographs of their house to falsely apply for financial aid or other scams.

The selection of the informants was based on their ethnic identities, and for analyzing the transformation of their houses, the research further focused on the informants who have experienced more than one house in Labuan Bajo. As shown in Table 3.7, there are 16 informants who have experienced more than one house and three informants who only have renovated their houses. Two informants who perceived their houses as not interesting did not follow the designed interview flow

and did not provide how many houses they had experienced before the current one. The two informants did not allow house observations due to the scamming experience.

The 17 permitted observations and the two partial observations are in twelve different neighborhoods in and around Labuan Bajo. The neighborhoods in Labuan Bajo are depicted in Figure 3.13, while the neighborhoods outside of Labuan Bajo are depicted in Figure 3.14. The legend of the neighborhoods is explained in the description of the areas and is also used to analyze the development of the houses throughout the decades. These descriptions are especially crucial to understanding their recent transformations. The pressure to provide more rooms in a limited plot of land in a strategic area or the flexibility to keep the same lifestyle in a larger plot of land with no tourism strategic attachments are some examples of the current transformations and the reasons related to the tourism phenomenon.

Table 3.7 List of informants and house observations

No	Initials	Ethnicity	Interview at house	Observation permitted	Experienced more than one house in LB	Received the government subsidy
1	UI	MA	●	○	●	○
2	SU	BU	▲	●	●	●
3	AH	BA	●	●	●	○
4	DR	BU	●	●	▲	○
5	MS	MA	●	●	●	●
6	TU	MA	●	●	●	○
7	AA	MA	●	●	●	○
8	ES	MA	●	○	-	○
9	SA	BA	●	●	●	○
10	UL	BI	●	●	●	○
11	SY	BU	●	●	▲	●
12	AN	MA	●	○	-	○
13	RA	BU	●	●	●	○
14	RI	MA	●	▲	●	○
15	RL	BI	●	●	●	○
16	DP	BU	●	▲	▲	○
17	YU	MA	○	○	●	○
18	RH	BU	●	○	○	○
19	FH	BA	○	○	○	○
20	SB	MA	●	●	●	○
21	HJ	MA	●	●	●	○
22	MT	BI	●	●	●	○
23	AL*	BA	●	●	●	○
Total			21	17	19	3

- Houses observed
- Houses partially observed
- Houses observed, not processed
- Yes
- ▲ Somewhat
- No

These changes within the plot of land can also be seen in the development of the houses' room functions and the public-private distinction levels. This is assessed through analysis of the room function and API levels, as mentioned earlier, and is shown in Figure 3.15. The transformations of these room numbers, functions, and public-private levels from one house to the next are analyzed through the changes in number, size, and locations. This is aimed at understanding the territorial change of a society's vernacular architecture.

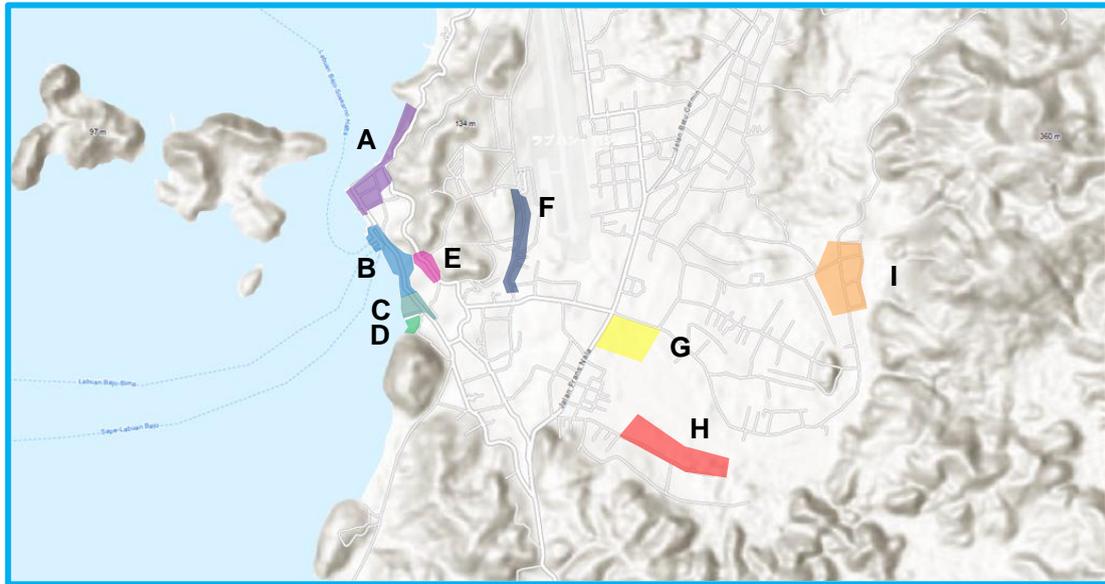


Figure 3.13 Map of the observed houses in Labuan Bajo

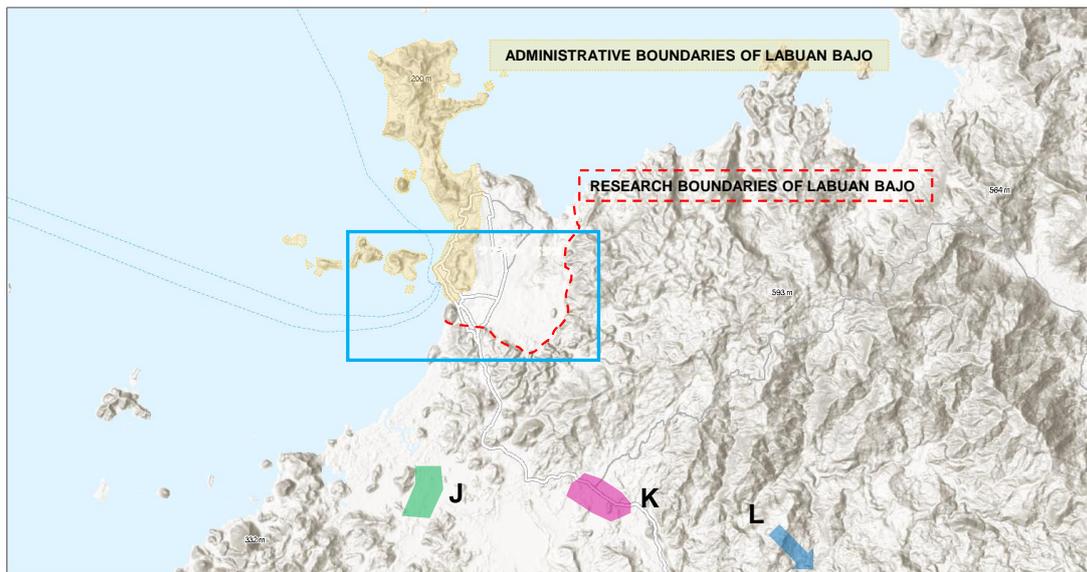


Figure 3.14 Map of the observed houses outside Labuan Bajo

A, B, C, D, and L are strategic for tourism facilities and supporting functions, while E, F, J, and K are access areas, and G, H, and I are periphery areas. The strategic areas are most impacted by tourism activities through direct impacts like traffic and indirect impacts like the influence on lifestyle and

vernacular architecture. The access areas are the ones that will be passed through to get to a destination, and the flow of traffic is a higher concern compared to the strategic areas where the amount of traffic is more valuable. The dynamic nature of tourism-related activities in the strategic zones renders them more susceptible to direct consequences, like heightened traffic flows. Additionally, the indirect impacts are noteworthy to the transformation of lifestyle choices.

The description of the areas is also used to analyze the development of the houses throughout the decades, as seen in Table 3.8. These descriptions are especially crucial to understanding their recent transformations. The pressure to provide more rooms in a limited plot of land in a strategic area or the flexibility to keep the same lifestyle and preferences with a larger plot of land with no tourism strategic attachments are some examples of the current transformations and the reasons related to the tourism phenomenon. This gives context to how far tourism and economic development had impacts on different parts of the town.

Table 3.8 Description of informants' neighborhood

	Neighborhood name	Description of the neighborhood	Highlight of the neighborhood	Tourism potential	Houses observed	Houses processed
A	Kampung Ujung	Low-density area in Soekarno-Hatta Street with government-owned mass public facilities such as a culinary center, a shopping mall, a hotel, and a local military base.	Mass tourism facilities, port of small tourist boats	Strategic	1	0
B	Kampung Tengah	Dense housing along the coast, between the main street and the waterfront promenade, direct access to the newly renovated port and the new waterfront plaza	Location of the main port and the center of tourism activities of the Soekarno-Hatta Street	Strategic	2	2
C	Kampung Air	Location of the old market, dense housing along the coast, between the main street and the waterfront promenade	A lot of house business, the end of the coastal part of the main street	Strategic	6	6
D	Kampung Baru	Relatively newly built, at the end of the water promenade with the observation deck, dense housing between the waterfront and a hill	Built on reclaimed land, does not have direct access to the main street	Strategic	1	0
E	Puncak Waringin	A part of the hilly areas of Soekarno Hatta Street, location of the Weaving Cultural Center and sunset viewing deck built by the government under the tourism agenda	High density residential area with an Islamic school and tourism facilities as well	Access	1	0
F	Bandara	Near the airport, houses sparsely spread along the street	Komodo International Airport	Access	1	1
G	Wae Mata	A flat area near a natural tourism destination and one of the main markets, medium density and with many facilities	Medium density residential area with some small businesses	Periphery	1	1
H	Sernaru	Villages in the flat areas of Labuan Bajo the nearest farming and agriculture area, has different water sources	Sparse residential neighborhood with landed houses	Periphery	3	2
I	Lancang	Far from tourism activities, near a water spring	Sparse residential neighborhood	Periphery	1	1
J	Nanga Na'e	A village with many stilt houses, located near a river, new widened road as the access to the newly built MICE venue outside Labuan Bajo	Stilt houses, new widened road to the MICE venue	Access	1	1
K	Nggorang	A village with many landed houses, the road is the access to the cultural tourism attraction in Melo and other places in the island	Sparse residential neighborhood with farming and agriculture outside of Labuan Bajo	Access	1	1
L	Melo	Location of a cultural tourism destination sponsored by the government	Sparse neighborhood on the steep hills outside Labuan Bajo	Strategic	1	0

These changes within the plot of land can also be seen in the development of the houses' room functions and the public-private distinction levels. This is assessed through analysis of the room function and API levels as mentioned earlier and is shown as in Figure 3.15. The transformations of these room number, functions, and public-private levels from one house to the next is analyzed through the changes of number, size, and locations. This is aimed at understanding the territorial change of a society's vernacular architecture.

In conclusion, this study undertook two observations in Labuan Bajo in 2021 and 2022, collaborating with a local researcher to navigate the complexities of this unique cultural landscape. The research focused on understanding the transformations of vernacular architecture in the region, with a keen eye on how houses relate to one another and influence cultural dynamics. These findings hold significant value for architects, historians, and researchers seeking to document such transformations, particularly when historical records are scarce.

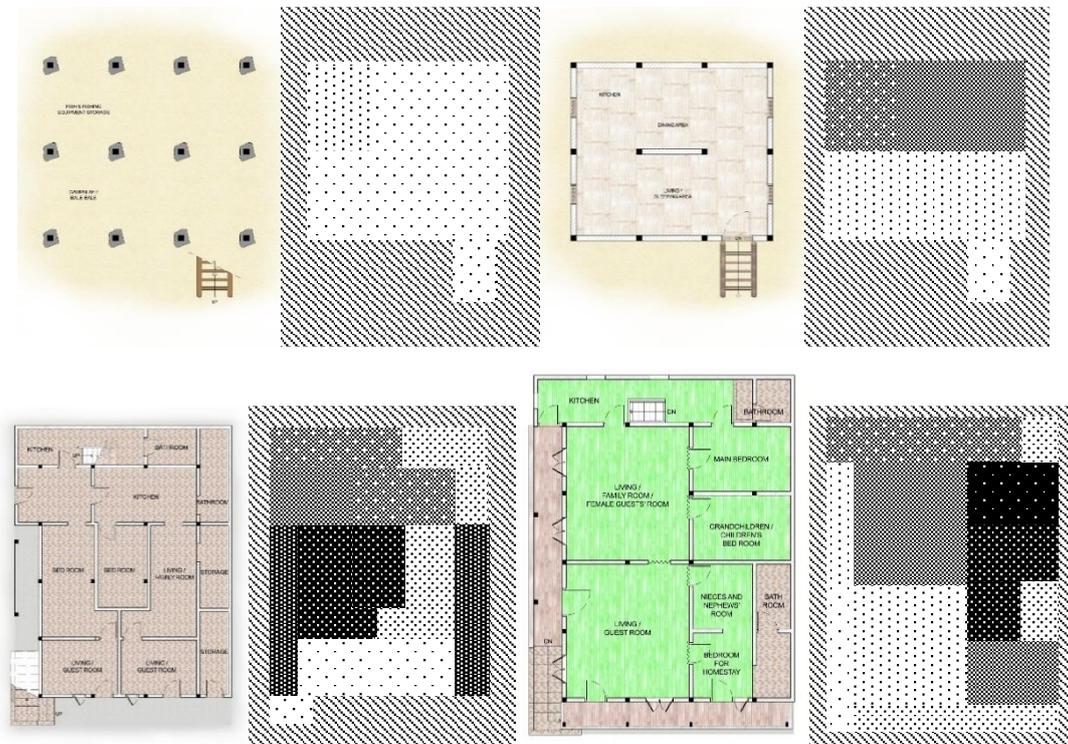


Figure 3.15 Examples of public-private analysis during the observation of two different houses

Throughout the study, the public-private distinction within houses emerged as a key element, revealing a complex interplay of access, permission, and invitation based on relationships between hosts and guests. This intricate cultural tapestry, deeply rooted in Indonesian society, shapes the architectural landscape, influencing room functions, privacy, and social dynamics. The research demonstrated how architectural changes were not only responsive to cultural preferences but also to challenges and opportunities from big events such as government meetings, hosting the G20 summit, cultural observances, land disputes, the COVID-19 pandemic, and environmental concerns.

### 3. 4. 2. Interviews

During the first observation, the two-week period was aimed at interviewing 20 people, ideally five people of each ethnic identities. The informants selected were residents of Labuan Bajo and some areas around the town which have a unique position in the town's history. The map of the informants' houses is shown below in Figure 3.16. In the map the informants' ethnic identities are also shown with different colors. Briefly it might show how only the Manggarai people live far from the coast, but that might not be the case. This map is limited to the informants who participated in this research.

The in-depth interviews followed both unstructured and semi-structured approaches, primarily guided by the levels of the built environment (Habraken, 2000). All informants were queried about several key aspects, including personal details such as name, year and place of birth, marriage status, and the number of children. Furthermore, the interviews explored their ethnic identities, encompassing their own, their parents', or their spouse's ethnic backgrounds. Migration history was a significant focus, delving into the number of generations their family had resided in Labuan Bajo, as well as the migration routes of their personal, parental, or ancestral history, as applicable. Lastly, the interviews comprehensively covered all the residences they had occupied throughout their lifetime, dating back to their earliest recollections. Only the latter, regarding the house, was semi-structured to cover the levels needed for transformation analysis. This approach to investigating their broader history is adapted from a study of the link between memory and architecture in medieval York (Douglas, 2003).

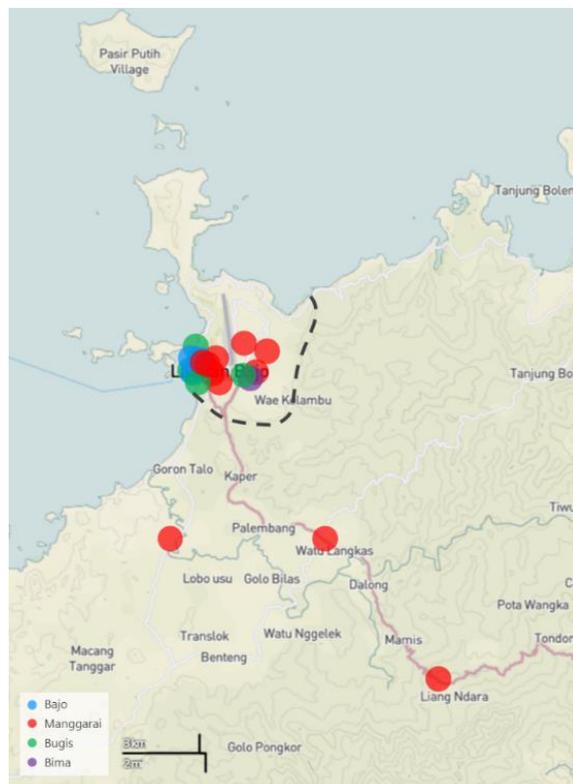


Figure 3.16 Map of Labuan Bajo and the surrounding areas with the locations of informants' houses

The unstructured aspect of the interview design was to accommodate the access to gain their lived experience and create a good rapport with the informants (Bernard 2006) before asking about the tedious details of their houses. The interview is strategized to accommodate different types of people, from people who are not conscious about their built environment to people who are very involved in the construction or decisions of their built environment. Indeed, some are keener to talk about their history than their previous houses and vice versa. In a previous study on recreating traditional architecture in rural Indonesia, the team did a field study where they lived in a village for a month to get closer emotionally to the locals (Khambali and Lukito 2022). Due to time constraints, a stay-in was not an option, and a flexible-timed schedule for an unstructured interview was opted. The interviews were, on average, two hours per person, with 42 minutes as the shortest and the longest at 8 hours, some in multiple sessions.

The survey team also included a local researcher and a tourism agency owner of Manggarai identity, who resides and works in Labuan Bajo, knows many locals, and is a native Manggarai speaker who knows some other languages spoken in Labuan Bajo. The assistance of a local researcher in translating the local languages and approaching in a locally excepted manner has helped some informants to be more relaxed during the interview. All the interviews were done in Indonesian (Bahasa Indonesia), which all informants understood and used well, with some local languages spoken by the informants and were asked to translate into Indonesian ((Constitution of The Republic of Indonesia, 1945).

The local researcher also helped select some of the informants before the survey, approached them beforehand, and explained the intention of the interview. The informants chosen for this research were based on their significant role in their community and of different ethnic backgrounds. Not all agreeing informants were interviewed. During the survey, some informants were suddenly unavailable, and some recommended other promising informants deemed knowledgeable about the topic. Some informants who participated in this research are referrals from other informants or other locals encountered during the observations. The flow of this selection is shown in Figure 3.17.

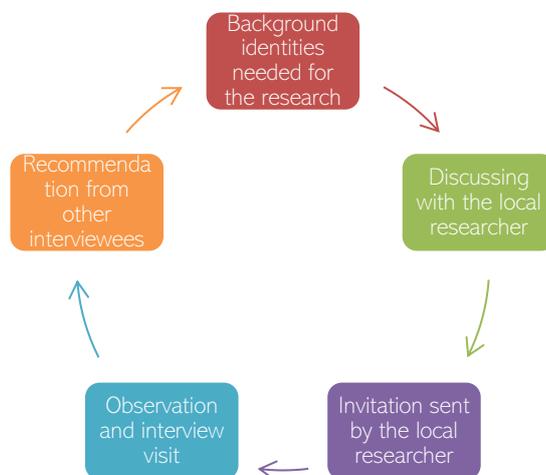


Figure 3.17 Flow of interviewee selection

When asking to describe their houses' floor plans, an iPad Pro or a regular notebook was used immediately to sketch their descriptions and consulted the informants for confirmation (Figure 3.18). The informants will confirm or correct the sketch; sometimes, they help sketch their houses. This process happened throughout all the sketching parts of this research. When they describe local materials or construction techniques with which the author is unfamiliar, sketches are opted to help better communicate, the local researcher will help explain the name of materials in Indonesian, or sometimes a quick image search on the internet would be done. All the informants do not have any architectural education, and the informants in this paper do not have any construction experience. In contrast, a study done to recollect a lost court lodge in Kent where the author was the one recollecting his memory and, although not educated directly in architecture, is an archaeologist interested in medieval architecture (Baker and Rigold 1977).

The in-depth interviews with locals were made sure to be from various ethnic backgrounds. The list of the participating informants is shown below in Table 3.9. The names of the informants are reduced to their initials, or in some cases their abbreviations (due to them having only one name). The order of the informants is shown in the order of the interview done in the observations. They were asked to confirm their ethnic identities, and some were even presumed to be of a different ethnicity before the interviews. The 'n<sup>th</sup> generation' column describes how long they or their ancestors have moved and settled in Labuan Bajo. For example, 1 means that they are the first generation in their family to move and settle in Labuan Bajo, and they were in charge of the decision to move. While 3 means that their grandparents were the ones who had the reasons to migrate to Labuan Bajo. The informant with '>4' was at least the fourth generation to live there, since they said they were the first families to come to Labuan Bajo and do not remember the exact year or generation of when they first migrated.



Figure 3.18 The interviews and sketching process in informant' house and outside their house

Their address was noted to map their locations to one another and in the town's formation. In the table, it is also shown that not all informants gave access or were interested enough to allow us to do house observation. Out of 23 informants, 8 did not give full permission. The  $\circ$  symbol means that they did allow us to see parts of their house but not all of it, or in other cases, they showed their previous house but did not permit us to observe their current house, making the observation not in accordance

of the research method design. While the × symbol means that no observation of their houses were done at all, but they were obliging to participate in the interviews. The last column is the description of their role in society and played part in the reason they were selected to participate.

The research acknowledges that the roles might give a biased result because the participants were mostly local figures in some definition, with very few informants who are just residents. Another bias that this research will acknowledge is that the findings will portray perspectives from men or head of families because almost all of the informants are male with the exception of number 11 and 19 who are both women, one a widow and another not married yet. However, during the interviews some of the informants' wives joined and answered along their husbands, sometimes in agreement and sometimes even correcting their husbands. Hopefully this will provide a less biased research compared to if the interviews were done individually with no other family members present.

Table 3.9 List of informants

No	Initials	Ethnicity	<i>n</i> <sup>th</sup> generation	Address	House observation	Role
1	UI	Manggarai	3	Kampung Tengah	○	4 <sup>th</sup> dalu of Nggorang
2	SU	Bugis	2	Kampung Air	●	Local figure
3	AH	Bajo	>4	Kampung Air	●	Local figure
4	DR	Bugis	1	Kampung Air	●	Head of neighborhood
5	MS	Manggarai	2	Nggorang	●	"Sarhunta" program beneficiary
6	TU	Manggarai	2	Lancang	●	Tu'a golo of Lancang
7	AA	Manggarai	3	Nanga Na'e	●	First head of Nanga Na'e Village
8	ES	Manggarai	2	Wae Mata	×	First head of Goron Talo Village
9	SA	Bajo	2	Puncak Waringin/ Kampung Tengah	●	Senior Bajo figure (descendant of the Bajo 'punggawa' or courtier)
10	UL	Bima	3	Sernaru	●	Head of Sernaru village
11	SY	Bugis	2	Kampung Air	●	"Sarhunta" program beneficiary
12	AN	Manggarai		Gang Pengadilan	×	Tu'a golo of Ranggawatu
13	RA	Bugis	3	Kampung Air	●	Senior resident
14	RI	Manggarai	3	Bandara/ Kampung Tengah	○	5 <sup>th</sup> dalu of Nggorang
15	RL	Bima-Bajo- Manggarai	3	Sernaru	●	Head of Land Transportation Division, Department of Transportation of West Manggarai
16	DP	Bugis	1	Kampung Ujung	○	Senior resident
17	YU	Manggarai	2	Melo	×	Owner of Compang To'e studio, Melo Village
18	RH	Bugis	>2	Sernaru	○	Local resident
19	FH	Bajo-Ngada	1	Sernaru	×	Local resident
20	SB	Manggarai	3	Wae Kesambi	●	Head of Batu Cermin Village
21	HJ	Manggarai	2	Sernaru	●	Local figure
22	MT	Bima	3	Kampung Air	●	Head of neighborhood
23	AL*	Bajo	2	Kampung Baru	●	Local resident

The presence of other family members during the interviews also allowed room for corrections from other family members, as well as an ‘honest meter’ to the description they shared. Another way to measure their honesty is to triangulate the information we had before during our pre-observation desk study and information from previous informants. After the observation was done, another desk study was done to ensure the accuracy of their stories.

The interviews used a voice recorder, an iPad Pro, and a regular notebook. Shown in Figure 3.19 is the process of the sketch and some of the sketches produced. The sketches were needed to make communications between the informants and the research team better and to avoid misinterpretations. Some materials and techniques were asked to be described due to some name differences between different places in Indonesia. Sometimes the research team would initiate the drawings and then ask for confirmation or correction from the informants. At other times, the informants were the ones eager to describe them in sketches. Not all informants were comfortable with drawing, but they were obliged to describe more in words and then the research team would correct the sketches according to the description. This might give some room for mistakes because there is a possibility that the informants were not able to describe it correctly but chose to agree with the sketch produced. The limitations of the sketches are acknowledged as they might sometimes provide room for misinterpretations and can be improved in future research with the same method.

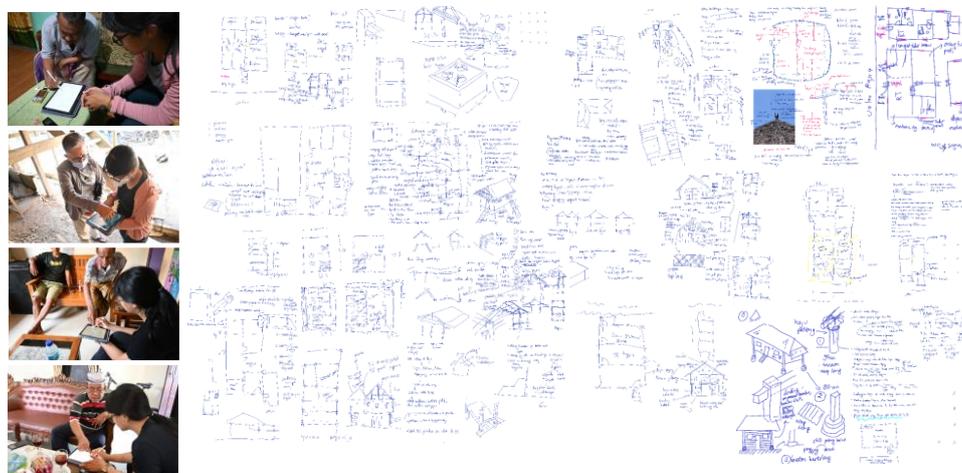


Figure 3.19 The sketching process during the interview and some of the sketches

This research conducted two field surveys, one from 11-24 October 2021 and another from 15-22 October 2022. During these two field surveys 22 informants were interviewed with an added interview conducted by the local researcher outside of the survey period. The list of interviewees is shown in Table 3.10. As previously mentioned, the informants were selected based on their ethnic identities. In which generation do they belong to is also noted to give insight into how long they have adjusted to the conditions in Labuan Bajo, and how many house transformations have they endured. Although the interview duration varies from one person to another, the average per person is two hours. Some informants were interviewed more than one time due to limitations in one of the interviews.

Table 3.10 List of the interviews schedule and duration

No	Initials	Ethnic identity	n <sup>th</sup> generation	Ancestors' ethnic identity	Date of interview(s)	Interview duration	Total duration
1	UI*	Manggarai	3	Manggarai	13 October 2021	1:23:40	1:23:40
2	SU	Bugis	2	Bugis	23 October 2021 18 October 2021	1:33:16 0:57:48	2:31:04
3	AH	Bajo	>4	Bajo	13 October 2021 16 October 2021 16 October 2021	2:37:11 3:41:52 1:48:51	8:07:54
4	DR*	Bugis	1	Bugis	13 October 2021	2:49:03	2:49:03
5	MS	Manggarai	2	Manggarai	14 October 2021	3:30:24	3:30:24
6	TU	Manggarai	2	Manggarai	15 October 2021	2:03:37	2:03:37
7	AA	Manggarai	3	(Sulawesi)	15 October 2021	2:03:24	2:03:24
8	ES*	Manggarai	2	Manggarai	17 October 2021	0:42:06	0:42:06
9	SA	Bajo	2	Bajo	17 October 2021 17 October 2021 17 October 2021 17 October 2021	1:05:44 0:34:45 0:01:29 1:09:09	2:51:07
10	UL	Bima	3	Bima	18 October 2021	3:03:55	3:03:55
11	SY	Bugis	2	Bugis	18 October 2021	0:59:58	0:59:58
12	AN*	Manggarai	2	Manggarai	18 October 2021	2:00:54	2:00:54
13	RA	Bugis	3	Bugis	13 October 2021 19 October 2021	0:10:33 4:43:50	4:54:23
14	RI	Manggarai	3	Manggarai	19 October 2021 20 October 2021	0:53:14 0:59:09	1:52:23
15	RL	Bima-Bajo-Manggarai	3	Bima-Bajo-Manggarai	20 October 2021	3:11:59	3:11:59
16	DP	Bugis	1	Bugis	21 October 2021	1:04:36	1:04:36
17	YU*	Manggarai	2	Manggarai	22 October 2021	3:33:16	3:33:16
18	RH*	Bugis	>2	Bugis	23 October 2021	1:26:50	1:26:50
19	FH*	Bajo-Ngada	1	Bajo-Ngada	23 October 2021	1:26:50	1:26:50
20	SB	Manggarai	3	Manggarai	23 October 2021	1:36:46	1:36:46
21	HJ	Manggarai	2	Manggarai	24 October 2021	3:16:22	3:16:22
22	MT	Bima	3	Bima	18 October 2022 20 October 2022	1:57:32 1:05:46	3:03:18
23	AL**	Bajo	2	Bajo	28 October 2022	0:48:51	0:48:51
				Total			58:22:40
				Average per person			2:03:37

The objective of the research was to comprehend the changes that occurred in the informants past houses and the decisions that were stored in their memory. Therefore, the interviews took place in their homes if possible. This would help the informants easily recall their environment and provide the research team with insight into their built environment if further observation was not possible.

As mentioned earlier in the details of the investigation period in Table 3.2, the length of the interview and direct observation varies. The length of the interview was not initially discussed; however, the time was usually divided into two-hour sessions to accommodate the daily Muslim prayer times. This resulted in an average of one to two sessions in the morning (ranging around 8 am-12 pm) and two sessions in the afternoon (ranging around 1-3 pm and 4-5:30 pm), which is an important consideration in an area with many Muslim informants or mosques in the neighborhood. Despite the success of avoiding the call to prayers during the interview recording, sounds from the neighborhood

and people coming and going during the interview interfered with creating a clean record. Nevertheless, the team strived to balance the project's objectives and the informants' perspectives, including the duration of the interview and pace with which the informants were comfortable.

The asterisk (\*) signifies that those informants did not participate in the whole designed interview. They were reluctant to answer some questions under some topics. This hesitancy was due to some problems found occurring in the near past or during the field survey. Amongst the many socio-cultural problems happening, the ones found during the field survey were regarding the land ownership problem, the authority of the Manggarai leaders in those land problems, and people doing surveys of 'poor-looking' houses for their scam material, while some just do not want to be interviewed accordingly. The double asterisks (\*\*) signify the informant who was interviewed by the local researcher after the field survey was finished. This was done to add another Bajo informant and to check if this topic can be conducted by a person with no architectural background in the future.

The interviews were recorded with a SONY IC voice recorder and the smartphones of the three interviewers. Later, those interviews were transcribed in f4transkript, VLC Media Player and Microsoft Word. The transcriptions were made by two different people, not during the field survey, which may create a gap in the interpretations. The duration of the interviews in Table 3.10 refers to the recordings of the SONY IC voice recorder. Some interviews were conducted over several days due to time limitations and observation limitations, amongst many others. Some interviews were not conducted in the homes of the informants and were interviewed again in their homes on another day.

The questions asked during the interviews were unstructured and semi-structured. The unstructured part was regarding their individual/family and neighborhood/town history, and the semi-structured part was about their houses' transformation. The list of questions and their willingness to answer is shown in Table 3.11. The flow of the interview was not structured as listed in Table 3.11, and the mentions of these answers and unrelated topics were sporadic and done in a more casual manner.

The willingness of the answers will provide insight into the affordability of this method to be implemented in other areas with similar social tendencies. Willingness may mean to share information, to recollect information, or simply talking about it. These parts of willingness can also be related to the ability to remember or decide to forget said information. Overall, 55% of the questions were answered, with 59% personal, 64% house, and 42% of the neighborhood-related questions.

The 23 informants were then filtered based on their willingness to share information regarding the history of their houses, with a minimum of 52% willingness to share houses-related answers, and the filter resulted in 13 informants. They consisted of 5 Manggarai people, 4 Bugis informants, 2 Bima informants, and 2 informants with Bajo ethnic identities. These informants are slightly different from the informants in the observation permitted filter. This list is only to highlight willingness percentage of all the interviewees and not to be mistaken with the findings later processed from the 12 informants selected for the vernacular architecture and memory recollection assessment.

Table 3.1.1 Interview questions and the informants' willingness to answer

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	%	
	UI	SU	AH	DR	MS	TU	AA	ES	SA	UL	SY	AN	RA	RI	RL	DP	YU	RH	FH	SB	HJ	MT	AL		
Individual/family history	Ethnicity	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	10:6:2:3
	Religion	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	7:16
	Family members*	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	48%
	Marriage/divorce*	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	65%
	Migration	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	74%
	Generation	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	83%
	Tradition*	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	61%
	Language	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	65%
	Education*	○	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	26%
	Livelihood	○	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	52%
House history	Year built	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	74%
	Builder	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	57%
	Design decisions	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	57%
	Dimensions	○	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	57%
	Rules	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	65%
	Shape	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	78%
	Material	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	65%
	Room functions	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	83%
	Renovation	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	43%
	Environment	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	61%
Neighborhood/ town history	Neighborhood	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	52%
	Infrastructure	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	43%
	Historical events	○	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	39%
	Special events	○	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	35%
	Natural disasters	○	▲	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	22%
	Answered %	0%	74%	96%	83%	52%	74%	96%	0%	74%	74%	35%	100%	26%	48%	65%	61%	17%	17%	78%	78%	91%	30%	55%	

### 3. 4. 3. Desk study and data analysis

Before and after the observations, the research did desk studies to support the findings by gathering historical records, official government decrees and wide-scale events that the informants mentioned. The desk study before the observation was mainly to gather the cultural context and impactful occurrences that can bridge the survey team to the informants. This pre-survey research may help give a better rapport to smoothen the interview and data collection.

The events varied from national scale to provincial, island, former regency, current regency, and town scale. The personal scale events were noted and triangulated with other family members but not supported by another desk study. Some collected records were maps from the war and it depicts how the story of Labuan Bajo in the formative years was correct or not as told by the informants.

The desk study also gathered material information and depiction from photos of the same year of the informants' description. This part was used to later render the houses in 3D and in floor plan for better visualization of the transformations over the generations as shown in Figure 3.20. The sketches were made into 3D models in SketchUp and then rendered in Enscape. The floor plans were made from sketches as well and the rendering was made in Photoshop by overlaying material texture on the exported AutoCAD drawing of the floor plans.

After the 3D and floor plan were made, an analysis was made to gain understanding of the physical, territorial, and cultural order of the houses and how it transformed throughout the generations. In the physical level, the partitions and how each room was located was mapped down and the public-private hierarchy analyzed. This is further translated to the territorial order of the house itself. While the location of the house to the land and the neighbors can be analyzed as the shifts of territory with other agents of control with different decision-making systems.

The material of building elements was also compared from one generation to another to analyze the shifts of material change and the reason behind those decisions. The form of the houses (buildings level) was also examined to see the trend and the logic responsible for those changes. This analysis is first done within the same person and then within the same ethnic group to see if there are any similarities and differences. Furthermore, the houses from the same area will be analyzed to one another to see if there are unique characteristics found in different areas. The comparison between areas may also give insight into the territorial order shown in the buildings' level.

Lastly, the analysis of the houses will be on the cultural order, that is to observe the logic behind the transformations based on their cultural preferences. This does not exclusively mean that their actions were dictated by their ethnic identity and traditions. But this will be the phase of understanding their rules and reasoning behind the decision on their built environment.

After the transformations of the houses were analyzed, the transcripts of the interviews were analyzed to understand the memory system they operate on. This will be seen from the level of detail the informants spoke when asked regarding their own history, the town or neighborhood, and the

houses they lived in before. Some of the milestones of the stories will be triangulated with supporting data gathered at the desk study. This will help check the level of accuracy of a memory system.

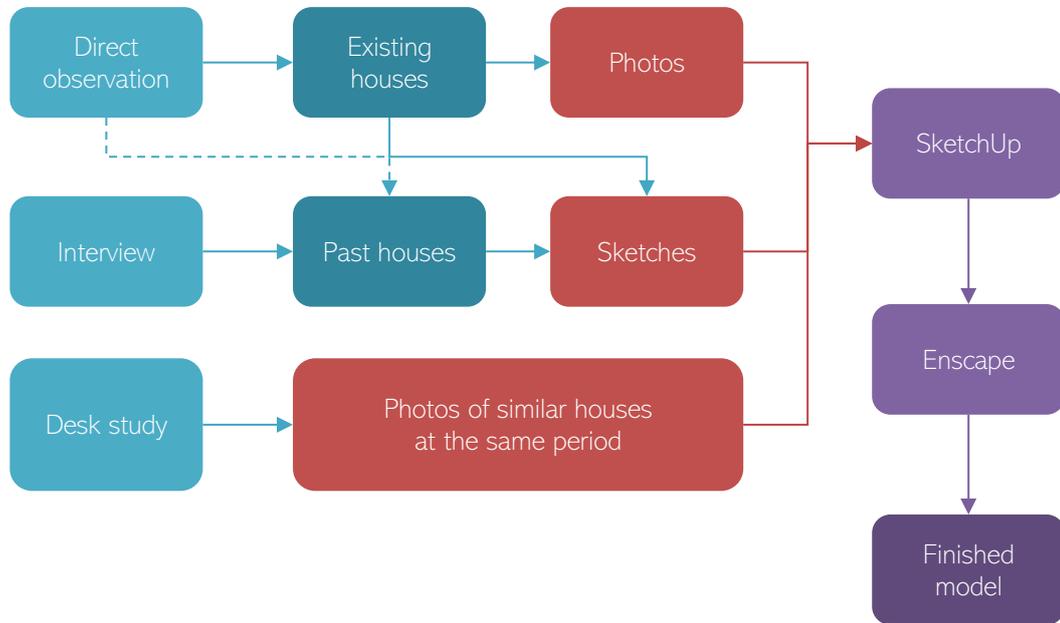


Figure 3.20 Flow of the model rendering

### 3.5. Chapter conclusion

This chapter discusses the methodology flow for a research project investigating transformations in vernacular architecture in Labuan Bajo, Indonesia. The overall methodology is based on the theory of transformation and memory and vernacular architecture and involves three categories of tangible actions: direct observation, in-depth interview, and desk study and analysis. The key and proposed methodology is the Ethnography-based intensive architecture memory recollection method. This is to convert somewhat unreliable data like oral recollection into more reliable data through memory verification and a rigorous data triangulation.

The chapter also explains the importance of the team members role in this research where the team comprises of an architectural researcher, a social researcher, and a local researcher. The architectural researcher is essential in drawing the rough sketches and later translating those sketches. The social researcher is needed to read the social context during the interviews and observations. While the local researcher is the key to understanding the local customs and to verify the data shared during the memory recollection process. The discussions between the interviews amongst the three team members are also fundamental in the foundation of understanding how different issues have connections and impacts on one another.

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**CHAPTER 4**  
**FINDINGS IN HISTORY**  
**AND SOCIAL CONTEXT**



#### 4. 1. Written records of Labuan Bajo

Historical records of rural places in Indonesia are usually very scarce and, in some cases, are kept in family-owned libraries with very strict access. The same issue is applied to Labuan Bajo. Historical records are undeniably limited, especially on architecture or built environment documents. The only depiction of what Labuan Bajo looks like are found on the website of the Dutch National Museum of World Cultures (*Nationaal Museum van Wereldculturen*) and some of the few photos available in that website. It is clear to see there are few to no developments in the area in around 1900-1960. With these two photos taken from the same angle and from the same ‘speech’ as described on the website, it is safe to assume this is taken during a similar time. Yet further studies are needed to know the actual time of when Bajo and Buginese people started to do their trading with the Manggaraians and when did they started settling on Flores. These two photos are from the same angle, and from the same ‘speech’ as described on the website. It is safe to assume this is taken during a similar time.

Referring to the earlier chapters, at the beginning of this study, all the accessible historical records of Labuan Bajo from all issues will be collected to then be filtered into relatable fields of the research. The categories of the relatable fields are socio-economic, political, environment-development, architecture, and tourism issues. The records are also divided into their scale of impacts, from national, provincial, island, regency, and town scale. This scale category is needed to provide more comprehension on the scale an event or policy has impacted the object of research. The collected and simplified historical data of Labuan Bajo and its wider context is shown in Table 4.1.

The earliest depiction of Flores was found in Karel Steenbrink’s paper entitled “Dutch Colonial Containment of Islam in Manggarai, West-Flores, in Favour of Catholicism, 1907-1942” (Steenbrink, 2013) which mentioned how in the 1600s, Flores, or Reo in West Flores to be exact, was seen as a source of slaves for the Bima Sultanate in the neighboring island. This Manggaraian territory was an area of contention between the Goa Sultanate of South Sulawesi and Bima Sultanate of Sumba Island in the 1600s (Erb, *Tourism Space in Manggarai, Western Flores, Indonesia: The House as a Contested Place*, 1998). Yet in the end of the century, many refugees from the Bima Sultanate fled the Dutch attacks and migrated to Flores. Then there were considerably peaceful times when the Todo and Pongkor family of the Manggaraian community ranked to the top of society while still under the Bima Sultanate. Until the Dutch army entered Manggarai in 1907 and led to the surrender of the Bima Sultanate’s reign over Manggarai in 1909. A Bimanese Sultan remained as the King of Manggarai during that surrender, until finally in 1930 a Manggaraian from Todo family was appointed as the King of Manggarai (Erb, *Contested Time and Place: Constructions of History in Todo, Manggarai (Western Flores, Indonesia)*, 1997). After bringing wet rice field technology, the King of Manggarai raised the Todo family name even higher yet after his death in 1949, the kingdom was subjected under the Indonesian Republic after the Dutch left and his successor never made it to the throne.

The short story of the Kingdom of Manggarai may give insight on how Labuan Bajo and the Manggaraian society did not have a long engagement. The Manggaraians were mostly living in the mountains and usually avoided living on the coastal areas because they were more prone to attacks from the Goa or Bima Sultanates. The history of Labuan Bajo itself remains unclear, especially when it was founded.

On the other hand, the first short term visitors to Labuan Bajo were found in the records. They came due to hearing the news of the Komodo dragons' discovery in Reo in 1912 and of the Komodo dragon natural habitat (Komodo, Rinca and Padar Island) being nature reserves by the middle of the 1960s (UNESCO, n.d.). The dragon habitat then became a magnet for international scientists. The first tourist recorded to come to Manggarai Regency were a German couple who arrived with a sailboat in Labuan Bajo in 1967 (Erb, *Understanding Tourists: Interpretations from Indonesia*, 2000). At that time there was no establishment or even tourist accommodation whatsoever and the couple had to go to Ruteng (the capital of Manggarai Regency) by horseback. Since then, the tourists came every six or seven months or so and stayed with the government officers or sometimes with the local fishing populations in Labuan Bajo before continuing their trip, as the first German couple did, to go horseback to Ruteng. The number of tourists coming to Labuan Bajo, either to continue to Komodo Islands or further east to the island, has increased from more than 15.000 visitors in 2006 to 50.000 visitors in 2013 (Erb, *Sailing to Komodo: Contradictions of Tourism and Development in Eastern Indonesia*, 2015). This number is planned to reach 1.5 million in 2019 by the government, and that attention is one of why many developments are happening to benefit from this plan. Even though the target was not achieved, the national attention to Labuan Bajo and investments given to improve the existing infrastructures have continued until today.

By seeing Table 4.1 in a glimpse, one can see the architectural records relating to Manggarai and Labuan Bajo are only of Manggaraian architecture. This type of Manggaraian architecture is also not found in Labuan Bajo, yet some of the altered forms influenced by the Dutch's policy in 1919 (Erb, *Contested Time and Place: Constructions of History in Todo, Manggarai (Western Flores, Indonesia)*, 1997) are found in Soekarno Hatta Street. The lack of documentation of the Buginese and Bajo houses in this melting pot of a town creates a disparity on whose architecture is the embodiment of Labuan Bajo's identity.

Many design competitions and government-funded projects have been done with local and imported architects bringing the Manggaraian architecture, originally made to sustain lifestyles in the mountains like in Wae Rebo yet brought to be placed seaside in small islands (Mubarsyah, 2020; Purwaningrum, 2022). These design competitions were intended to highlight Nusantara architecture as a prospective and attractive style that should be embraced more by Indonesian architects. The term Nusantara architecture is still highly debated amongst scholars due to the oversimplification of a complex and diverse cultural ecosystem that is Indonesia (Purwaningrum, 2022). The competitions

themselves have room for improvement when providing the time and space for the participants to do an in-depth research about the sites and their related cultural identities (Purwaningrum, 2022; Purwaningrum & Ardhyanto, 2018).

The domination might also be the cause of the recent divide of the Manggarai Regency in 2003 (Arsip Nasional Republik Indonesia, 2018) to which led the regency to become smaller regencies: West Manggarai, Manggarai and East Manggarai. This divide was done to reduce the administrative borders, and itself does not contribute to the cultural identity domination. Yet, the chairs of the West Manggarai new office were filled with people from Ruteng or the capital of Manggarai Regency in the beginning of the divide. The newcomers from Ruteng did not know the history of Labuan Bajo, yet they were awkwardly positioned to be decision makers. This situation led to the decision not to go to the local government for data collecting, to reserve an objective perception. This also led to the decision to do interviews with locals from different ethnic backgrounds who have lived in Labuan Bajo, specifically Soekarno Hatta Street. The interviews will be explained in the next subchapter as it collected depictions and history of Labuan Bajo's development through the memories of the residents, and how it has led this research to delve into the memory recollection in analyzing vernacular architecture transformation.

Table 4.1 History of Labuan Bajo and its wider context

Nation	Province	Island	Older Regency	Regency	Town
Indonesia	NTT	Flores	Manggarai	West Manggarai	Labuan Bajo

Year	Socio-economic-political condition	Government	Developments & Environment	Architecture	Tourism
1600s	Flores was a source of slaves (Steenbrink, 2013) Bajo and Bugis people migrated out from Sulawesi (Kemdikbud, 2018)	West Flores was the contention of Goa and Bima Sultanates (Aritonang & Steenbrink, 2008)			
1685		Bima Sultanate forced suzerainty to Western Flores (Aritonang & Steenbrink, 2008)			
End of 1600s	Many refugees from Goanese Sultanate fled to Flores after the defeat by the Dutch (Erb, 1998)				
1750s				Todo Village Main House was built (Erb, 1998)	
1800s	Todo and Pongkor villagers achieved high ranks in Manggaraian society (Erb, 1998)				
1907		Dutch forces entered Manggarai (Erb, 1998)			

Nation	Province	Island	Older Regency	Regency	Town
Indonesia	NTT	Flores	Manggarai	West Manggarai	Labuan Bajo

Year	Socio-economic-political condition	Government	Developments & Environment	Architecture	Tourism
1909		Bimanese Sultanate surrendered Manggarai, but a Bimanese Sultan remained a 'king' of Manggarai (Erb, 1998)			
1912			Komodo dragon was first discovered in Reo (Murphy, Ciofi, Panouse, & Walsh, 2002)		
1919				Dutch regulation for replacing traditional dwellings to smaller houses (Erb, 1997)	
1930	First wet rice field technique in Flores was applied by Todo Villagers (Erb, 1997)	First Manggaraian appointed as king, from Todo family (Erb, 1997)			
1938			Padar and Rinca islands declared as nature reserves (UNESCO, n.d.)		
1945		The declaration of Indonesian Independence (Constitution of The Republic of Indonesia, 1945)			
1950		The end of the Dutch aggression (B. Anderson & McVey, 1978)			
1953	Kahar Muzakkar claimed Sulawesi and surrounding areas as part of Islamic State of Indonesia				
1955	Islamic State of Indonesia was spread to NTT				
1965	30 September Movement (Howland, 1996); disputed death of Kahar Muzakkar and the end of the Darul Islam movement (Zurbuchen, 2005)	Failed coup attempt, start of the new order era (Howland, 1996)	Komodo Island declared as nature reserve (UNESCO, n.d.)		
1967					First tourist recorded in Manggarai (Erb, 2000)
1977			Komodo Island declared as a biosphere reserve from UNESCO (UNESCO, n.d.)		
1980			Komodo National Park founded (Komodo, Rinca and Padar Islands) (UNESCO, n.d.)		

Nation	Province	Island	Older Regency	Regency	Town
Indonesia	NTT	Flores	Manggarai	West Manggarai	Labuan Bajo

Year	Socio-economic-political condition	Government	Developments & Environment	Architecture	Tourism
1983					Tourism in West Manggarai was still in the infancy stage (Erb, 2000)
1984			The surrounding marine area of Komodo, Rinca and Padar included into the national park (UNESCO, n.d.)		
1986		Tourism was made as a development strategy			-- See govt. section
1987	First minor seminary in Labuan Bajo (Aritonang & Steenbrink, 2008)				
1989-1997					Tourism boom in West Manggarai (Erb, 2000)
1991			KNP was declared a UNESCO World Heritage Site (UNESCO, n.d.)	Rebuilt of the Todo Village Main House (Erb, 1997)	
1995			The Nature Conservancy started to support the national park (UNESCO, n.d.)		
2003		Manggarai Regency was split into three: West Manggarai, Manggarai and East Manggarai (Arsip Nasional Republik Indonesia, 2018)			
2005					Putri Naga Komodo was founded (World Rainforest Movement, 2004)
2013			First Boeing 737-800 landed and took off at Mutiara II Airport (detikTravel, 2013)		Sail Komodo was held in Labuan Bajo. (Erb, Sailing to Komodo: Contradictions of Tourism and Development in Eastern Indonesia, 2015)
				First national design competition of Nusantara architecture was designated in Messah Island	
2015			Komodo Intl' Airport was inaugurated (Anwar, 2015)		
2015		Ministry of Tourism made Labuan Bajo as one of its prioritized tourism destinations (Agmasari, 2019)			

Nation	Province	Island	Older Regency	Regency	Town
Indonesia	NTT	Flores	Manggarai	West Manggarai	Labuan Bajo

Year	Socio-economic-political condition	Government	Developments & Environment	Architecture	Tourism
2018					Labuan Bajo Tourism Authority Board was formed as a direct right hand of the central govt. (Indonesia.go.id, 2020)
2019					Strategized as a super prioritized tourism destination
2020				Government subsidized home improvement for kiosks and homestays program starts	Covid-19 pandemic halted many tourism activities
2021				Government funded tourism facilities were officially opened to public	Officialized as a super-prioritized tourism destination (Rencana Pembangunan Jangka Menengah Daerah Kabupaten Manggarai Barat Tahun 2021-2026, 2021)
2022			Drinking water supply system of Wae Mata II finished		
2023		Indonesia became host of ASEAN Summit 2023 and G20 Summit	Road expansion finished to the Golo Mori tourism strategic area		Labuan Bajo became the venue for the main event of the ASEAN Summit 2023 and side events of G20 Summit

The reclaimed coastal areas in Labuan Bajo have also undergone a massive transformation when observed in 2021. The first observation witnessed the seaside projects still under construction, especially the waterfront area. Other projects were almost 100% at that time, ready enough to be declared finish by the president during his visit. In 2022, the waterfront area was almost 100% finished and was already accessible by the public. Figure 4.1 shows the finished waterfront area built on reclaimed land in 2023 and their zoning functions.

The first international event held in Labuan Bajo was the Sail Komodo in 2013 and the scale was contrasted greatly by the ASEAN summit held in 2023. During the Sail Komodo, not many conflicts rose as not many new infrastructures were constructed in preparation of the sailing event. The event preceded the land reclamation in 2012 and the airport runway assessment for expansion. Several years after, there was an issue with their sacred beach of Pantai Pede being taken by the provincial government. This was one of the first vertical conflicts where the locals arranged many protests and other initiatives to reverse the one-sided decision from the foreign authorities, also relating to the built environment. After that the prioritized destinations were announced in 2015 and the town experienced

many infrastructure improvements and observed many new independent tourism facilities constructed. This was the start of the rapid changes, in comparison to other places not made as the top ten prioritized destinations by the central government. In 2022, there was another huge conflict due to the management decisions of the Komodo National Park. The issue was not mainly about spatial problems, but there was a preceding issue regarding the trust of the people towards the company in charge of the park's operation. This company was a new company who has ties with the provincial government, and no experience in managing a national park with the caliber and level of importance as the only habitat of the Komodo dragons. In addition of their previous distrust to the provincial government, this company decided to plot the lands of the national parks to other companies which has ties to powers near the central government.



Figure 4.1 Functions of the reclaimed coastal areas in Labuan Bajo in 2023 in preparation for the ASEAN Summit 2023

Apart from the records from newspapers and public officials, this research also gathered records from citizens, which are mostly photos of private documentation nature. These photos come from an observer, and even though the person is not the researcher, these photos may act as documentation of the events as it is far from a staged photo with the special intention of portraying something else (Müller, 2021). These photos were gathered in an interview session before the study to recollect the changes experienced by the town and were shared to support the story told by the informants.



Figure 4.2 Photos of Sail Komodo in 2013 collected from interviewees

#### 4. 2. Migration routes of the local residents

As previously stated, Labuan Bajo has a variety of local identities. Although the case of a port town being a melting pot is not a new phenomenon, the migration route and the reasons behind them are rarely explored, especially in small towns in Indonesia. Most people will make assumptions on how people from small villages will inevitably move to the big cities to improve their lifestyle. Yet that is not entirely the case of this small town, which has very limited historical records, even during the Dutch colonial times and Spanish trading times.

Many maps made by the Dutch East India Company have shown the little significance Labuan Bajo has compared to Reo and Ruteng. This is mostly due to exert of the Bima Sultanate, a position named as *naib*, being stationed in Reo, which led to it being one of the several strategic administrative and governmental center of Flores Island when the Dutch took over. Ruteng itself is a town made by the Dutch when their company was expanding in Flores. The economic activities done by the Dutch explains how Reo and Ruteng have more records compared to Labuan Bajo.

Seeing how small Labuan Bajo was in the colonial times, compared to the two administrative centers, the reason behind the migration of people from many parts of Indonesia should give a different insight on how migrations occurred before the modern times. The routes they take before settling in Labuan Bajo will also provide some ideas on how their lifestyles and identities have been exposed to others before and after they settled in the area.

N.J. Habraken, born in Bandung, Indonesia, is a Dutch architect, educator, and the mind behind the theory of transformation of built environments, which was built upon his observations of many settlements in the world as portrayed in his book, *The Structure of the Ordinary*. In his book, he

explained how there are three main ways of understanding the decision-making systems happening behind an ordinary looking built environment, which are the physical orders, territorial orders and lastly the cultural order<sup>2</sup>. The latter two orders were used to comprehend the impacts of the migration on the formation of a town's built environment because the scale of the physical order is not discussed in this part of the research. Territorial orders on the other hand may be observed by examining the territories of the first inhabited spaces and the dynamics behind the inhabitation process.

The cultural order will be reviewed by dissecting the common understandings between the different cultural groups of the current residents in Labuan Bajo. Through highlighting the different villages from which they have migrated, the distinction between each initial built environment systems will be discerned. However, to understand the historical contexts of the settlements in Labuan Bajo and how the people came to be considered as the 'locals' in this relatively young town, interviews were conducted with some residents of Labuan Bajo and some neighboring areas. By interviewing the locals with various cultural backgrounds, this research aims to gain an unbiased perspective, neutral of the different narratives available now.

As mentioned before, the interviews were done in person on 11-25 October 2021 in their houses. Most of the interviewees are local or senior figures of the community, specifically chosen to be the sources of this research due to their age and significant role in the community. The interviewees come from Bajo, Manggarai, Bugis and Bima ethnic groups. To understand the local terms, locations and language, the interviews were also done with the accompaniment of a researcher based in Labuan Bajo, equipped with a deeper comprehension of the local context.

These interviews, as well as this paper, are a part of the research on how vernacular architecture has transformed in this rapidly growing town in Eastern Indonesia. The ethnic or tribe backgrounds were needed in order to determine whether the transformations are related to the different cultural roots, the assimilation of them when living together or other external factors unrelated to cultural identities. The examples of questions asked in the interviews are about how their parents, grandparents, or ancestors before them migrated to and from which villages until they settled into Labuan Bajo. Why and when they migrated and settled were also queried to gain a better understanding of their circumstances.

From the informants, this paper has collected a sample of migration routes of Bajo, Manggarai, Bugis and Bima current residents of Labuan Bajo and is depicted in Figure 4.3. This map is an illustration of places from where the residents of Labuan Bajo originated. The location of the lines, be it on the sea or on the land parts of the map, is not an indication of which exact route or mode of transportation they took. The map depicts how the locals migrated from different islands or within the island but from different geographical context and certainly different sociocultural contexts as well. The diversity of Labuan Bajo itself complicates which culture the designs should refer to in the scheme of the national tourism development agenda.

Table 4.2 List of informants and their migration background

No	Initials - Ethnicity	n <sup>th</sup> gen.	Current address	Family migration route	First migrated in	Reason behind migration
1	UI-MA	3	Kampung Tengah	Nggorang → Kampung Tengah	Around 1937	Grandfather was hired to help govern the Manggarai kingdom
2	SU-BU	2	Kampung Air	Kajuara, Bone/Senjai → Kampung Ujung → Kampung Air	1955	Fled the rebellion in South Sulawesi
3	AH-BA	>4	Kampung Air	Kampung Air, Labuan Bajo (folktales provided clues to earlier migration)	At least in the end of 1800s was already there	A folk story about a princess who was lost at sea and sought out by the ancestors of the now Bajo people
4	DR-BU	1	Kampung Air	Makassar → Kampung Air	1996	Stationed in Labuan Bajo
5	MS-MA	2	Nggorang	Nuri, Rekas → Nggorang	Before 1945	Born in Nggorang, migration was unclear.
6	TU-MA	2	Lancang	Rekas, Kempo → Duli → Lancang	1950s	There was a government directive which forbade clearing of forests
7	AA-MA	3	Nanga Na'e	South Sulawesi → Reo → Nanga Na'e	Unknown <sup>1</sup>	Sailed for trading
8	ES-MA	2	Wae Mata	Mata Wae → Ruteng → Boa Wae, Ngada → Ruteng → Rekas → Dahot → Wae Mata	1966-1968	Migrated from the origin village to study, to work, to do farming, and lastly his father was stationed in Labuan Bajo
9	SA-BA	2	Puncak Waringin/ Kampung Tengah	Sulawesi Island → Bajo Island → Kampung Air → Kampung Tengah → Puncak Waringin	1400s	Change of government established a new system for the head of village ( <i>kepala desa gaya baru</i> )
10	UL-BI	3	Sernaru	Bima, Sumba Island → Sernaru	Dutch colonial times, before 1942 (Japanese occupation)	Fled from the Dutch in Bima, fled from the coasts of Labuan Bajo from the Japanese
11	SY-BU	2	Kampung Air	Bone → Kampung Air	1950s	Fascinated by the promise of better livelihood in Labuan Bajo
12	AN-MA	N/A	Gang Pengadilan	N/A	N/A	N/A
13	RA-BU	3	Kampung Air	Sulawesi → Goron Talo, Flores → Kampung Air	1960s	Grandparents fled from the rebellion in South Sulawesi
14	RI-MA	3	Bandara/ Kampung Tengah	Nggorang → Kampung Tengah	Around 1937	Grandfather was hired to help govern the Manggarai kingdom
15	RL-BI	3	Sernaru	Lenteng, Warloka → Kampung Tengah →	1923-1924 (paternal lineage),	Escaped from Bima during hard times

<sup>1</sup> The only memory was that in Reo, people were still speaking in Bima language at the moment, presumably during the Bima kingdom rule or some period after their retraction.

No	Initials - Ethnicity	n <sup>th</sup> gen.	Current address	Family migration route	First migrated in	Reason behind migration
				Sernaru (paternal lineage)	1912-1912 (maternal lineage)	
16	DP-BU	1	Kampung Ujung	Ara, Bulukumba → Kempo → Bima → Labuan Bajo	1997	Invited by a cousin from his wife to stay in Labuan Bajo
17	YU-MA	2	Melo	Senge → Nobo → Culu → Melo	1960s	Instructed to come down from his initial village up on the hill
18	RH-BU	>2	Sernaru	Bulukumba → Ara → Labuan Bajo	Unknown	Looking for a better life
19	FH-BA	1	Sernaru	Riung → Rangko → Lamtoro → Sernaru	1988	Had a cousin living in Labuan Bajo and wanted to go to highschool
20	SB-MA	3	Wae Kesambi	Luwuk → Reo → Goron Talo → Wae Moto → Lamung → Loha → Senge → Mbore → Los Baba → Wae Kesambi	1932	Grandfather worked with a Chinese tradesman
21	HJ-MA	2	Sernaru	Toerlaing → Sernaru	1967	Change in government after 1965, asked to come down from their villages
22	MT-BI	3	Kampung Air	Bima → Kampung Air	1982	Looking for better opportunities
23	AL-BA*	2	Kampung Baru	N/A	N/A	N/A

By examining this map, it is clear to see how the Manggarai people have indeed migrated from villages to villages before finally settling in Labuan Bajo, as expected from the technically ‘most local’ tribe as they are the dominating tribe of the western part of Flores. Compared to other tribes, the Manggarai tribe are mostly non-seafaring people which includes their migratory patterns, while excluding their early ancestors’ voyages from villages outside of Flores Island, like Luwuk from Sulawesi Island or Mentawai Islands off the western coast of Sumatra Island.

The identity attachment to each village is depicted in how the informants from Manggarai background explained in explicit details on which exact village under from and to which administrative jurisdiction (*kedaluan* in Manggarai) did their ancestors migrate. One particular Manggarai informant disclosed how Manggarai people will immediately know your family lineage and which villages they come from previously just by knowing in or within which village you currently live or was born. The villages may be close to each other in geographical terms, yet the people living in one village will have the same identity and the neighboring one with another. This can be seen as well in Figure 4.3 as the dots in the migration route represents all the different villages the informants mentioned in the interview, and the red dots (representing the villages from where the Manggarai people migrated) can be seen to appear more than the other colors.

This illustration in Figure 4.3 can also depict how the people with Bajo, Bugis and Bima cultural roots tend to migrate on the coastal areas. Although later in the smaller Labuan Bajo town-scale, it can

be seen how the Bajo and Bugis people have migrated from settlements with direct access to the sea to the ones further inland, and the Bima people are more flexible in choosing their location for settlements. Nevertheless the illustration shows how the different ethnic groups have interacted with the others in some points other than Labuan Bajo, yet the real melting pot is when they migrated and settled in to Labuan Bajo.

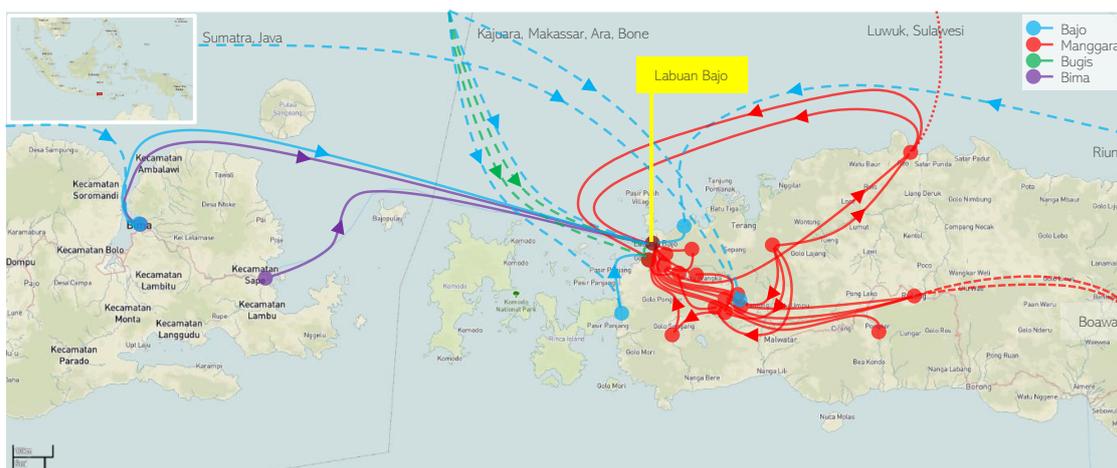


Figure 4.3 Illustration of the residents' migration route based on the different ethnic backgrounds.

As far as oral history can be engaging and detailed due to the significant role of the informants in the community, vetting the stories with official records or other supporting documents will help verify them hence amplifying the message. For this paper, maps have been collected from different periods to examine the stories and to gain a better picture on the geographical as well as chronological context.

During the interviews, some of the informants had quite clear information on the timeline of their families' migration, while others only have vague recollections of the stories they heard or not a slightest idea. By analyzing the locations of the earliest villages with clear timelines and overlaying them with the map from before World War II, as seen in Figure 4.4, it shows how the stories are verified. This is done by seeing whether the location of the informants' villages color-coded with the cultural background are overlaid with the location of town or village or settlements on the official map made in 1942-1943 based on other maps created in 1916-1928. Simple circles on the map are symbols of either 'town' or 'village or settlement' as explained on Figure 4.5. Names on the map are written in Dutch and Indonesian because, as previously stated, the map was compiled from Dutch maps by the U.S. Army Map Service although this time it is officially made for navy and military purposes.

Out of thirteen villages or settlements mentioned by the informants, only three are not overlaid with any circle icons from the original map. Two of them are Manggarai settlements from which the informant described those settlements being very small and familial scale settlements in 1932 and a decade after. This explains why the map does not show these settlements in 1916-1928. The other one not shown on the map is the Bajo settlement on Bajo Island (written as 'P Badjo' on the map), and this

checks out as well as the Bajo informants have described that they have migrated out of Bajo Island some generations ago. This must mean that at least by the time the survey for the map was conducted, the settlement in Bajo Island have decreased significantly.

In Figure 4.4, the settlement locations of each ethnic groups can be seen to be quite far apart from each other, except the Bajo-Bugis-Bima settlement by the coast of Labuan Bajo. This pattern of Bajo-Bugis-Bima settlements being on the coast while the Manggarai settlements are up in the higher altitude is the imagery often told as the history of Labuan Bajo. The story is that Labuan Bajo was once a trading port between people bringing goods from the sea and the people bringing goods from the mountain. This good trade is what is said to lead the Manggarai people, or the local tribe of the west part of Flores Island, to give parts of the land to their trading partners, the sea nomad Bajo people, so they could rest more comfortably between their fishing journeys. By seeing this map, it can be assumed that the legendary story had happened and by 1916-1928 the Bajo people have transitioned to settle into the coast of Labuan Bajo.



Figure 4.4 An overlay of a map of Komodo from the U.S. AMS (1942-1943) with village locations from or into which the informants migrated

Although the map depicts ethnic groups' early settlement, it is only an illustration based on the informants interviewed during this research. It is not by any means making a definition that those villages are exclusively settlements of a certain ethnic group.

To determine the earliest settlement in Labuan Bajo is a challenging task, yet to grasp the image of how the early settlements look and how each cultural group interacts with one another is achievable through the methods used in this research. The result of interviewing some senior and local figures and verifying the coordinates to locations they mentioned as their earliest settlement in Labuan Bajo with existing maps in that time period is an illustration map of settlement history in Labuan Bajo, shown in Figure 4.6.

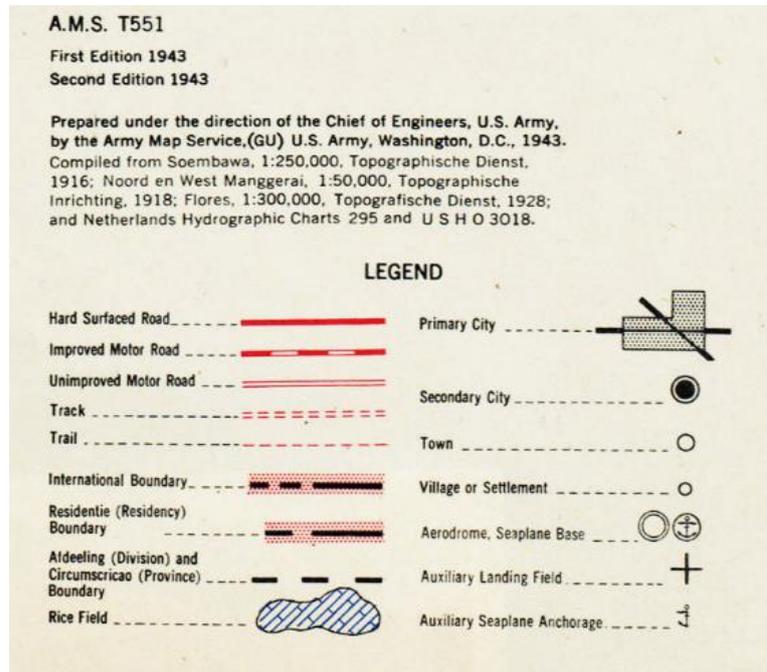


Figure 4.5 Description and legend of the map partially used in Figure 4.4

First of all the research has concluded a definition of Labuan Bajo widely used by the current residents may derive from the topographical formations notated by the black dashed line in Figure 4.6. The boundaries of Labuan Bajo is defined by the array of hills surrounding the wide and flat area. Even though this definition and boundaries are different from the ones from the current or colonial administrative borders of both Kelurahan Labuan Bajo (only on the coastal area of the now Soekarno Hatta street neighborhood) and the Kedaluan Nggorang (a wider yet deactivated administrative term, culturally still play a significant role), these boundaries and definition represents what the current resident or neighboring areas refer to as Labuan Bajo, Labuhan, Lem' Mbajo, Mbom Mbajo, Lehe or just as 'down there' by the mountain village people. As mentioned before, these boundaries are the boundaries used in this research.

To circle back to the question of why did the residents of Labuan Bajo or their ancestors migrated to Labuan Bajo, Figure 4.3 has successfully portrayed the results of the interviews. Most of the

Manggarai people answered how they have a semi-nomadic culture; with each marriage a son and his newlywed wife are usually instructed to move to another place and build their own village with the help of some aide. This is why cultural identity as well as the family history and lineage adhere to a Manggarai village, regardless of its proximity with other Manggarai or any other villages.

As for Bugis informants, most of them or their ancestors either fled from the terrors of the Islamic revolution rebellion in South Sulawesi or just wanderers looking for a place which promises a better life. Most of the informants' families came in the 1950s, which is in the same timeline as the rebellion while the others came sporadically years and decades after that.

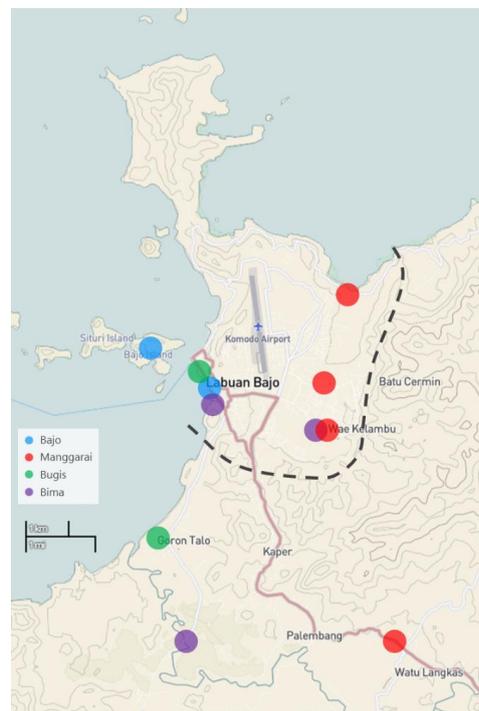


Figure 4.6 Illustration map of the early settlements in Labuan Bajo

The Bima informants shared how they were initially living by the coast or at least near the river, yet they had to move up into the mountains to hide from attacks of the Japanese military during the World War II. The settlement at the flatlands is built by the Bima people due to this reason and was later joined by the Manggarai people in the 1950s. However, the reasons behind their earlier migrations to the coastlines of Flores were to find a better livelihood in a better environment, just as the Bugis people did.

The informants of Bajo descendant have a different story, as they have not recently migrated. To trace back to when their ancestors first settled in Labuan Bajo is difficult. They have shared stories of how their ancestors came at least from the 1700s, yet it is hard to verify such a statement. However, there are several documents coming from as early as the 18<sup>th</sup> century mentioning the many names of Labuan Bajo, such as Laboean Badjo, Badjo Baai, which has a similar meaning of ‘where the Bajo

people dock their boats'. There is also Laboean Badjak which means 'where the pirates dock their boats'. This may support the claims of the Bajo informants, yet more proof is needed.

Even though the family lineage claim is hard to be proven, the impact the Bajo people have on the names of the town is evident. For example, the west coast of the current Soekarno Hatta Street is the first area settled in Labuan Bajo (seen in Figure 4.6), and the name of the first settlement is Bitta Boe, where '*bitta*' in Bajo language means 'village', and '*boe*' translates as 'water'. This name was to signify a water spring on this then stretch of white sand beach. Even though now the name of the village has changed into Kampung Air, it still holds the same meaning of 'water village'.

To understand the history of the town chronologically, and through hard proof, the earliest record of a settlement is by a photo taken during the Siboga expedition, depicting a photo of a house of a Mr. de Siso located in Badjo taken in 1899-1900 seen in the records of the Royal Netherlands Institute of Southeast Asian and Caribbean Studies. The picture of the same house was taken from another angle and verifies the location of the house was at the corner of the Labuan Bajo coastlines and across from Bajo Island, as seen in Royal Netherlands Institute of Southeast Asian and Caribbean Studies. Nevertheless, the map made by the U.S. American Map System, partially used in Figure 4.4 and Figure 4.5, is the best source to comprehend the earliest record of the town and its significant position in the trade route within Flores Island and the neighboring islands in 1932.

Systematically the town was and still is under the cultural jurisdiction of the Manggarai people. Most informants told the story of how their ancestors had to do the ritual '*kapu manu lele tuak*' which is a traditional Manggarai custom literally translated as 'hold a chicken on your lap, bring a bottle underneath your arm'. This custom is performed when asking permission from the local leader of the Manggarai tribe, either *dalu* or *tu'a golo*. This can be used for many occasions, though it is an undebatable default when asking for land. It requires the pleader to bring a live and healthy chicken along with any kind of alcoholic drink. Starting from the use of traditional palm wine to now using a 600 ml bottle of beer, this ritual has been simplified in accordance with the modern times. A relatively small amount of money is also accepted in exchange of the live chicken, and the necessity of this custom has decreased since most land has already been given out and owned by individuals. Transactions between landowners and their buyers no longer need to pay a visit to the local Manggarai leader, neither *dalu* or *tu'a golo*.

This common understanding of the land inhabitation process sheds a light on both the territorial order and cultural order behind the formation of Labuan Bajo. Seen through Habraken's theory, the process of *kapu manu lele tuak* symbolizes how all the informants coming from other villages within or outside the Manggarai territory will honor the Manggarai system of space control. The land within the Manggarai tribes' control, the west part of Flores Island, will always follow the system set in place by the Manggarai traditions. One Manggarai informant shared the story of how in the past their ancestors came from Sulawesi Island, and when settled in a cave in the Manggarai lands, they were

discovered by a Manggarai patroller, called as *gelarang*. The patroller reported the sightings to the local Manggarai leader, the *dalu*, and the *dalu* instructed the *gelarang* to ask the cave inhabitants to explain from where they came and the status they hold, are they royalty or not. The informant's ancestors were in fact part of the royal lineage back in Sulawesi, as they have the Bugis traditional script (*naskah lontar*) to prove it. The *dalu* then accepted them into his territory and even gave them official positions within the Manggarai community. This story is confirmed by another Manggarai informant, whose ancestors apparently are still in the same lineage with the previous informant. They are both from the Toe tribe in the Manggarai culture groups. Their lineage runs from the same village of Senge, and from which the first son of the family went to a village called Nobo and after two generations resulted in the first informant's settlement, which is located on the mountain ranges southeast of Labuan Bajo. The fifth son of the Toe family in Senge went to Mbore with the fourth son, and then migrated further in the Labuan Bajo boundaries and resulted in the second Manggarai informant in this story. The longwinded path to become where and who they are now started with the acknowledgment of their inhabitation by the local *dalu* at that time.

#### **4. 3. Territorial division and the social power hierarchy**

Territories were divided through an act that can be observed in the territorial and cultural order, named *kapu manu lele tuak*. The shifts of these orders can also be comprehended by seeing the changes and adaptations of this custom, and how the social power hierarchy changes.

In the early stages of settlement in West Manggarai or the most western part of Flores Island, the land was under the rule of the Manggarai kingdom which consisted of many smaller tributaries. These tributaries were called *kedaluan*, and the leaders of these tributaries were named *dalu*. These tributaries have several villages under its rule, which is led by a *tu'a golo*, the tribe leader of a village. These roles are seen as the tribe leader in the area, and were the places where people will ask for favor or help, especially when asking for a plot of land to settle in.

The process of asking a favor to a tribe leader is called *kapu manu lele tuak* where it literally translates to chicken on the lap liquor in arms. This process is conducted when asking a favor to a Manggarai tribe leader. Shown in Figure 4.7 is the diagram of two newcomers who wants to plead for land. Even if the pleaders are not from Manggarai ethnic identities, they will follow this procedure. They will come to the tribe leader with a chicken on their lap and a bottle of liquor as a trading offer, and with the tribal land manager (*tu'a teno*) present in the meeting.

As most land in Labuan Bajo currently has been individually owned, due to it being given to the applicants when their ancestors first settled by the former *dalu* or *tu'a golo*, the control of a plot of land is now in the hands of each current owner. Shown in Figure 4.8 is the continuation of the traditional ritual when asking for land to the landowners. The landowners can continue the Manggarai traditional rituals, or they can implement their own requirements as they see fit. Some of these

adjustments are needed because they have different beliefs and religious limitations. For example, the Bajo group are mostly Muslims, making the liquor part not useful for them because of the prohibition of consuming alcoholic drinks in Islam. The Bajo and Bugis people in the coastal areas of Soekarno-Hatta Street have reported that when they ask for land from a Bajo or Bugis landowner, they will bring a sarong and a kerosene lantern to trade in for a plot of land. This was what was accepted at the time.

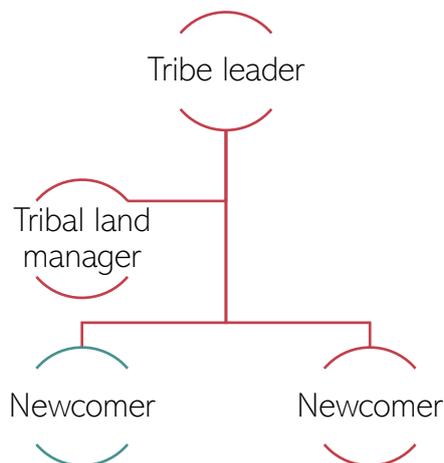


Figure 4.7 Initial phase of settlement with traditional rituals when asking for land to a Manggarai tribe leader

A Manggarai informant told how when his parents first came down to settle in Labuan Bajo, they lived within the Bima community in the flat lands of Sernaru in Labuan Bajo, seen in Figure 4.6 where the Bima and Manggarai dots are next to each other. This Manggarai family was living under the roof of the leader of the Bima community, entitled as *pua sa'i*. Later afterwards the Manggarai people were given a plot of land by the *pua sa'i* within their territory, which leads to the two existing and different Sernaru territories, Sernaru-Bima and Sernaru-Boleng (Boleng is the name of the village from which the Manggarai people settling here have migrated). This is backed by the resident of Sernaru Bima, which confirmed how the Sernaru village was built by the Bima, as it was named in the Bima language as Sera Naru, translating as 'long field' which is the flat lands of Labuan Bajo. This Bima informant also described how there were four elders who built the village and confirmed that the *pua sa'i* was the one in charge of land division in those times.

Even though the Bima people still identify as having Bima cultural roots, they asked for land with the Manggarai custom to the Manggarai leader, and when the control of a land has transferred into their hands, they were able to share the territory back with other new settlers. Despite both plots of lands having the same spatial hierarchy considering their direct access to the street, the cultural hierarchy between groups have shifted in Sernaru, as the Manggarai people have in turn pleaded to the Bima leader. The local leader of the Manggarai settlement will always respect the higher position the Bima leader has in this village.

The high respect held by the residents of Labuan Bajo of any ethnic groups towards their local leader is evidenced in the stories of the coastal settlement as well, as told in the story of how the Bajo

people was welcomed by the Manggarai in their earlier trading times. This hierarchy continued as well when the Bajo people became the first inhabitants of Kampung Air and were asked for land by the other newcomers.

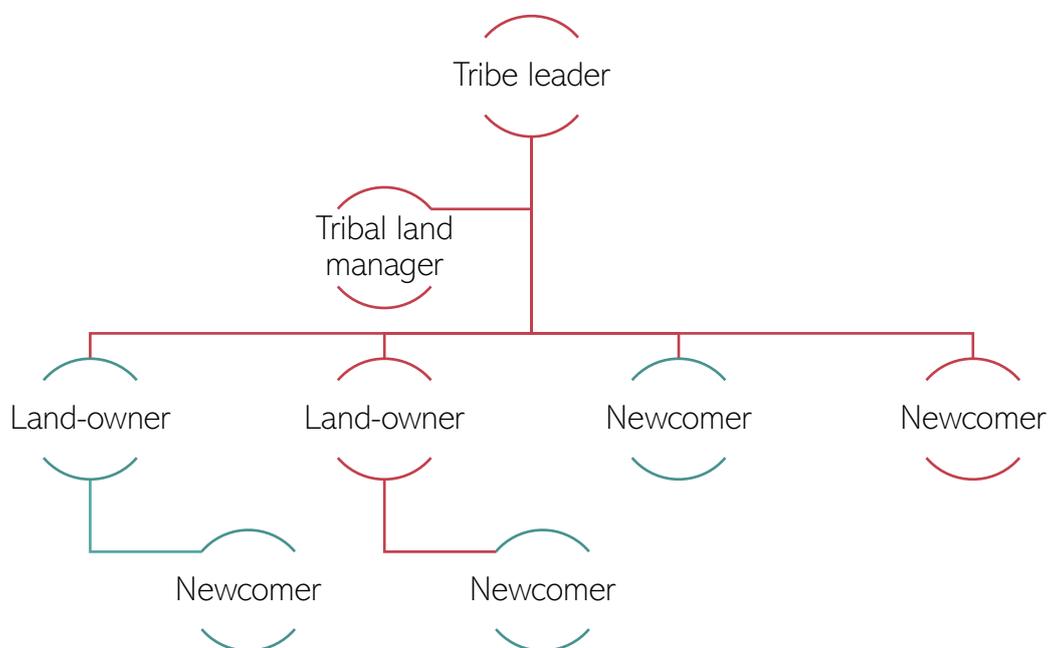


Figure 4.8 Following phases and different rituals when asking for land according to the land-owner

The continuation of hierarchy and the respect the residents have for it are preserved until now Figure 4.9, and it shows how the transformation of built environment is still operated by the same system since the first settlements were built. Although the residents have migrated from different villages and even various islands within the Indonesian archipelago, they have met a common understanding of territorial orders.

Their differences of cultural systems are not discounted, as each group has their own system of inhabiting preferences. This can be seen from how the Bugis and Bajo people prefer to live by the coasts, as their livelihood traditionally depends on the sea; the Manggarai mostly prefer the higher altitudes as they depend on agriculture; and the Bima people prioritize proximity to natural resource and defense advantages from natural and geographical formations.

Apart from the land division scheme, the Manggarai leader also has chosen a representative of the coastal communities during the Dutch colonial era. This representative was from the Bajo families and was declared as the leader of the Bajo and other coastal communities and were the ancestors of SA and AH. SA's father was the first person to move to the coast of the island when before they were living in the small island across the small strait. They were the first ones to receive the plots of land in this area, hence placing them at the highest spot on the hierarchy levels of the Soekarno-Hatta Street neighborhood as far as this research has found out.

The first Manggarai leader to join settling in the coastal areas was married to a Bugis woman and was RI's late father. This move in the 1950s was intended to strengthen the bonds between Manggarai and coastal people from Bajo, Bugis and Bima ethnic groups. In the hierarchy levels, RI's family is still the leader by jurisdiction, but not the holder of the biggest plots of land on the coastal areas. His father's house, on the other hand, might be the only Manggarai house with distinct Bugis elements, which will be analyzed further in the next subchapter.

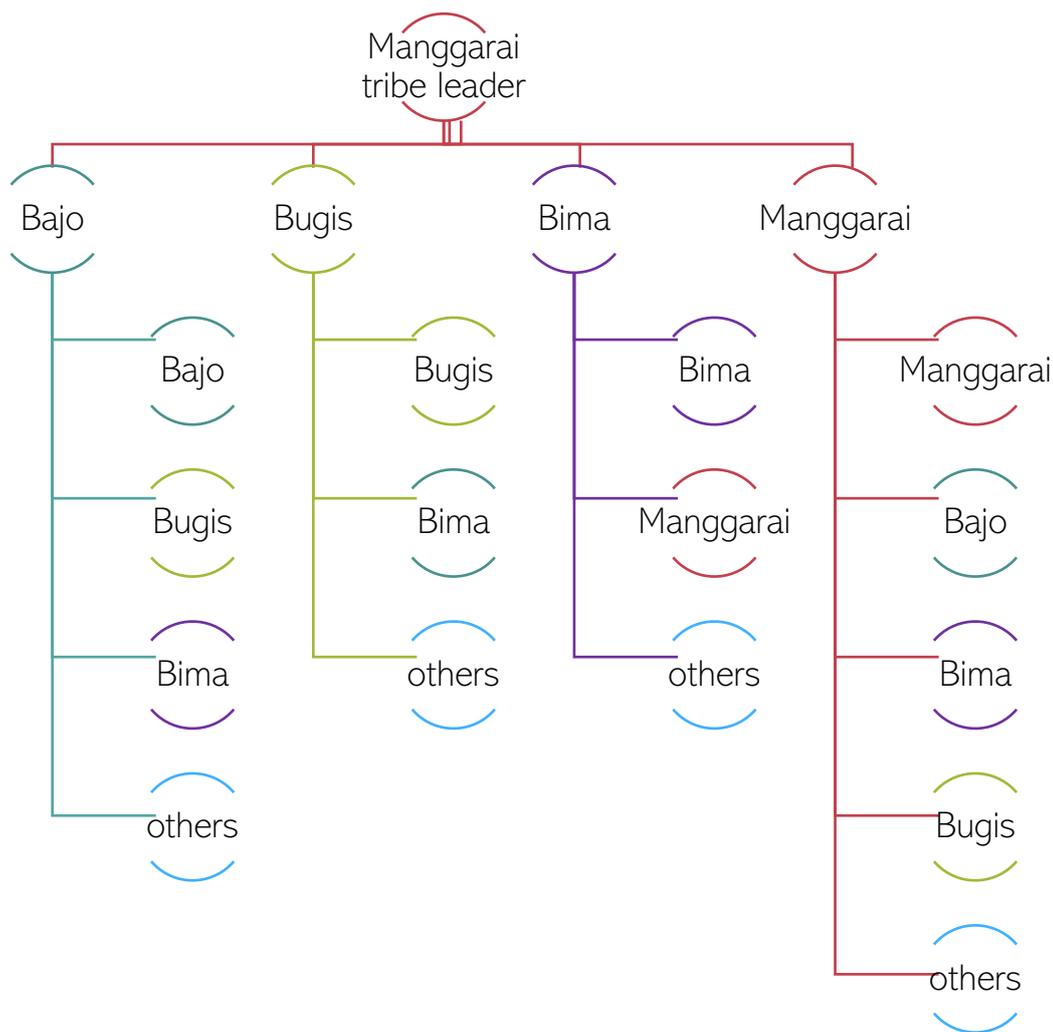


Figure 4.9 Reported land acquisition flows from interviews

With the introduction of tourism, the power has shifted in an unprecedented form, scale, and pace. The locals of Labuan Bajo are now under the direct control of the national tourism agenda with direct instructions from the president. This great gap of power has never occurred in Labuan Bajo, as it has never been a national strategic area in their previous history. Moreover, in the early stages of growth as an independent nation, this region was one of the poorest and just before the declaration as a super-premium destination, this region has the highest percentage of poor population compared to the other prioritized tourism destinations' regions.

One of the fast changes is shown in Figure 4.10 when in the span of 4 years Labuan Bajo has a new marina and waterfront area on the Soekarno-Hatta coastal area to accommodate the ASEAN summit in May 2023. This is a contrast to the earliest changes from the government that they remembered was the renovation of the main road from a simple concrete mixture to a standard asphalt road in the early 2000s, and the land reclamation of the Soekarno-Hatta coastal area in 2012 to accommodate the international sailing event, Sail Komodo, in 2013.

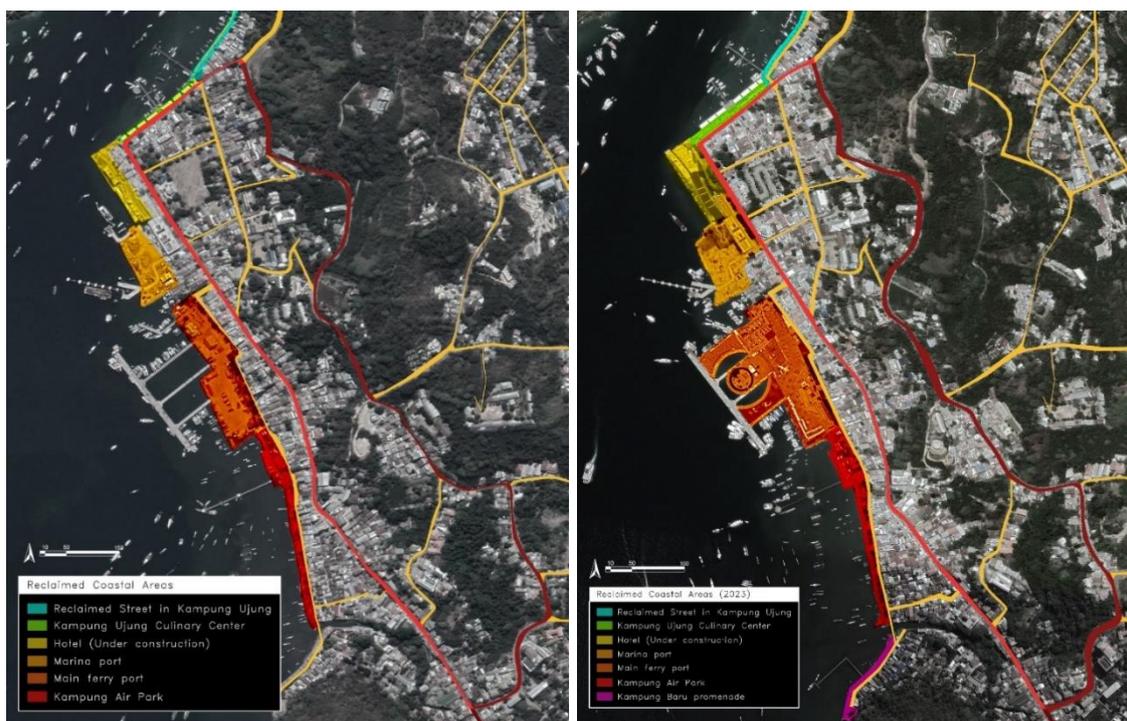


Figure 4.10 Satellite photo from 2019 to 2023 to support the stories from the interviews

The Bajo and Bugis were said to conflict with the idea of tourism at the beginning, because by allowing tourism they will have to live with tourists with different lifestyles, some which are not aligned with Islamic views, such as minimal coverage of clothing and accommodation for unmarried couples. Manggarai people and other ethnic groups from within the Island, were the ones who accepted tourism at the beginning, although it was still a conflicting idea. Even though there is a tendency of Manggarai people seeing foreigners, Indonesians from Java Island included, as someone with a higher influence and power, some of them has also been very critical about the way the national government is treating the locals within their development agenda.

Conflicts of land use and retribution have been increasing in the last 5 years, and the previous social power hierarchy has been replaced with a new hierarchy under the tourism agenda (Jengamal, 2022; Ninu, 2019; Suyatni, 2022). This may also be seen in the built environment as tourism has become the main source of income in most households in the area, and the dominating business sector especially in the Soekarno-Hatta coastal areas. Many houses in this neighborhood have been transformed into multi-functional buildings which both support the workers and tourists alike, from

accommodation to service, food, and beverage to retail. This will be seen and discussed later in the next chapters as it can be shown how different areas of the town transform according to the proximity to tourist activities, and how the previous social hierarchy is no longer continued.

#### 4. 4. National policies published during the research period

In addition to the historical context elucidated in the preceding section, this subchapter delineates the regulatory frameworks promulgated by the Indonesian government spanning the temporal domain from the 1940s to the 2020s, aligning with the chronological boundaries of this research, shown in Table 4.3. Commencing in the 1940s, the government instituted regulatory measures, prescribing guidelines and directives for adherence by the inhabitants of Indonesia and to an extent has impacted Labuan Bajo. Over the successive decades, extending to the 2020s, an evolving corpus of regulations emerged. These regulatory interventions pertained to various facets, encompassing architectural practices and material specifications. The regulatory landscape was ostensibly crafted to ensure compliance with prescribed standards, fostering both structural integrity and safety considerations.

Table 4.3 Legal policies and the impacts on different sectors

No	Legal documents	Govt.	Migration	Economy	Architecture
1	Constitution of the Republic of Indonesia 1945	•			
2	Law Number 22 of 1948 on the Determination of Basic Regulations on Self-Government in Regions with the Authority to Regulate and Manage Their Own Affairs	•			
3	Law of the Republic of Indonesia Number 1 of 1957 concerning the Basic Principles of Regional Government	•			
4	Law of the Republic of Indonesia Number 18 of 1965 concerning the Basic Principles of Regional Government	•	•		•
5	Law of the Republic of Indonesia Number 5 of 1974 on the Basic Principles of Regional Government	•	•		•
6	Law of the Republic of Indonesia Number 22 of 1999 concerning Regional Governance	•	•		•
7	Law of the Republic of Indonesia Number 8 of 2003 concerning the Establishment of West Manggarai Regency in East Nusa Tenggara Province	•	•	•	•
8	Law of the Republic of Indonesia Number 32 of 2004 concerning Regional Governance	•	•	•	•
9	Government Regulation of the Republic of Indonesia Number 50 of 2011 on the National Tourism Development Master Plan for the Years 2010 - 2025	•	•	•	•
10	Presidential Decree of the Republic of Indonesia Number 8 of 2013 on the National Committee for the Organization of SAIL KOMODO Year 2013		•	•	•

Within the purview of this investigation, the objective is to ascertain the potential ramifications of these regulatory impositions on the architectural characteristics of residences in Labuan Bajo. Regulatory frameworks wield influence over decision-making processes, impacting choices related to construction materials, structural designs, and spatial configurations. Consequently, this inquiry seeks

to discern the discernible impact of governmental regulations on the morphological evolution of houses in Labuan Bajo during the stipulated temporal trajectory.

To understand changes in the contemporary vernacular buildings in Indonesia, it is necessary to see how the modernization and globalization takes part in this transformation. For instance, changes in dwelling culture that younger generations gradually leave agriculture-based livelihood and embrace the rise of industrial paradigm shaping modern production and consumption with a tendency to be more functional, economical, fast, and individual, instead of gradual and communal. Another reason for this change is that there is a growing preference for modern buildings that are usually identified by the use industrialized materials as an image of being modern and civilized as promoted by the governments. In addition, accessibility to natural materials (in most cases, wood) is increasingly limited. In other words, maintaining and constructing a vernacular house the way it used to be, by using the same materials of wood and thatched roof, has become significantly more costly compared to replacing the materials with industrialized ones such as concrete and zinc plate. Replacing vernacular materials with the fabricated ones has been increasingly mushrooming in Indonesia since 1990s, which is considered as the mark of modernization process in the country. In contrast to being modern, the governments perceive vernacular architecture as comprised of primitive buildings that need to be replaced to strengthen the civilized image of an independent nation. This consequently led the government to encourage homeowners to improve their houses by replacing the materials with more modern ones.

The causes of material change in vernacular architecture, especially in the 1990s, can be traced back to the material sourcing. Amongst the many natural materials used in previous vernacular architecture, one that is governed under national law is wood. The first law in Indonesia to govern forestry and define the allowed type of forests to source wood was made in 1999. This law refers to the first law of agrarian rules made in 1960 by the Indonesian government after the nation's independence to manage the authority over land. The next references were also from the 1990s concerning conservation of natural resources and their ecosystems, spatial planning, and environment management. In the four references there was no mention of wood sourcing as they were mostly regarding spatial planning and environmental conservation. This leads to the assumption that the reduce of wood in vernacular architecture in Indonesia started after the implementation in 1999.

The law divides the forests into three types: conserved forests, protected forests, and production forests, and mentions how wood can only be sourced from the production forests. There are procedures to apply for the logging of these wood, and even though it can be applied individually or by group, the reality of the process is that it is complicated and costs a lot of energy and money compared to their previous wood sourcing processes. Although the steps are daunting, some traditional villages have managed to get their forest as their registered customary forest for them to conserve, protect and harvest according to the communities' customary laws. This type of forest is directly linked to their

existence as a traditional village and allows them to continue the use of local timber for their traditional vernacular architecture. However, it does not cover the whole of the Indonesian vernacular architecture outside the traditional villages. With many regulations about timber standardization and export, it seems that this decline of wood in vernacular architecture is not yet perceived as an urgent problem that needs to be solved.

On the other hand, the government is currently highlighting the need to provide inhabitable healthy houses, especially for lower income Indonesian citizens. These programs grant the applicants a sum of money that is used for the material and construction of a very basic house with a disclaimer that the applicants should provide other things that they require in their residence outside of the proposed drawings. The goal is to reduce uninhabitable houses which are categorized through the buildings' structural resilience, area of the house per person, sanitation system and access to drinking water. Currently, there are three aid types giving support in creating livable houses with different levels of outputs and target different levels of low-income households. In addition to self-funding the house's completion, applicants must participate in workshops on standards of healthy and livable houses. This effort to increase awareness of a better lifestyle is beneficial for the people if applied according to the local context and material availability, hence avoiding adding more power disparity.

The aid implemented in the tourism prioritized regions are the inhabitable houses with business, targeting households with low income, usually referred to as tourism residential facilities (*sarana hunian wisata* or abbreviated as *sarhunta*). The material used in this program may adjust to the material availability in each area. Although the applied policies on *sarhunta* projects are limited to be publicly accessed, the process of material selection of another aid type is said to be delegated to the local managers to assess available local materials along with the recipients. This gives a hope that the locals can continue their vernacular material in these new partially government-funded houses, as there is only one mention regarding the material and type of houses in each region, published in 2002, which was to regulate the housing aid program of the previous cabinets. Hence, leading to the assumption that if local material is not used in the recent projects, apart from the expensive price on timber as mentioned before, it might be due to the changing preferences of the recipients, designers, and government officials, because of the engrained standard of housing projects from the 2002 projects.

#### **4. 5. Chapter conclusion**

In conclusion, the historical records of rural places in Indonesia, including Labuan Bajo, are usually very scarce and often kept in family-owned libraries with very strict access. This makes it challenging to study the history of these areas, especially on architecture or built environment documents. However, the available data shows that the Manggaraians were mostly living in the mountains and usually avoided living on the coastal areas.

The chapter also highlights the earliest depiction of Flores found in Karel Steenbrink's paper, which mentioned how the earliest mention of the area in Flores was in the 1600s where it was seen as a source of enslaved people for the Bima and Bugis sultanates of Gowa and Bima. Then the historical records were mostly about government statutes' changes and only recently has national attention been brought to architecture and development as seen in the national design competitions.

The migratory patterns of different ethnic groups in Labuan Bajo were gathered to understand the historical and social context to the transformations. The Manggarai people migrated from village to village before settling in Labuan Bajo. The Bajo and Bugis groups tend to migrate to coastal areas, the Bima group in flat lands, while the Manggarai people prefer higher altitudes. The story of Labuan Bajo being a trading port between sea nomads and mountain people is depicted through the locations of settlements of different ethnic groups. The accuracy of the memory recollection was verified through the overlaying of early village locations mentioned by the informants with a map from during World War II which shows names of villages with significant amount of population.

This chapter also gained insight into the history of the Kingdom of Manggarai and the Manggaraian society as the first landowner. It explains how the traditional ritual of asking for land and the process of territorial division has created a social power hierarchy in the beginning. However, this hierarchy has changed throughout the decades as the previous pleader of land becomes the landowner who can give land to newcomers. The power hierarchy shifts further as the central government enters the scheme with a national tourism agenda directly under the president's orders. The peak of the development up to the time of investigation was to host the side events of the ASEAN summit in 2023 and the infrastructure designed and constructed for said event.

Lastly, it concludes that some regulations have affected the changes in the vernacular architecture in Labuan Bajo. The rules were mostly regarding the expansion of government as it encouraged migration, economic growth, and an indirect impact to architecture. There were also rules regarding the limitations of material sourcing which will be proven further in the discussion on vernacular architecture transformations. This further checked the information shared by the informant, especially regarding the time marks mentioned during the interview sessions. These events did happen, and the timeline matched.

Overall, the chapter achieved to collect information on the history and tourism of Labuan Bajo and how the social dynamics are changing behind the scenes, especially with the introduction of the tourism industry with an external power from the central government. This is essential to understanding the reasons behind the changes and what needs to be preserved when designing in a culturally sensitive area. Furthermore, this supports the data shared by the informants were reliable.

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**CHAPTER 5**  
**FINDINGS IN PHYSICAL**  
**TRANSFORMATIONS**



## 5. 1. Transformations of houses in Labuan Bajo

After narrowing down the collected data of 23 informants, this chapter will assess the transformations of 12 informants' houses over the years. This data has been meticulously collected and analyzed in order to gain insight into the evolution of these houses and how they have changed over time. The data was obtained through field surveys and interviews with the informants who own the houses. While the number of informants may seem small, the information collected from them is incredibly valuable in understanding the changes that have taken place.

Table 5.1 List of houses and the input acquired

Basic data					Input			
No	Informant	House code	Ethnicity	Year built	Drawing	Total per group	Material	Total per group
1	AA	AA01	MA	1980s	•	11	•	13
		AA02	MA	1960s	•		•	
2	MS	MS01	MA	2020s	•		•	
		MS02	MA	1990s	•		•	
		MS03	MA	1990s	•		•	
3	RI	RI 01	MA	2010s			•	
		RI 02	MA	1990s			•	
		RI 03	MA	1950s	•		•	
4	SB	SB 01	MA	2000s	•		•	
		SB 02	MA	1990s	•		•	
5	TU	TU01	MA	1990s	•		•	
		TU02	MA	1960s	•	•		
		TU03	MA	1950s	•	•		
6	MT	MT01	BI	2010s	•	6	•	6
		MT02	BI	1980s	•		•	
7	RL	RL 01	BI	2000s	•		•	
		RL 02	BI	1960s	•		•	
8	UL	UL01	BI	1990s	•		•	
		UL02	BI	1960s	•		•	
9	RA	RA01	BU	2010s	•	7	•	7
		RA02	BU	2000s	•		•	
		RA03	BU	1990s	•		•	
		RA04	BU	1980s	•		•	
10	SU	SU01	BU	2020s	•		•	
		SU02	BU	1980s	•		•	
		SU03	BU	1970s	•		•	
11	AH	AH01	BA	2000s	•	7	•	8
		AH02	BA	1970s	•		•	
		AH03	BA	1940s	•		•	
12	SA	SA 01	BA	2010s			•	
		SA 02	BA	1980s	•		•	
		SA 03	BA	1970s	•	•		
		SA 04	BA	1960s	•	•		
		SA 05	BA	1960s	•	•		
Total					31		34	

In total there are 34 houses to be processed with 12 houses still exist to be observed during the field survey and the rest 22 have either changed ownership, exist only in the structures, or cease to exist. This means that the data collected is representative of a wide range of houses that have undergone various changes over the years. The houses are owned by the 12 informants from different ethnic groups, which adds to the diversity of the data. The period span of the houses is from the 1940s to the 2020s, which provides a comprehensive view of the changes that have occurred over a long time.

From the 34 houses, only 31 houses have the estimated measurement drawing, and all 34 houses have the material information (Table 5.1). This means that some houses were not able to be measured due to limited observation and time constraints. However, the data collected still provides valuable insight into the changes that have taken place. Measured drawing was not possible to be conducted in these few houses because observation was limited, dimension and floor plan was organic, and personnel and time was limited.

In this subchapter the analysis will focus on the transformation of physical, territorial, and cultural aspects of the 34 houses. The physical elements discussed in this subchapter are the area, form, materials, and room number. The territorial aspect assessed in this subchapter is the public-private space levels transformations. Lastly, the cultural order will be analyzed through the lens of the chronological order, the ethnic identities tied to the informants, and the proximity of the houses to tourism activities or their tourism potential. The chronological order will start in 1940s and end in 2020s, while the ethnic identity is limited to Manggarai, Bima, Bugis and Bajo groups. The proximity analysis is divided into peripheral areas with little exposure to tourism and lower land price, access areas are located on the way from main ports to some destinations and has high traffic of indirect tourism activities, lastly the strategic areas are the places with direct exposure to tourism activities and have higher land prices.

These analyses will provide a comprehensive view of the changes that have taken place and how they are influenced by various factors and what are seen as important values of the community. By analyzing these three perspectives, the hypothesis whether the transformation was a time-based phenomenon, related to ethnic identities, or an effect of the tourism development can be answered. Whether these trends of transformation can be altered or are inevitable can also be figured out. This part is especially important to decision makers, stakeholders, and government officials as they are the ones who can make the large-scale changes in this built environment. Furthermore, the findings can also support the image of tourism architecture from both architects, users and locals.

Seen in Figure 5.1 is the overview of houses per decade, with the highest number of houses built in the 1990s and the second most is the houses built in the 1960s. This acts as a disclaimer that this data set is not a whole depiction of the community, due to the sample size and to the limited number of houses in certain decades. This research leans more as an exercise of memory recollection and as a review of the implemented methodologies.

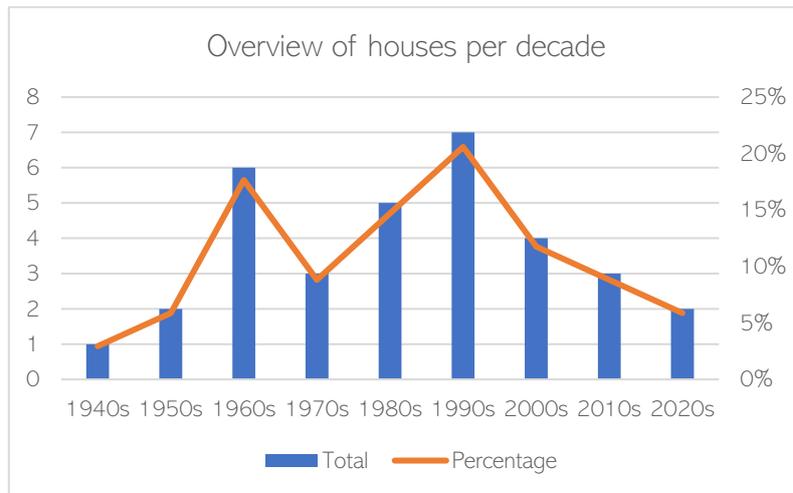


Figure 5.1 Overview of houses per decade

### 5. 1. 1. Area transformations

The first transformation analyzed in this chapter is area transformation of the houses. These numbers are estimations from the sketches of the previous and current houses. In remembering previous houses, the informants referred their size to the number of columns, or in Indonesian, *tiang*. The number of columns represents length of the house and was their basic house measurement as the sets of columns crosswise were arranged as a unit from the columns to the roof truss. The number of columns along the width of the house need to be sketched to get confirmation after the lengthwise columns were drawn. The span between these columns are on average 2 meters, and is the number used in these area size estimations.

Furthermore, the changes in area size will be analyzed through their ethnic background categories, the decade in which the houses were constructed, and the location of the houses and their proximity to tourism activities or their tourism potential. Through these analyses, the patterns will emerge, and the correlation can be seen to which categories are the values more related.

By analyzing the area transformations from the ethnic backgrounds, it is shown how almost every person experienced an increase in area like reported in the statistics mentioned earlier in . In Figure 5.2 the overall of the houses is shown to have had experienced area transformation. The graph shows how the twelve informants have several houses over the span of the 9 decades and that mostly they experience an increase of their house size. The y axis is the area of the house in  $m^2$ , and the x axis is the decades in which the individuals reside in Labuan Bajo. The colors of the x axis resemble the ethnic group of the individual.

Only one house experienced a decline in area size and another interviewee did not provide the area of all their houses. From the 11 transformations, all has an increase of area except for MS from the Manggarai group who was a recipient of the government subsidy program. MS also had a decrease before in his houses in the 1990s, which was said because they needed to move from a stilt house to a

landed house. SU only had a slight increase throughout six decades, this is due to the couple having no children, therefore no need to increase the area of the house. SA had an increase and a decrease in between his second and third house, which was said to happen because there was a sudden move and a temporary. In this overview, it is also shown that the biggest area of the house belongs to the Bajo group. But the reasons behind this can only be explained through analyzing the transformation from different perspectives.

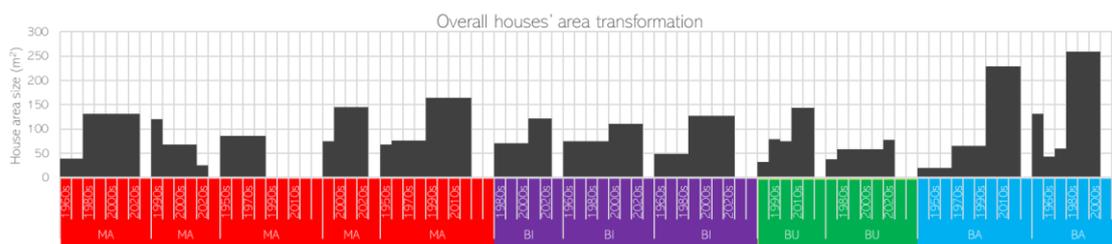


Figure 5.2 Overall houses' area transformation

Further, this research analyzed the house area transformation by the decade they were built (Figure 5.3), the ethnic groups of the owners (Figure 5.4), and the proximity of these houses to tourism activities (Figure 5.5). By analyzing these three perspectives, the hypothesis whether the transformation was a time-based phenomenon, related to ethnic identities, or an effect of the tourism development can be answered. Whether these trends of transformation can be altered or are inevitable can also be figured out.

First, the average of the houses built in each decade shows an inevitable steady increase, with an exception in the 1970s and 2020s seen in Figure 5.3. The opaque lines show only one new house was built smaller than the average in the 1970s. The individual trend still proves a constant gain of the area from the previous houses as time goes by. The slight decrease in 2020s is mostly due to the governmental aid project. The trend stagnates in the 2000s which might lead to an insight into the 'goldilocks' of the area size of a house. This might even be related to the standard given by the central statistic bureau, which is at least 8 m<sup>2</sup> per person of the dwelling household members.

Due to the limitations of the samplings, the 1940s and 1950s were only represented by a few houses, hence making the findings not accurate enough to resemble the decades. In the 1960s, 1980s, 1990s and 2000s there were at least three ethnic groups and at least 5 houses. The findings from these four decades reflect the increase in area size. The area size decreased again in the 2020s as the houses constructed in that decade were both recipients of the government program.

Next, the house area transformation by ethnic group in Figure 5.4 shows that the Bajo people have the highest area increase. This is followed by the Manggarai group, the Bugis group and lastly the Bima group. This reflects the power dynamic shown in the previous chapter in Figure 4.9. The Bajo informants were the royal family of the Bajo lineage in Labuan Bajo and supports their statements that

their ancestors were the first groups of people to acquire land in the coastal areas of this town as the legend says of the good trade between the Bajo and Manggarai people.

The increase in the Bajo group of households is due to the roles of the two informants in society, where their families are the leaders of the Bajo tribe and the first landowners of the coastal area in the early settlement stages. In the previous subchapter, it was mentioned that the Bajo were the ones to settle on the coastal areas of West Flores. The large plots of land owned by their families and the prime locations on the coast of Soekarno-Hatta Street leads to their duty in paying huge amounts in tax. Hence, enforcing them to maximize their plots of land to also earn income from the opportunities given by the tourism industry. In result, one of them built rooms under their stilt houses to be rented as accommodation for out-of-town workers, and the other built a RC brick landed house with extra rooms for rental accommodation and some commercial spaces on the street level.

Lastly, the changes seen through proximity to tourism activities show a different story. The houses in the periphery areas have less increase and one was a result of the government tourism development homestay/kiosk aid project. The periphery areas with their lower land prices are not pushed to increase their houses area yet still experienced an increase. The strategic areas, on the other side of the spectrum, have the biggest increase as they were pushed to rent rooms out to out-of-town workers or high school students or to give roofs above more than two generations on their limited plots of land.

In this proximity analysis, the size of the areas increased in every location except in access areas where MS's houses are in. Once again this is related to the government subsidy program for the national tourism agenda. The houses in the periphery categories have the same average as the strategic area. This is because the houses in the periphery of tourism activities have more spacious plots of land, while the ones in the strategic places have limited land but they are required to maximize the potential of their land to benefit from the tourism activities and pay the increasing land and building tax. The number of houses in the access areas are too few to be considered samples, hence needing further exploration in future studies.

From these three cultural reasonings acting from behind the scenes, it seems that the house area transformation is affected by all of them in some extent. In the decade analysis from 1940s to 2020s, the size of the area increases as time goes by and stagnates at an average of around 130 m<sup>2</sup> per house. The ethnic group analysis provides that the variations of the sizes in each decade depend on the status of the house owners' family and their position in the power dynamics of the neighborhood. Lastly the proximity to tourism activities also plays a factor in the increase in the house area size, as houses in strategic areas are demanded to keep up with the increasing land prices and the economic opportunities that follow suit. The intertwining of the three cultural factors shows how the transformation of the size area of the houses in Labuan Bajo is a complex phenomenon that is unique to the area and the problems they have. This proves how the study of transformation is needed in analyzing the weaving of the urban fabric of a sociocultural sensitive site.

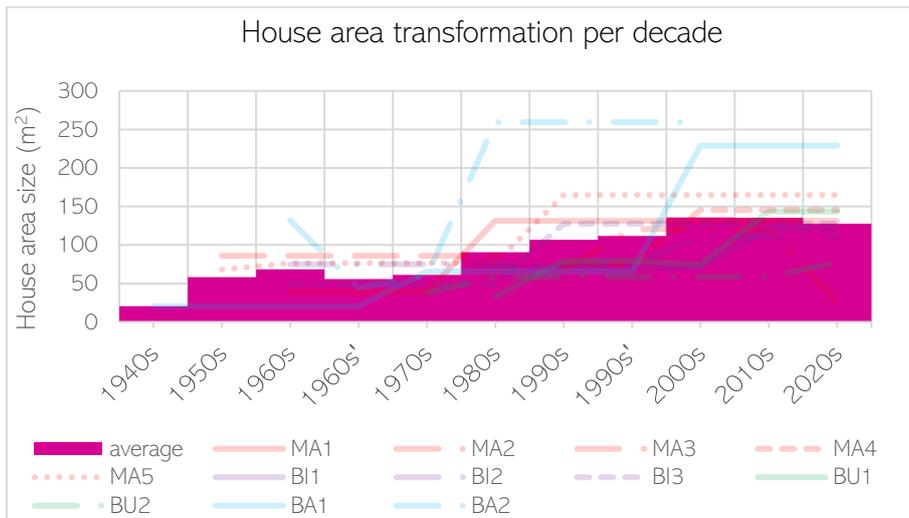


Figure 5.3 House area transformation by decade

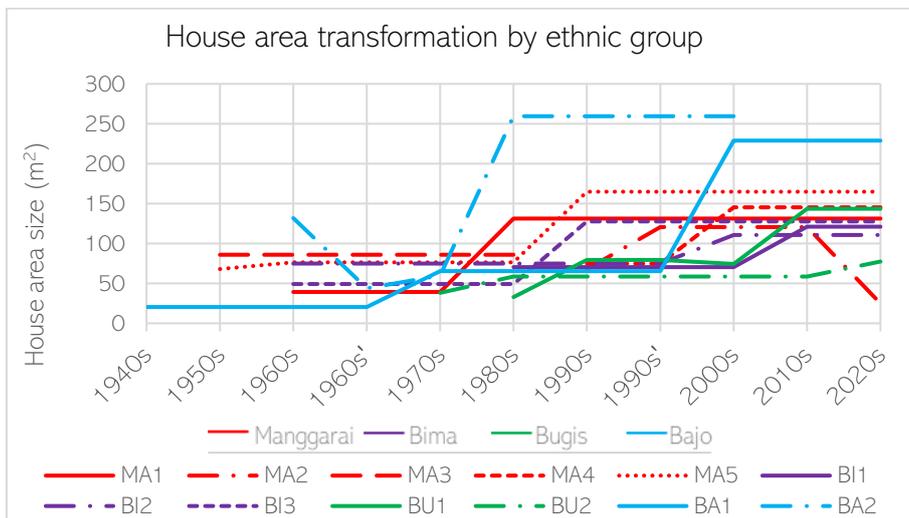


Figure 5.4 House area transformation by ethnic group

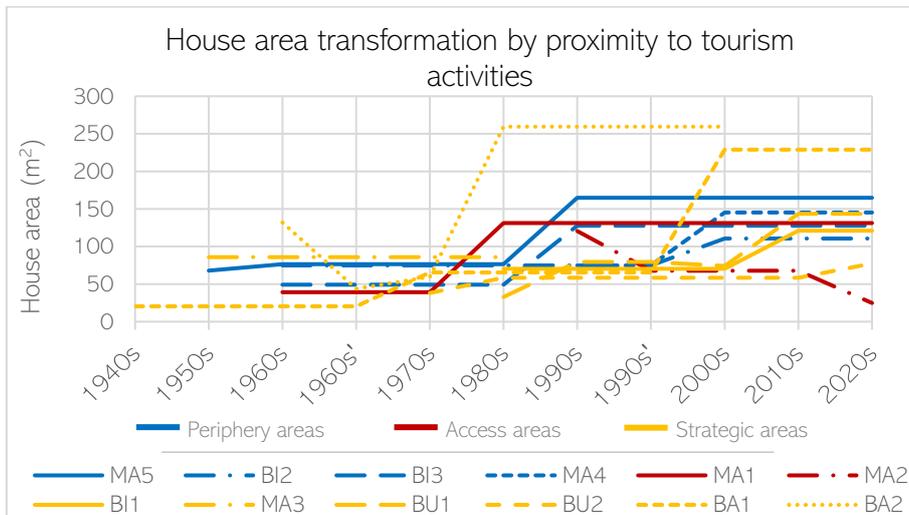


Figure 5.5 House area transformation by proximity to tourism activities

### 5. 1. 2. Form

The houses in the dataset can be categorized into the type of structure and the type of their roof. The type of structure is divided into three categories, which are the stilt house, the hybrid house and the landed house. The stilt house was the original form of the houses in the area and the landed house was the latest form in their evolution, while the hybrid house was the form in between of the stilt house to the landed house (shown in Figure 5.6).

The stilt house, or in Indonesian referred to a stage house (*rumah panggung*), has its floor level above ground level with a varying height from a mere 60 cm off the ground surface to fully accommodating adults to utilize the space under the house at around 2 meters from level zero of the site. It is mostly made with timber construction, along with timber or bamboo floors, palm leaves, timber or bamboo walls, and roofing made of palm leaves. This form in this area anticipates the natural and geographical context of the area, to which mostly is to combat high tide of the sea level or flooding. When located on the coastal area, it also allowed direct access from the boat to the houses, making storing fish and other sea produce easy, and to also dock their boats to the houses when not used.

In the middle of Figure 5.6 is the hybrid house. The hybrid house defines those that were initially stilt houses but then were renovated to utilize the space under the house or to have an annex landed house structure. In most cases, the main wooden structure is preserved, and additional reinforced concrete structures are added in the back or the sides of the house to provide bathrooms. This house type has the physical and material features of both landed houses and stilt houses.

Lastly, the landed house (Figure 5.6, right) is the latest form of the houses in this region. These houses have first floors that are only a few steps away above ground level. The structure varies from timber to reinforced concrete, and the floor material is either dirt, cement or ceramic. The space under the floor is filled with soil and rubble and is not used for anything else. This type of house no longer responds to the natural disasters anticipated by the stilt house and is viewed as the modern option for the modern lifestyle.



Figure 5.6 Examples of house types based on the structure type

The other variation of the forms comes in the shape of the roof. The shape of the roof is strongly related to the ethnic identity of the owner or the location, furthermore it can also represent the royal status of the family. There are five common shapes of roofs in this dataset, as shown in Figure 5.7, the Manggarai roof, Bima roof, Bugis roof, Bajo roof and hipped roof. The Manggarai, Bugis and Bajo roofs are box gable roofs with layers of planes on the gable sides, with the difference of the Manggarai

roof having the entrance on the non-gable side. The Bugis and the Bajo roofs have the entrance at both the gable sides, with variations of the abutment of the planes along the outer column lines for the Bugis roofs and the abutment lines deeper inside of the outer column lines for the Bajo roofs. In some cases, there are Bugis roofs with a connected double gable, forming into an asymmetric “M” with a lower ridge on one of the gables. The Bima roofs is similar to a dutch gable with a small gable facing the entrance and hips on the gable sides. Lastly, hipped roof is the most modern shape in the area, where the roof are variations of a simple hip shape, to the hip and valley, and, in rare cases, cross hipped. These ethnicity related shapes did not just stayed within the realm of the natural materials used in the past generations, but have transcended into modern iterations using contemporary materials.

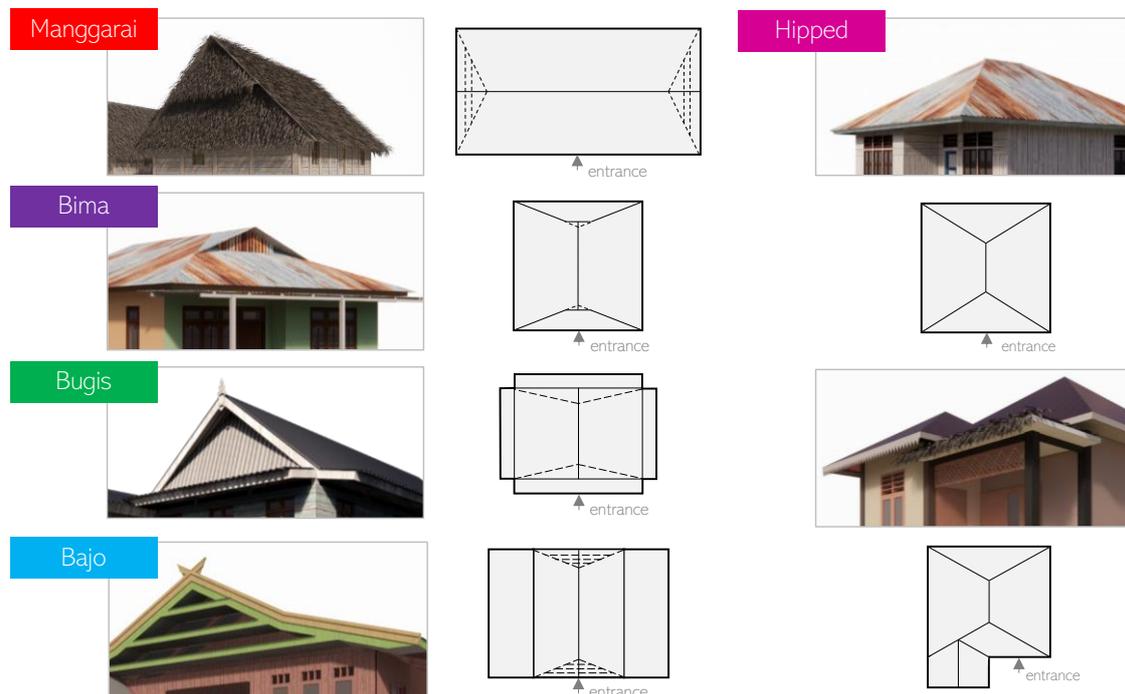


Figure 5.7 Examples and sketches of roof shapes

The house form type faced an inevitable change and, in some extent, extinction, where houses were mostly stilt houses in the beginning and shifted to landed house in the passing of time. This is shown in the chart of house form type over the decades shown in Figure 5.8. Despite the limited dataset, there is a steady decline of stilt houses with the highest number of houses from the informants coming from the 1960s with 7 stilt houses and by 2020 the stilt house was only 1 left with the addition of 3 hybrid houses. The landed house, on the other hand, was only introduced in the informants’ lives as early as the 1970s. Then the number increased in the 1990s and continues the trend to the 2020s.

In contrast, the roof types experienced a steady existence throughout the 9 decades. Shown in Figure 5.9 is the number of houses with the different roof shapes over the decades. There is a steady increase in the hipped roof since the introduction in the 1950s until the 2000s. However, the trend seems to change to embrace back the ethnic identities through the roof shapes in the 2010s. This might

be related to the unique image needed in tourism destinations planning or simply the need to represent their own identity has increased after a short interest to modernity in the previous decades. This proves the roof is preferred as the symbol of identity compared to the house form types which is seen as inevitable to change and is the new norm.

The reasons behind these two form changes are observed under the three factors, through time (Figure 5.10, Figure 5.11), according to their ethnic identities (Figure 5.12, Figure 5.13), and their proximity to tourism activities (Figure 5.14, Figure 5.15). The graphs of the individual houses forms in Figure 5.10, Figure 5.12 and Figure 5.14 are drawn with the earlier form or the stilt house in the top of the graph and the latest form or the landed house at the bottom of the graph. The graphs of individual experiences of the informants with roofs in Figure 5.11, Figure 5.13, and Figure 5.15 are drawn with the order from the top to the bottom of the chart as Manggarai, Bima, Bugis, Bajo and, lastly, hipped. This is drawn in this order to also show the preference over traditional ethnic related shapes and the switch to modern shapes by the informants. The increase in each category shows a different iteration in a different house, which means they kept their previous preferences when building a new house. This shows the perseverance of their option during the design decisions.

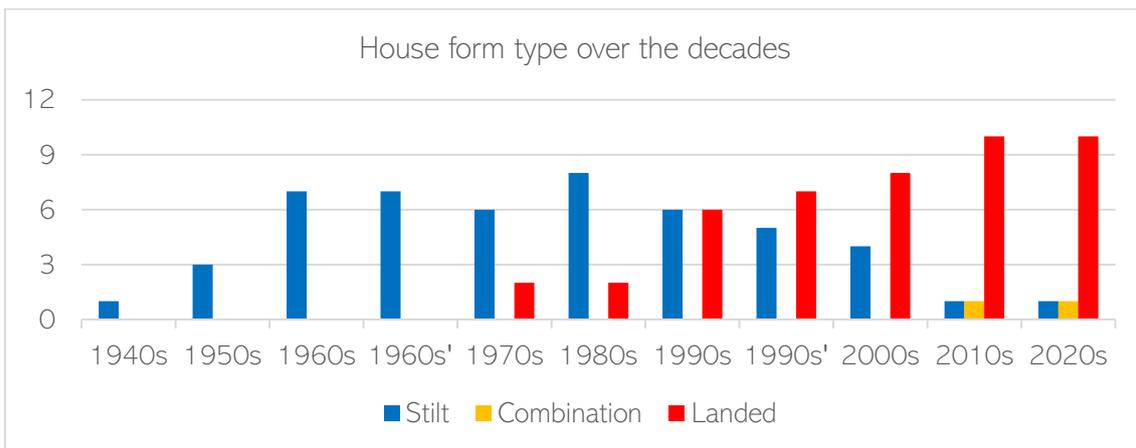


Figure 5.8 House form type over the decades

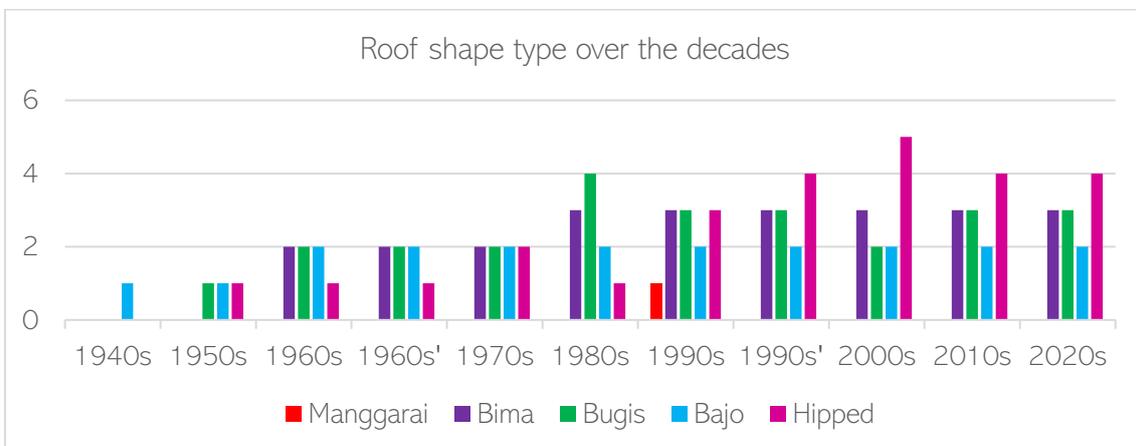


Figure 5.9 Roof shape types over the decades

The analysis will first discuss the house form type, then the roof shapes, and then the analysis of the similarities and differences between the two. First, the house forms over the decades in Figure 5.10 shows the individual experience of the informants in their stilt houses. It is seen how most informants experienced different iterations of stilt houses before changing to either hybrid or landed houses. This seems to be a collective experience that the residents of Labuan Bajo have gone through from as early as the 1970s until the 2020s. As shown before in Figure 5.8, the number of landed houses increased and at the same time the number of stilt houses decreased in the 1990s. This might be related to the Law of The Republic of Indonesia Number 41 of 1999 Concerning Forestry where the national government started to restrict the sourcing of wood by unauthorized personnels through some application processes (Law of The Republic of Indonesia Number 41 of 1999 Concerning Forestry, 1999). As mentioned in the previous chapter, this has put a limit to the use of wood in new constructions. This comes in time with the availability and affordability of fabricated materials, thus enforcing the shift to landed house with RC structures, brick walls and zinc roofs. The owner of the last stilt house currently existing in the data set expressed how he will opt a landed house if a chance to construct a new house arises due to his bad knees not able to climb up the stairs of the stilt house and because other people in his neighborhood and neighboring areas have made the shift as well.

A deeper analysis on the cultural reasoning behind the changes is shown in the house form based on ethnic groups in Figure 5.12. The individual lines are now colored separately between different ethnic identities. The Bajo groups made the first shifts to hybrid and then landed houses while one Bugis house was the last to switch to hybrid. There is still one stilt house existing until the 2020s coming from the Manggarai group. While the Bima made the switch to landed houses after the Bajo group did and one remained in the hybrid form. From this analysis, the power dynamics of the previous chapter are shown to some extent. As mentioned earlier in area transformations, the Bajo group was the first landowners of the coastal area. As the economic activities are in the coastal areas, this group escalated in their position in the power dynamic hierarchy. This economic and power status allowed the freedom to experiment in their new dwellings with novel and foreign materials earlier than others in the same community. Although one of the Bajo informants said that the landed house style was opted in following the style of the Manggarai group's houses, in this data set the Manggarai people were more 'conservative' in their design choices and only started to shift in the 1980s. This shows that there is still a different power dynamic behind the informants in these interviews compared to the bigger picture of the whole Manggarai-Bima-Bugis-Bajo relationship in Labuan Bajo.

Lastly, the analysis of house form type transformation is based on their proximity to tourism activities as shown in Figure 5.14. In this analysis, it is easy to see that the shift happened faster in the strategic areas compared to the periphery and access areas. This is not to say that other areas are more reserved to these changes, but the economic opportunity and access to foreign cultures and construction knowledge were then limited to the coastal areas of Labuan Bajo which happen to be the

strategic areas in this study. Now with the foreign trends and knowledge spread faster with the recent affordable internet and smartphone prices. Along with the import of many foreign builders from other islands in Indonesia, the vernacular architecture trend is catalyzed further. The houses in the strategic areas need to adapt faster as they are pressured by the increasing land price and tax as well as the increasing economic opportunities.

The roof shape will first be analyzed through changes over the decades. Shown in Figure 5.11, it shows a different story compared to the house form types. The informants tend to change between one shape and another without a clear trend. Even with the hipped roof being the most modern option, it is not seen as an option they need to take to show the status of their modernity. During the interviews, the informants expressed how they would switch to another group's roof style just because they think it looked nice or because that was what the neighbors have. In the decade analysis, the switches from one style to the other happened in the 1980s until the 2010s. This might be because of the tourism boom in the 1980s and they had the freedom to experiment with new styles influenced by other cultures (Erb, 2015). In the 2010s the government started to spread awareness on the significance of cultural identity especially in tourism development and marketing (Purwaningrum, 2022; Purwaningrum & Ardhyanto, 2018). This proves how powerful the government's narrative is in this region, especially since it has received the limelight since they were announced as one of the super prioritized destinations amongst other prioritized destinations.

Then the analysis of roof shape based on ethnic groups, shown in Figure 5.13, tells a different story as it shows a different trend within each group. First, the Manggarai group, depicted in the red line, is seen to have chosen different styles from their own style, the Bugis shape and the modern hipped roofs. The only group to use the Manggarai roof with the perpendicular box gable shape is the Manggarai people themselves and it was in the 1990s. The Manggarai group was proud to say that they have opted Bugis style roofs to assimilate with their neighbors. On the other hand, the Bugis group has shown switches between Bugis shape and the hipped roof. Lastly, the Bima and Bajo have kept their own shapes in their past and current houses with adjustments to the current materials and contexts. This shows the flexibility of the Bugis and Manggarai groups compared to the Bima and Bajo. This might also relate to the royal status of the Bajo groups which confined them to their ethnic identity. The Bima group on the other hand might have the same royal confinements or less economic freedom as they are either first landowners of the uphill areas or are the latest landowner in the coastal areas.

Lastly, the roof shape type transformation is analyzed based on proximity to tourism activities as pictured in Figure 5.15. The dominant roof types in the strategic area are either the Bugis or Bajo roof. Even with the area being under the Manggarai rule to some extent, the urban landscape seen in the tourism strategic area is not dominated by the Manggarai roofs. It is expected as the only house with a specific Manggarai roof was in the access areas and built in the 1990s, the cultural impact to the region's vernacular is limited. This supports the contestation between the Manggarai or Bajo-Bugis

identity as the representative of the destination in addition to the existing controversy between the lowland and highland Manggarai (Allerton, 2012; Erb, 2005).

Analysis of the similarities between the findings of the form and roof transformation revealed some points on the cultural order of the changes. The decades the houses were built or existed play a part in the experimental era of the roof and the shift to landed house. Before the 1970s, the houses were following the previous values or were their first houses in Labuan Bajo. Then they experienced the urge to change and try out different forms of both the structure of the house and the roof shapes. The analyses based on ethnic groups and proximity to tourism activities did not provide significant similarities to be concluded.

On the other hand, the analysis of the differences uncovered more points to comprehend the cultural aspects of these changes. The most significant finding is that the house form and the roof shape type behaves differently in their transformations. The house form type has a predicted trend of all stilt houses becoming landed houses or hybrid houses at the very least. This can be a hint to an impending extinction, especially with the last stilt house owner wanting to shift to a landed house if given the opportunity to build another house. In contrast, the roof is seen as experimental, especially by the Bugis and Manggarai group as they have opted for different styles in the past. In recent decades, the Bugis took a different approach and stuck to their ethnic groups' signature styles as they declared during the interviews. However, the Manggarai stuck with the hipped roof and to some extent signifying that style as part of their identity. The Bima and Bajo adamantly preserved their styles throughout different houses and decades. This is also supported by the narrative from the government which encourages people to preserve their ethnic identity through their roofs as made clear in the government subsidy programs for low-income households.

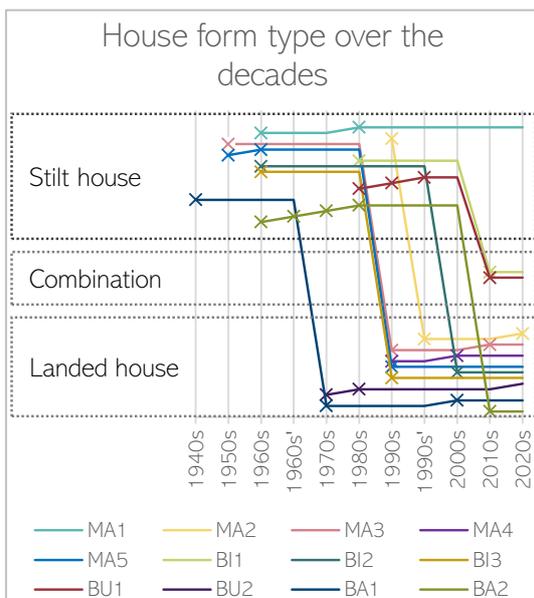


Figure 5.10 House form type over the decades

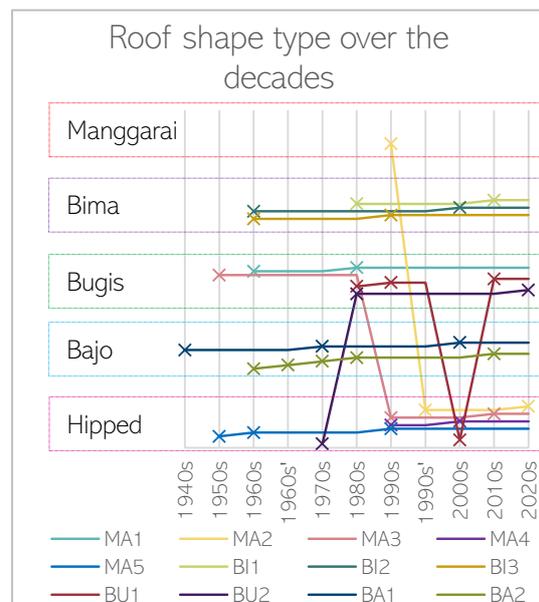


Figure 5.11 Roof shape type over the decades

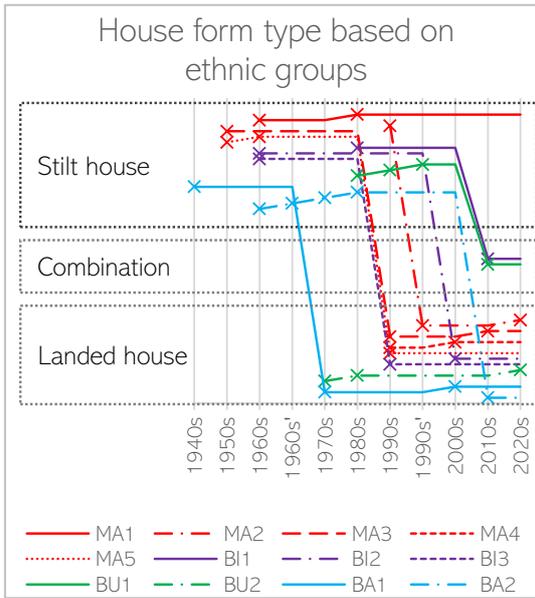


Figure 5.12 House form type based on ethnic groups

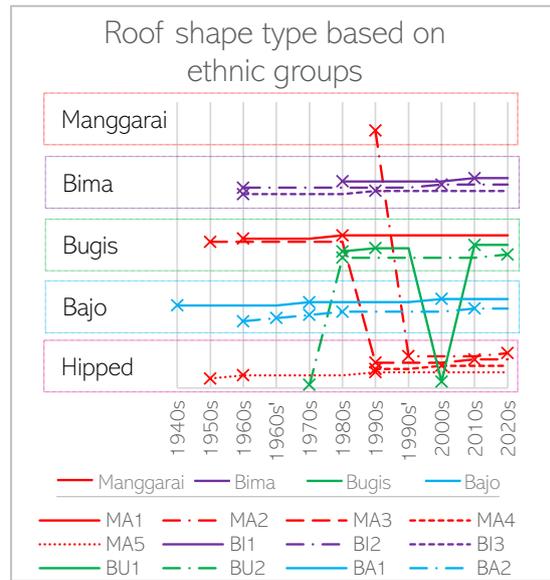


Figure 5.13 Roof shape type based on ethnic groups

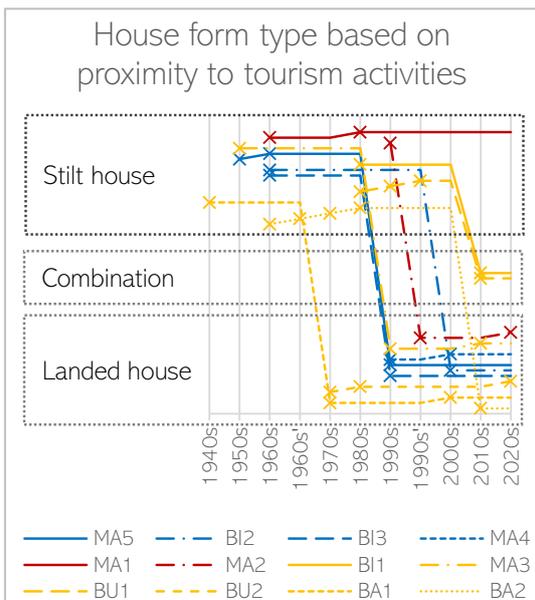


Figure 5.14 House form type based on proximity to tourism activities

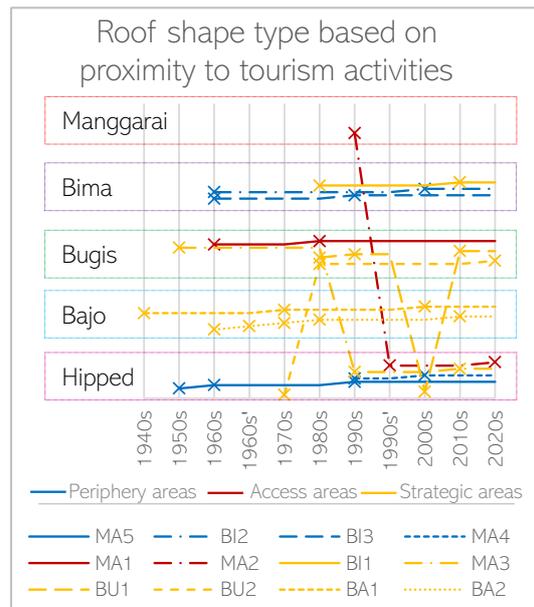


Figure 5.15 Roof shape type based on proximity to tourism activities

The differences of the values preserved and allowed to change between the house form and the roof shape show that the roof shape is closer to their ethnic identity and is not a time-based change when compared to the house form type. Preserving and adapting the traditional vernaculars of the roof shape to the modern context is viewed as highly important as a reflection of their ethnicity and status and is now one of the attractive features needed for tourism development. The transformation of the form is just seen as an inevitable option as one progressed into the modern lifestyle. The statement

from the informant residing in the last standing stilt house in the data set supported this notion as he expressed the willingness to change to a landed house if an opportunity to build a new house arises.

### 5. 1. 3. Material

From the 34 houses built over 9 decades, an interesting pattern emerges in the materials used. As shown in Figure 5.16, stone foundations are the most used, followed by wooden blocks for columns and other structural parts. Zinc is the favored material for roofing, while wooden doors dominate as exterior doors and curtains as interior doors. Moving on to the walls, palm leaves are the most popular material, followed closely by brick walls. For the windows, wood and glass come out on top, with simple bamboo or wooden bars in second place. Finally, the floor material is a three-way race between ceramic tiles, bamboo, and cement. These trends in building materials used across the decades provide a glimpse into the evolution of architecture and construction in the area.

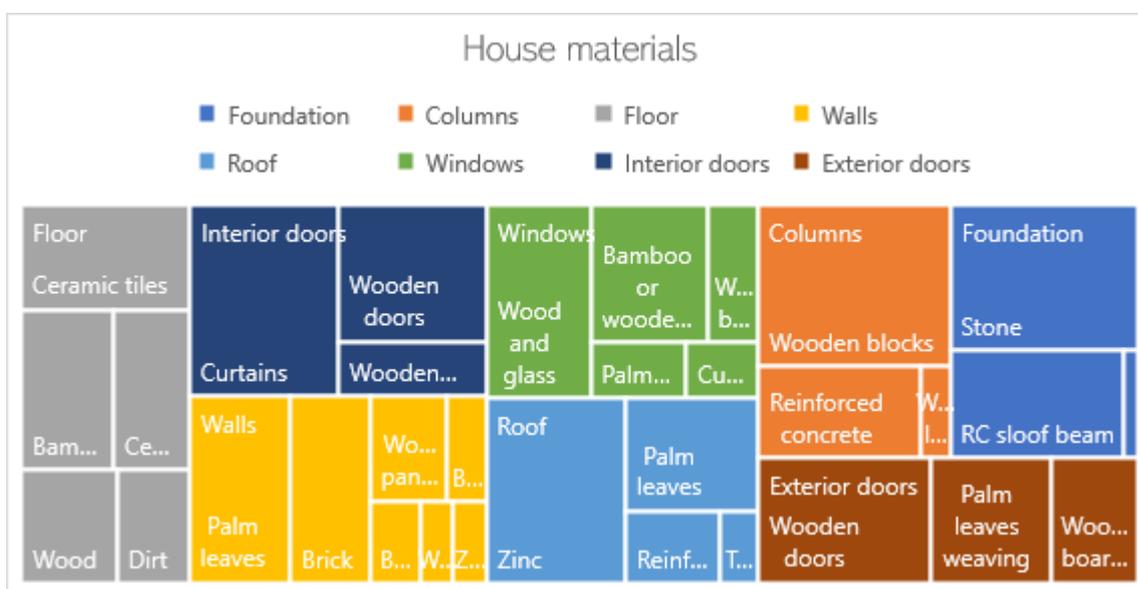


Figure 5.16 Overview of materials used in the informants' houses

However, the materials mentioned the most in the previous figure do not equal to the amalgamation of it as the overall material in houses in Labuan Bajo. Materials used in the 1960s is displayed in an assembly hierarchy in Figure 5.17 and the materials used in the 2020s is shown in Figure 5.18. To assess the materials transformation further, an extensive elaboration of each material is analyzed through the three factors as it was previously done in the analysis of the areas and forms. These categories will follow the area transformations' analysis, which will be viewed from the decade in which the houses exist, the prism of ethnic identities of the individuals, and the proximity of the locations to the tourist destinations. Such detailed analyses will enable a more nuanced understanding of the materials used and their interactions in the construction of houses.

In the series of graphs shown from Figure 5.19 to Figure 5.42, the data of materials transformation gathered is assessed, with each level in the assembly hierarchy categorized into options that is ordered

from natural materials to modern materials, with variation of the labor intensity and price affordability to sort them even further. These options are sorted from left to right and/or top to bottom in the graph series. For example, in ‘foundation’ the most natural and local is rock foundation, hybrid, reinforced concrete (RC) sloof or tie beam, and lastly by RC foundation blocks which did come later in the advancement of prefabricated material technology. Therefore, it is ordered from left to right in Figure 5.19. and top to bottom in Figure 5.21, Figure 5.22, and Figure 5.23 as rock foundation, hybrid, RC sloof beam and RC foundation blocks at the end. This order is also color coded from blues to reds to make seeing the data easier, and to see in which direction the transformation is directing towards, from what the locals see as the simplest to the most advanced form.

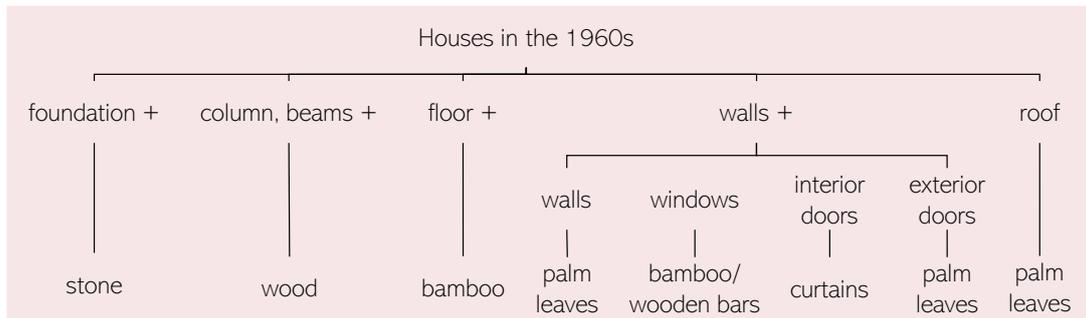


Figure 5.17 Assembly hierarchy of the materials in the 1960s

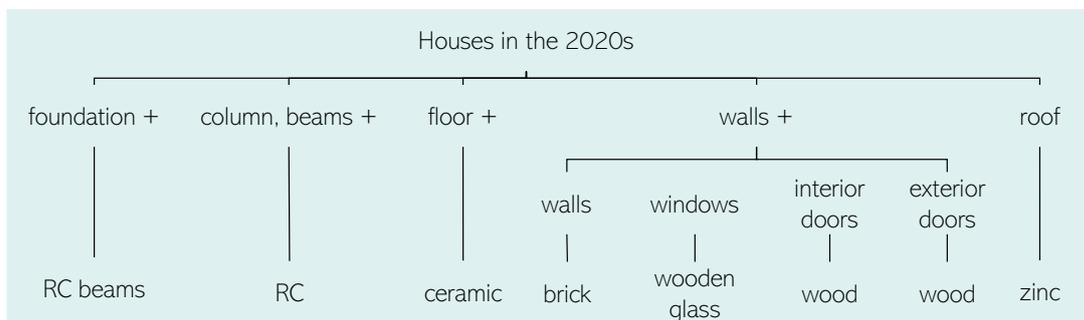


Figure 5.18 Assembly hierarchy of the materials in the 2020s

The discussion of the findings will start with the foundation, columns, floor, walls, roofs, windows, interior doors, and lastly exterior doors. As done in the previous sections, each building element will be analyzed through its transformations over the decades, by ethnic groups, and by their proximity to tourism activities. In the end of the section, a discussion over the similarities and differences between the findings of each material will conclude the findings of material transformation.

### Foundation

As mentioned above, the material for foundation varies from the simplest and most accessible in the area, stone foundation, to hybrid, to RC sloof, and lastly RC foundation as the latest construction and material technology available. First the chronological transformation will be analyzed. In Figure 5.19, a graph of foundation material over the decades, a striking trend shows how all the houses started

with stone foundation and some remained until the 2020s. The decrease of the use of stone started in the 1990s, which coincided with the shifts of the houses to the landed forms discussed in the previous section. Filling in the gap of the stone foundation is the RC sloof or tie beam foundation made with reinforced concrete. While RC blocks and hybrid foundations remain in the smaller percentages of the dataset as the RC blocks is found at the only existing stilt house and was a replacement of the previous foundations made from stones, and the hybrid applies in hybrid houses form type with an annex building to the original stilt house.

In the analysis of the transformation based by ethnic groups, most groups have shifted from stone to RC sloof in between 1980s to 2020s with the Manggarai and Bajo groups as the first to make the switch. The Bugis and Bima groups made the switch as early as in the 2010s. In this switch, it is apparent that the former power dynamics and fastness in adopting change seen in the house form type transformation repeats the same pattern. This proves how power dynamics and economic status are the defining factors in allowing change.

This flexibility and exposure to alternative materials might be due to the proximity of these houses to the tourism activities. This is explored in the last analysis on this material and shown in Figure 5.23 the houses in the strategic area dominated the graph. It can be safe to conclude that the houses in that area are expected to leave stone foundations and opt RC sloof or the hybrid option. The only house that kept using stone foundations is in the periphery areas with less demands to adapt to the new industry and modern lifestyle. Lastly, the only house that has RC blocks as foundation is in the access areas and it is the only stilt house still used by the informants.

From these analyses the foundation shift shows a close tie to the form change from stilt house to landed house. The change seems a predictable outcome of the changing of time and does not relate to their identity that needs to be preserved. The material change was also not due to a shortage in stones, but it might be related to the shift to RC columns used in the landed houses. Overall, the changes did not receive any resistance from the informants' descriptions and happened organically because of the decisions of the house form.

### **Columns**

The variations of column materials in the 34 houses in the span of 9 decades spanned from whole wood, wood, hybrid to RC as it is shown in Figure 5.20. Whole wood is described as distinct from regular wood because the whole wood did not undergo the sculpting process in producing blocks of wood. This whole wood column is described as the earliest form of column in the data set as it is used before, they had access to wood planes. Hence, the term wood here refers to wood blocks shaven to similar dimensions. Hybrid defines houses with a combination of wood and RC columns, and lastly, RC refers to houses built with specifically reinforced concrete columns.

Over the decades, the columns have shown a great preference for using wood in the early houses as seen in Figure 5.20. From the 1990s RC is introduced in this data set, and since then has shown a

change of trends. RC becomes more favorable, and the wood becomes less. This also coincides with the shift to landed houses in the previous section. According to the interviews, this is very closely related to the limit on wood sourcing applied in the 1990s, hence making the shift reasonable and predicted to continue.

From the four ethnic groups, wooden logs are only used as columns in the Manggarai groups. This might be due to the locations of the Manggarai houses that used these columns which are up in the hills, one at the foot of the hill range bordering Labuan Bajo and another on the road out of Labuan Bajo. Compared to the Bajo, Bugis and Bima groups adopted wooden block columns since their first houses because they were in the coastal areas and/or more connected to foreign exposures and construction technology. Some of them eventually changed to RC or hybrid with the first change coming from the Bima and Manggarai groups. The Bima and Manggarai groups making the first change is understandable because both groups are located far from the coast and do not need a house that responds to the different tidal levels of water surface, hence allowing the shift to happen earlier. The informants disclosed how the shift was because of the wood sourcing law and that some hybrid forms were renovations that happened during the lifetime of the houses.

Lastly, the column material transformation is analyzed based on their proximity to tourism activities as shown in Figure 5.24. The houses in the strategic area show the same pattern as the findings of foundation transformation in Figure 5.23 which shows that the transformation is adapted faster in these areas due to its coastal nature with more exposure to foreign and imported cultures and tools and having economic advantages and opportunities before and after the tourism industry was developed officially. The wooden blocks and the hybrid columns remained in the periphery and access areas to which might be interpreted as these areas having more reserved traits in changing their houses.

The transition from whole wood to wood blocks, hybrid, and reinforced concrete (RC) columns reflects not only technological advancements but also socio-economic and environmental considerations. The widespread use of wood in early houses gradually shifts towards a preference for RC, particularly since the 1990s, in response to constraints on wood sourcing. Interestingly, the Manggarai group stands out as the only ethnic group utilizing wooden logs, possibly influenced by their hillside locations. The coastal Bajo, Bugis, and Bima groups, more connected to external influences, adopt wooden block columns early on, eventually transitioning to RC or hybrid forms. The shift happened earlier in the groups that were and are in the non-coastal areas thus not needing the house to respond to the tidal conditions of the sea, allowing more flexibility in their design decisions. Furthermore, the proximity to tourism activities emerges as a common factor influencing column material transformation, with strategic areas exhibiting faster adaptations, aligning with the patterns observed in foundation transformations. The persistence of wooden blocks and hybrid columns in peripheral and access areas highlights the nuanced relationship between architectural choices, geographic context, and economic opportunities.

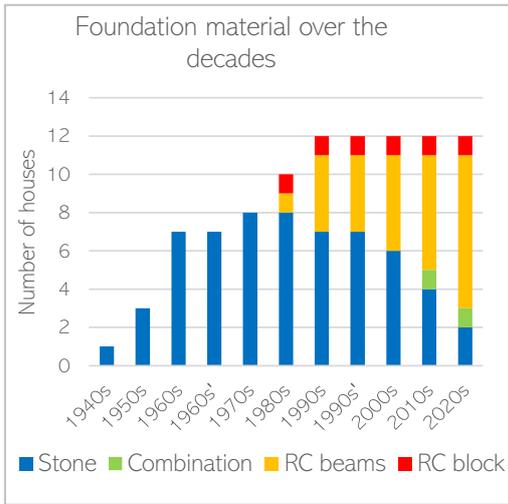


Figure 5.19 Foundation material over the decades

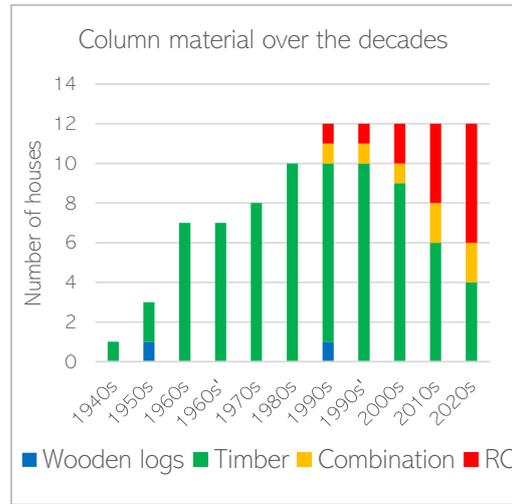


Figure 5.20 Column material over the decades

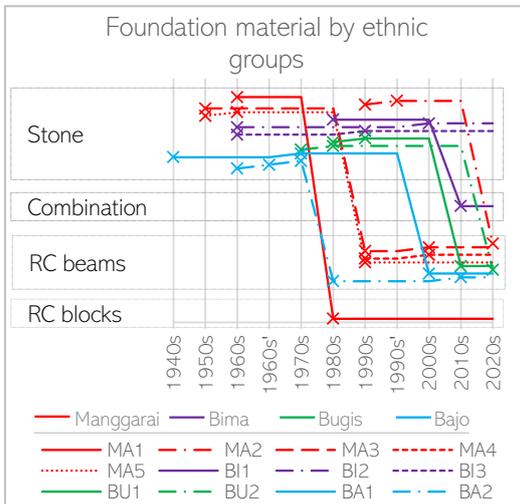


Figure 5.21 Foundation material by ethnic groups

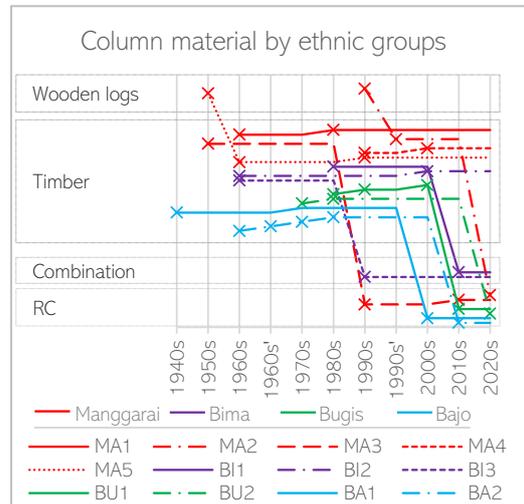


Figure 5.22 Column material by ethnic groups

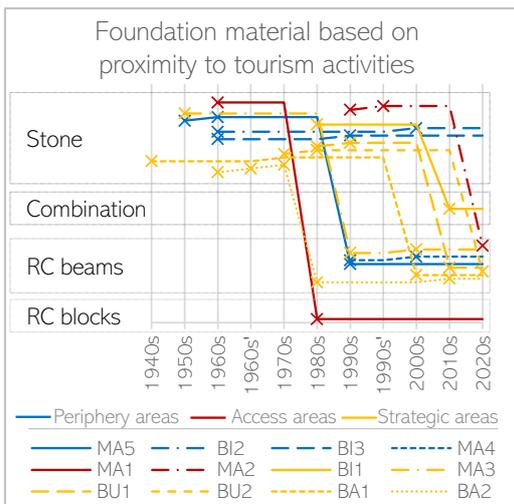


Figure 5.23 Foundation material based on proximity to tourism activities

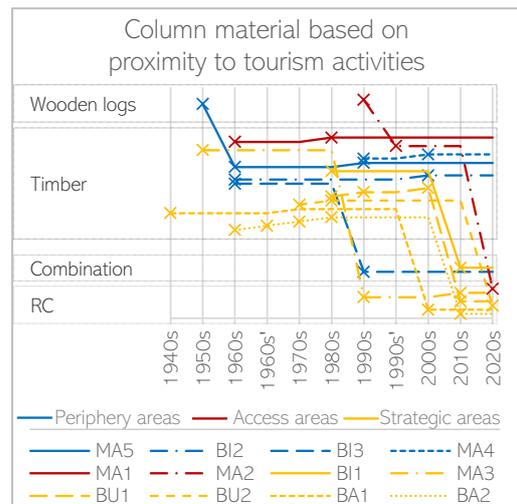


Figure 5.24 Column material based on proximity to tourism activities

## **Floor**

Changes of flooring materials have a different story than the previous materials. Floors tend to be more varied according to the room and function. One house may have more than one material used. Seen in Figure 5.25 is the overall trend throughout the decades. This shows the earlier houses opting for natural materials, with the exclusion of cement, up until the 1970s. The first use of ceramic was in the 1980s and it has been a steady increase since then. This might be closely related to the shift to landed houses and slightly connected to the regulations of wood sourcing. Referring to the statistics in the earlier chapters shown in , it is seen that while non soil flooring materials have increased, the dirt floor is still persistent in some houses in this data set.

Next, by analyzing floor material based on ethnic group, depicted in Figure 5.27, it is seen how the materials do not have any relationship to the ethnic identity of the owners. The fact that it is an amalgamation of many combinations within some houses deliberately sends the message that it is a matter of convenience and practicality, not an ethnic representation. The different types of lines between each informant in one group signify the different path they took from one house to the next, however, it does not result in a solid conclusion in relation to their ethnic identities. The only trend is that they collectively shy away from using natural materials, and eventually adopted ceramic. The last houses to adopt ceramic are stilt and hybrid houses. This leads to the assumption that if the stilt house goes extinct, so will the natural flooring.

The same result is shown in the analysis based on the proximity to tourism activities as seen in Figure 5.29. Each area experimented in different materials at different times but then at the end the houses in the strategic areas still have almost all the materials except bamboo. While the access areas are found with either wood or ceramic in the end of the dataset, and the periphery areas have dirt, cement, and ceramic in their final houses.

All these three analyses conclude that flooring is flexible and adjustable to suit the type of house and the room and function it serves. It supports the findings made by the central statistics bureau where people still have soil or dirt flooring in their house until the 2020s despite also using other materials (Badan Pusat Statistik, 2020, 2021, 2022). The transformation in flooring materials ties closely to the type of house, and as the stilt and hybrid house decrease, the use of natural materials will decrease as well and be replaced with their prefabricated materials.

## **Walls**

There are seven answers for the types of materials used in making their walls, ranging from bamboo, palm leaves, wooden panels, wood boards, brick and wood combinations, zinc, and brick as seen in

Figure 5.26. The order of walls is sorted by the price of materials, ranging from the most natural material to cheapest and least labor intensive to the most expensive and labor extensive. In further dividing and sorting the materials, the first group is made up of bamboo and palm leaves where it is

the only natural materials, with the bamboo being the least labor-intensive option. The second group is made up of wooden panels, wooden boards, and brick and wood combinations. Wooden panels are made manually with the more advanced tools compared to palm leaves which requires harvesting and weaving. But in comparison to wooden boards which are made from MDF boards, the wood panels come first in the transformation stages. The brick and wood came earlier than the MDF boards, but it is seen as a more advanced form of wall, hence positioning it on the right side of the second category. Zinc comes later than brick because of the prefabricated nature it has, which only allows people to import them from bigger islands. Bricks can be made in the local home industries, but it is seen as the most advanced material, which allows brick walls to be on the right end of the wall material category.

First the analysis will start with the changes throughout the decades. Seen in Figure 5.26, walls from palm leaves weaving were left because of the last two reasons, as it loops into a material in the past. The palm leaves weavings were said to be made by Bima people and were traded with other things harvested or owned by the other groups. This material must be replaced every two years, hence making it a little troublesome, especially with the existence of modern and cheap materials like zinc. Since then, many have opted out palm leaves weaving as their walls. The same goes for palm weaving as roof materials. The weaving style is different, but the reason behind the decreasing preference is because it needs to be replaced every 3-5 years, depending on the construction and western monsoon wind that year. This is why most poor households have opted out natural materials like stated in the statistics in and have preferred zinc instead. The affordability and durability of zinc has made it the most preferred material, despite the effects it has on the environment and thermal comfort of the houses.

Then the relationship between wall material and ethnic group will be analyzed. Depicted in Figure 5.28 the houses have used different materials as their walls in the same houses and altered the options again in the next ones. This is almost like the floor material transformation based on ethnic identity, but it has a more apparent trend as it has less variations. The decision to use which wall is said to be related to the function of the room it encapsulates during the interviews. Hence making the trend more observable as they move from most natural materials to more fabricated modern materials. However, it still lacks any pattern that relates to ethnic identity.

The last analysis is done by the proximity to tourism activities, pictured in Figure 5.30. This reflects the finding of the floor material, where the strategic areas still have different variations of walls at the end of the data set series. Yet the natural materials such as bamboo and palm leaves have been left out completely by the end and replaced with more modern ones. This raises the question to the image branding of the urban fabric for tourism development purposes, will the roofs of the houses be enough to attract the cultural tourists and give a different feel to the area, or will the zinc and brick walls be off-putting at one point as it does not respond well to the natural context and climate?

Overall, the first findings show the houses started with a combination of natural materials as their walls and have shifted to fabricated ones in the recent decades. For example, initially, the use of palm

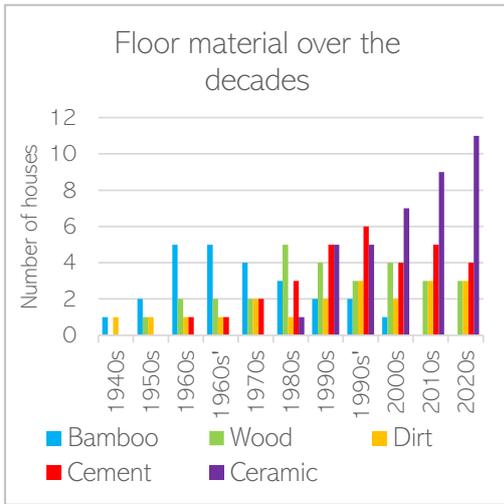


Figure 5.25 Floor material over the decades

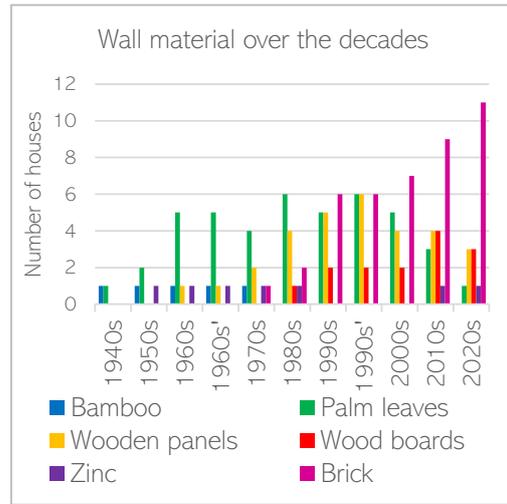


Figure 5.26 Wall material over the decades

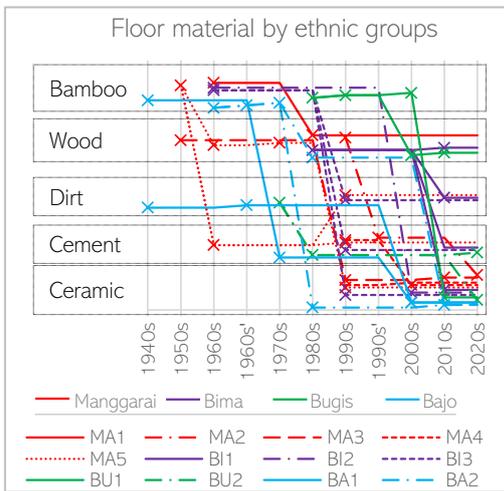


Figure 5.27 Floor material by ethnic groups



Figure 5.28 Wall material by ethnic groups

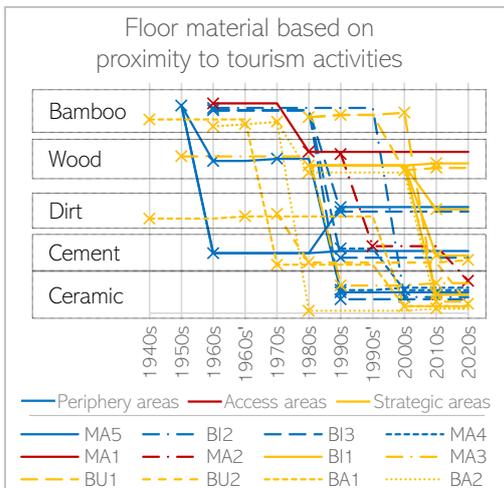


Figure 5.29 Floor material based on proximity to tourism activities

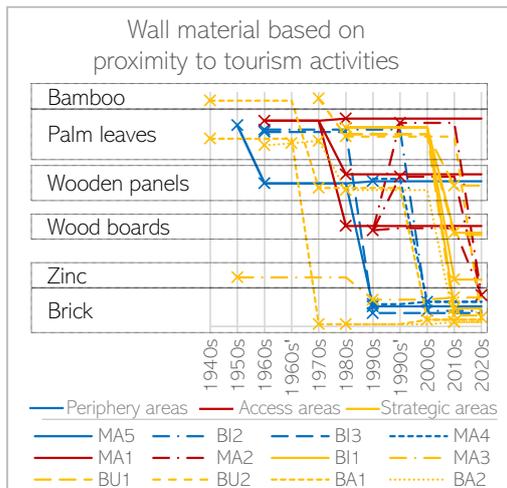


Figure 5.30 Wall material based on proximity to tourism activities

leaves weaving for walls and roofs prevailed, driven by trade among ethnic groups, but the need for frequent replacement led to a shift towards more durable and affordable options like zinc. The second analysis, focused on the relationship between wall material and ethnic groups, reveals a less pronounced pattern compared to floor material transformations. While there is an observable trend from natural to modern materials based on room function, no clear ethnic identity-related pattern emerges. Lastly, the proximity to tourism activities echoes the findings in floor materials, with strategic areas adopting more modern wall materials, leaving behind natural materials. This shift raises questions about the implications for the cultural authenticity and appeal of the urban fabric, especially in the interest of the government and the locals, in the tourism development scheme.

### **Roofs**

In roofing material, the informants shared four alternatives they have experienced in their lifetimes, from palm leaves, terracotta tiles, zinc, and RC, displayed in Figure 5.31. Palm leaves roof is the most natural material and considered the first material they used. The second option is terracotta tiles which are limited in this data set yet is more natural than zinc, which is the next option. The last option is RC where it is considered a novel material and is not commonly found in the data set. The zinc option also refers to plastic or composite sheets which are now at the same level of affordability and preference as zinc. The most expensive option is an RC roof. The traditional forms of roofs rely heavily on the high roof pitch and the addition of RC as roofing material has introduced a new form of roofing which allows a flat deck roof. This is considered very new in the area and is not found in any of the houses in this research, but during the observation many buildings have opted this material and form.

The analysis starts with the chronological analysis seen in Figure 5.31. Palm leaves roofs have been opted in the beginning of the series and replaced completely by the alternative options since 2010s. This signifies the extinction of this material in the data set taken for this research. It still opens chances of its revival or the usage in other buildings at the time. The terracotta tiles were only opted by one informant signifying its scarcity or the nature of it being an outlier in this data set. Houses that have opted for zinc, however, have started from the 1970s and increased steadily to the 2020s. It was said that in the 1980s, zinc was seen as a luxury item where only the wealthiest and most respected person in the neighborhood could afford. Meanwhile houses with RC roofs have been steadily increasing since the 2000s and might continue the trend if the shapes of the roofs were negotiable to add flat roof alterations. The finding of this analysis is that the materials have inevitably changed from natural materials to fabricated materials as time goes by. This shows that if the newer materials can create the same look as the older ones in their ethnicity related roofs, then the shift is not deemed as a problem by the homeowners.

The transformations based on ethnic groups is shown in Figure 5.33 and tells the time of transitions made by each group. The Bajo groups were the first to switch from palm leaves to zinc roofs, while some of the Manggarai and Bima groups have opted zinc roofs from the beginning. The Bugis group

showed a little hesitation in switching away from natural materials but finally made the shift in the recent decades. This shows how the Bima and Manggarai have repeated the pattern found in the column material transformations, and it might show the tendency of using zinc earlier in places far from the coast as they do not need to consider the strong monsoon winds.

Lastly the analysis of the roof material based on proximity to tourism activities, seen in Figure 5.35, shows how all the areas have the same tendency to use zinc and RC in the end. This shows how the locals, and the government welcomed the adaptation of zinc into the ethnic roofs, even in the strategic areas. The government subsidy program also provided the renovations with zinc roofs, further approving the use of this material, regardless of the thermal comfort in this climate or the anti-locality embedded in the material.

From these analyses, there are three findings. The first is that they shy away from using natural materials in the recent decade, even to the extent of eliminating palm leaves and left it as a vernacular of the past. The second is how the Bima and Manggarai have adopted this material faster than the Bajo and Bugis counterparts, signifying the probability that this relates to the geographical locations of their houses that do not face the same natural problems faced by the coastal houses. The third point is that even in the strategic areas, they have leaned towards the use of zinc and RC roofing. This shows that both the locals and the government have allowed these foreign non-local materials to infiltrate the urban fabric of this destination imagery if the forms of the roofs are still ethnically identifiable.

### **Windows**

As for windows material, the range is from curtains, bamboo or wooden bars, palm leaves, wooden boards, and wood and glass as seen in Figure 5.32. Curtains, even though not a natural material, but it is sorted as the simplest material since it does not provide any security for the rooms inside. Bamboo and wooden bars are in the same category as curtains as they do not provide much coverage to protect the rooms from the natural elements. The combination of these two options is also found in many of the houses. Then there are palm leaves and wooden boards which provide security and protection but are still possible to be made by hand by the locals. The last option in the list is made of windows made of glass and wood, which also includes the recent addition of aluminum frame windows with glass panes. This is the last on the spectrum of answers as it requires more specialized labor and industrialized prefabricated parts.

The first analysis is the chronological order of the changes seen in Figure 5.32. The simpler and natural materials that dominated the beginning of the series have been replaced by the wooden boards and wood and glass by the end. The decrease is slow and steady, but the increase of wood and glass started from the introduction in the 1980s and has not decreased since. The decrease has led to the total omission of the use of curtains, bamboo or wooden bars and palm leaves in the 2020s. Wood and glass, and its alternative, aluminum frames and glass, have become the trend over the decades and do not show any signs of being replaced by other materials.

The analysis of window material transformation based on ethnic group is depicted in Figure 5.34 and shows a similar pattern to the previous findings where the Bajo group has a wider variation in trying different options in the spans of their houses, and this is also found in the Bima group. The Bugis group had the runner up position in experimenting with different types of windows. Lastly the Manggarai had chosen the least options throughout their houses. The first to make the change was from the Manggarai group but then the Bajo group surpassed them in the 1970s and 1980s. This might relate to the position in the power hierarchy the Bajo and Bima groups have in their respective neighborhoods. Thus, allowing them the freedom to experiment with their economic and power status.

In this last analysis, based on their proximity to tourism activities (Figure 5.36), as all the houses go to the same point, the options used in their earlier houses still varies. There might be a relation to the increased number of foreigners in their communities, regardless of the houses being in the strategic, access or periphery areas. This raises the concern for safety that comes as the negative side of the economic developments. However, in the end, this is the most preferred material in the data set and the shift to it is inevitable.

Overall, although the houses have different window materials in each house, the trend is clear that they have left behind the natural and simple materials for the sleek and modern shape of the wood and glass. Wooden boards are still opted in some houses, yet it is rarely used as the front façade windows and is more located in the kitchen areas. This shows the inevitable trend of wood and glass and the early demise of simple natural materials, especially with the added concern of safety that came along with the recent developments.

### **Interior doors**

The doors are divided into interior and exterior doors, each with three options. The interior doors start from the curtains, wooden boards, and wooden doors. Curtains were only found in the interior doors, and the palm leaves were only said to be found in the exterior doors. When the exterior doors were using palm leaves weaving, the interior would use curtains or no doors at all. On the other side of the spectrum, the wooden doors are distinct from the wooden board doors as the wooden doors are made of solid wood parts that costs more than wooden board doors made from MDF or other light wood boards. The same rules follow the exterior doors, with wooden boards in the middle of the spectrum and wooden doors on the advanced side of the answer spectrum.

The changes of options through time are the first analysis and is depicted in Figure 5.37 and Figure 5.38. Curtains, the simplest material, have prevailed and are kept in some houses from the beginning to the end of the series. This is opted as a way of preserving the modesty of the inhabitants of the house, especially with their tendency to have guests over. Curtains are sometimes paired with wooden boards or wooden doors, to ensure modesty and privacy even with the doors opened. The number of curtains used has decreased a little, showing some signs of preference reducing in the recent decades. The number of wooden board doors has stagnated as the least preferred alternative and the wooden

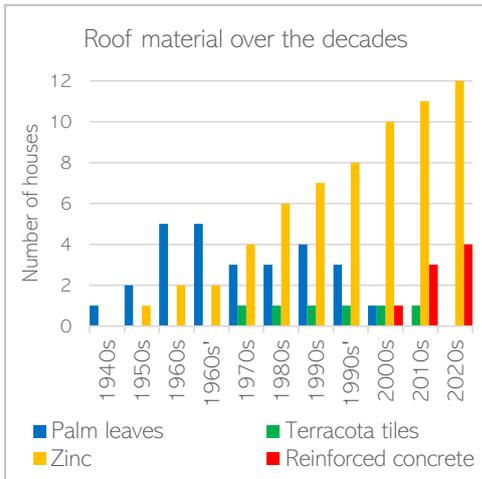


Figure 5.31 Roof material over the decades

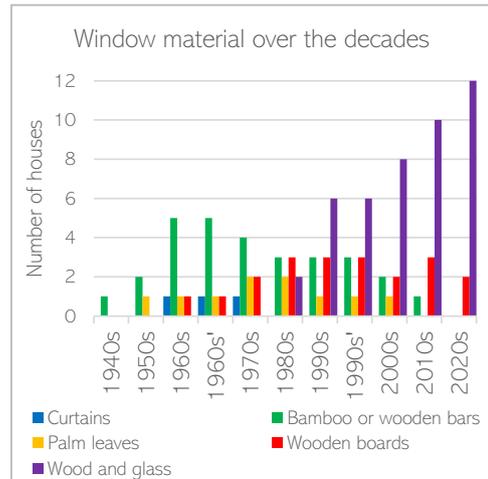


Figure 5.32 Window material over the decades

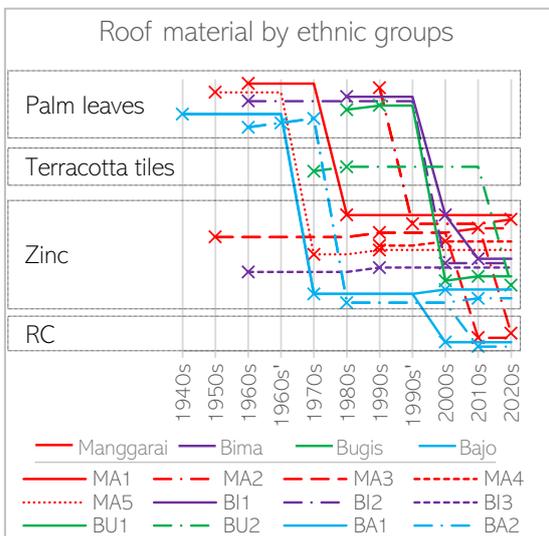


Figure 5.33 Roof material by ethnic groups

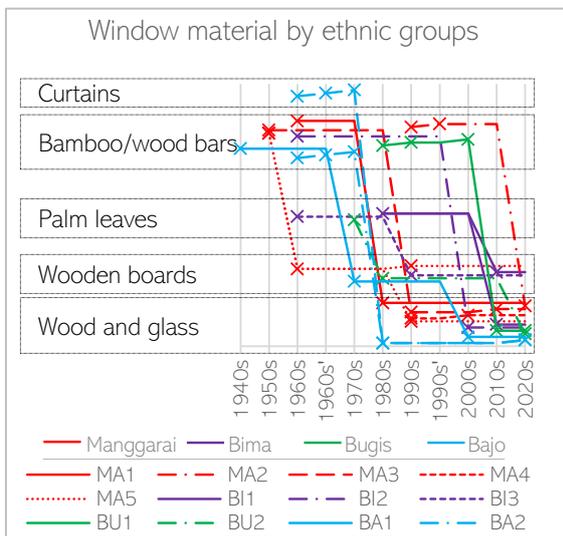


Figure 5.34 Window material by ethnic groups

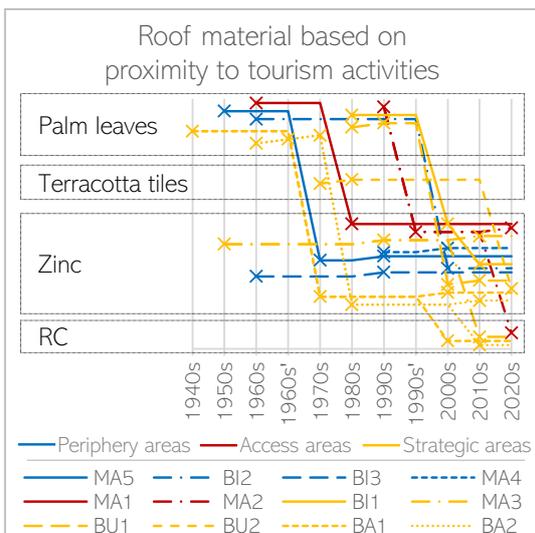


Figure 5.35 Roof material based on proximity to tourism activities

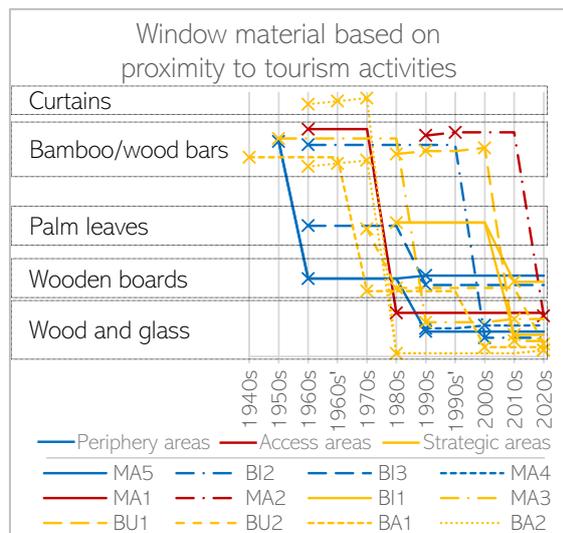


Figure 5.36 Window material based on proximity to tourism activities

doors increased since the 1980s to the current decade. The number of wooden doors increased in the 1990s which coincided with the decade in which the number of landed houses increased. This is very likely to be related, as the weight of a solid door is heavy for the simple versions of stilt houses. However, the regulation on wood sourcing did not apply to the wood doors as they are mostly sourced from farmed timber and made to order in carpentry services.

The second analysis is based on the ethnic groups and is displayed in Figure 5.39 and Figure 5.40. This analysis shows that all groups have preserved the use of curtains from the earlier forms of their houses to the current iterations. The Bajo and Bima were the first ones to adopt the wooden doors, might be related to the position they have in the power dynamics of their neighborhoods.

Shown in Figure 5.41 and Figure 5.42, the last analysis is based on the proximity to the tourism activities and shows that the combinations spread in the three areas. There seems to be no relationship between interior door materials and the tourism industry. The only exception comes from the lack of curtains at the end of the data series in access areas. This seems to be a coincidence and not related to the locations, though this was not highlighted during the interviews nor the observations.

Through the three analyses, a form of the simplest material is still opted in the current houses which is the curtains for interior doors. This is not discounted by the fact that the curtains are often combined with wooden boards or solid wooden doors in the modern iterations. The value behind this material is what has kept them being opted in these houses, to preserve the modesty and privacy of the inhabitants during guest visits. This is so far the only building element being preferred due to their value.

### **Exterior doors**

The options of exterior doors are palm leaves, wooden boards, and wooden door as seen in Figure 5.38. The chronological analysis seen in Figure 5.38 shows how in the beginning of the series palm leaves doors were the dominant type until the 1970s when wooden boards were made available and was opted as a lighter version of the wooden doors. After that the number of houses with palm leaves exterior doors have reduced until it was opted off since the 2010s. This might be due to the shift of the houses to no longer use palm leaves walls and the need for a sturdier door to match the brick walls and reinforced concrete columns in recent houses. In the 1990s the houses have also adopted more solid wood doors compared to palm leaves, as it coincides with the shift to landed houses.

The next is to view the data from the ethnic group perspectives as seen in Figure 5.40, where the Manggarai households experienced wooden doors decades earlier than the other groups. This signifies the weight the Manggarai structures were able to sustain compared to the other which focus more on the use of lightweight materials. This is followed by the Bajo group with their high position in the power hierarchy. This signifies that solid wooden doors were seen as a reflection of the status of the royal family. In which were followed suit by the next high rank in the society, the Bima group. The last group to follow the shift is the Bugis which tied to their position in the power dynamics, allowing them to hold on longer to the palm leaves doors and wooden boards. This also shows a connection to

the growing concern of safety in the recent decades or just an inevitable change of material like the transformations in windows.

Last analysis of the exterior doors is the relation to their proximity in Figure 5.42 which shows the strategic areas started the adoption of solid wooden doors in their early houses' exterior doors. However, the periphery areas are close behind the strategic areas in the shift to wooden doors and exclusively no shifts to wooden boards. The houses in the access areas, on the other hand, is seen to balance the shift from palm leaves doors to wooden boards and wooden doors. This leads to the conclusion that the option of exterior doors material has no direct relation to the proximity of the tourism activities and is just the best option in the locals' preferences.

In conclusion, the chronological analysis reveals a shift from palm leaves doors to wooden boards and solid wooden doors, with the latter gaining more prominence, particularly in the 1990s coinciding with the transition to landed houses. Ethnic groups exhibit distinct timelines in adopting these changes, with the Manggarai households leading the shift towards wooden doors, emphasizing structural strength, while the Bajo, Bima, and Bugis groups follow suit based on their respective positions in the power hierarchy. The analysis of proximity to tourism activities shows strategic areas leading to the adoption of solid wooden doors, reflecting perhaps an alignment with aesthetic and status considerations. However, periphery areas and access areas demonstrate a more balanced shift, suggesting that the choice of exterior door materials is more influenced by local preferences than direct associations with tourism and is inevitable in the changing of times.

### **Conclusion of material transformation**

Each material transformation has a different cultural order behind it. Some are more related to the chronological order and show an inevitable trend while others have shown more connections with the ethnic identity of the owners. In some cases, the exposure and proximity, and lack thereof, to the tourism industry have affected the transformation of the material selection.

The overall trend of material transformation based on chronological order shows that each person tends to choose to 'upgrade' their material selection if given the opportunity. The 'upgrade' is based on their perception of the modernity or status the material brings to the new house. This applies to the change from wooden logs to wooden blocks in the houses' structural elements and to roof transformation to zinc. It was said even zinc was seen as a luxury item with only the wealthiest and most respected person in the neighborhood could afford. The reason behind the transformation from cement to ceramic tiles was not explored in depth, but it was said to be the common decision. This might be related to the image of poor housing which people want to avoid if possible.

In some materials, the option to 'upgrade' is simply because the natural material is no longer accessible, it is no longer produced, or it is no longer preferred because of the high maintenance required. This reason applies to the upgrade from wood block columns to RC structures, which was because they are now prohibited to source wood directly from forests under the government regulation

(Law of The Republic of Indonesia Number 41 of 1999 Concerning Forestry, 1999). The wood that is sold at the material stores costs more than using RC, hence reducing the interest in this option.

The 1960s, 1980s and 1990s were the only decades where at least 5 houses were analyzed, making the findings the most representative of all the decades. In the 1960s the houses rely mostly on natural materials and the other simplest options available. Then in the 1980s and 1990s the modern alternatives started to take place in their vernacular architecture. This might also happen later in the decades after as a part of renovation, which will need further investigation. In the decades after the 1990s the building materials were mostly using the advanced and prefabricated options with almost no traces of the simple ones. It is in accordance with the findings in , , and where people have opted more prefabricated and modern materials. The exception only applies to a few houses with stone foundations, bamboo floors, and a lot of houses which still preserve the use of curtains as interior doors. This use of curtains as interior doors is paired with wooden board doors or wooden doors. The use of curtains is seen as a way of keeping the privacy and modesty of the rooms.

The reasons behind these shifts were said to be based on their perception of the modernity or status the material brings to the new house, because the natural material is no longer accessible, it is no longer produced, or it is no longer preferred because of the high maintenance required. Although very reasonable, but there might be a hidden reason that relates to the survey done to acquire the data in , , and . An assumption is made that the reason they change their materials if the budget allows, is to avoid being seen as a poor household with the 'poor selection' of materials. This assumption can be correlated with their reason of wanting to be seen with a higher status or to have a house that resembles a higher status. Therefore, the existence of the survey can also lead to the opting out of natural materials or materials that may be more suitable for the climate compared to the prefabricated modern materials which are mostly concrete, bricks and zinc.

The cultural order through the perspective of the ethnic group identity has concluded that the power dynamics of each neighborhood have shown the flexibility of experimentation in material selection, yet in some cases they have given boundaries to the royal families, dictating them to show status by using the most modern, expensive, or luxurious materials available. This order has also shown the different preferences brought by the geographical context of the houses. Some materials have been opted because of the lack of natural occurrences in the way of shifting materials. Some cases, the locations of some ethnic groups defined the accessibility to certain materials and tools.

Speaking of geographical locations, the order behind the proximity to tourism activities has shown the least connection to material selection. The only connections were in the foundation and columns which are related to the house form types based on its structures. This was proven in the previous section to the tourism impacts as it has given more economic freedom to evolve. The government also did not have any rules to limit these changes, therefore proven to be the preference of both the government and the people.

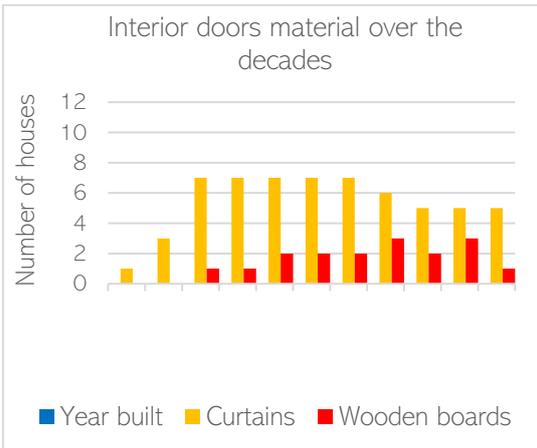


Figure 5.37 Interior doors material over the decades

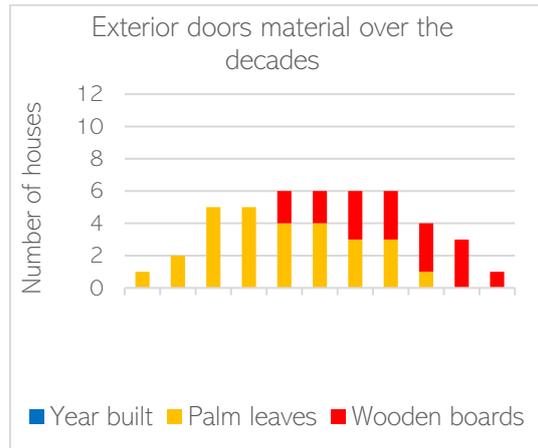


Figure 5.38 Exterior doors material over the decades

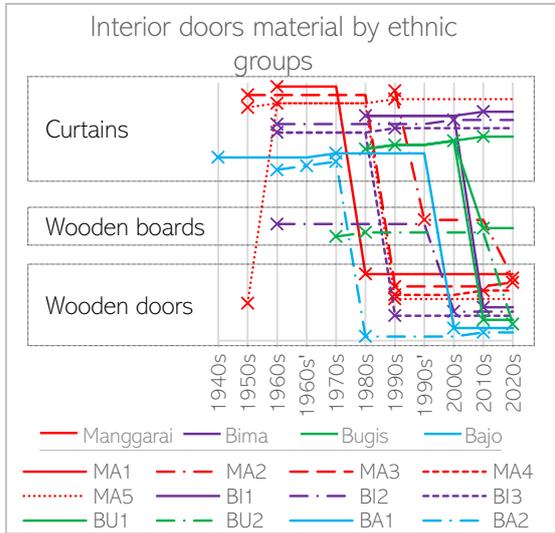


Figure 5.39 Interior doors by ethnic groups

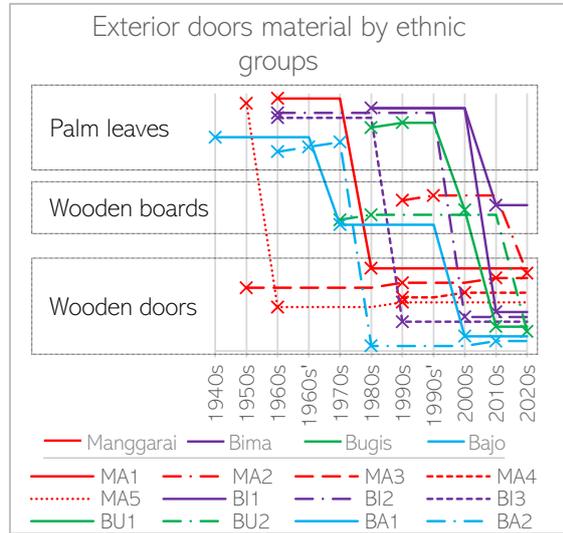


Figure 5.40 Exterior doors by ethnic groups

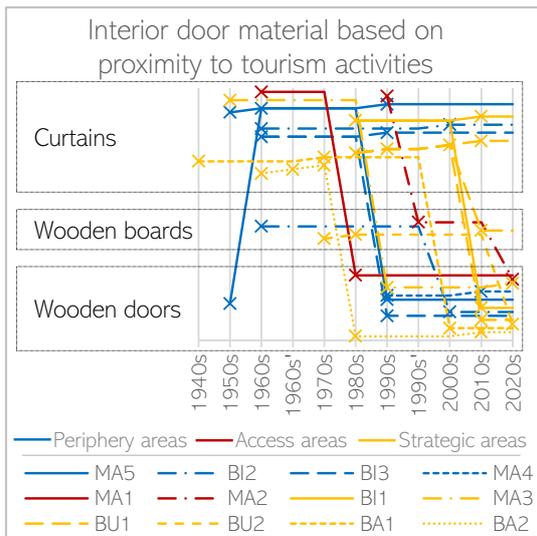


Figure 5.41 Interior doors material based on proximity to tourism activities

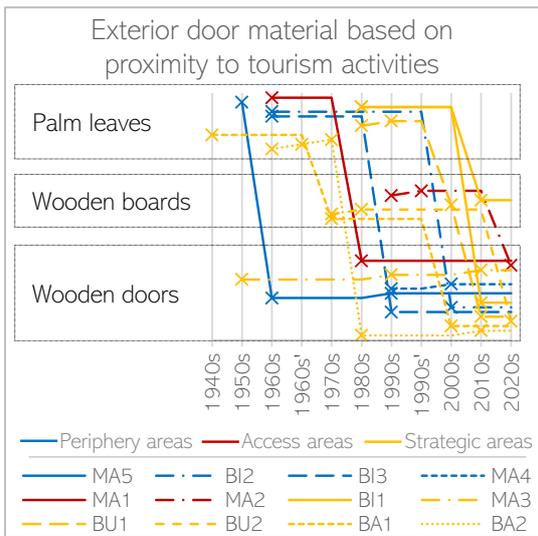


Figure 5.42 Exterior doors material based on proximity to tourism activities

#### 5. 1. 4. Room amount

Over the course of decades, a discernible trend emerges in the architectural evolution of vernacular houses in Indonesia, particularly in the notable increase in the number of rooms as seen in Figure 5.43. This trend reflects the changing needs, lifestyles, and preferences of the inhabitants, intertwined with broader societal shifts. The data, spanning over nine decades, depicts a progression from simpler structures with a limited number of rooms to more intricate designs accommodating an expanding array of functions and individual uses.

Notably, the 1990s stand out as a pivotal decade marked by a substantial surge in the number of rooms within these houses. This increase can be attributed to the growing popularity of landed houses during this period. As the shift from stilt to landed houses gained momentum, the architectural landscape witnessed a transformation that went beyond mere structural changes. Landed houses, characterized by a larger footprint, provided increased space for diverse functionalities, prompting a surge in the number of rooms.

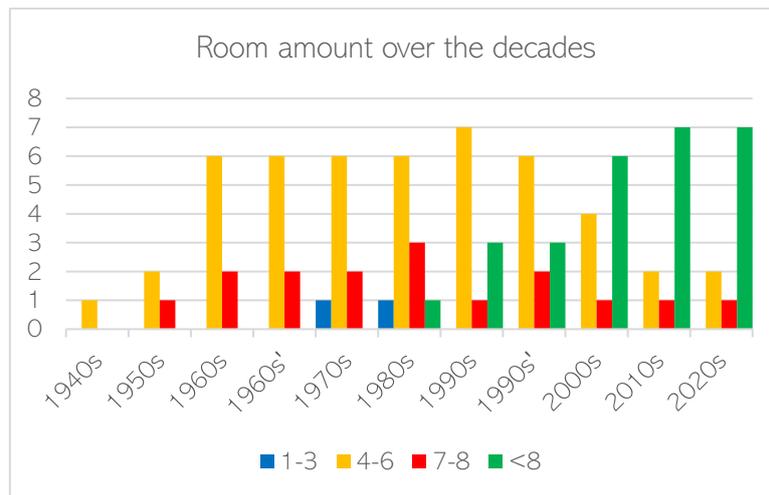


Figure 5.43 Room amount over the decades

The increase in the number of rooms based on ethnic groups and tourist activities seen in Figure 5.44 reflect not only a shift in architectural preferences but also the dynamic interplay between societal changes and an amalgamation of factors such as economic prosperity, changing lifestyle expectations, and perhaps a shift in cultural perspectives. This preference, in turn, influenced the architectural choices, leading to an augmentation in the number of rooms within these structures. The expanded living spaces in these houses mirrored the inhabitants' evolving needs, accommodating various domestic activities, and providing a more versatile living environment.

Delving into the nuanced dynamics of room expansion within vernacular houses, a closer examination based on ethnic groups reveals intriguing patterns. The Bajo group, in particular, emerges as a distinctive outlier, experiencing the highest increase in the number of rooms. This notable surge signifies more than just architectural evolution; it unveils the intricate power dynamics embedded

within the Bajo community. Their propensity for a higher number of rooms may well be indicative of their elevated status and influence within the neighborhood. The architectural choices made by the Bajo people, reflected in the increased room count, might be a tangible manifestation of their socio-economic standing and cultural prominence in their neighborhood. The power status came along with economic freedom and bigger plots of land which allowed the group to expand their living spaces.

Shifting the lens to the influence of tourism on room expansion, a distinct narrative emerges based on the proximity to tourist activities. Strategic areas, strategically positioned to capitalize on economic opportunities and face the accompanying challenges, exhibit the highest increase in the number of rooms. This trend aligns with the economic forces associated with tourism development, where strategic locations often become hubs for commercial activities and hospitality services. The heightened demand for accommodation and services in strategic areas prompts a corresponding need for increased living spaces. The surge in the number of rooms, therefore, becomes a pragmatic response to the economic prospects presented by tourism. As these strategic locations become focal points for both economic opportunities and challenges, vernacular houses adapt to accommodate the evolving demands of the burgeoning tourism industry.

The rising number of rooms in Indonesian vernacular houses unfolds a narrative of architectural evolution tied to societal shifts. The chronological shift from traditional stilt houses to more expansive landed houses reflects changing needs and preferences. This transformation, inevitable given evolving socio-economic dynamics, and material availability, highlights the interplay between cultural heritage and contemporary necessities. The increase in rooms becomes a tangible symbol of broader architectural change, encapsulating a departure from communal lifestyle to the more individual lifestyles. In essence, the differential increase in room numbers across ethnic groups and proximity zones underscores the cultural reasonings behind these transformations.



Figure 5.44 Room amount by ethnic groups and by proximity to tourism activities

In essence, the differential increase in room numbers across ethnic groups and proximity zones underscores the cultural reasonings behind these transformations. It intertwines cultural dynamics, socio-economic status, and adaptive responses to the demands of the burgeoning tourism sector. The houses, beyond being physical structures, become an embodiment of the intricate negotiations between power structures, economic forces, and cultural expressions and the inevitability brought by the amalgamation of those aspects.

### 5. 1. 5. Public-private space transformation

After assessing the physical transformations of the house through the area size, materials and room numbers, the research can now analyze the territorial transformations in the houses as the house owner exercises their control over their space when hosting a guest, whether during a short visit or months-long stays. These scales also correlate to the room functions, even if the scales are more flexible towards the guest's relationship to the hosts and the context happening at the time.

As mentioned in the earlier chapters, there are eight scales in the public-private distinction within a house. Figure 5.45 shows the average size of the scales within each ethnic group in m<sup>2</sup>. The total houses of each ethnic group are not equal, hence needing further investigation to determine the characteristics of each ethnic group. From this small sampling, there is a trend where the API-1 and API-2 scales, which are the most easily accessible areas within the house, are always bigger than the API-7 and API-8 which are the most private areas in the house. This can be interpreted as the houses in this sample set have a bigger communal area than the private areas and live a more communal lifestyle.

Basic data		Attributes		Public-private scales							
Ethnicity	Total houses	Average rooms	Average scales	API-1	API-2	API-3	API-4	API-5	API-6	API-7	API-8
MA	11	7.27	6.27	13.52	13.13	9.39	12.78	11.64	17.17	6.48	6.71
BI	6	8.33	6.83	16.69	17.81	11.05	10.63	9.51	10.35	8.19	8.05
BU	7	6.00	4.86	18.99	12.64	2.88	7.39	1.26	13.16	4.17	8.45
BA	4	9.29	6.57	21.32	19.25	8.38	36.00	5.29	10.67	7.71	7.05

Figure 5.45 Average area size of public-private scales within the houses based on ethnic groups

The lowest average rooms and scales are found within the houses of the Bugis group. This group also has the lowest size area in API-3 and API-5 scale levels. This can be interpreted as the group's houses have less distinction in their public-private spaces and more lax control over the hierarchy of accessibility. The Bugis houses also have the lowest area size of API-7 which is usually reserved for the daughters' rooms or the married children's rooms. In this case, only one Bugis household has children, therefore making it reasonable to find a low API-7 number in this group. This might also explain the low area size in the API-3, API-4, and API-5 due to the few members of one of the families, hence needing less public-private distinction in the house.

The highest average of rooms and scales are found within the Bima and Bajo groups with the Bajo with more rooms and the Bima with more scales by a little bit. The public-private scales on the other hand have a different finding. The Bajo group has a very high area size in the API-4 level which is more than 3 times the average in the other groups. This is due to the API-4 levels being the rented accommodation provided by the Bajo households in order to gain more income to combat their increasing land and building taxes. While the other levels show a similar trend where the API-1 and API-2 are larger in size compared to the API-7 and API-8, this shows how the Bajo households have converted most of their spaces to be profitable, optimizing the tourism potential their location holds.

The houses are further analyzed in Figure 5.46, where the composition of the average house in each ethnic groups is displayed with the number of total houses sampled in each group in the span of 8 decades. In seeing the compositions, it can be seen that the Manggarai has the API-6 scale as the biggest area in their house, which is to be accessed by extended family members and select female neighbors. The other scales are considerable to be even in the Manggarai houses. While in the Bima households, they tend to have more space for the API-2 where conditionally strangers can access and almost every time the female neighbors and extended family can access. Signifying a more communal lifestyle compared to the Manggarai but falls in comparison to the Bugis houses where almost half of the house is for the public spaces easily accessed by strangers through invitation and permission. The Bajo houses, as discussed before, has almost half of their houses for API-4 which are not easily accessible for strangers but easily accessible for female neighbors and extended family members. This level also includes rented spaces either for accommodation or commerce.

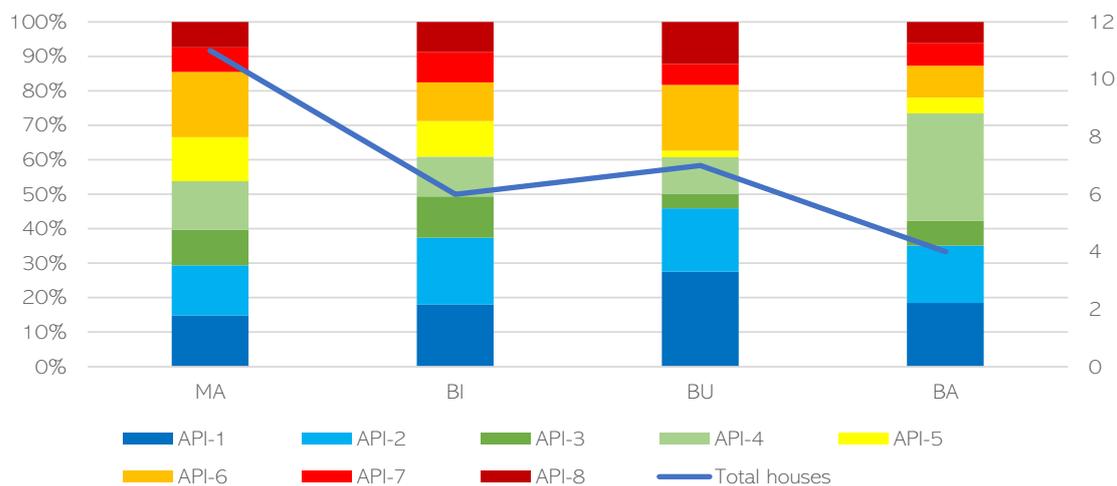


Figure 5.46 Average composition of public-private scales

The least spaces they have in their composition also varies, as the Manggarai houses have the private spaces (API-7 and API-8) as the smallest spaces, the Bima has an almost equal area from API-3 to API-8, the Bugis has the least space for API-5 and API-3, and the Bajo has very limited space in their API-5. The Manggarai house allows more guests to be accommodated in their house, especially the

close neighbors and extended family. The Bima families have an equal distribution of private spaces which allows them more privacy on a controlled scale. While the Bugis houses have only a sliver of distinctions in the API-5 which is not accessible at all for strangers. This can be interpreted as them not having the need to really differentiate their access given to strangers and their close acquaintances. As more people will have access to most part of their houses, the close acquaintances and neighbors can have special treatment in a little part of their houses. The Bajo houses reserve more spaces for economic gain rather than themselves, as seen in the small proportion of their private spaces. More people are accommodated in these houses, especially if they are using their facilities, making them less like strangers but more like close acquaintances. This graph alone can give insight into the priorities they have in designing the layout of their home, but to understand their transformations, an analysis of their evolutions throughout the decades should be studied.

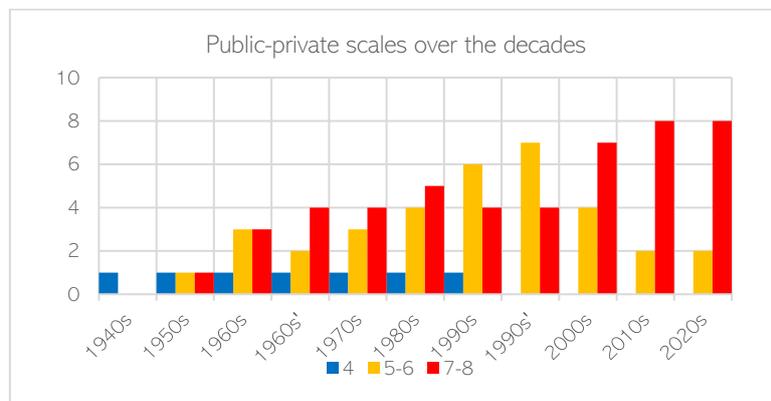


Figure 5.47 Public-private scales over the decades

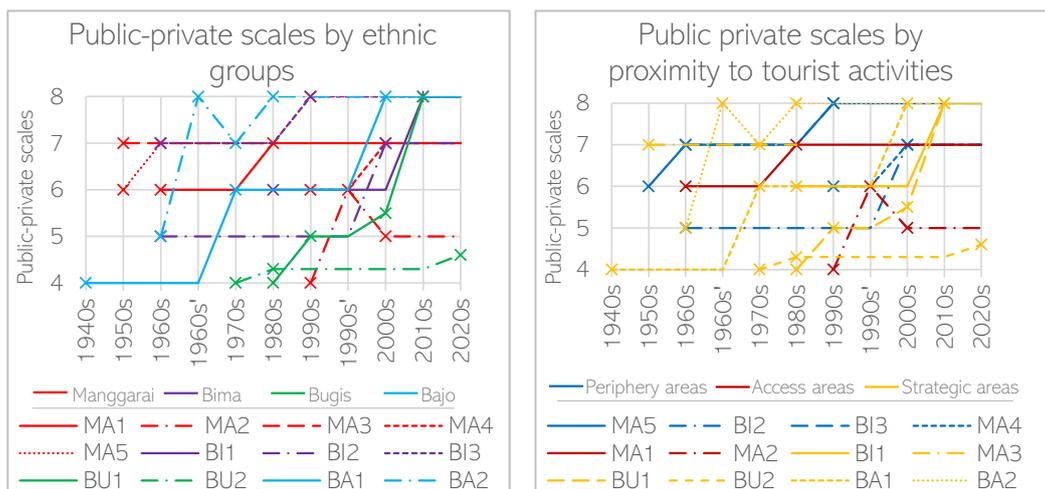


Figure 5.48 Public-private scales by ethnic groups and proximity to tourism activities

The transformations of these levels are shown in Figure 5.49 with the blue colors representing the most public spaces, the greens represent the controlled spaces within the public spaces, the yellows represent the more accessible private spaces, and the reds represent the most private spaces. The chart

displays the transformation of each house from each informant in a chronological order, and within the ethnic groups they identify with.

The first group is the Manggarai group with five informants but with only four informants who shared their data of transformations. RI03, which does not have the data of its predecessor, will instead represent the only Manggarai house that is built in the Bugis-Bajo coastal settlement and will be discussed further later. In every informant's experience, there is an increase of area in the middle part of the public-private scale. This is seen by the variations of green colors in the chart. The houses also experience an increase in public spaces except for the AA01 and SB01 which experienced a decrease in the API-1 scale. It can be interpreted as the decrease in API-1 area correlates to the increase in API-3 scales in the Manggarai case.

The Bugis cases in Figure 5.49 show the increase in API-1 size in one household and an intense diversification of API scales in the other household. This is due to the extreme differences in the expanding number of family members living in each household. The SU household does not have any children, therefore having no need to increase the levels of their public-private distinction. The RA household, on the other hand, has two sons who are both married and have their own nuclear families. The RA house evolved from simple houses to being a house where three families dwell together. It can be easily interpreted that the more family members the house accommodates, the more distinction it needs. Even more so if the family members become more complex, such as the daughters in law moving into the parents in law's house, making a more distinct border required.

Houses from the Bima group had a very high API-1 in the beginning, but all three had a decrease in their current houses. The same goes for the API-2 level which in one house diminished into nothing. This is mostly because all three of them had a stilt house in the beginning and changed into landed house as their current house. The space under the house was one of the biggest public spaces in their houses' transformation history. It was where they meet with neighbors, work together to weave the palm leaves walls and roofs. With the subsided demand for the material and also the switch of house forms, this public space dwindled as well. Replacing those spaces are the API-3 and API-4 levels which are more controlled public spaces, reserved for closer acquaintances. The increase of space for closer acquaintances serves an interesting finding that Bima people are more closed now compared to the past when they were living in a communal village, where sharing the spaces they own was the hospitable thing to do.

In one of the Bima households, there has been a noticeable increase in the API-7, which is a measure of the number of private spaces in the house that are not the main bedroom. Upon investigation, it was found that this increase was due to the addition of a married child's room and a daughter's room. This is not uncommon in households where two nuclear families live under the same roof, as in the case of the Bima household. In fact, households in the Bugis community have a similar

marital relationship where women marry into their husband's family, and the houses are transformed to accommodate the new family members.

As families continue to expand, it is expected that the houses will undergo partitioning to create more private spaces. This is a natural progression as families grow and new members are added to the household. The increase in private spaces not only provides more accommodation for the family members but also ensures that everyone has their own personal space, which is essential for maintaining peace and harmony within a household.

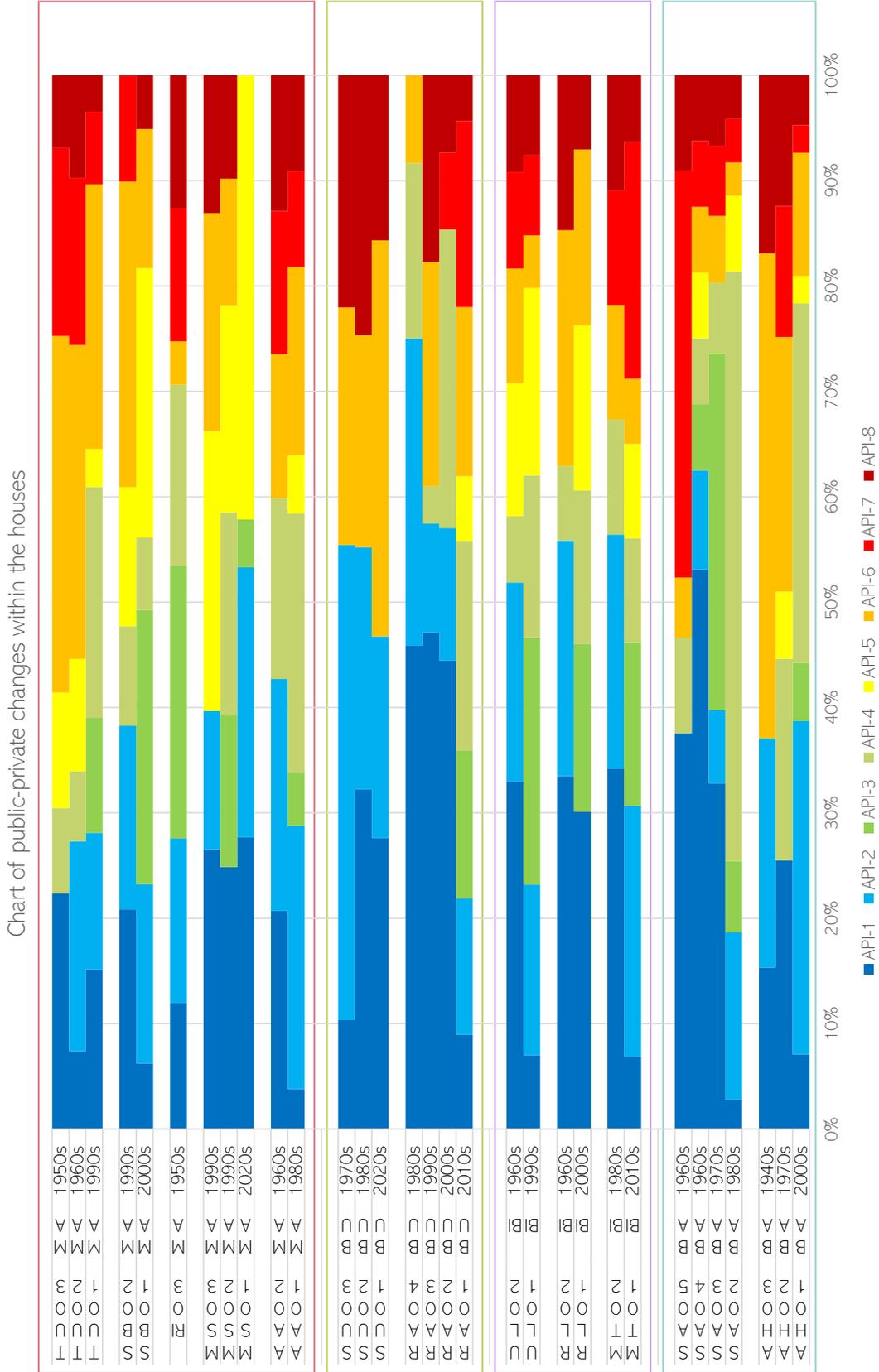
The Bajo group has a unique pattern of API transformations, which refers to the level of privacy and access given to different members of the household. In the beginning, the two houses in the group had different compositions of API levels, with one house having a dominating API-7 and the other a dominating API-6. API-7 meant that the household had a private room for their daughters, while API-6 indicated that the household had a communal space accessible to female neighbors and extended families. The first house was more reserved and intended for the nuclear family and daughters, while the second house provided more space for neighbors and guests. This difference in access and privacy could be explained by the fact that the first house was the direct descendant of the Bajo royal family, while the other was second in line at the time.

functions to include rented accommodation or commercial space to optimize their strategic location. This suggests that the Bajo group adapted to changing circumstances and economic opportunities, while still maintaining their unique pattern of API transformations.

In conclusion, the composition of the public-private scales has changed and diversified. The next step is to analyze the transformation of levels in each house as shown in and the access given to them. The simpler hierarchy also translates as simpler circumstances, hence needing less distinctions. To assess this further, an analysis of the public-private scales is seen based . In this table, it is apparent that the API-1 and API-8, on the opposite sides of the spectrum, are the most necessary spaces in the house. Only two cases in the Manggarai households have no API-8 and one from the Bugis households. One house from the Manggarai households is the government recipient house built in the 2020s and the other is a house that is no longer used now and was inherited as an additional house. The latter reason is an exceptional case and the former one is an anomaly from houses designed not in respect of the past vernacular architecture. While the Bugis house with no API-8 levels is a simple hut made for a temporary dwelling and only has 1 room. This room is then divided into different scales of public-private levels just by a stand-alone partition in the middle of the house, and each corner of the room has a different function to serve. Other than the three exceptions, all houses have the most private room that serves as their main bedroom and the most public rooms that serve guests during visits.

The levels between API-1 and API-8 have more variations as mentioned in the preceding analyses. and the access given to them. The simpler hierarchy also translates as simpler circumstances, hence needing less distinctions. To assess this further, an analysis of the public-private scales is seen based

Figure 5.49 Chart of public-private changes within the houses



shows the transformations of a house in reverse chronological order, showing the current house first and the previous house below it. By seeing this order, an interesting pattern emerges, showing that almost all of the current houses have more levels of public-private distinction compared to their earlier forms. This excludes the anomaly in the Manggarai 2020s house again, as it is the recipient of the government subsidy program and dwindled in many levels of the API scale. The other anomaly is found in the Bugis household, where SU did not experience an increase in public-private levels of distinction. As mentioned before, this is mostly due to them not having any children, thus not having the need to accommodate more people in the household. This contrasts with an informant from the same ethnic group, RA, where they started with a simple hut with very little distinction of public-private functions as it was just one room. But then in the latest form, RA had every distinction available as their family has expanded to accommodate their grandchildren and children-in-law.

The levels previously not accommodated in the earlier houses have a thin pattern in each group. The Manggarai group tend to have less API-3 in their earlier houses, and the other levels vary from one person to another. This means that there is a significant distinction between strangers and close acquaintances. The treatment of a stranger will be very different compared to when they have become close acquaintances. There is little space in between those two categories.

The Bima tends to leave out the API-3 and API-5 in their earlier forms. This can be interpreted as a greater distinction between the guests status, be it close acquaintances or female neighbors, as they do not have intermediate spaces between those distinctions and keep it simple and less steps in the hierarchy. This can mean they are more open to every guest, or less hassle in their hospitality approach.

Like the Bima, the sample set from the Bugis group tends to be simpler in their earlier forms where they did not have API-3, API-5, and API-7. This can be interpreted as the Bugis as people with less formalities, where the relationship of guests to the host does not necessarily translate to a different set of treatment and access that they will receive. But it can also be interpreted as they have more distinction between each guest's status and keep it direct in their hospitality.

The Bajo sample set has a great increase in their current forms, but they started with houses without API-2, API3 and API-5. This is a little different from the other ethnic groups as they do not have API-2 which can be interpreted as there is only API-1 for the strangers to access, hence limiting the access for strangers in normal circumstances. The unavailable API-3 and API-5 can be interpreted like the Bima and Bugis where they have simpler distinctions in their hospitality and access given.

In conclusion, each ethnic group has a different preference but mostly they will start with no distinctions in API-3 and API-5. In the beginning, they had a simpler hierarchy in assessing the guests and the access given to them. The simpler hierarchy also translates as simpler circumstances, hence needing less distinctions. To assess this further, an analysis of the public-private scales is seen based with having a simple distinction between public and private places within the house and increasing in the 2000s and 2010s with a sudden decrease in the 2020s. This can be attributed to the shift of stilt

houses to landed houses in 2000s and 2010s. The sudden decrease in 2020s can be attributed to the government program house which has a very limited distinction as it is designed to be a homestay and does not follow the vernacular architecture rule. The big increase of API-4 in the 1980s is also an outlier as those places were results of renovations, perhaps done in the 2010s.

This graph in Figure 5.50 is a stacked chart, therefore the decrease in thickness of the decade means that the sample is fewer than the other decades, like the part in the 1970s. The thing to be concerned about is the varieties of the colors available in each decade. To serve the purposes of this research, this sample is enough to give a glimpse of what memory recollection can do for transformation studies. Yet, further investigation is needed to get a better understanding of the scales' transformation throughout the decades.

The data presented in Table 5.10 highlights a significant increase in API-4 from the 1980s onwards. This sudden boost in API-4 can be attributed to the renovations made during that period. Interestingly, the table also shows that the decades with the highest number of houses are the 1960s, 1980s, and 1990s, with at least five houses or more from three different ethnicities. If we look closely at these decades, we can infer that the levels of distinctions have increased over time. This can be attributed to the growing need for privacy and space distinctions within a house. With changing lifestyles, people are looking for more individualistic spaces that reflect their personality and preferences. Furthermore, this trend towards individualistic lifestyles can also be seen as a reflection of society's changing values. In the past, communal living was more common, but now people are more focused on their personal preferences and needs. This shift towards individualism has also led to an increase in the variety of house designs and styles, as people are looking for unique and personalized living spaces.

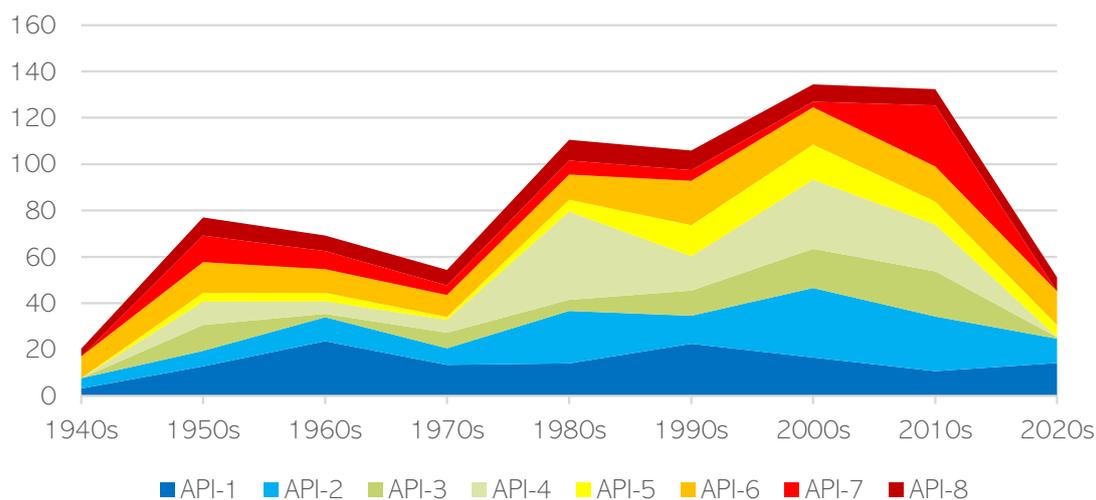


Figure 5.50 Stacked area graph of the scales' area transformation in chronological order

Figure 5.50 presents valuable insights into the changing housing design and architecture trends. It showcases how privacy and individuality have become increasingly important in modern-day homes

and how these factors have greatly influenced how people design and build their living spaces. Further investigation is required to fully understand the transformations that households have undergone over the decades, which is shown in Figure 5.48 as it compiles each household on the decade their houses were built and orders them according to their ethnic identities.

As per the previous findings, API-1 and API-2 also have the most area of the house, while API-7 and API-8 have the least. However, it's important to note that the in-betweens vary from one person to another. To better understand the trends, a closer look at the 1960s, 1980s, 1990s, and 2000s is needed. In the 1980s, most houses had no API-3, and some did not have API-5. The highest areas were at API-1 and API-2, which signifies the intense need for communal space within the house. This could be due to the social norms of that time, where different families would gather to work together, either weaving palm leaves for wall materials or roof, or to prepare fishing equipment together. Overall, this information highlights the importance of understanding the evolving trends in housing design and architecture, and how they are influenced by cultural and societal factors.

An assessment of the room number transformation is to study a part of the partitioning level in the physical order of built environment transformation. The total rooms are assessed along with public-private scales in a house because if the hypothesis is correct that each person wants to increase the size of their house due to an increase in needs for more complex activity that requires more elaborate distinction then the total rooms will also increase as well as the public-private scales in the houses.

Figure 5.51 tries to prove this hypothesis, where the transformation of public private levels is represented with the orange lines and the total rooms of each house are represented with the blue bars. The graph is in chronological order and from the Manggarai to Bima, Bugis and Bajo informants. As the earlier findings indicate, most houses increase in room numbers to almost twice their original amount, except the government subsidy recipients in one of the Manggarai informants. One of the Bugis informants also did not experience an increase in the number of public-private scales, but they did increase the number of their rooms. One Bajo informant experienced a decrease in the number of public-private scales throughout the changes between the first and second house. As mentioned earlier, this was due to a sudden and necessary move which forced them to make a temporary house.

To assess these statistics from each ethnic group, Figure 5.51 showed that the Bajo households increased their room numbers exponentially to more than three times the initial number. This is due to the changes from a single-family residential function to also providing accommodation for rent. The switch from single function to multifunctional is required in the adaptation process to the booming tourism industry in a strategic area where the land and building tax increased exponentially and the opportunity to gain side income is abundant.

To analyze the average trend of each decade, as mentioned before, the sample data of each decade is not enough to portray a clear representation. Seen in Figure 5.52, the trend is unclear whether the room number and scale number is increasing each decade or not. This is simply due to the limited

sample size of each decade. It would be advisable to gain more data based on each decade in addition to the sample size representing various ethnic groups if a clearer transformation depiction is needed. Yet this research is focused on how the memory recollection can be used as a source of understanding past versions of their vernacular architecture, therefore this is not a big concern for this research and serves more as an evaluation of the methodology and data sampling.

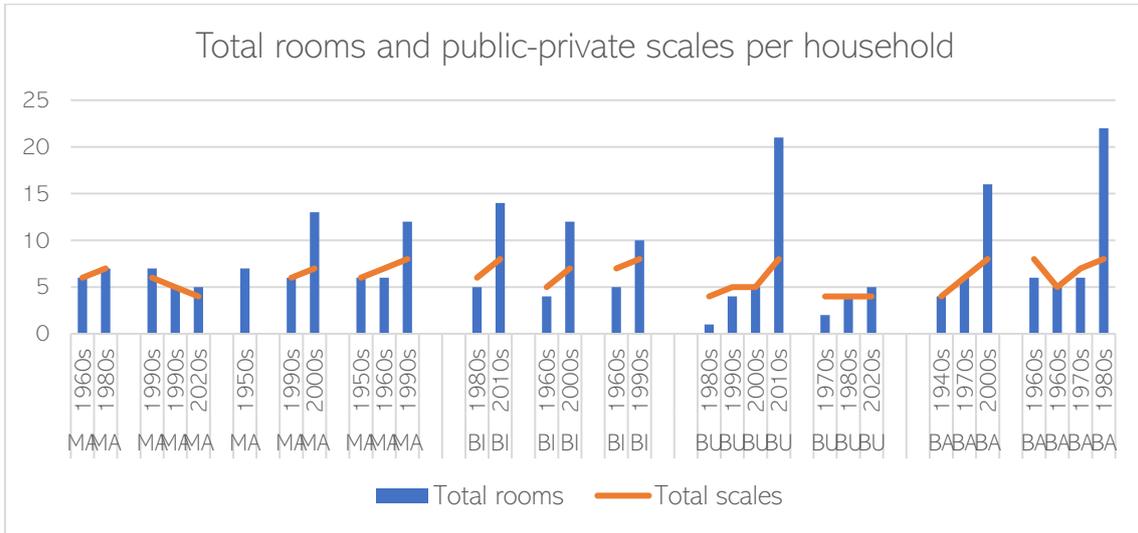


Figure 5.51 Total rooms and public-private scales increase per household

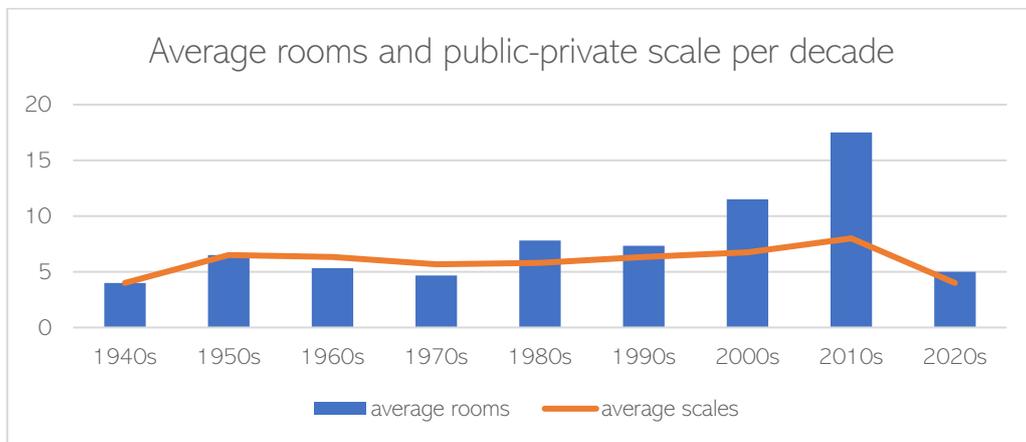


Figure 5.52 Average rooms and public-privacy scales per decade

The room number analysis works to find the patterns of increasing or decreasing needs that are portrayed in the floor plan and partitioning used by the people to distinguish one place from another. The proximity of the houses to the tourist destinations also has a more visible pattern compared to their ethnic identities or the decades the houses were built. The proximity categories show that the strategic places tend to partition their house to provide more functionality in adaptation to the tourism industry available on their doorstep. While on the other end of the spectrum, the periphery areas have more spacious plots of land where they can continue to expand the number of their rooms as they

please. Whether they have experienced economic benefits from the tourism industry is out of the scope of research and could be explored further if necessary. The findings here should also be considered with the limitations in recollecting the time of the renovations and even though the houses were built in those decades, the number of rooms might be an addition in the later decades.

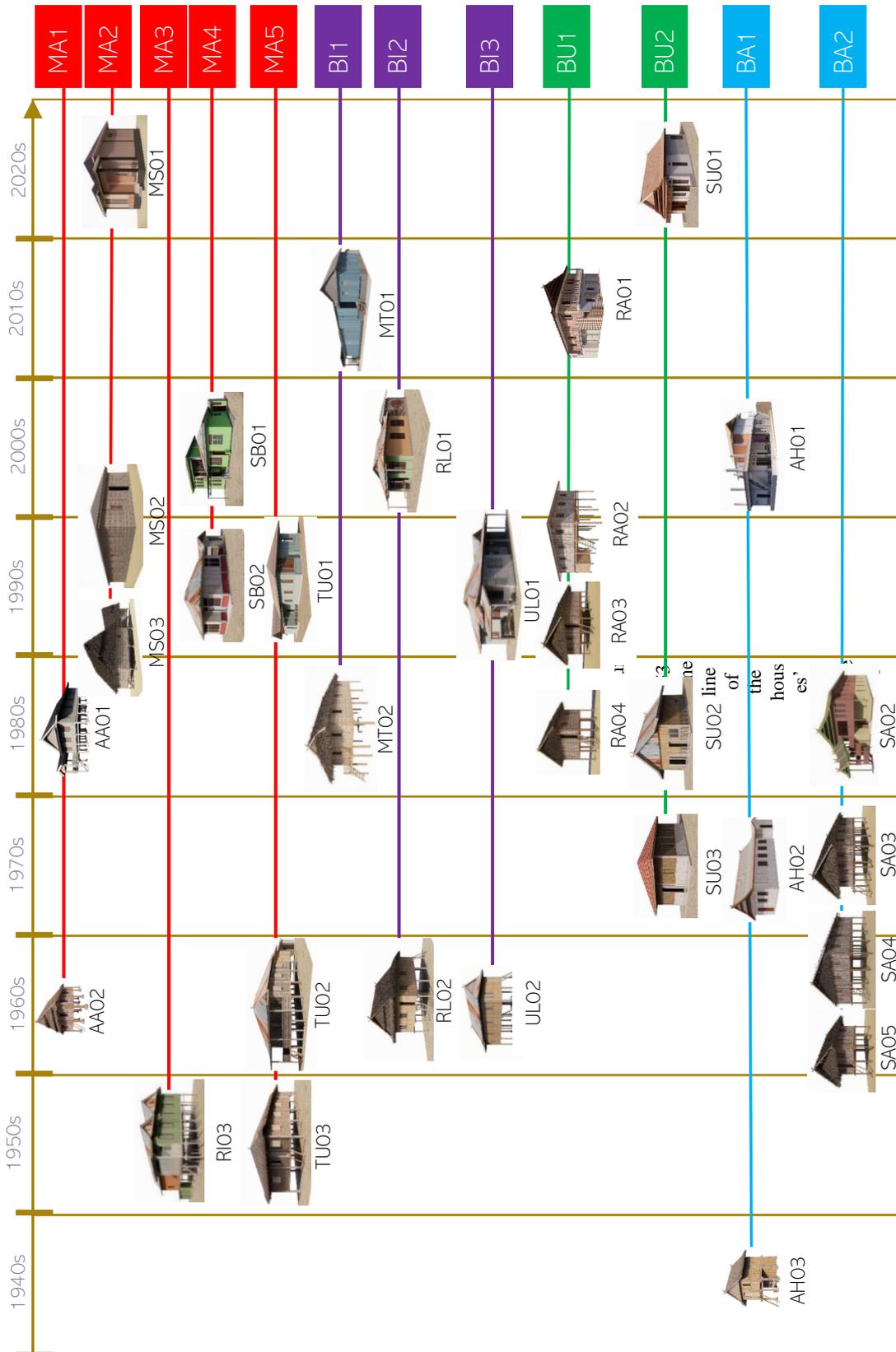
The shift towards landed houses is likely to result in an increase in the number of scales, leading to a more hierarchical relationship between hosts and guests. This is because the spaces in the house become more distinct, with some being accessible to certain people only. As a result, the lifestyle of residents and how they interact with visitors and other people may be affected. The trend of opening the house to strangers, acquaintances, friends, neighbors, and extended family members may decrease as residents become more reserved and closed.

This trend can be seen as a reflection of the modern lifestyle that is more supportive of individualism and less reliant on communal living. One question that arises is whether it is possible to maintain the openness of earlier forms of vernacular architecture while still providing the privacy that is necessary in the modern lifestyle. Another important question is how tourism has impacted this change in lifestyle and vernacular architecture. Further investigations are needed to figure out which makes the most impact, the distinction and segregation that comes with a landed house or the modern individualistic lifestyle? Is it possible to continue their openness in their earlier forms of vernacular architecture and still allow privacy needed in the modern lifestyle. How far has tourism impacted this change in lifestyle and vernacular architecture? How will this change affect the young generation and how their houses will be in the future?

## **5. 2. Houses of Labuan Bajo in the present and past**

From the sketches collected through the direct observations and interviews, there were 30 houses from which we can observe the changes throughout the decades. Figure 5.53 shows the timeline of the houses that were experienced by the informants who participated in this study. From the 12 informants, this study has collected houses that were built from the 1940s to as recently as 2021. Figure 5.53 shows the different cultural identities associated with the informants and separated the houses in those four categories. The first category shown is the Manggarai group where the greatest number of houses were collected with 11 houses from 5 informants; the second category is the Bima group with 6 houses from 3 informants; the third category is the Bugis group with 7 houses from 2 informants, and lastly the fourth category is the Bajo group with 7 houses from 2 informants.

Figure 5.53 describes the evolution of the houses in the sample set over the decades from the 1940s to the 2000s. The first landed house was from the Bugis and Bajo group in the 1970s, and the first Manggarai landed house was in the 1990s. Similarly, the first Bima landed house was also built in the 1990s. But by the 2000s, only the RA02 from the Bugis group was the only stilt house in the sample set, while almost all landed houses in the 2000s were made with brick walls and RC structure.



Furthermore, the figure highlights that visually it can be understood that the brick and wooden board wall combination was only used in the 1970s to 1990s. It also provides information about the houses from different groups in the sample set and the data available for each group. The Bugis houses in this data set were only from the 1970s, with no information on houses earlier than that decade. The earliest Bima house was from the 1960s, with no data of houses before then. The earliest Manggarai house was from the 1940s, but the data lack the houses built during 2010s. Similarly, the earliest Bajo house was also from the 1940s, and no data available for houses built from the 2010s until the 2020s.

Overall, this text provides an insightful glimpse into the evolution of different types of landed houses in a sample set, highlighting the differences in construction materials and techniques across different decades and groups. From the direct observation and interviews, some informants have provided access to their houses, and some have described their previous houses. The next subchapters show the houses redrawn and modeled from the sketches and descriptions from the informants. The subchapters are also divided by proximity and by ethnic groups.

#### 5. 2. 1. Design analysis of houses within the same proximity

Previously during the analysis, there were findings related to the proximity of the houses to the tourist activities. After the previous subchapter explores the physical and territorial orders of the transformations, this part of a subchapter will analyze the cultural analysis of the houses within the same neighborhood. Figure 5.54 shows the timeline of the houses with the 3D renders that are in Soekarno-Hatta neighborhood. There is only one Manggarai house in the neighborhood, two Bima houses from the same informant, 7 houses from two Bugis informants, and 7 houses from two different Bajo informants. The majority in the area are from Bugis and Bajo groups, which makes the sample have a similar composition.

In Figure 5.55 the 6 existing houses is shown with their locations in the neighborhood. Most of these houses have predecessors in the same area, as described in the Figure 5.54 and Figure 5.55 where SU01 has SU02 and SU03 in the same location before, etc. The only exception is SA's houses, where the SA03, SA04 and SA05 were not in the same location as the current SA02. RI03 is the furthest from the group, yet almost like SA02 by its proximity to the marina. The SU01, RA01, AH01 and MT01 are all near one another in the Kampung Air part of the neighborhood.

Soekarno-Hatta Street neighborhood has a strategic potential for tourism activities. By analyzing this area, the effects of the tourism industry can be assessed as they impact the transformations of the vernacular architecture. First the assessment will be in the year of construction of these houses. The oldest house still standing in the area is RI03 from the 1950s, the next oldest house is SA02 from the 1980s, AH01 from the 2000s, RA01 and MT01 from the 2010s and lastly SU01 from the 2020s. The order is from the Manggarai house, Bajo, Bajo, Bugis, Bima and Bima. However, this does not represent the actual order of settlement in the area.

Most of the houses have other functions apart from a simple residential dwelling. SA02 and AH01 provide rented long-term accommodation for out-of-town workers and students. Ah01 also has for rent commercial spaces, which are now being rented by a phone shop and a convenience store. RA01 was renovating a part of his house to provide a room for tourists to stay in as homestay accommodation. MT01 has a dessert beverage business and SU01 has a kiosk business like a bodega or a convenience store. The only house in this dataset in the neighborhood with no commercial is RI03, where the house was not even inhabited any longer, it was said that it was due to its dilapidated floors. Except RI03, all houses have adapted to the opportunities brought on by the development of the tourism industry.

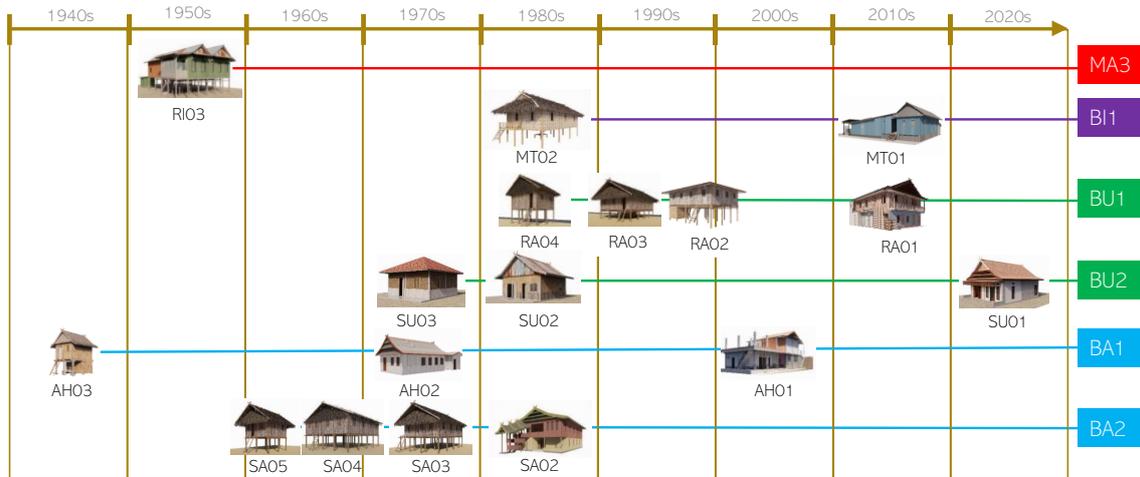


Figure 5.54 Timeline of the houses' 3D renders in Soekarno-Hatta Street neighborhood

RI03 is the only Manggarai house in the area, serving as a case of transformation from the other Manggarai houses located far from the coast. There is only one Bima house in the area, serving as a comparison to the other Bima houses far from the coast. While the Bugis and Bajo houses in this sample set are only found in this neighborhood, which can be used as the influence giver to the Bima and Manggarai houses, if applicable.

Table 5.2 shows the layout analysis of the houses' public-private levels. The houses' layouts are coded with the ethnic identities (MA for Manggarai, BI for Bima, BU for Bugis, BA for Bajo), followed by the house codes (RI03 means that it is RI's third house in a reverse chronological order, while MT01 means that it is MT's current house), and the decade they were built. To visualize it further, the box of the house codes is colored to represent the position in the timeline, with brown as the 1940s-1960s, cream as 1970s-1990s and orange as 2000s-2020s. The order of the house from top to bottom is Manggarai and Bima in the same row, Bugis for the next two rows and Bajo for the last two rows. The horizontal order of the houses is displayed in chronological order.

In overall, the layouts of all the houses look like one another with the most private spaces (black areas) on the right side of the house, and the public areas (white spaces) taking the first squares of the house with the whole width of the house. The most private spaces are the main bedrooms, and the

most public areas are the guest living rooms. The kitchen and family living room are rendered dark grey, and the position of these spaces have changed. The layouts of these houses may show the transformation in the territorial order in each house.

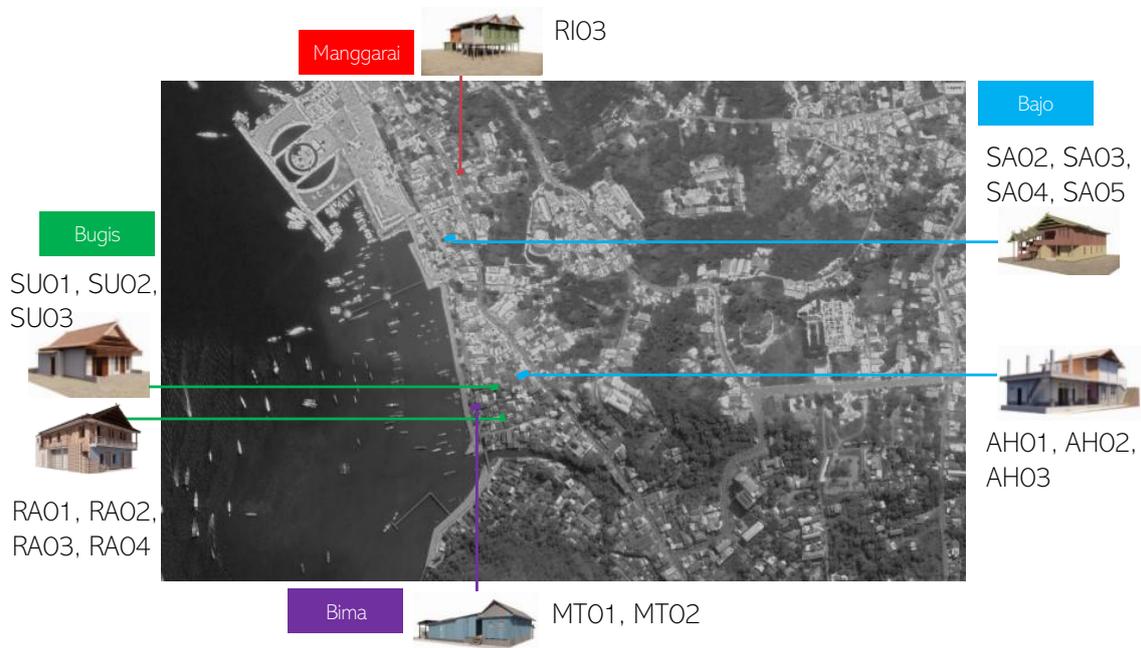


Figure 5.55 Observed houses in Kampung Tengah, Kampung Air and Kampung Baru

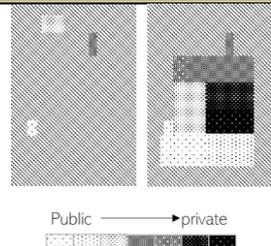
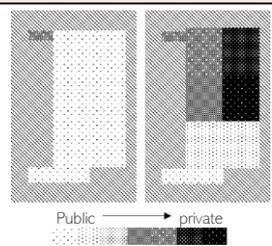
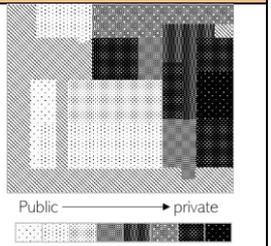
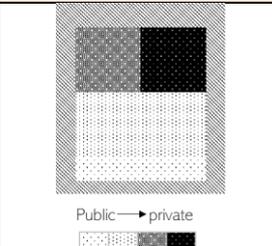
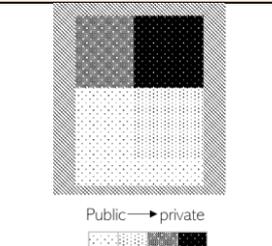
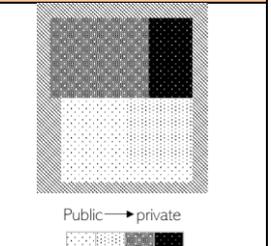
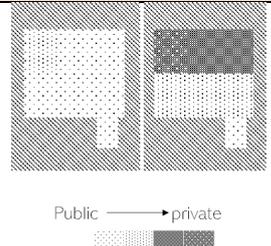
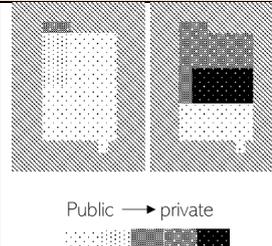
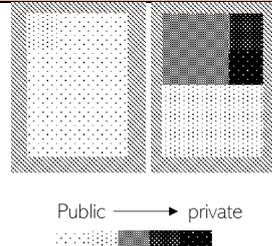
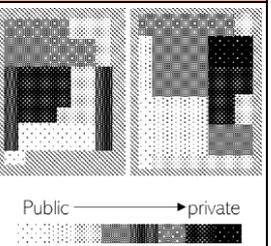
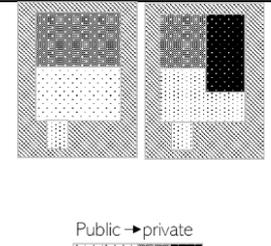
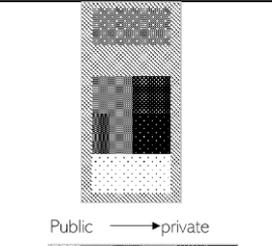
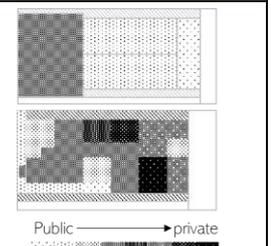
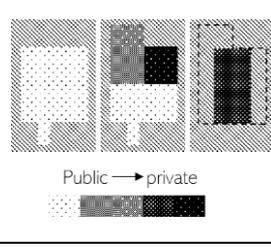
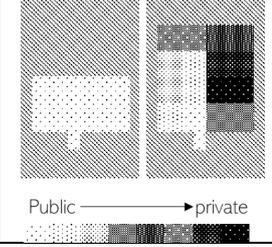
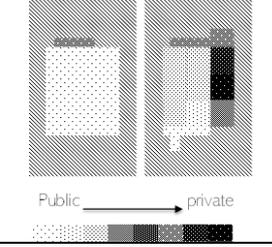
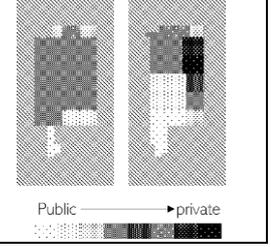
Most houses have the kitchen or family living room on the left side of the main bedrooms, in chronological order those houses are the AH03, SA05, SU03, SU02, RA03, RA02, and SU01. There seems to be a trend to move the position of the kitchen to the back of the house. Only SU01 has preserved the position of the kitchen in relation to the main bedroom, where other houses have changed. RI03, MT02, MT01, RA03, AH02, SA04, SA03, SA02, and AH01 do not have the kitchen next to the main bedroom. RI03 was the first house with the kitchen at the back of the house, this indicates the layout may be brought from the Manggarai vernacular architecture before they migrated to the coast.

In a glimpse, by the 2010s all new construction uses landed house as their chosen form. The last stilt house constructed was the RA02 from the Bugis group, in the 2000s. While SU from the Bugis group has been constructing his house as a landed house from the beginning in the 1970s. The shifts to landed houses requires them to find a replacement for the communal space that was the space under the stilt houses and may justify the increase in public-private distinction in the landed houses. The analysis will be divided into the three-decades' division. In the first phase, compiled in Table 5.3 is the earliest house built, the BA-AH03, followed by the MA- RI03 and BA-SA05 and lastly the BA-SA04. As mentioned earlier, the houses have similarities in the position of the main bedroom in relation to the guest living room. But the RI03 is the first to have the kitchen at the back of the house.

This might be an imported feature from their Manggarai vernacular architecture roots or part of a renovation done in the later decades. Same as the way the under space of the house is not utilized,

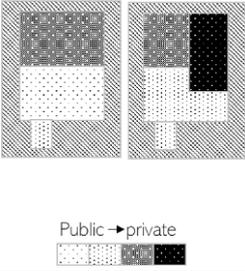
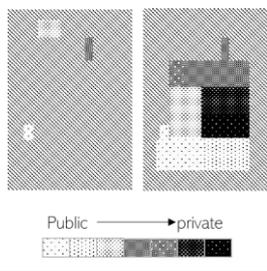
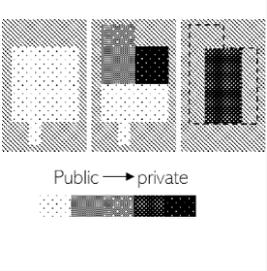
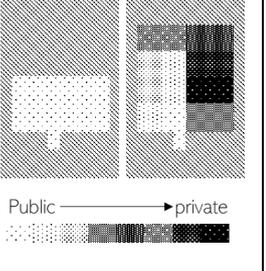
unlike the under-house spaces as the Bajo, Bugis and Bima groups where they spend the communal activities. There is also a pattern of the stairs or entrances coming from the left side, the farthest distance from the main bedroom's positions.

Table 5.2 Table of public-private levels layout analysis in houses in Soekarno-Hatta Neighborhood

1940s		2020s	
MA- RI03 1950s 		BI- MT02 1980s 	BI- MT01 2010s 
	BU- SU03 1970s 	BU- SU02 1980s 	BU-SU01 2020s 
BU- RA04 1980s 	BU- RA03 1990s 	BU- RA02 2000s 	BU- RA01 2010s 
BA- AH03 1940s 		BA- AH02 1970s 	BA- AH01 2000s 
BA- SA05 1950s 	BA- SA04 1960s 	BA- SA03 1970s 	BA- SA02 1980s 

In SA05, despite the simple house construction and layout, they said they utilize the attic space for keeping their daughters during ‘pingit’ period where the daughters are going to get married or betrothed and need to be kept away from prying eyes and people who are not family. This serves as the daughters’ room during those periods and has very limited access. The informant was adamant about sharing this part of the house, which was not mentioned in other houses during the investigation.

Table 5.3 Public-private levels in houses in Soekarno Hatta Neighborhood 1940s-1960s

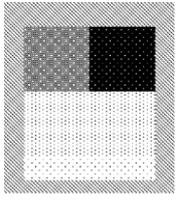
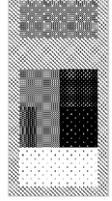
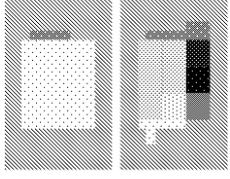
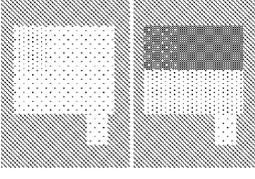
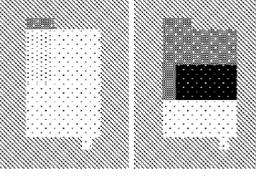
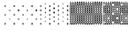
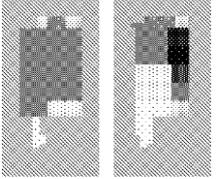
BA- AH03 1940s	MA- RI03 1950s	BA- SA05 1950s	BA- SA04 1960s
			

In the next group of decades, from the 1970s to the 1990s, there has been an increase in diversification of public-private levels as analyzed before as seen in detailed in Table 5.4. RA04 is the simplest form amongst all the houses in the dataset and was said to be a temporary house on a neighbor’s land. Then in the same decade, he was able to build another house with a unique layout unseen in other houses. The house is only partitioned into three rooms with the last room at the back of the house serving as his mother’s room and the kitchen. A sense of limitation still binds the decisions of this house, yet his creativity made it possible to break from the common layout.

The position of the stairs and entrance also differed from the earlier forms as they have more entrances on the right side of their houses, seen in RA04 and RA03. Although this might be a personal preference of RA, because as it was seen before, he tends to curve away from the common rules of their vernacular architecture. This might be because RA himself is a trained builder, therefore it is logical that he has more authority in deciding changes and what suits him best, rather than following the usual way of the community.

In these decades, there seems to be more variety in the houses’ layout as they started to switch to landed housing. A separate kitchen in the back of the house is also seen in AH02, a Bajo informant, where it was said to follow the common architecture that he sees in Manggarai houses. This is an interesting case as the Manggarai groups had no direct influence in the neighborhood, and it might not suit the environmental context of this coastal area. It might lead to an assumption that perhaps at the time the beach was already reclaimed. This also leads to another assumption that the influence of vernacular architecture was already widespread beyond proximity at the time. Different communities in different areas already influence one another, beyond the limits of their cultural identities. This may lead to a hypothesis that the Bajo people tend to be flexible and willing to adopt a new trend earlier than other groups.

Table 5.4 Public-private levels in houses in Soekarno Hatta Neighborhood 1970s-1980s

BU- SU03 1970s	BA- AH02 1970s	BA- SA03 1970s
 <p>Public → private</p> 	 <p>Public → private</p> 	 <p>Public → private</p> 
BU- RA04 1980s	BU- RA03 1990s	BA- SA02 1980s
 <p>Public → private</p> 	 <p>Public → private</p> 	 <p>Public → private</p> 

The next decades, the 1990s to 2020s, the layouts transform significantly as they have committed more to the landed houses form, complete with RC structures and brick walls. In the 2010s, tourism was introduced and developed greatly by the government. The houses diversified their rooms and the locations of their public, communal and private spaces are no longer limited to a duality of public and private areas.

Interestingly, the main bedrooms are still on the right side of the houses. Only one house had moved the kitchen to the right side of the house, but this might be due to the limited space in which they also need to reserve for rental accommodation functions. The main bedrooms of the houses are always located on the right side of the houses and might be related to the ‘main column’ which was referred to the first set of columns erected in the construction phase of a stilt house. This main column is a sacred spot in their traditional building rules, where they would hang a coconut, palm sugar and bananas and wrap a white cloth after the construction of the floor is finished, as shown in Figure 5.56. Most informants have shared how they have left this tradition because it does not come from Islamic rituals, and some explained that there is an adaptation to the ritual in RC buildings, where pieces of gold are embedded into the foundation before the concrete pouring began. Despite the changes in the sacredness of the rituals, the location of the main bedroom seems to be preserved in the same spot.

Overall, each phase of decades has its own unique characteristics. During the first phase, all shared similarities in the position of the main bedroom. However, the RI03 was the first to have the kitchen at the back of the house, which might have been an imported feature from their Manggarai vernacular architecture roots. In the next phase, from the 1970s to the 1990s, there was an increase in diversification of public-private levels, as seen in RA04, which was the simplest form amongst all the

houses in the dataset, and in RA03, which had more entrances on the right side of the house. During the final phase, the layouts transformed significantly as they fully committed to the landed houses form, complete with RC structures and brick walls.



Figure 5.56 Remnants of the sacred main columns

There is more variety in the houses' layout as they have started to switch to landed housing. It is also quite interesting to note that the influence of vernacular architecture was already widespread beyond proximity at the time, and different communities in different areas already influenced one another beyond the limits of their cultural identities. This will be interesting to investigate in future research because these findings can be applied to new designs.

#### 5. 2. 2. Manggarai vernacular architecture in Labuan Bajo

The data collected from five Manggarai informants regarding 11 houses reveals insight into the transformations of materials, layouts, room functions, and the evolving lifestyles of the inhabitants from the 1950s to the 2020s, shown in Table 5.5. These details shed light on the dynamic nature of their living spaces and how they adapt to changing needs and preferences. This can also be insightful to use in designing for the current context as to see the history embedded in this past architecture.

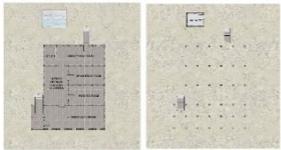
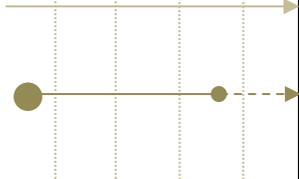
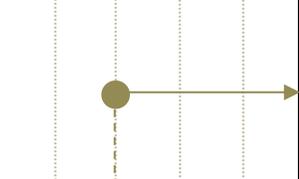
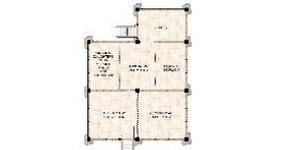
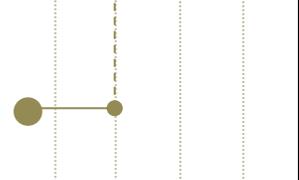
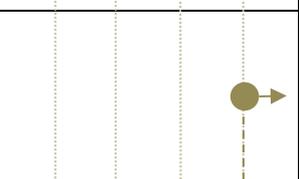
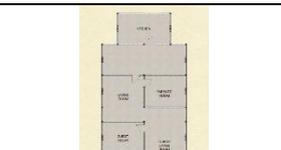
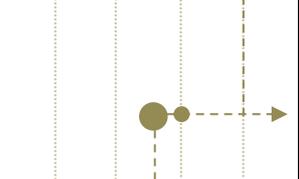
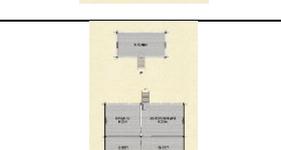
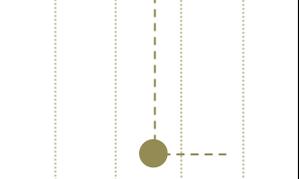
Firstly, the materials used in these houses have seen significant transformations over time. While some older homes featured traditional materials like brick and wood, newer constructions exhibited a shift towards sustainable and labor-efficient materials. This reflects the desire for more modern and efficient homes.

Then, the layout of these houses also showcases noteworthy changes. Older homes tend to have open spaces or rooms for many functions. In contrast, newer houses often feature closed individual spaces or with a more complex hierarchy. This shift underscores a move towards more rigid living spaces with a more complex relationship. Room functions have evolved in tandem with changing lifestyles. More rooms for more members of the family, and even individual rooms for each person if possible. The locations of these Manggarai households show less impact from tourism as they are in more peripheral and access areas in the tourism development scheme.

Lastly, the data highlights the shift in the lifestyle of the inhabitants. For example, where the decreasing of communal spaces and the increasing distinction of the public-privacy reflects the

decreasing communal lifestyle. In summary, the data collected from these 11 houses and five informants vividly illustrates the ongoing transformations in the materials, layouts, room functions, and lifestyles that shape our homes in response to the changing needs and preferences of homeowners.

Table 5.5 Manggarai informants' houses with floor plans, 3D renderings and time of construction

House code	Floor plan	3D rendering	Time of construction			
			1960	1980	2000	2020
RI03						
AA01						
AA02						
MS01						
MS02						
MS03						

Floor plan legend: Ba: bathroom; BL: 'bale-bale'; BR: Bedroom; BR1: Main bedroom (parents'); BR2: Unmarried daughters' bedroom; BR3: Unmarried sons' bedroom; ~BR3: also functions as unmarried sons' bedroom; K: kitchen; L: living room; L/F: living room/family room; L/G: living room/guest room; R: room for rent; R/C: rent for commercial space; S: storage; St: study; \*UC: under construction.

House code	Floor plan	3D rendering	Time of construction			
			1960	1980	2000	2020
TU01					●	→
TU02				●	●	
TU03			●	●		
SB01					●	→
SB02					●	●

The transformations observed in these 11 houses can indeed be closely linked to their proximity to the tourism activities. As mentioned before, the impact of tourism on the built environment of residential properties is multifaceted and can be categorized based on their location as strategic, access, and periphery areas.

Table 5.5 provides a comprehensive overview of 11 Manggarai houses, offering a holistic representation of each property by including essential details such as their 3D renderings, floor plans, and the time of their construction. The 3D renderings provide a visual insight into the architectural aesthetics and design of each house, allowing for a better understanding of their structural elements and exterior features. The accompanying floor plans offer a detailed layout of each house, indicating the spatial organization and allocation of rooms, thereby enabling an appreciation of their internal functionality. Additionally, the inclusion of the time of construction provides a temporal context, allowing viewers to assess the evolution of architectural styles and design trends over different eras. Together, these elements in Table 5.5 serve as a valuable resource for evaluating and comparing the 11 houses in a comprehensive and visually informative manner.

### **R.I.'s house in Kampung Tengah**

RI is of Manggarai ethnic identity. He is the 5<sup>th</sup> dalu of Nggorang, the customary judicial area wherein Labuan Bajo is located. His predecessor was his oldest brother, UI, who was intended to be an informant and had a brief talk with the team at the beginning of the survey but was prevented from participating in the interviews by his daughter due to his old age and deteriorating memory. The dalu title was then given to RI at the beginning of 2021. In his short 'term of office' he admitted how he has limited knowledge and memory regarding the history of Labuan Bajo, of their family's history and the houses' transformation history. The issues regarding land certificates' contentions also furthers his openness in describing the sensitive areas to which the research brushes.

The house observation and one interview with RI are shown in Figure 5.57 and Figure 5.58. A paper related to this research referred to this house as the Kampung Tengah Manggarai House, appertaining to the location of the house in Labuan Bajo, but in this research, it will be referred to RI03. The code name refers to the reverse chronological order of when RI lived in the house. Even though the first interview we had with RI took place in RI's current residency, RI was not comfortable with the team to observe it. The RI02, or his previous house before the current one, was already torn down to build a house for tourist businesses to rent (last renter used it for an in-town office and shuttle bus stop for customers to be carried to their main location).



Figure 5.57 Direct observation to RI03 or the Kampung Tengah Manggarai House



Figure 5.58 Interview process of the Kampung Tengah Manggarai House or RI03

RI's family no longer uses it, and he insisted on the survey team not going inside the house due to safety concerns of the house's old age and the structures' unkept conditions. However, considering the location of this house, on the town's coast and amongst Bugis and Bajo houses, this house acts as a good portrait of the Manggarai house in Labuan Bajo. This house was also the house of the late previous Manggarai leader or 'dalu' of the Nggorang region, RI's father, who was the first dalu to live by the coast.

The RI03 is located on the coast of Labuan Bajo (Figure 5.60) making the 'lowland' context on the extreme opposite of the spectrum in comparison to Wae Rebo, a highland Manggarai traditional house, shown in . Most residents in that area were of Bajo and Bugis cultural backgrounds, or other foreigners who were traders and settled due to the good trading activities. As mentioned earlier, the owner of the house was the first 'dalu' of the Nggorang principality to reside in the coastal areas. This 'dalu' was married to a Bugis woman and had five sons and four daughters. The informant was the third son, and the second successor of his father, after his eldest brother retired from the position due to old age. He was living in a nearby coastal area, following the marriage custom of living with the wife's family until they have a house on their own, when he was appointed as 'dalu' of Nggorang. Then he decided to move, not back to Nggorang, but to Kampung Tengah to be closer to the activities of the people he governed (Koentjaraningrat, 1972). When he moved circa 1956-1957, Nggorang was a small village compared to the hustle and bustle of the markets and people in Labuan Bajo. The house was built at the same time and was where the former 'dalu' passed away.



Figure 5.59 Wae Rebo Traditional Village in 2015

Together with the informant, we drew the layout of the house. The layout Figure 5.61 shows how the division of rooms has a similar approach to the 'mbaru niang' yet differs in the scale. This house accommodated only one family, hence giving the two permanently partitioned rooms to the parents

and the unmarried daughters. The unmarried sons' sleeping quarters were said to be only divided from the hallway with a curtain.

In the RI03, the public space is in the front and is usually the biggest room of the house. A doorway layered with a curtain is the gateway to the private space and goes to the 'hallway' where another curtain partially partitions the sons' quarters. The parents' room is located nearer to the living room and the daughters' room is further back. At the end of the hallway is another curtain that leads to the living room for the family and the kitchen. This space is used for preparing the ingredients or other steps of cooking and gathering with the nuclear family or other close relatives that come by. This room has another door with stairs that go down to the land, where their crop garden and bathroom are located. In total this house has two doors that can be accessed from the outside, with one acting as a private door and the other as a public one. The public one has a balcony to add distinction to visitors who do not want to intrude the residents inside.

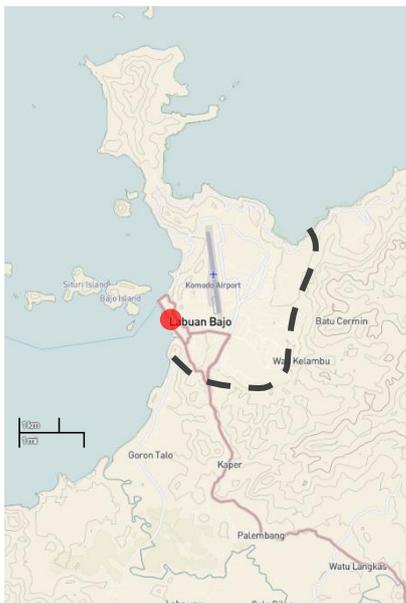


Figure 5.60 Location of the RI03

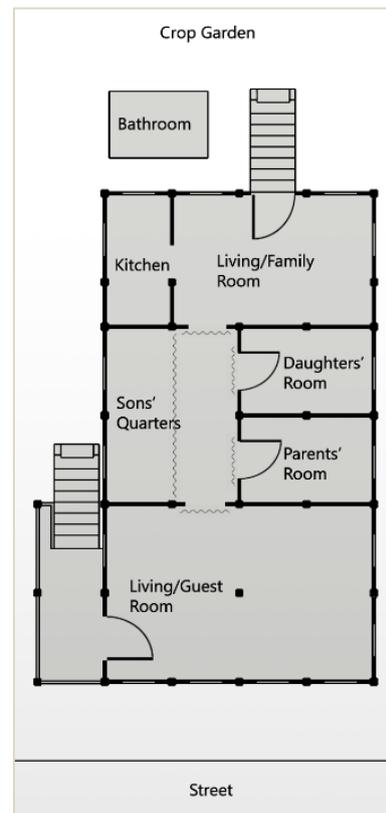


Figure 5.61 The layout of the RI03

Like the typical coastal houses, the underside of the house was utilized to keep pets, lumber and to do other activities in the daytime. The stilts or the posts of the house were initially taller, going up until two meters high, and was a good strategy to combat the western monsoon wind. The western monsoon wind usually detains the residents inside their houses, and this taller house type is said to be good for keeping things dry and safe from the downpour and flash flood from the hills. The number

of stairs is also accustomed to the traditions of the coastal people with odd numbers preferred by the Bajo and Bugis people.

Compared to Khambali and Lukito's research, this house has several differences. Firstly this house still exists even though uninhabited and has an unaccessible interior (Khambali & Lukito, 2022). This house only belonged to one family and furthermore to a special Manggarai family who lived in the area of Bugis and Bajo people, hence making this house unique and does not resemble all Manggarai houses in the coastal area. The interview was done only with one member of the family who owns this house, thus not maximising the potential of the oral history tradition.

Comparing the 'mbaru niang' to the Kampung Tengah Manggarai house, we can see some similarities aside from the obvious distinction brought by the geographical context. The similarities lay in the public areas that are in the front of the house and are both located in front of the main post. The main post in both Manggarai and coastal (Bajo and Bugis) architecture has the same sacred value. Therefore, in a way, guests to both houses are welcomed by the host and the ancestors.

The kitchen is also paired with a gathering space exclusively for the family. Same goes for the positions of the rooms where the parents' room are located more upfront in the house compared to the unmarried daughters' room. The sons' quadrant on the other hand is a little bit more private in the Kampung Tengah house. This might be due to Labuan Bajo being a bigger town with a wider variety of people and guests compared to the isolated village of Wae Rebo where the guests will mostly be family or a distant relative. A bathroom is also available in the Kampung Tengah house, this may be because of the ease of access Labuan Bajo has to imported products and technology.

Lastly, the biggest difference is obviously the shape. The shape responds to different geographical contexts and their source of livelihood. The highland Manggarai architecture in Wae Rebo is a product of an agrarian society while the lowland and coastal Manggarai architecture has adopted many forms that are used by their neighbours on the seaside. Food scarcity is no longer a problem when they are near to the market hence reducing the space needed for storage. The shapes also answer to the demands of living in the different geographical contexts, where floods and monsoon season need to be anticipated. The number of families living is also different and may be the product of modernisation where nuclear families can be independent because they no longer need a village to work the land and produce crops together.



Figure 5.62 The front of the house, obscured with kiosks and on-street parking (left), the side of the house with the protruding entrance area (middle), space under the house is utilized currently (right)

In comparison with the experiment of memory recollection in reconstructing the Tazo traditional architecture (Khambali & Lukito, 2022), there are several differences in the characteristics of the house. The method only included the interview part and did not ask the community members to confirm the sketch. Although confirmation from other members of the local community might be applicable in future research as the house had an important role for the society in the past.

To describe the floor plan and materials of the built space better, the floor plan rendering was made with materials as well, shown in Figure 5.63. The rendering was furthered to depict the house without any obstructions, like in Figure 5.62, and is rendered in its current form, shown in Figure 5.64.

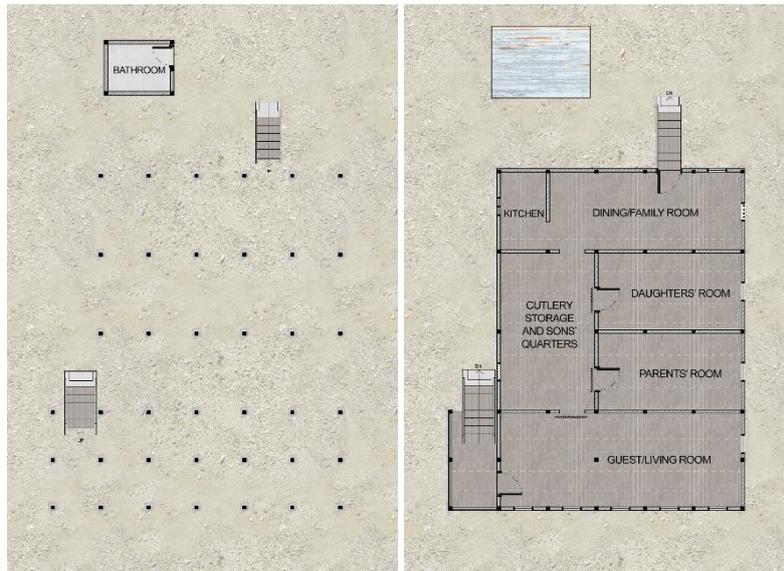


Figure 5.63 Floor plan of RI03 with material rendering

At the nominal level, the house's partitioning can be assessed by examining how the interior space is divided into different rooms or functional zones. This analysis involves understanding whether the partitioning aligns with the occupants' needs, providing an optimal balance between privacy and connectivity. Evaluating the partitioning in a house, you might consider whether it caters to contemporary living patterns, including open floor plans, flexible spaces, or adaptable layouts.

Moving on to building elements, the review should focus on the materials and structural components that make up the house. This involves an assessment of the quality and durability of these elements, as well as their compatibility with the overall design and the surrounding environment. Evaluating building elements according to Habraken's theory means ensuring that they are not only functional but also contribute to the aesthetics and sustainability of the house.

Configuration levels encompass both the building and floor plan. When reviewing the building configuration, it's essential to consider the external design and how it relates to the house's context, including the neighborhood and landscape. Does the house's architecture harmonize with its surroundings, or does it clash with the existing urban fabric? Regarding the floor plan configuration, the review should analyze the spatial arrangement and layout of rooms. Is the house designed to

accommodate various lifestyles and preferences, or does it impose a rigid structure that may not suit modern living?

This image in Figure 5.64 shows a comprehensive depiction of the house is achieved, it becomes possible to delve into a detailed study of its architectural elements without any other nearby buildings obstructing the view. This unobstructed view serves as a significant historical record, allowing future architects and historians to gain valuable insights into how the first Manggarai leader, who relocated to the coastal areas, masterfully designed his dwelling. This house stands as a remarkable amalgamation of Manggarai and Bugis architectural elements and cultural traditions, providing a unique and invaluable resource for understanding the fusion of these influences, architectural evolution, and the historical context that shaped the coastal communities in the region.



Figure 5.64 The 3D render of RI03

The layout of the house further exemplifies the fascinating fusion of Manggarai and Bugis lifestyles. Notably, the positioning of the main bedroom on the right side signifies a strategic arrangement that reflects the common reverence that is preserved until now. In contrast, the kitchen's location at the back of the house, distant from the main bedroom, underscores the influence of Bugis culture, where cooking areas are often placed in more secluded sections to minimize heat and potential fire hazards. This harmonious blend of Manggarai and Bugis traditions within the house's layout highlights the adaptability and creativity of the first Manggarai leader in crafting a living space that honored both cultural legacies while considering practicalities and the coastal environment.

On the day of the survey, we noticed that the coconut, banana, and palm sugar traditionally utilized in Bugis construction rituals were still suspended from the main post. However, it was intriguing to observe that the main post in this house was situated in the first row of columns, deviating from the

typical Bugis and Bajo house construction where it occupies a central position. This unique placement of the main post is exemplified in Figure 5.65, which illustrates the demarcation of public and private zones within the house. Normally, the main post is positioned in the main bedroom, but in this house, it was situated within the public area, signifying a distinctive departure from convention.

The story here centers on a unique Manggarai house situated in Labuan Bajo, where the dynamics of architectural transformations take center stage. The house in question showcases a fascinating blend of Manggarai and Bugis architectural elements and cultural traditions. This hybridization is a testament to the ever-evolving nature of architectural styles and design preferences, reflecting how they adapt to different cultural influences and practical considerations over time.

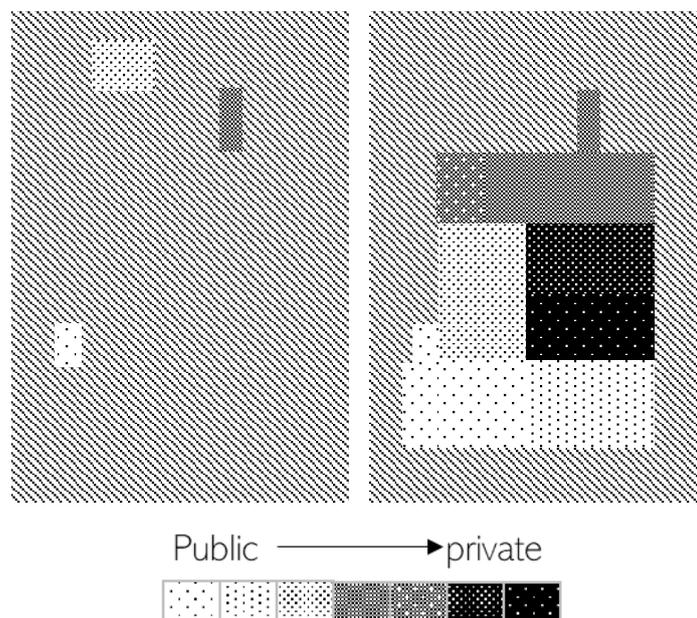


Figure 5.65 Public-private analysis of RI03

Remarkably, the house departs from the conventional layout found in both typical Bugis and Bajo houses. Its distinct feature is the strategic placement of the main post, as opposed to the traditional central position, along with an intriguing arrangement of interior spaces. This exceptional approach to the house's layout, which notably includes placing the main bedroom adjacent to the main post and positioning the kitchen at a distance, underscores the influence of both Manggarai and Bugis lifestyles. The house's transformation history becomes a critical focal point for exploring the nuances of Manggarai architecture and the accommodation of diverse cultural influences in the coastal community of Labuan Bajo.

The house's unique architectural arrangement, beyond its personal history, serves as a significant historical record. It allows future architects and researchers to gain valuable insights into the shifts in architectural preferences and the interplay of various cultural traditions, as well as how practical considerations and historical context shape a dwelling's form and function. By studying the

transformations evident in this house, a rich tapestry of Manggarai architectural evolution in a coastal context can be understood better, exemplifying the dynamic nature of architectural design and its adaptability to cultural diversity.

#### **A.A.'s houses in Nanga Na'e**

In Nanga Na'e, another coastal area, two houses constructed by AA exhibit intriguing architectural parallels with RI03. These similarities are particularly pronounced in the layout and room placement within these coastal residences. The main bedroom, much like RI03, is positioned on the right side of the house, creating a pattern of arrangement that echoes the Manggarai architectural tradition. In both cases, this strategic placement of the main bedroom fosters a sense of privacy while maintaining a connection to the central area of the house.

Additionally, both of AA's houses in Nanga Na'e feature the kitchen at the back of the house. The earlier house places the kitchen on the right side, while the subsequent one situates it at the far end of the left side. These variations in kitchen placement reflect adaptations to the residents' needs and environmental factors. The utilization of different sides of the house for the kitchen showcases how architectural elements are tailored to accommodate functional requirements. This approach mirrors the flexible and adaptable nature of these coastal houses and how their designs evolve in response to the shifting dynamics of daily life.

What's particularly noteworthy is that the latter of AA's two houses in Nanga Na'e share commonalities with RI03, even though these structures were constructed three decades apart. This continuity of design principles across different time periods underscores the enduring importance of the main bedroom's location, the kitchen's positioning, and other architectural features within the coastal Manggarai context. It illustrates how these traditions persist and remain relevant, ultimately revealing the resilience and cultural significance embedded in coastal Manggarai architecture.

The similarities between the layout and architectural features in both AA's houses in Nanga Na'e and RI03 raise intriguing questions about the existence of distinct and consistent principles within Manggarai coastal vernacular architecture. This observation strongly suggests that there might be a set of underlying rules or design conventions specific to this coastal context that warrant further in-depth investigation. By delving into these shared architectural elements and principles, we can gain a more comprehensive understanding of the cultural and environmental factors that shape the architectural identity of Manggarai coastal communities. Such an exploration can illuminate the enduring legacy of these architectural traditions and their role in creating resilient and functional dwellings adapted to the unique coastal way of life.

The visuals presented in Figure 5.66 provide a comprehensive showcase of AA's houses, offering insights into the architectural evolution of Manggarai coastal dwellings during the 1960s and 1980s. These detailed renderings, complemented by the corresponding floor plans and public-private layout analyses, serve as a valuable resource for future investigations into the intricacies of Manggarai coastal

and lowland architecture. The comparative study of these houses not only allows for a deeper understanding of architectural transformations over time but also offers a lens through which to explore the enduring principles and design conventions that underpin this unique architectural tradition. This visual and analytical material opens the door to further research, shedding light on the cultural and environmental factors that have shaped these coastal communities' architectural identity and providing a rich context for future architectural studies within the Manggarai coastal region.

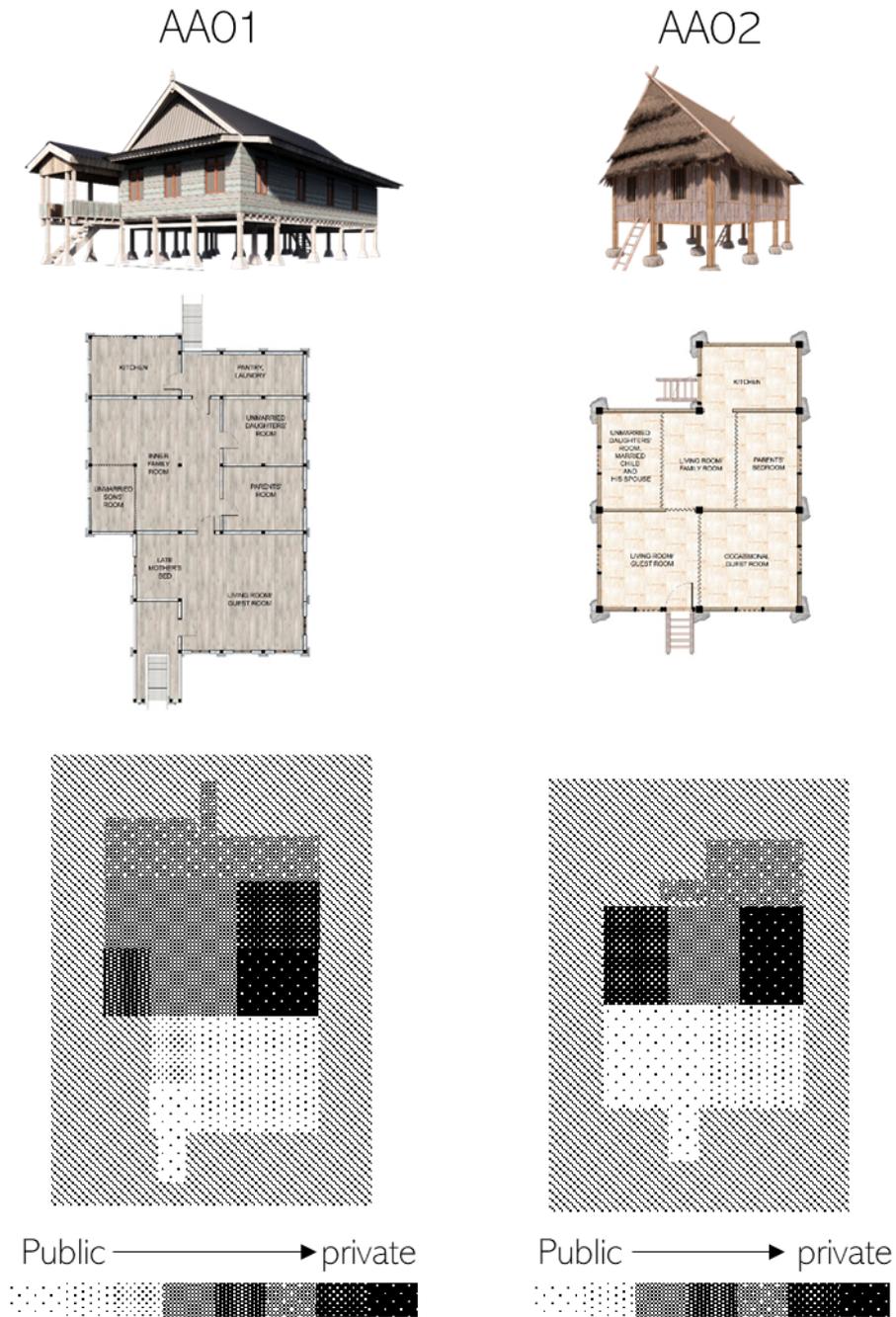


Figure 5.66 AA's houses in Nanga Nae with 3D render, floor plan and layout analysis

The documentation of AA's house in the lowland Manggarai context serves as a valuable resource for future design endeavors in the region. Firstly, it showcases how locally available materials and construction techniques were ingeniously utilized, offering insights into sustainable and regionally relevant design approaches. Secondly, this documentation is steeped in cultural and historical context, enabling designers to incorporate authentic elements and a profound sense of place into their projects, fostering a strong connection with the local community. Thirdly, it reveals practical solutions for addressing environmental challenges, as AA's house integrates climate-responsive features that can inform eco-conscious designs in the lowland Manggarai context. Additionally, the adaptability and resilience displayed by this house become a crucial reference point for contemporary designers aiming to create structures that are not only functional but also robust and enduring, adapting to the unique environmental conditions of the lowland Manggarai region. Ultimately, the documentation of AA's house bridges the past and future, empowering designers to draw upon established architectural principles while embracing innovation and sustainability in their lowland Manggarai architectural ventures.

#### **T.U.'s houses in Lancang**

In Lancang, a region of lowland Manggarai, TU's houses offer a unique perspective on architectural design within this distinct context. TU's three houses display intriguing parallels with RI03, particularly regarding the placement of the main bedroom on the right side of the house. However, they deviate in terms of the house's entrance, reflecting a subtle evolution in design principles over time. In the oldest house, the entrance is on the right side, while the newer house situates it on the left side, and the current house features an entrance almost in the middle but slightly to the left. This progression highlights an adaptation of spatial orientation in response to practical and cultural considerations.

Furthermore, TU's houses share the commonality of having the kitchen positioned at the back of the house. However, the current house takes a distinctive approach by placing the kitchen at the back and right side, setting it apart from RI03 and AA's two houses. This change in kitchen positioning underlines the dynamic nature of architectural design within the lowland Manggarai region. Interestingly, TU's houses also introduce a unique feature – a corridor in the middle of the house, facilitating access to rooms on both sides. This design element is not found in RI03 or AA's two houses and hints at variations in family structures. It suggests that TU's family may have had more daughters or married children living with their parents compared to RI or AA's families. This intriguing contrast in house layout underscores the multifaceted role architecture plays in adapting to family dynamics and local customs within the lowland Manggarai context.

Figure 5.67 provides an insightful display of the renderings of TU's houses, spanning the 1940s, 1970s, and the 1990s, accompanied by detailed floor plans and public-private layout analyses. These visual and analytical records offer an invaluable resource for future investigations specifically focused

on lowland Manggarai architecture. By studying these houses, which exhibit unique design principles distinct from the common records of highland Manggarai architecture, researchers can gain a deeper understanding of the specific regional architectural nuances within the lowland Manggarai context. This documentation becomes a crucial reference point for exploring the evolution of architectural practices, spatial arrangements, and cultural adaptations over time. In essence, the rich visual and analytical material presented in Figure 5.67 opens a gateway to an enriched exploration of lowland Manggarai architectural heritage and its enduring relevance within the contemporary context.

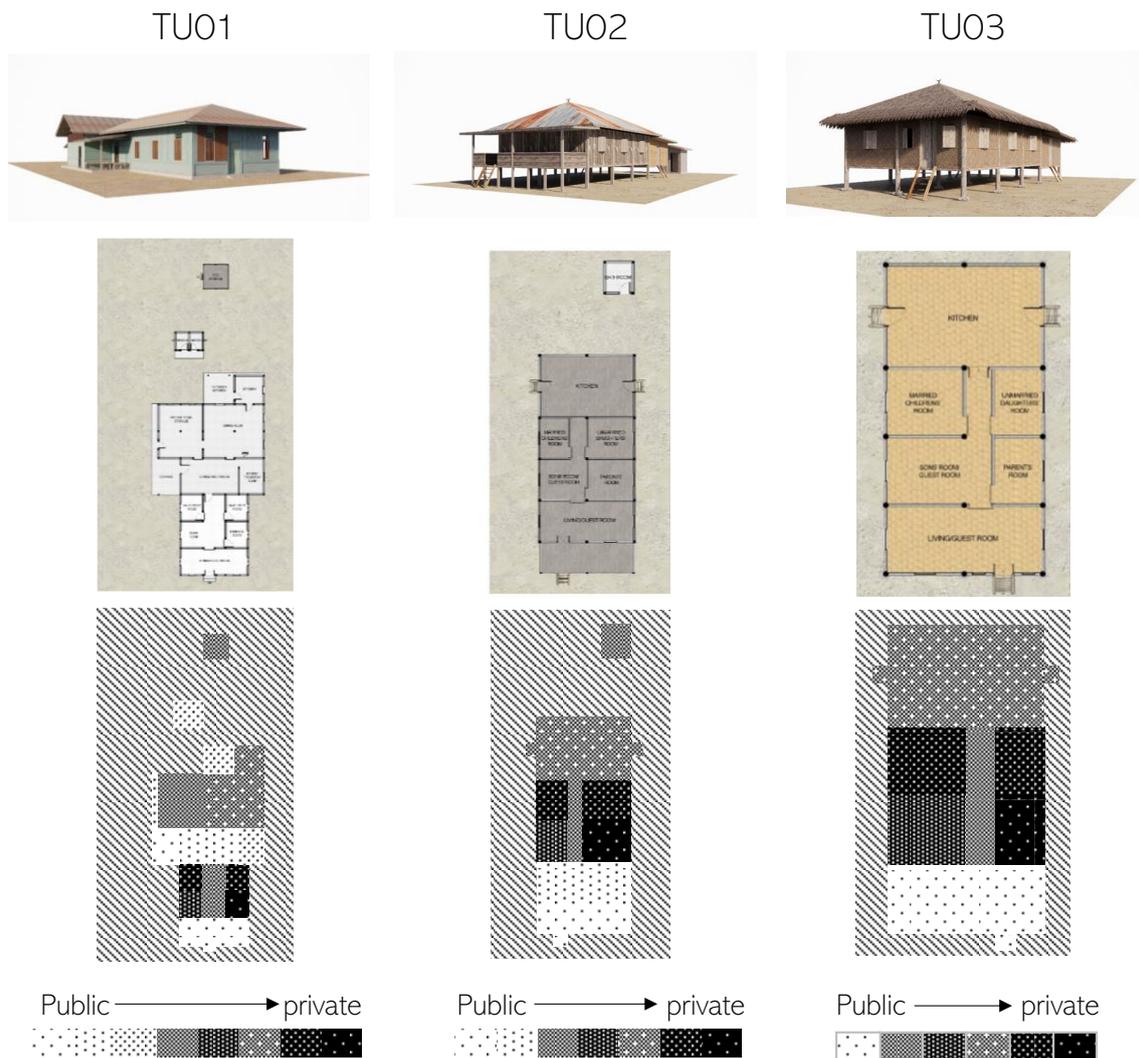


Figure 5.67 TU's houses in Lancang with 3D render, floor plan and layout analysis

Situated in the periphery areas of Labuan Bajo (Figure 5.68), TU's houses have the potential to expand over time. The peripheral location not only offers the luxury of space but also signifies a degree of proximity to the town's urban center, allowing for easy access to resources, trade, and interactions with the wider community. In this context, TU's family holds a unique historical position as they were the first to be granted authority by the Manggarai tribe leader, known as the 'dalu.' This authority was

extended to them to 'open' and manage the land in Lancang, signifying their crucial role in pioneering and shaping the development of this area. Such historical significance adds layers of cultural and administrative relevance to TU's house and the broader Lancang region, underscoring the entwined relationship between land management and architectural evolution within the Manggarai community.



Figure 5.68 TU house location

Exploring the architectural elements and transformations within TU's house provides valuable insights into the unique characteristics of Manggarai lowland vernacular architecture. By delving into the design principles and adaptations specific to this lowland context, we gain a deeper understanding of how these houses are distinct from both Manggarai highland vernacular architecture and the coastal lowland architecture. This comparative study sheds light on the nuances of spatial arrangements, room layouts, and structural features, reflecting the cultural, environmental, and historical factors that shape architectural choices. The architectural evolution within TU's house serves as a critical reference point for differentiating the architectural heritage of the lowland Manggarai region, contributing to a more comprehensive appreciation of the diversity and resilience embedded within Manggarai architectural traditions.

### **M.S.'s houses in Nggorang**

In contrast to the previously discussed houses, MS's house is in Nggorang, an access area of a tourism development scheme, for people going inwards the island. Notably in , MS's current residence takes on a distinct role as it is part of a government subsidy program with the specific objective of serving as a homestay for tourist accommodations. This marked shift in purpose and context is reflected in the house's layout and design. Analyzing the layout, it becomes evident that the house designed under the government program deviates significantly from the inherited lifestyle and vernacular architecture that characterizes the Manggarai region.

The architectural disparities between MS's house and the traditional Manggarai houses underline the transformative impact of tourism-driven development on the local architectural landscape. This

unique case demonstrates the adaptive nature of architecture in response to external influences and the dynamic interplay between heritage and modernization. It also serves as a case study for understanding how government initiatives can shape the architectural identity of a region and influence the lifestyles of its residents. In sum, MS's house provides a distinct lens through which to examine the intersection of tourism, government intervention, and architectural evolution within the Manggarai context.

The documentation of vernacular architectural changes, particularly in houses that have undergone interventions by external agents, holds immense significance. These architectural transformations, driven by factors such as government subsidy programs or tourism development schemes, provide a window into the intricate relationship between tradition and modernization. As the Manggarai region undergoes economic and cultural shifts, it becomes imperative to record and analyze these architectural shifts to comprehend how these external forces impact the communities' way of life and their cultural heritage.

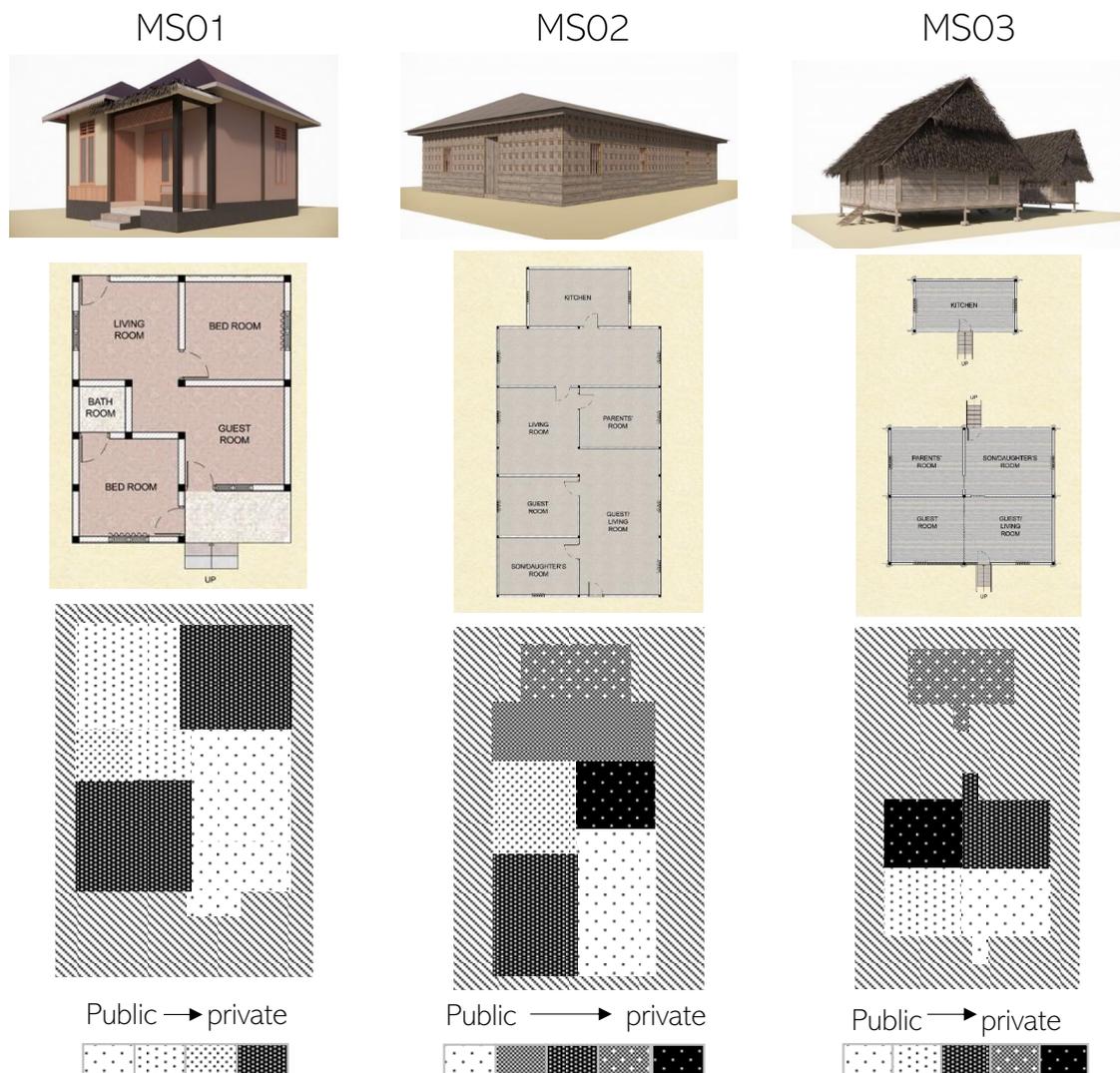


Figure 5.69 MS's houses in Nggorang with 3D render, floor plan and layout analysis

In cases like MS's house, where external programs play a pivotal role in shaping the architectural landscape, documenting these changes becomes not only an academic pursuit but also an ethical one. It is vital to preserve the heritage and traditional values that are embedded in vernacular architecture while acknowledging the inevitability of external influences. This documentation can illuminate the complexities and challenges faced by communities in safeguarding their cultural identities while adapting to economic opportunities. It highlights the delicate balance between the preservation of cultural heritage and the necessity for economic growth.

Moreover, further investigation is needed to delve into how recipients of these programs experience the transformations. Understanding the perspectives of the communities living in these altered spaces is essential for comprehending the full spectrum of their impact. This involves examining the social, cultural, economic, and environmental implications of such interventions. It is crucial to recognize the agency and resilience of these communities and how they negotiate their cultural values in the face of external pressures.

Ultimately, these documented changes offer valuable insights into the evolving nature of vernacular architecture and the multifaceted dynamics of the Manggarai community. By studying these transformations, we can gain a deeper understanding of the intricate tapestry of culture, heritage, and development that shapes the architectural identity of this region.

### **S.B.'s houses in Wae Mata**

In the context of SB's houses in Wae Mata, we encounter a fascinating example of modern lowland Manggarai transformations. His current residence, a two-story reinforced concrete structure, stands in stark contrast to the more traditional architectural forms discussed earlier. The significant transition in construction materials and techniques signifies the evolution of architectural practices in response to contemporary demands and economic opportunities. This architectural metamorphosis showcases the emergence of a new Manggarai vernacular that not only preserves elements of tradition but also integrates modern features.

The layout of SB's house exemplifies this shift in architectural design and lifestyle. While the main bedroom's position on the right side remains consistent with Manggarai tradition, the upper floor introduces additional rooms. Moreover, SB's family-owned rental boutique and salon on the premises reflect the contemporary trend of blending commercial and residential spaces, indicative of the economic diversification in the lowland Manggarai region. This dual-purpose layout underscores the adaptability of Manggarai architecture to accommodate both traditional values and contemporary needs. The transformation in SB's house serves as a compelling case study that provides insights into the ever-evolving trends and dynamics of lowland Manggarai vernacular architecture. Further research and documentation are essential to unravel the nuances of this architectural shift and its implications for the community's way of life.

Even in the periphery areas of a tourism development scheme, SB has displayed a remarkable commitment to expanding his house to encompass commercial activities within its confines. This entrepreneurial spirit, in conjunction with the evolving architectural layout, demonstrates the adaptability of Manggarai vernacular architecture in the face of contemporary economic opportunities. It reveals how even in the periphery areas where tourism development is shaping the landscape, individuals like SB are finding innovative ways to leverage their homes for both residential and commercial purposes, underlining the multifaceted role of these structures in the local economy.

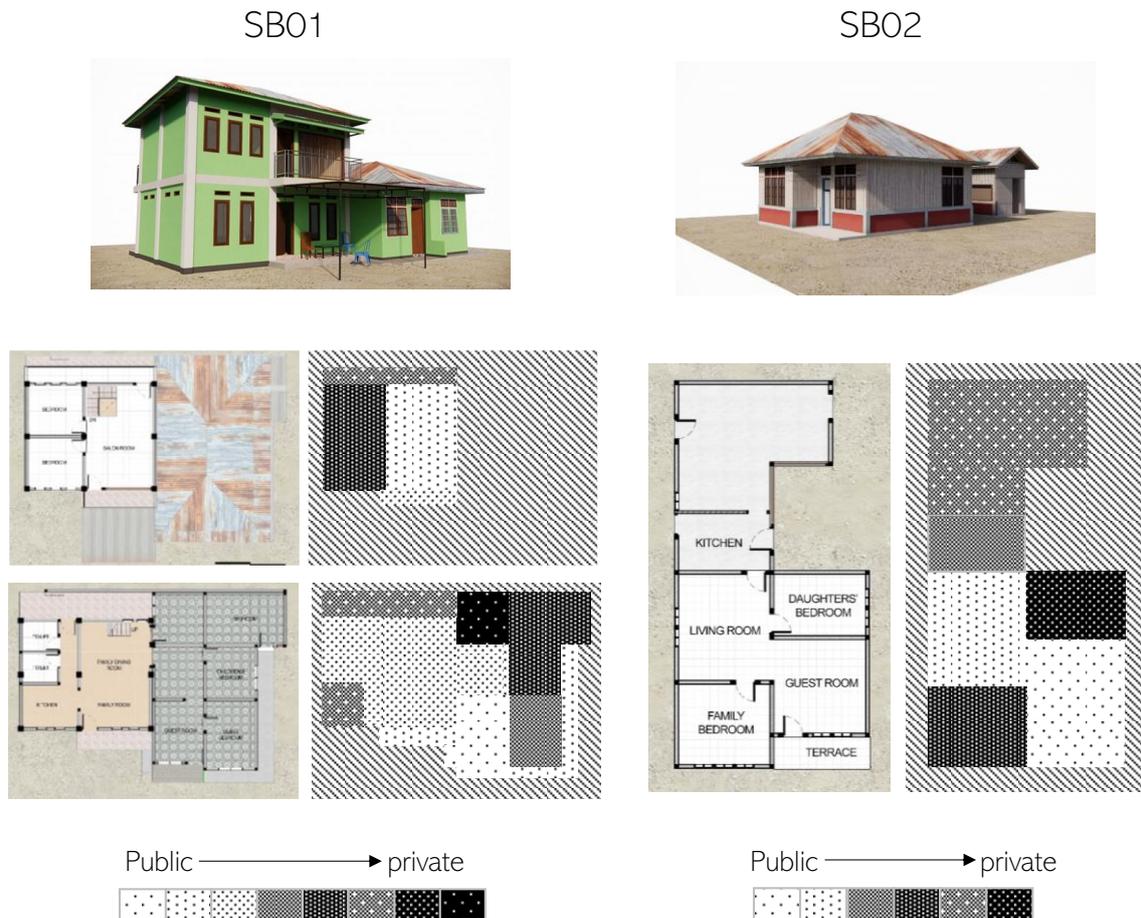


Figure 5.70 SB's houses in Wae Mata with 3D render, floor plan and layout analysis

Moreover, the peculiar placement of the kitchen in SB's current house sheds light on the fluidity of architectural arrangements in response to specific contextual factors. The kitchen's position at the front side of the house, while not unprecedented in other Manggarai houses, has an intriguing backstory. It is the result of the merging of the current house with the earlier one, leading to a centralized kitchen in the same area, specifically the front left side of the house. This narrative underscores the malleability of Manggarai architecture, which can seamlessly adapt to unique circumstances and changing spatial configurations while preserving the cultural essence of the

vernacular. These architectural transformations continue to enrich our understanding of Manggarai culture and offer a window into the complex interplay between tradition and modernity within the lowland Manggarai region.

The exploration of Manggarai houses, spanning various contexts from the lowland to periphery areas under tourism development schemes, offers a captivating insight into the evolving landscape of Manggarai vernacular architecture. These architectural investigations provide essential documentation and highlight the transformative impact of external agents and modernization on traditional structures. The significance of these findings extends beyond academic curiosity, as they bear relevance to both architectural preservation and future sensitive design practices.

The architectural transitions within these houses underscore the multifaceted dynamics at play. They reveal a spectrum of changes influenced by factors such as government subsidy programs, tourism development, and economic diversification. The flexible adaptation of these houses to accommodate modern requirements while retaining essential cultural elements underscores the resilient nature of Manggarai architecture. These findings emphasize the necessity for further research to comprehensively understand the nuances of architectural transformations and their implications for the community's way of life.

There are two important directions needed for future research. First, it is vital to continue documenting these shifts, preserving the vernacular architectural heritage of the region, and preventing the loss of traditional knowledge. Second, this ongoing research serves as a foundation for better-informed, culturally sensitive design practices in the future. By understanding the architectural transformations in various contexts, architects can create spaces that resonate with the local culture, ensuring a harmonious blend of tradition and modernity. Thus, the need for further investigation is not only an academic pursuit but a means to bridge the past and future, fostering architectural continuity and cultural preservation in the Manggarai region.

### 5. 2. 3. Bima vernacular architecture in Labuan Bajo

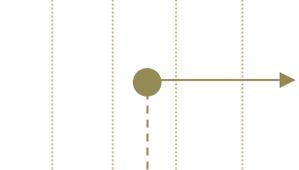
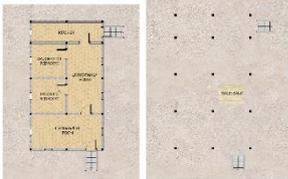
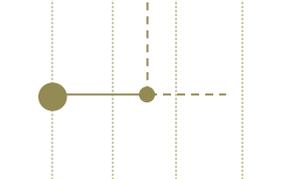
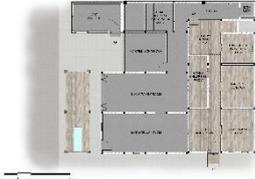
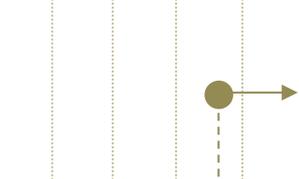
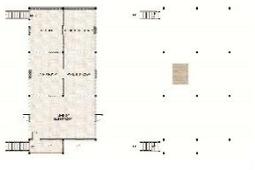
The analysis of Bima houses shows a contrast between two distinct locations: the coastal area and the flatlands, shown in Table 5.6. Within these contexts, the architectural transformations within the homes of various informants provide a compelling narrative of adaptation, responding to both external influences and local needs. In the coastal area, two informants have confronted spatial limitations, resulting in innovative solutions to maximize their living spaces. On the other hand, in the flatlands area, four houses of two informants enjoy more spacious lands, affording them the opportunity to expand their homes in their current forms.

A discernible pattern comes to light when examining the architectural history of Labuan Bajo, particularly in two distinct locations. The initial observation reveals a consistent practice, wherein early constructions in both areas adhered to the stilt house design, showcasing a shared traditional

architectural style. This choice in architectural form was deeply embedded in local practices and reflected the historical context of the region. However, a notable transformation becomes evident when considering more recent developments.

In contrast to their stilted predecessors, contemporary iterations of these dwellings manifest a departure from tradition. The predominant shift is observed in the adoption of brick and reinforced concrete as primary construction materials, accompanied by a transition from elevated stilt structures to grounded foundations. This transformation signifies a pivotal juncture in construction techniques and material preferences, marking a departure from the conventional stilt house paradigm. The prevalence of this shift across both locations underscores a broader architectural evolution that extends beyond Labuan Bajo, echoing trends observed in various regions. This architectural metamorphosis reflects the dynamic interplay of historical influences, socio-economic factors, and the inevitable impact of modernization on traditional building practices.

Table 5.6 Bima informants' houses with floor plans, 3D renderings and time of construction

House code	Floor plan	3D rendering	Time of construction
			1960 1980 2000 2020
UL01			
UL02			
MT01			
MT02			

Throughout the analysis, each informant's unique experience of house transformation will be explored, providing insights into the driving forces behind these changes. Accompanying this narrative, 3D renders, floor plans, and public-private layout analyses of their houses will be presented and dissected, shedding light on the adaptations in architectural design and layout. These findings underscore the pressing necessity for vernacular architecture documentation. Such documentation serves not only to capture the architectural nuances but also to document the social phenomena and the complex interplay between tradition, modernization, and space utilization. It also stands as an invaluable resource for future architects and designers aiming to create spaces that respect local culture while addressing contemporary needs within the Bima region.

### **U.L.'s houses in Sernaru**

The first Bima informant to be analyzed here is UL who resides in the flatlands of Sernaru in Labuan Bajo. Figure 5.71 shows the two houses offering a glimpse into the evolving architectural dynamics in the region, at least since the 1960s. Visually the two houses look different in both form and material, with the similarities being only the position of the front entrance door.

Yet in his previous house, a stilt house built in the 1960s, the main bedroom occupied the left side of the house. While in his current home, a landed house built in the 1990s, the main bedroom is situated on the right side, aligning with the more common positioning found in houses discussed earlier. Both main bedrooms remain within the main post, in accordance with traditional Bugis Bima and Bajo architectural conventions. But this change seems to not fit the other houses' rules.

The creativity in deciding the location of the rooms within the house might be related to UL being a construction worker, hence having more than social memory but also disciplinary memory. This difference of memory is also found in RA from the Bugis group, although RA is more of a boat constructor. However, the knowledge of construction seems to have a different implication when designing their own house. They have more flexibility and authority over the specificity of their dwellings according to their needs, whilst others might follow the constructors' decisions which are usually based on the commonality found in the communities.

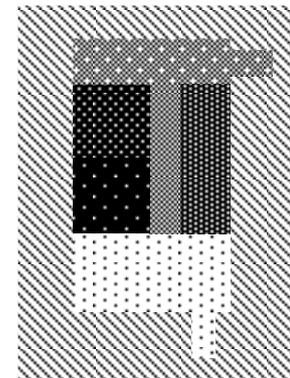
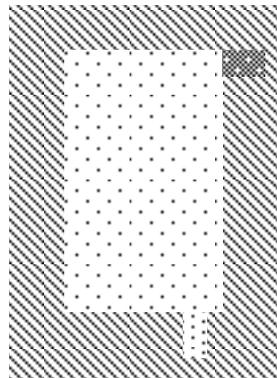
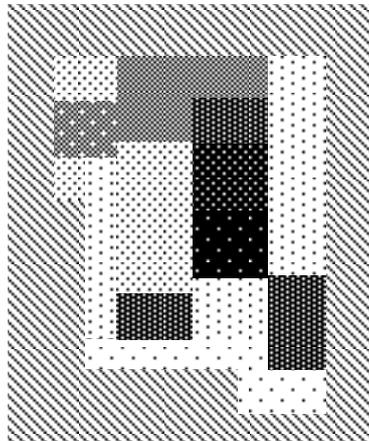
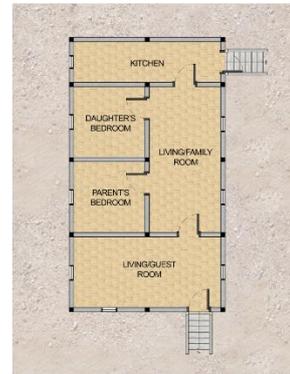
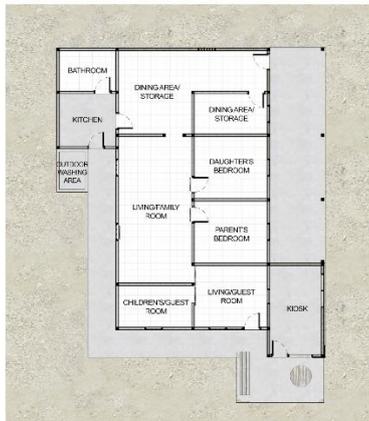
The kitchen area in UL's houses retained its position at the back of the house, with the current house having the kitchen in the back left side. This change of position might be related to the orientation of the house in relation to the main road. UL02 was located on the side of the main road, with the entrance facing the main road. UL01 is located inside the plot of land, accessible through the neighborhood road as seen in Figure 5.72. In relation to the main road, the location of UL01's kitchen is the furthest from the road. Hence leading to an assumption that the kitchen's location needs to be in the position furthest away from the 'public's eyes' in the Bima vernacular architecture principles. This might also be related to the conversation during the interview where they did not share about how the kitchen is a communal shared space where female neighbors and extended family members would

gather and prepare cooking for a celebration feast together, unlike the Bugis, Bajo and Manggarai informants who shared stories along that line.

ULO1



ULO2



Public —————> private



Public —————> private



Figure 5.71 UL's houses in Sernaru with 3D render, floor plan and layout analysis

Notably, the current house has additional public-private levels like other houses' transformations. Despite the location within the tourism development scheme which is in the peripheral area, the house still accommodates a kiosk at the front. UL and his family have chosen to integrate a commercial space within their home even though not targeted to tourists. This transformation resonates with the economic purpose of the earlier house, where the space beneath was utilized for weaving palm leaves

for wall and roofing materials, which has now evolved into a kiosk. However, the communal lifestyle has experienced a shift from a communal working area in the past to a more individualized working space in the current setting.

The shape of the roof in the two houses is emphasized by the informant, signifying its classification as the Bima roof. While the current house exhibits a modified version of this roof, it still maintains a connection to traditional architectural elements. During the cross-check phase of this research, it was found that indeed traces of the Bima roof were found in islands between Sumbawa Island (where Bima people is from) to Flores Island (where Labuan Bajo is in). Apart from the informant showing a neighboring house with a clearer Bima roof form, another informant also shared some pictures of his cousins' house in Bima that was built in the 1960s.

Seen in Figure 5.72 is the location of the UL01. It's worth noting that UL's father played a pivotal role in this Sernaru area, being one of the first group of men to open the land and involved in land management, contributing to the shaping of the local built environment. The area was even split into two, Sernaru Bima and Sernaru Boleng. Sernaru Bima refers to the part of Sernaru that was received by the Bima leaders, one of which is UL's father, from the Manggarai leaders having sovereignty at the time. Sernaru Boleng, on the other hand, is the part of Sernaru that was received by the Manggarai group coming from Boleng (a name of an area in the neighboring regency) as the land was given by the Bima leader of Sernaru Bima. To look back, the village that is shown in Figure 5.72 is composed of the lands given by the Bima leader to the newcomers, a different hierarchy applies in this area.



Figure 5.72 Location of the UL01

This flatland area is also where they harvested the reeds and palm leaves to make the weavings for wall and roofing material. That is why only the Bima people are known to make these material. Leading to the assumption that if houses in Labuan Bajo had these materials, then they might have been trading their produce with the Bima people for these materials. The Manggarai, Bugis and Bajo informants shared how their people were never taught or trained to make those materials. They would

always get palm leaves walls and roofs from the Bima group in Sernaru. This is why when the material for housing changed, then the Bima also had no purpose to keep making these. The land was also converted into farmlands for other agricultural purposes.

Furthermore, these houses contribute to the broader architectural landscape of Labuan Bajo, offering a unique perspective on how regional architecture is shaped by local traditions, economic opportunities, and historical legacies. The allocation of land, guided by different hierarchies and leaders, reflects the layered history and cultural significance that continue to shape the architectural landscape of Sernaru in Labuan Bajo. The architectural transformations within UL's houses, as part of this historical context, resonate with the enduring heritage and cultural legacy of the Bima people in the flatlands of Labuan Bajo.

### **M.T.'s houses in Kampung Air**

MT's two houses in Kampung Air (shown in Figure 5.73), the coastal area of Labuan Bajo (shown in Figure 5.74), provide a narrative of architectural transformations over four decades, from the 1980s to the current time. Their earlier house, though still standing today, exhibits a noticeably skewed structure that poses considerable safety concerns for residential use. However, financial limitations constrained them from making more substantial changes to their dwelling. The need for expansion became apparent when their son got married, necessitating additional space for the growing family. The architectural expansion of their house reflects the changing dynamics within the family, a testament to the evolving needs and hierarchies.

The transformation in the increase in public-private levels and additional rooms is a tangible response to the growth of the family, with a pressing need to accommodate more people and establish a clearer hierarchy within the household. The architectural shift symbolizes the adaptability of vernacular architecture to accommodate changing family dynamics. Importantly, MT's house is situated in a strategic area within the tourism development scheme, opening the door to commercial opportunities. Their economic purposed spaces are used for a dessert beverage stand owned by their daughter and an art studio owned by their married son. The inclusion of commercial spaces highlights the integration of modern economic opportunities with traditional architectural settings.

The layout of the house has remained the same as they have preserved the previous house. But in comparison to the new road location, it is quite an interesting adaptation. The previous house has its entrance on the front of the house, with stairs on the left side of the house. This aligns with the road location which was in front of the house. The left side of the house was then the para-para or the houses used to dry salted fish. During the preparation for the Sail Komodo 2013, the beach was reclaimed to be a waterfront area. Within this reclamation many houses rearranged their orientations to face the new 'road' which was the reclaimed part of the beach. This new road has changed a lot of the original vernacular architecture and the way they arrange their houses according to access.

In MT's cases, the expansion in 2010s, the same decade with the international sailing event, was to reorient the house to the road as well. As seen in Figure 5.73, the public levels within the house expanded to the left to accommodate the new road and orientation. Visitors will no longer come through the small neighborhood road in front of the where it was before, but more people will navigate from the waterfront road when wanting to visit them. It can be assumed that's the reason the area to entertain guests move to the left of the house.

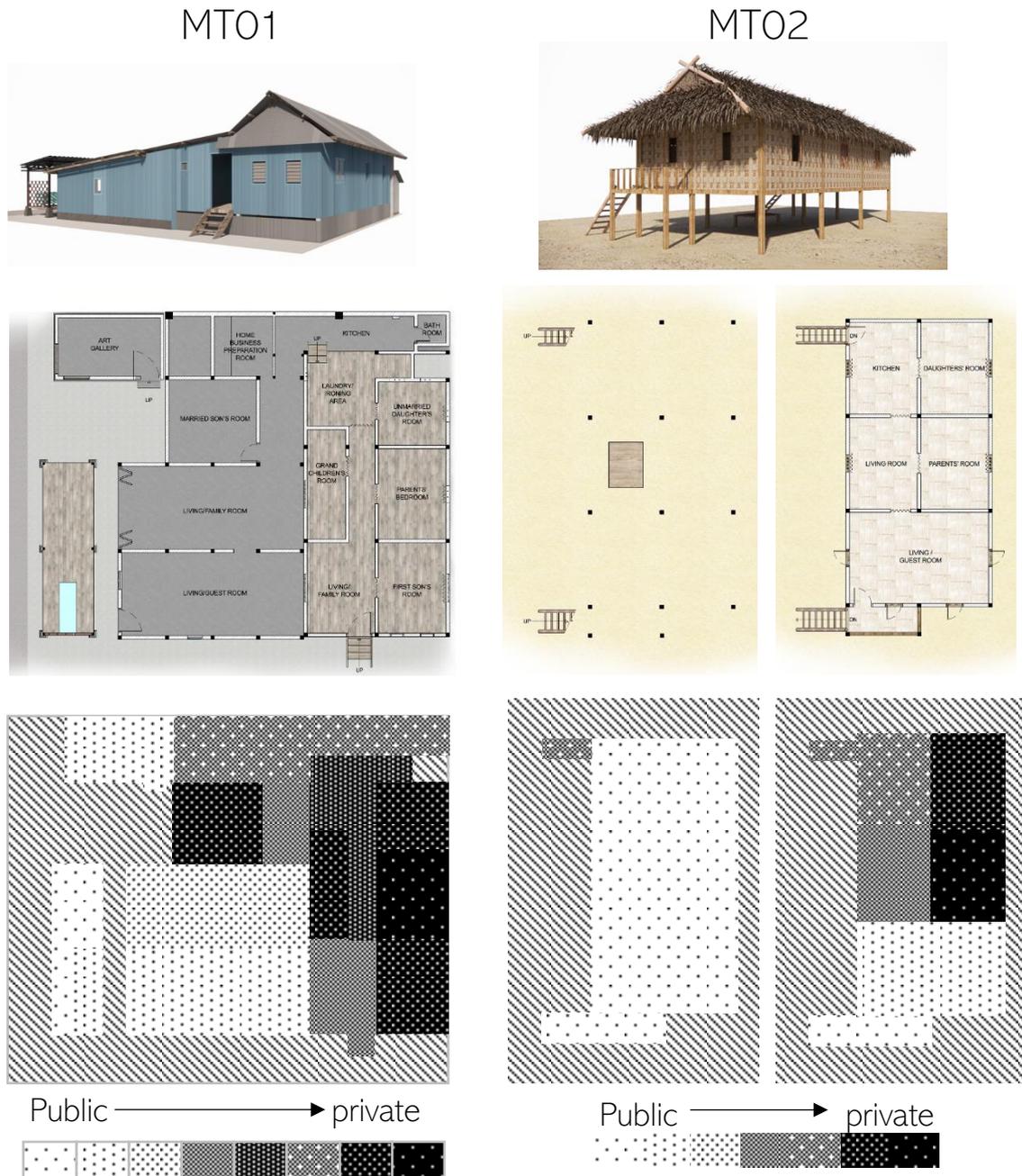


Figure 5.73 MT's houses in Kampung Tengah with 3D render, floor plan and layout analysis

The public area come hand in hand in this case as the commercial area also needs a sitting area to enjoy the drinks or to wait for the drinks to be made. The kitchen also increased to facilitate the back of house production area of the dessert business. The location moved to the back of the house and on the ground level, despite the earlier kitchen was on the stilt house. This is also to accommodate a bathroom which is now incorporated in the house.

The layout looks similar to the earlier house from UL, where the main bedroom is with the main post, but the MT houses had the main bedroom on the right side as earlier mentioned when assessing the houses in Soekarno-Hatta neighborhood. The bedroom of the married son in the current house is a little peculiar as it is close to the main road on the left of the house. But it seems that it is located there to gain access to the service areas of the house: the kitchen and bathroom. Also it is located near to the art studio belonging to the married son. This shows how a pragmatic transformation with limited budget and space is, and despite of the limitations they still preserve the values they have.



Figure 5.74 Location of the MT01

The impact of tourism on MT's household and their vernacular architecture is palpable. The coastal location within the tourism development scheme has brought both opportunities and challenges. The commercial spaces and expansion of their house underscore the influence of tourism on their daily life and economic endeavors. Despite these transformations, the potential for government subsidy programs to support the improvement of vernacular architecture remains a complex issue. The obstacles they faced during their application process, influenced by neighbors and bureaucratic hurdles, signal a need for further investigation. The case of MT's houses is a prime example of how tourism has woven itself into the fabric of traditional lifestyles, bringing both advantages and complexities that warrant in-depth exploration for future researchers and policymakers.

#### **R.L.'s houses in Sernaru**

RL's two houses in Sernaru, situated in the flatlands area of Labuan Bajo, offer a compelling insight into architectural transformations that have unfolded over time as shown in Figure 5.75. RL, who

identifies with Bima ethnicity, belongs to a family with a historical connection to the early land development in Sernaru Bima, much like UL's father. The earlier house, constructed on stilts, featured wooden structural elements and used palm leaves for both walls and roofing. In stark contrast, the current house has undergone a significant evolution, now standing as a landed structure comprised of reinforced concrete and brick walls. This transformation is emblematic of the broader architectural shift from traditional stilt houses to contemporary landed residences.

Within these two houses, one can observe a notable difference in the degree of public-private distinction, a factor contributing to diversified levels of privacy. As seen in previous houses, communal spaces for family gatherings and interactions with visitors have witnessed a reduction. However, RL's case deviates from this pattern, as they have introduced additional spaces at the rear of the house specifically designed to accommodate rented rooms for out-of-town workers. This adjustment speaks to the evolving nature of vernacular architecture, now adapted to the demands of the modern world, where the need to generate rental income supersedes the historical reliance on communal spaces.

In RL02, the main bedroom is on the left side of the house with the entrance on the right, this is the similar pattern to the UL02. The RL02 and UL02 were built in the same decade, and perhaps within the same year as their ancestors were both the first settlers of the area. This shows the initial form of the Bima houses in Sernaru. Where the ladders to the house will be on the right side, the public area below the houses, and a more private one on the front of the house. Continuing with the main bedroom with the main post in the middle of the house and a family living room that doubles as the sons' bedroom in front of the main bedroom. Lastly the kitchen on the back side of the house.

The transformations into landed house was in a different decade as UL01 was built in the 1990s and the RL01 was built in the 2000s. Even though this house was made later, the spaces for commercial purpose were an addition probably in the late 2010s as during the time of the survey the construction looks just finished some years earlier. Similar to UL's house, RL's residence stands in the peripheral areas of the tourism development scheme. Consequently, it proves challenging to attract tourists to use their accommodations, as the flow of tourist traffic is limited in these regions. Yet, RL has exhibited an alternative approach by targeting out-of-town workers temporarily stationed in Labuan Bajo for development projects. This entrepreneurial choice underscores the adaptability of vernacular architecture to cater to new economic opportunities. Moreover, the inclusion of economic purposes within the house offers a unique perspective on the extension of land ownership hierarchy, not just to newcomers but also to short-term residents who contribute to economic gains, highlighting the intricate interplay of tradition and modernity in Labuan Bajo's architectural landscape.

The transformations witnessed in RL's houses serve as a testament to the dynamic nature of vernacular architecture, adapting to contemporary needs and economic realities while preserving cultural legacies, especially in the context of Labuan Bajo. These architectural shifts and the

multifaceted uses of the house within the context of tourism development underscore the complex interplay between tradition, economics, and societal change in Labuan Bajo's coastal region. Even without the intervention of the government, they have preserved the roof shape. This intriguing phenomenon invites further research into the ever-evolving architectural landscape and its role in shaping the cultural and economic fabric of the region.

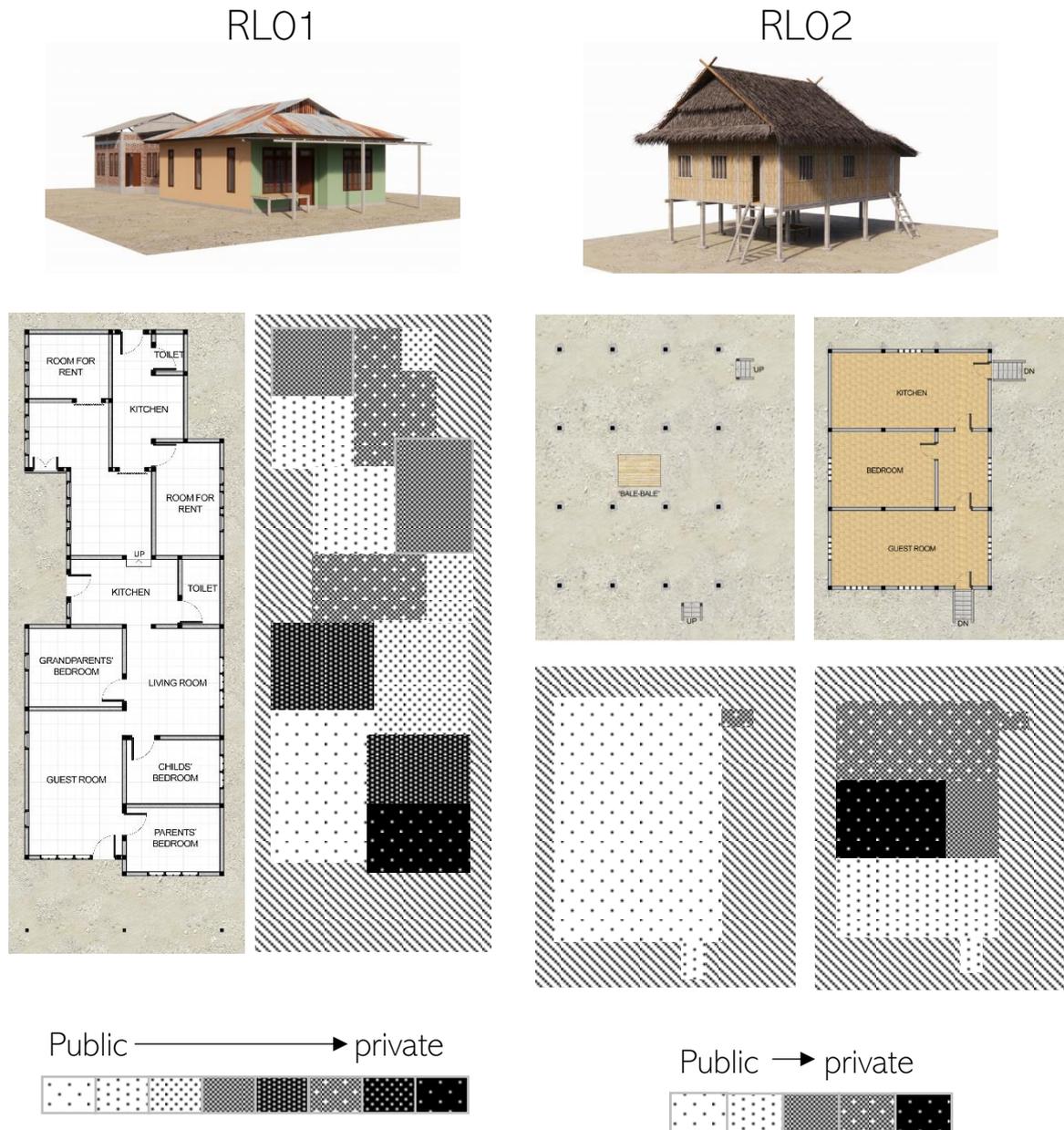


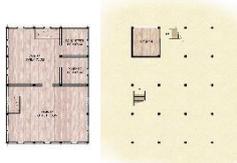
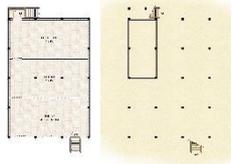
Figure 5.75 RL's houses in Sernaru with 3D render, floor plan and layout analysis

#### 5. 2. 4. Bugis vernacular architecture in Labuan Bajo

The comprehensive analysis of Bugis houses' transformations delves into the evolution of seven distinct residences, all of which belong to two informants from the same ethnic group. These houses,

shown in Table 5.7, are situated within the Soekarno-Hatta Street neighborhood, a strategically positioned locale with significance in the context of the tourism development scheme. The focus of this analytical exploration centers on delineating the distinctive trajectories of transformation experienced by the two informants, thereby offering valuable insights into the intersection of cultural change and tourism's influence on architectural evolution.

Table 5.7 Bugis informants' houses with floor plans, 3D renderings and time of construction

House code	Floor plan	3D rendering	Time of construction			
			1960	1980	2000	2020
RA01						
RA02						
RA03						
RA04						

These seven houses, dating from the 1970s to the 2020s, collectively represent a captivating timeline of architectural adaptation and response to dynamic socio-cultural shifts. Among this ensemble, one house stands out as a recipient of government funding, reflecting the intersection of public policy and private architectural development. The initial dwelling in this assemblage, constructed during the 1970s, adopts the form of a landed house. Its transformation narrative revolves around incremental size expansion and a consequential transition from traditional wooden structures to robust reinforced concrete components. In contrast, the second house, originating in the 1980s, takes the form of a stilt house. Its evolutionary path follows a trajectory of substantial size expansion,

marked by heightened distinctions between public and private domains within the house. This transformation also encompasses a transition from stilt construction to a grounded structure, accompanied by corresponding material alterations in line with the shift.

Crucially, the two houses resemble different trends in transformation, stemming from the contrasting family dynamics of the informants. The inhabitant of the landed house, marked by the absence of children, encounters a limited impetus for expanding the dwelling's spatial capacity or diversifying its functions and spatial zones. In stark contrast, the informant residing in the stilt house finds themselves navigating the complexities of housing a large family, including many children, some of whom are married and continue to reside within the household. This intricate familial dynamic compels the expansion of the dwelling to accommodate a burgeoning number of residents, each with specific spatial requisites and lifestyle preferences.

In the context of the Soekarno-Hatta Street neighborhood, which occupies a pivotal position within the tourism development scheme, these transformations resonate with the multifaceted impact of tourism on Labuan Bajo's architectural landscape. As visitors and travelers traverse this strategic area, they encounter a mosaic of architectural responses, shaped by cultural traditions, family needs, and the economic dimensions of the tourism industry. The dual narratives of transformation within these two Bugis households illuminate the nuanced interplay of tradition, modernity, and tourism, underscoring the profound role of vernacular architecture in accommodating and reflecting the diverse currents of change. This analysis invites further research into the intricate and dynamic relationship between culture, economics, and tourism within Labuan Bajo's coastal community.

#### **R.A.'s houses in Kampung Air**

In the middle of Kampung Air, RA has experienced the transformations of four different houses that he built himself, shown in Figure 5.76. RA is a boat constructor therefore having construction knowledge, albeit translated from boat construction knowledge and applied to house constructions. It leads to the assumption that his decision is based on practical solutions in answering the needs of the family. This can be an exemplary case, in addition with UL's case in the Bima group, of how people with discipline memory design and build their house in comparison to other people with social memory.

The materials employed in the construction of these houses exhibited a noteworthy consistency in the initial three dwellings, which date from the 1980s to the 2000s. However, a substantial transformation occurred in the 2010s when the predominant use of natural materials, such as wooden structures and palm leaf walls and roofs, transitioned to a blend of materials. This newer approach featured a combination of reinforced concrete and wood for structural elements, complemented by walls constructed from a mixture of brick and wood, all capped by a zinc roof. This shift can be attributed to various factors, notably the evolving availability of construction materials during this period and the logistical constraints associated with sourcing wood directly from the forests in the northern regions of the island, as had been their traditional practice.

The introduction of these mixed-material components marked a substantial departure from the earlier reliance on indigenous, environmentally sourced resources. It reflects a response to the changing landscape of construction materials and techniques, potentially driven by factors like urbanization, accessibility to building supplies, and a growing awareness of sustainable forestry practices. This shift in materials usage underscores the adaptability of the homeowners and their willingness to embrace newer construction technologies and options in the face of evolving circumstances. The move towards mixed materials appears to be both a pragmatic response to supply constraints and an acknowledgment of changing times in the construction industry.

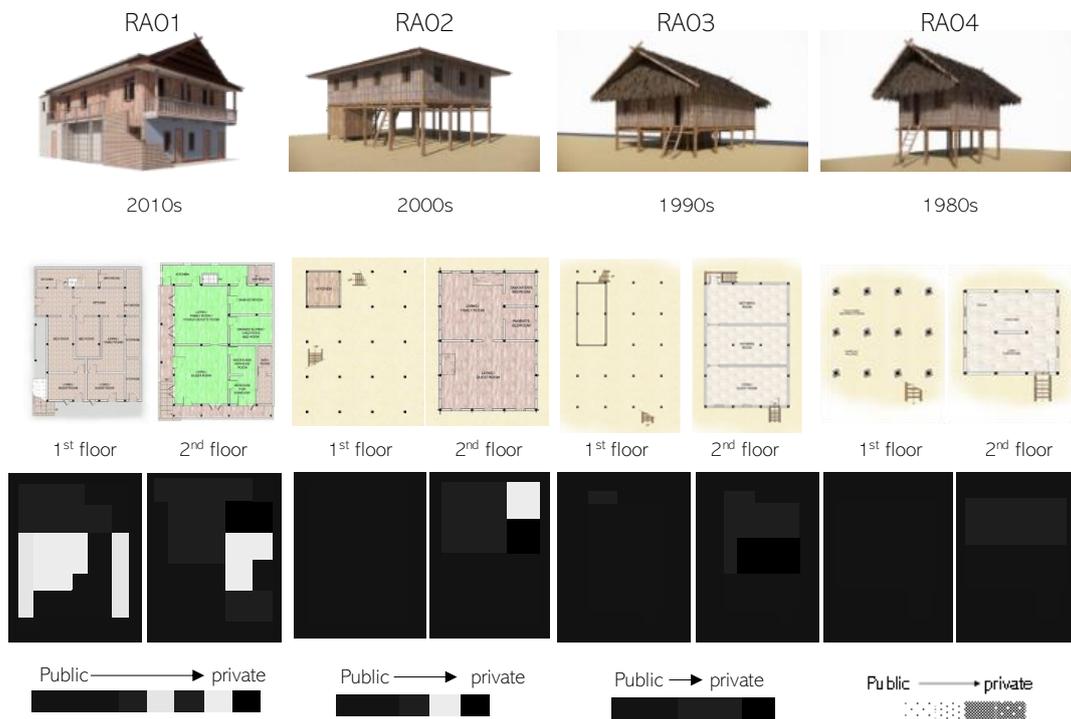


Figure 5.76 RA's houses in Kampung Air with 3D render, floor plan and layout analysis

The changes of the houses in the span of 4 decades (from the 1980s) are an interesting pattern as they are built on the same plot of land, shown in Figure 5.77, except RA04. The first house, RA04, was such a simple hut made for a short temporary period. This was even built on a neighbor's land since he had to reclaim his land first in order for it to be buildable. The next house, RA03, had an almost similar layout, which was very simple as well. The house was divided into three parts with the first part in the front serving as a public space, then the middle as the main bedroom and the part in the back functioning as his mother's room and also kitchen. The RA02's layout was more similar to other houses at the time with a main bedroom and a daughter's bedroom facing the family living room. The kitchen has now moved to the ground floor, allowing more people to access it. The RA01 has a totally different layout where the house was designed to accommodate three different nuclear families under one roof. The main bedroom belonging to RA is still on the upper floor on the right side of the

house, with the married sons with their families' room on the lower floor on each side of the house. These layout changes of the bedroom seems consistent to the common practice.

The unchanging position of the kitchen at the rear of the house reflects a steadfast adherence to cultural and functional norms in these four Bugis residences. It stands as an architectural element that resists the tide of change, maintaining a consistent presence despite the broader transformations occurring within the dwellings. In these houses, the kitchen holds a special place within the hierarchy of space, firmly rooted in tradition and practicality. To understand the kitchen's enduring placement, one can envision the house as a series of segments or zones, each with its own distinct functions and significance. At the rearmost segment of the house, which consistently retains its role as the kitchen zone, culinary activities take center stage. This design choice aligns with cultural norms and practical considerations, as it keeps the kitchen area separate from the more public or communal spaces within the home. It ensures that the culinary domain remains distinct, minimizing intrusion into the private spheres of the household.



Figure 5.77 Location of the RA01

This architectural constancy transcends the temporal boundaries of these houses' transformations. Even as each dwelling undergoes evolution and expansion, the kitchen's designated location remains unaltered. It speaks to the deeply ingrained cultural practices and values that inform the layout of these Bugis houses. A notable distinction from this tradition can be observed in the RA02 house, where the kitchen makes a significant move to the lower floor. This shift likely carries a specific rationale or adaptation, reflecting the changing needs and dynamics of the household. It's a noteworthy exception to the otherwise unchanging norm. In the RA01 house, the kitchen zone is further subdivided to accommodate three separate kitchens, each serving a distinct family within the shared residence. This modification reflects a creative response to the evolving needs of the inhabitants while still preserving the traditional emphasis on culinary spaces.

The zoning of the three houses' space under the house also looks similar from RA04 to RA02 where it is used as a public area with a little corner of a more private function on the left back side of the house. In the RA01 the space under the house is utilized for two families to dwell in, therefore reducing the space for a public area to only the front of the house. Interestingly, this house is more like a flat with several tenants as there are three entrance doors, according to which family's zone it connects to. Therefore further investigation can be done to explore how a flat can be designed in this area in the future.

RA01 is also a recipient of the government program to fund for more homestays in Labuan Bajo. During the time of survey, the room for the guest was still under construction. Unlike the other recipients in this sample set, RA01's project was distinct as it was categorized as a renovation rather than a new building construction. This differentiation has significant implications for the integration of the homestay function within RA01's existing house from the 2010s.

The government offered an alternative, allowing recipients to choose between constructing an entirely new building or renovating their current dwelling. In RA01's case, the renovation project brought the homestay function into alignment with his pre-existing house. This unique approach underscores the adaptability of the government's program to accommodate a range of housing situations and configurations. It allowed RA01 to retain a degree of control over the design and scope of the transformation, ensuring that the new addition harmonized with his existing living space. This approach stands in contrast to the new building construction projects in which the homestay is a separate structure, often having a more distinct or detached character from the primary residence.

In essence, RA01's transformation serves as a prime example of how government initiatives can influence and shape the architectural landscape in response to the demands of the tourism sector. The duality of house and homestay within the same structure not only showcases adaptability but also underscores the need for careful planning and design to ensure that the two functions coexist harmoniously. It highlights the importance of local homeowners' participation in these projects and their capacity to maintain a degree of agency in the face of broader tourism-driven transformations.

### **S.U.'s houses in Kampung Air**

Still in the same area in the neighborhoods of Soekarno-Hatta Street, SU's houses serve to balance RA's houses' transformations. Shown in Figure 5.78, SU's houses are almost the same size and with an almost identical layout of public-private spaces. This is due to the constant number of family member living in this house and no extreme lifestyle changes from being a fisherman to a merchant.

The most noticeable changes within these three houses revolve around the materials used in their construction. The transition from wooden structures to reinforced concrete and the gradual shift from walls constructed with a blend of wood and palm leaves to solid brick walls represents a significant shift. Another distinctive transformation is the choice of roofing material, with these houses adopting zinc roofs, a departure from the prevalent use of terracotta tiles in Labuan Bajo during the survey

period. The decision to incorporate terracotta tiles, while not the norm, adds a unique dimension to the architectural tapestry of the town.

Furthermore, the analysis reveals an intriguing metamorphosis in the roof forms. SU03 initially featured a hipped roof, evoking the traditional Manggarai architectural style. However, SU02 and SU01 have transitioned to the Bugis-style roof. It is important to note that the initial change from a landed house to the earlier form, like the switch in roof style, lacks explicit documentation, potentially hinting at a complex interplay of influences, local traditions, and personal choices.

Of particular significance, during the survey period, SU01 was still in the construction phase, serving as a recipient of the government subsidy program designed to support the development of homestays and kiosks. This house's multifunctional nature, now operating as a kiosk, has become the primary source of income for SU and his wife, showcasing the adaptability of vernacular architecture to accommodate changing economic dynamics.

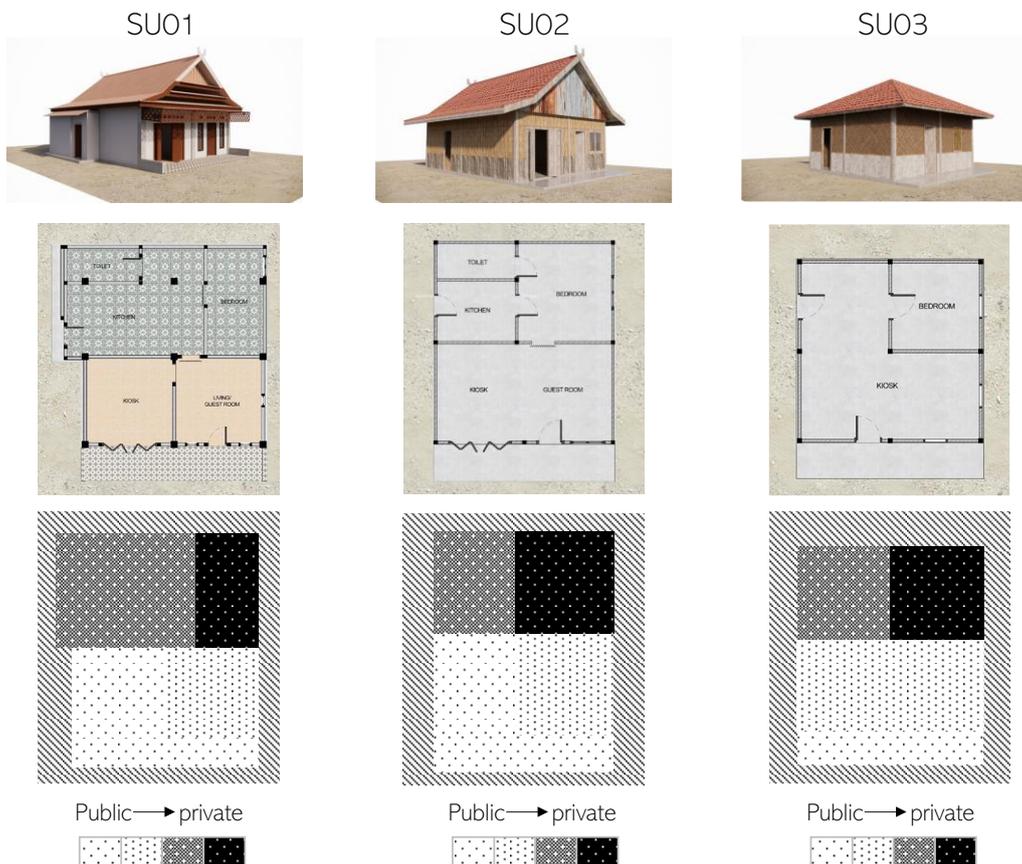


Figure 5.78 SU's houses in Kampung Air with 3D render, floor plan and layout analysis

What makes SU's houses especially noteworthy is their divergence from the common narrative of Bugis houses, which often started as stilt houses in the 1970s. The analysis of SU's architectural transformations demonstrates that not all Bugis homes adhered to the stilt house form during that era,

shedding light on the architectural diversity that characterized Labuan Bajo's landscape. This discovery underscores the profound importance of thorough exploration in vernacular architecture, challenging preconceived notions, and enriching our comprehension of the multifaceted evolution of the built environment. It reminds us of the nuanced stories woven into each architectural transformation and the valuable insights they offer into the tapestry of local history and culture.

#### 5. 2. 5. Bajo vernacular architecture

This analysis on Bajo houses in Labuan Bajo has systematically collected data from seven houses owned by two different informants. It is essential to preface these findings with the acknowledgment that these informants are part of the royal Bajo family, with one even being the rightful descendant of the royal lineage. This distinctive background provides a unique and elite perspective on the transformation of Bajo houses in the Labuan Bajo region.

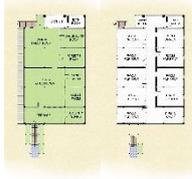
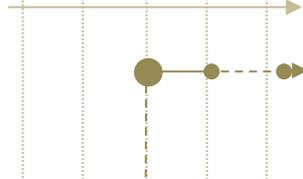
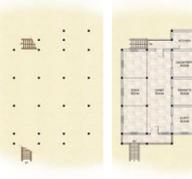
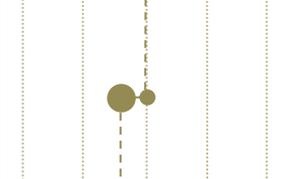
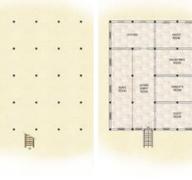
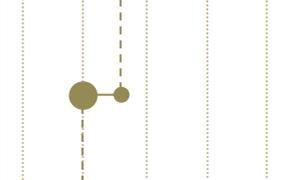
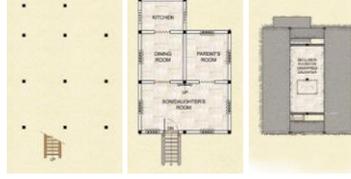
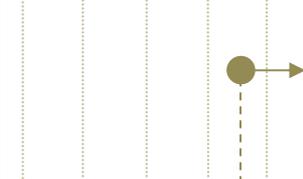
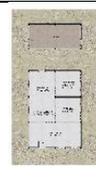
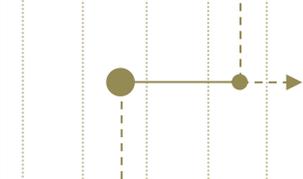
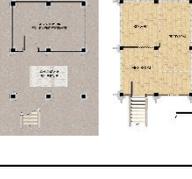
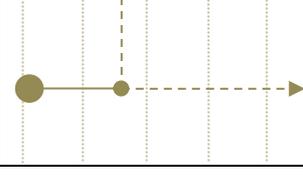
The houses, as illustrated in Table 5.8, have a historical trajectory dating from the 1940s to the 2020s. They all originated as stilt houses and underwent a gradual evolution towards becoming landed houses. Remarkably, the form and design of the roofs have largely remained consistent throughout this transformation process, with a notable exception in SA02. This house stands out due to the assertion that its unique roof signifies its status as the residence of a royal family, adding a layer of cultural significance to the architecture.

AH02 was the first among these houses to make the transition to a landed house. The inspiration for this change was from the Manggarai-style houses, with a distinctive combination of half brick and half wooden walls supported by wooden structures. In the process, the roofing material was also upgraded to zinc, marking a significant shift in material use. SA02, built in the 1980s, was another house where the roofing material evolved to zinc, aligning with the changing architectural landscape.

Beyond the materials and roofing, these Bajo houses exhibit a noteworthy alteration in size. Their relocations to the coastal areas of Labuan Bajo, driven by a combination of historical instructions and family migration, influenced the expansion and transformation of these homes. The initial houses were simple and reflected the early settlements, while later iterations demonstrate an increase in size, permanence, and architectural sophistication as they adapted to the evolving needs and lifestyles.

Furthermore, these Bajo houses serve as valuable reference points for understanding Bajo architecture in diverse regions of Indonesia. While analyses of Bajo houses in various areas have been conducted, the significance of this collection lies in the detailed and continuous examination of these Labuan Bajo residences. Comparisons can be drawn with Bajo communities in other parts of Indonesia, such as the Bajo people in Bajoe and Kabalutan. While the Bajo people in Bajoe are still closely related to those residing in Labuan Bajo, on the other hand, the people settling in Kabalutan Village, Tojo Una-Una, Central Sulawesi, were separated several generations before. Their settlement patterns also differ in their geographical context. Some homes are built on the sea and some on land. The settlement

Table 5.8 Bajo informants' houses with floor plans, 3D renderings and time of construction

House code	Floor plan	3D rendering	Time of construction
			1940 1960 1980 2000 2020
SA02			
SA03			
SA04			
SA05			
AH01			
AH02			
AH03			

is more individual and “elongated” as they are located more inwards to the land (Hamka, 2017; Syam et al., 2018). These documentations contribute to the broader understanding of Bajo architecture, revealing the regional nuances, adaptation to geographical contexts, and variations within the Bajo communities across Indonesia. As the vernacular architecture keeps adapting, the findings here can be a portrayal of the transformations experienced in 1940s to 2020s in two informants in Labuan Bajo.

### **S.A.’s houses in Kampung Tengah**

The transformation experienced by SA in Labuan Bajo encompasses a series of five houses, each representing a different phase in the evolution of their family's lifestyle and needs. While his current house is perched in the hilly regions of Soekarno Hatta Street, an access area within the tourism development scheme, his four previous houses were strategically located within the town's tourism scheme. The four houses are the ones analyzed further in this section and displayed in Figure 5.79.

The timeline of these houses spans several decades, beginning with SA05 in the 1950s, followed by SA04 in the 1960s, SA03 as a temporary residence, and SA02 in the 1980s. These houses were not mere replicas of each other; instead, they reflect an intriguing progression. SA05 was characterized by the limited room functions and few access distinctions, but it was compensated for by an attic space reserved for unmarried daughters. The design reflected the era's common vernacular architecture.

Subsequently, SA04 introduced a more intricate layout with a full spectrum of access distinctions. This transition highlights the family's emphasis on hierarchical levels concerning guests' access within their house. The architectural development continued with SA03, which served as a temporary residence before the construction of SA02. The latter marks a pivotal moment when the family's connection to royalty became apparent through the construction of a distinct roof, signifying their royal lineage. The layered roofs are sometimes found in other houses in the town, but further investigation is needed to understand this meaning better.

Interestingly, while the notion of public-private level distinction was introduced in SA04 during the 1960s, the integration of commercial functions within the house only became evident in SA02. Shown in Figure 5.80, this transformation was prompted by a renovation in the 2010s, driven by the need to accommodate the influx of out-of-town workers arriving for the Sail Komodo 2013 event and the town's overall development expansion. The land and building tax sudden increase also puts in motion the need to gain extra income from their strategic assets. In his case, SA preserved the private functions of his house on the upper level of the house. This might be possible due to his family owning more plots of land, allowing more space to be rented out and for the private area to stay untouched. This will be compared later to AH's house from the same ethnic group and same economic motives.

SA's houses represent not only architectural transformations but also mirror the shifting dynamics of Labuan Bajo. From the understated beginnings of SA05 to the royal connections emphasized in SA02, these houses provide an architectural narrative of the family's journey in the context of a changing urban landscape and evolving societal norms.

They also offer invaluable insights into the vernacular architecture of Labuan Bajo and highlight several key lessons that benefit both sensitive design and architectural documentation and the preservation of historical buildings. SA's houses depict the shifting social and cultural dynamics within Labuan Bajo. Each architectural phase corresponds to changes in family size, needs, and societal norms. This underscores how architecture reflects society and its values. The transition from SA04 to SA02 shows the growing importance of hierarchy and access distinctions within their house, designed for royals of the region. For sensitive design, understanding the significance of public-private boundaries in local culture is essential, and how the royal lives are how the people will follow leading to the assumption that they set the trend of this layout in the 1960s.

The distinct roof of SA02, symbolizing royal lineage, illustrates how architecture can be used to express one's heritage and identity. This signifies how historical buildings often bear the imprints of familial and regional history. On the other hand, the sequence of SA's houses serves as a valuable record of architectural changes over several decades. This documentation helps preserve local architectural history and can guide future designs and renovations. SA's houses also underline the challenges of preserving historical buildings within a rapidly developing urban context. They underscore the importance of striking a balance between heritage conservation and accommodating modern necessities. Lastly, historical buildings are repositories of community narratives. They carry stories of families, traditions, and cultural values. Sensitively preserving these structures helps maintain these narratives for future generations.

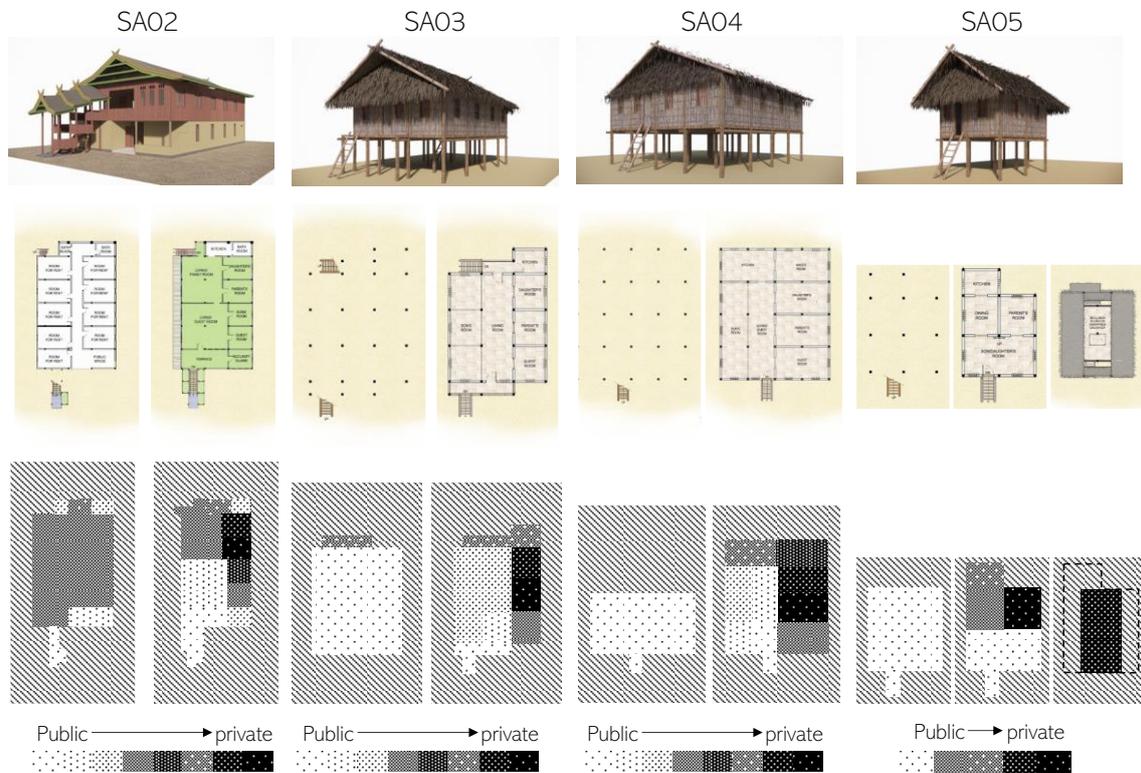


Figure 5.79 SA's houses in Kampung Tengah with 3D render, floor plan and layout analysis



Figure 5.80 Function changes from SA's houses

The integration of commercial functions in SA02 highlights the adaptability of historical buildings to contemporary needs. For sensitive design, it is crucial to recognize and respect the evolving functions of traditional buildings. The inclusion of commercial spaces in SA02 demonstrates the economic potential of historical buildings. Sensitively designed commercial spaces can contribute to the economic well-being of families and communities while preserving heritage.

In summary, these houses not only offer a glimpse into architectural transformations but also provide valuable lessons for those interested in sensitive design, architectural documentation, and the preservation of historical buildings. By understanding the multifaceted aspects of these vernacular architectural changes, future architects and preservationists can strike a harmonious balance between honoring local heritage and addressing contemporary needs.

### AH's houses in Kampung Air

AH, a member of the royal Bajo family and one of SA's nephews, played a significant role in the interviews, where considerable time was spent to understand his perspective. The interviews took place in two distinct locations, a public beach and AH's house. During these conversations, AH expressed his growing discomfort with living in a concrete house, stating a preference for the natural environment. In response to this desire, he initiated the construction of another house in the flatlands. However, he remained closely tied to his coastal roots in Kampung Air, a region within the Soekarno-Hatta neighborhood, as he is the eldest son in his family's generation and responsible for the welfare of his aunts.

As depicted in Figure 5.81, AH's life journey in Labuan Bajo is encapsulated by the three houses he has experienced. The oldest, AH03, dating back to the 1940s, was a simple stilt house characterized by minimalistic layout and access distinctions. In the 1970s, AH02 emerged as a landed house with a

unique blend of cement and board walls, inspired by the Manggarai style. The description of the roof reflects modifications made later. The most recent house, AH01, was constructed in the 2000s following his marriage.

The transformations in AH's houses are punctuated by significant material shifts. Each transition from one house to the next involved the adoption of distinct materials. This evolution serves as a timeline that reflects the prevalent construction materials during each period: natural materials in the 1940s, a shift towards more industrialized materials in the 1970s, and an embrace of entirely industrial materials in the most recent constructions.

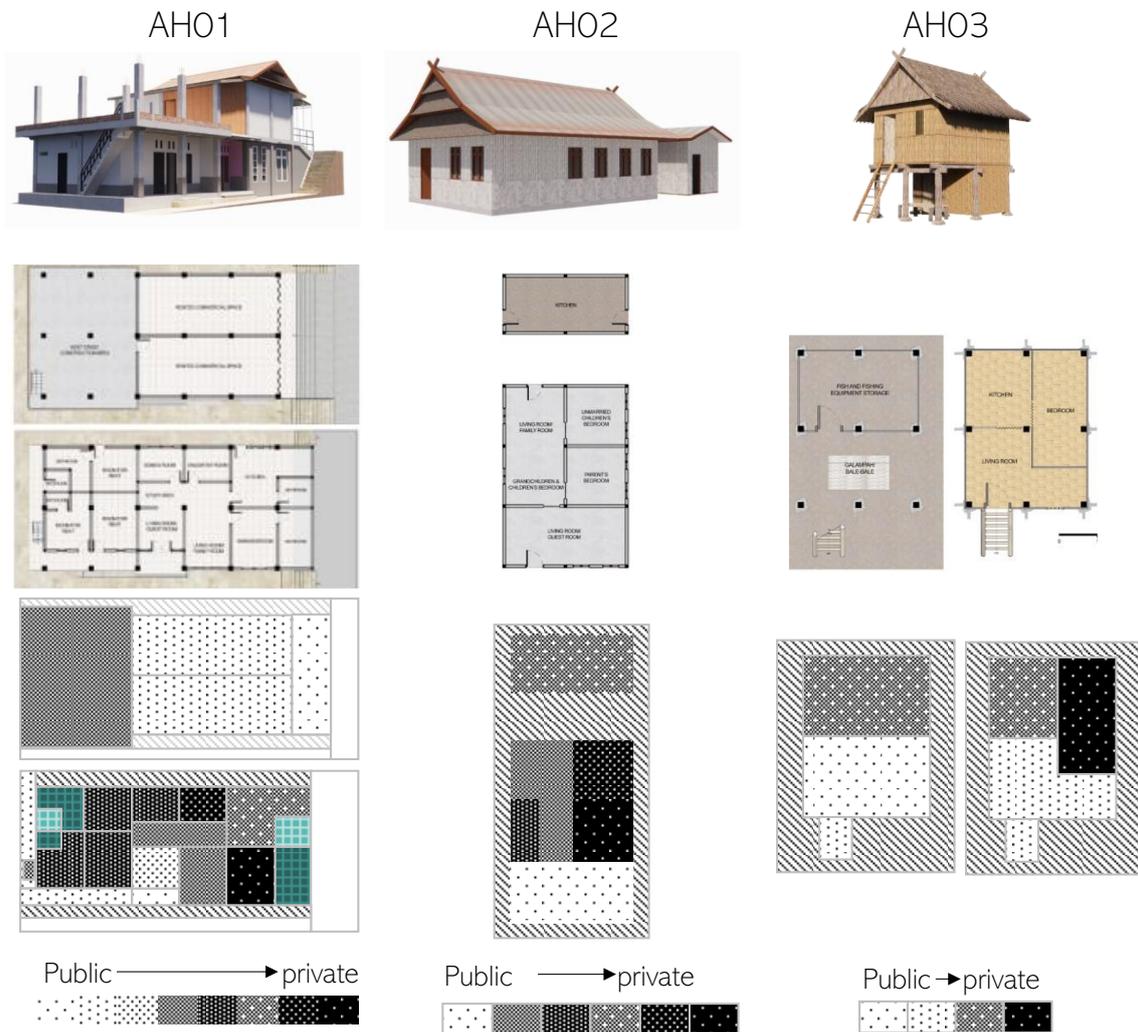


Figure 5.81 AH's houses in Kampung Air with 3D render, floor plan and layout analysis

AH's houses also reveal intriguing changes in layout. Despite the relocation from one house to another, the main bedroom consistently occupied the right side of the house, and the kitchen retained its position in the segments behind the house, adjacent to the entrance door. The evolution of access distinctions occurred progressively, in contrast to the royal house of SA, where full access distinction

was established as early as the 1960s. AH's houses align with the prevalent layout found in Bugis and Bima houses within this dataset.

Furthermore, the interaction between the influenced and the influencer can be traced back to their initial interactions and was further solidified when they settled together on land. This transformation among the Bajo people, traditionally sea nomads, from a maritime to a terrestrial lifestyle, often occurred within the territories of other ethnic groups. For instance, Hamka's research in Bajoe, Bone, South Sulawesi, revealed that Bajo people acculturated with local Bugis communities in both macro and micro aspects of their built environment (Hamka, 2017). Hamka's findings indicated that as Bajo people transitioned from sea-based to land-based living, changes in the forms of their houses were influenced by their geographical context (Hamka, 2017). Homes built above the sea displayed a more scattered sprawl pattern, while those on land featured a more linear arrangement.

The adaptation of the Bajo group also happens in Labuan Bajo, especially in the context of adjusting to economic motives. The changes in public areas seen in the public-private analysis of Figure 5.81 is interpreted further in Figure 5.82. It shows a shift in the function of the public space, where before it was a communal area tied with the features of a dirty space to store fishing produce and tools. Then the house transitioned to the Manggarai style house, where the area becomes a space to host guests. Lastly, in the 2010s house, the public areas once used as communal areas switched into commercial areas. The positions of the public areas adjusted to the new street and the main street on the same level as the second floor.

This adjustment to the two streets or two fronts of the house forced the private space to move to the least accessible area in the plot. Shown in Figure 5.83, the private space was once on the upper floor, but then the switch to a landed "Manggarai house" has moved the private areas to the ground floor. Finally, in the 2010s house, the private area is on the lower floor with the upper floor accommodated into a rental area that is on the same level as the main street. In comparison to the SA's house mentioned earlier, this provides an alternative to private area location within the house when adjusted to economic motives. This also teaches the message that there is a pattern in houses in Labuan Bajo, where the private areas are always in the least accessible location within the plot of land which aligns with the teachings in architectural education.

The architectural transformations witnessed in the case of AH and the Bajo people offer invaluable insights for sensitive design, architectural documentation, and historical preservation, with far-reaching implications for various stakeholders. AH's houses' transformations reflect the complex relationship between indigenous cultures and changing environments. This knowledge can guide architects and designers to create spaces that are culturally sensitive and respectful. Understanding the historical changes in architectural styles and materials is essential for avoiding designs that might disrupt the cultural and historical fabric of a region. Architects can incorporate traditional elements or materials that have historical significance to the local community.

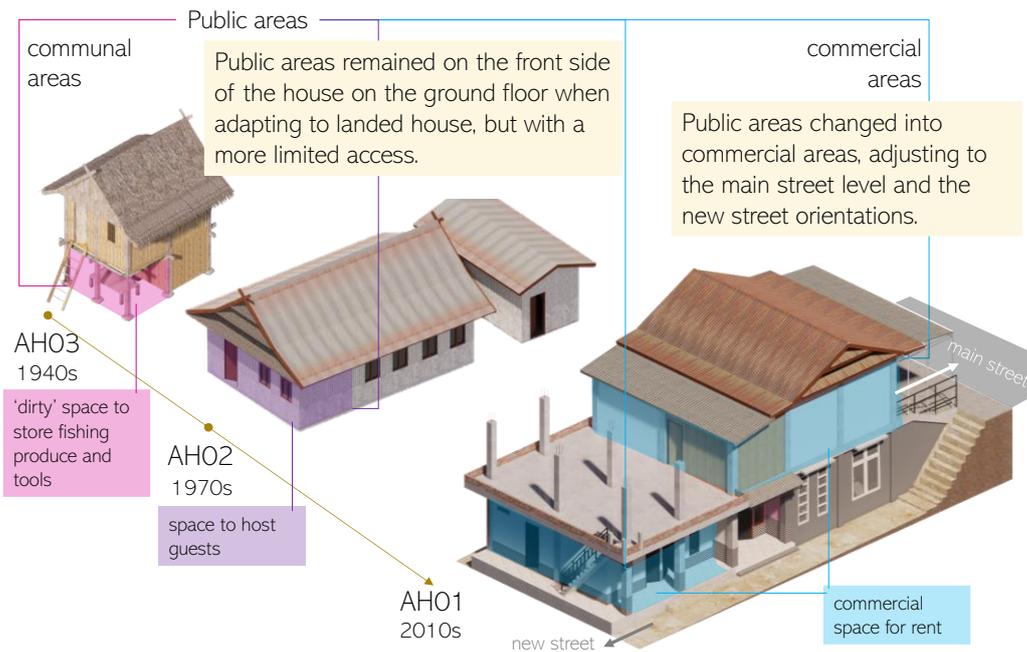


Figure 5.82 Public space changes related to economic motives

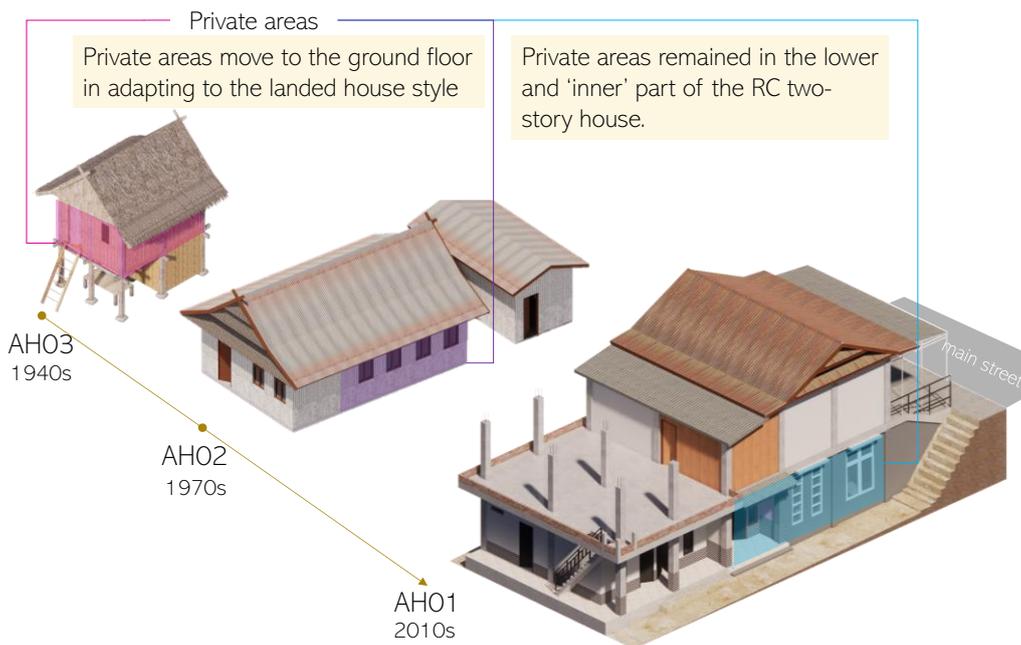


Figure 5.83 Private space changes related to economic motives

The documented changes in construction materials, techniques, and architectural forms offer vital guidance for the preservation of traditional building methods. Recognizing the shift from natural to industrial materials emphasizes the need to protect traditional craftsmanship and knowledge, ensuring their transmission to future generations. As heritage preservation gains momentum in places like Labuan Bajo, these insights help inform conservation initiatives, allowing preservationists to

safeguard historically significant structures and guide restoration efforts with appropriate materials and methods.

Detailed architectural documentation plays a pivotal role in ensuring that future generations comprehend the historical and cultural value of structures. This includes architectural surveys, photographs, 3D models, and comprehensive descriptions of buildings like AH's houses, alongside other indigenous structures, serving as valuable references. Such documentation facilitates the monitoring of architectural transformations over time and supports future restoration projects, enabling the preservation of heritage in the face of limited historical data access.

Furthermore, AH's architectural experiences exemplify how the architectural history of the Bajo people can stimulate community engagement and pride. It encourages communities to take an active interest in their architectural heritage, fostering an understanding of its significance and empowering them to participate in preservation endeavors. This preservation and showcase of indigenous architectural heritage not only attract cultural tourism, contributing to local economies, but also informs sustainable construction practices, allowing communities to make informed choices and create a bridge between the past and a sustainable future. Additionally, the architectural documentation of AH's houses, alongside other indigenous structures, serves as a valuable resource for educational institutions and researchers, supporting academic studies, cultural preservation programs, and in-depth analyses of architectural transformations within their cultural and environmental contexts. This adds further the notion of history embedded in the built environment of the vernacular context.

In summary, the insights drawn from AH's vernacular architectural transformation can guide architectural design, historical preservation, and sustainable development practices, enhancing cultural sensitivity and contributing to the long-term preservation of indigenous architectural heritage. These findings demonstrate the importance of understanding the past to shape a better future, where cultural and historical legacies are cherished and respected. Letting the locals design their own houses and learn from their ways in adaptations can also be an alternative to cultural preservation, especially in these culturally sensitive areas. This might lead to a new form of architectural education where a more participatory method between architect and locals is applied and developed.

### **5. 3. Chapter conclusion**

This chapter focuses on assessing the transformations in 12 informants' houses over the years, which were selected from a dataset of 23 informants. The data was meticulously collected through field surveys and interviews. While the number of informants may appear small, the information collected is valuable for understanding the changes in these houses, especially with the ethnography-based intensive architecture memory recollection method and direct observation of the existing houses, which is the primary goal of the research and what is hoped to be replicated in future research.

A total of 34 houses are analyzed, with 12 still existing and 22 having changed ownership or structures. The houses are owned by informants from different ethnic groups and span from the 1940s to the 2020s. The data includes the physical order with measurements, sketches, and material information for each house, with the majority having estimated measurement drawings.

The first section of the analysis focuses on area transformations, examining how the area size has changed over time for each informant, based on their ethnic backgrounds, the decade of construction, and their proximity to tourism activities. Notably, there is a substantial increase in area size, especially in houses owned by the Bajo group due to their strategic location in the tourism development scheme. These houses have been adapted to accommodate tourists, generating additional income to combat the increase of land, and building tax in the area.

The second section explores material transformations, revealing patterns in building materials used over the decades. Stone foundations, wooden blocks for columns, zinc roofing, and wooden doors dominate, while palm leaves, brick walls, and wood and glass windows are the common material used in the past 8 decades. The informants tend to "upgrade" to more modern materials, when possible, either due to the perceived status or availability of certain materials. This transformation reflects a shift towards more prefabricated and modern options.

The third section examines the territorial order which starts with the transformation of the number of rooms in the houses. Most houses experienced an increase in the number of rooms, often due to the need for more complex activities and accommodation. The trend is observed across different ethnic groups, with the Bajo households leading in room number increase, particularly to cater to the booming tourism industry and their potential assets.

Furthermore, the proximity to tourism activities influences the demand for short-term rentals. Houses in periphery areas tend to have added more rooms as they have more land, while those in access areas have fewer changes as the tourism potentials, they have is vague, and sometimes need to go through land decrease due to road expansion. Strategic areas see significant increases in the number of rooms to cater to tourists and out-of-town workers.

This part of the physical and territorial analysis provides valuable insights into how houses in this area have transformed in terms of area size, materials, and room numbers over the years. It highlights the impact of factors like tourism proximity and economic considerations on these transformations.

Then the cultural order is analyzed through a closer look at the Soekarno-Hatta Street neighborhood, where most houses are from Bugis and Bajo groups, and discusses the strategic potential of the area for tourism activities. It presents a timeline of the houses constructed over different decades, ranging from the 1950s to the 2020s. Most houses have adapted to the tourism industry, with some offering long-term accommodation or commercial spaces for rent. This section also highlights the layout analysis, demonstrating that despite minor variations, the houses share some common elements, like the positioning of main bedrooms and guest living rooms. This is then used to highlight the design

guidelines to be implemented if the local elements are needed, spanning from the main column and main bedroom preserved connection, direct access to kitchens, the changes in public-private locations within the house, design modularity inherited from the stilt houses, to the challenges of passive ventilation in the RC houses. Overall, this chapter provides a comprehensive overview of the housing evolution in Labuan Bajo, showcasing the impact of tourism and the influences of vernacular architecture on house design and layout.

The comprehensive analysis of each informant's house transformations goes beyond mere data collection; it delves into the intricate stories and motivations behind every architectural change. By scrutinizing the reasons and contexts for these alterations, this study provides invaluable insights into the evolution of vernacular architecture and the deep-seated local wisdom it encapsulates. This methodological approach is not only beneficial for the present study but also sets a precedent for future researchers, designers, and historians. It offers a blueprint for gathering data in vernacular architecture transformation studies where historical records are scarce.

Through this meticulous exploration of individual experiences, the study contributes to a more profound understanding of the nuanced and culturally embedded aspects of architecture. It not only documents the physical changes but also uncovers the social, economic, and cultural drivers behind them. This wealth of knowledge is a valuable resource for scholars seeking to replicate these methods and conduct similar studies, enabling a deeper appreciation of how vernacular architecture reflects the unique wisdom of local communities and how it adapts to changing circumstances. In essence, it serves as a guide for unlocking the stories hidden within the walls and layouts of houses, providing a richer narrative of the local built environment.

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**CHAPTER 6**  
**ANALYSIS ON ETHNOGRAPHY-BASED**  
**INTENSIVE ARCHITECTURE MEMORY**  
**RECOLLECTION METHOD**



## 6. 1. Memory system analysis

In order to gain insight into the memory systems of the individuals being interviewed, as well as the broader context of their communities, an analysis was conducted using their responses during interviews. The analysis began by determining whether the interviewees possessed a literate or oral memory system. This determination was made by assessing whether their responses were derived from written sources (literate) or from oral tradition (oral).

During the interviews with all 23 informants, only a few topics or questions were answered through literature recollection as summarized in Table 6.1 and shown in detail in Table 6.2. Only 4% of the questions regarding individual/family history were answered through literature, only 2% of the ones regarding neighborhood/town history and 0% of the house history had any literature from which a memory can be recollected. The forms of these literature ranges from a document of the Bugis royal lineage family tree or some written documents made by themselves or their families. The Bugis royal lineage family tree is an official document replicated from the kingdom in Sulawesi, while the written document made themselves were first acquired through oral history and just recently made into a written form. This shows how the society around the informants started with oral history and is recently started to document a few things in a more tangible form. Through this simple assessment, the communities of the informants have a more dominant oral memory system, in comparison to their growing literate memory system. This also reflect the importance of documenting their local vernacular architecture as it is proven to be only stored in their oral memory system and could disappear soon.

Table 6.1 Ethnography-based intensive architecture memory recollection methods of the informants during the interviews

History scale	Literature	Oral
Individual/family	4%	96%
House	0%	100%
Neighborhood/town	2%	98%

Subsequently, an assessment was made of their historical memory system by analyzing their willingness to answer questions. As shown in Figure 6.1, their willingness to share information is a reflection of the historical memory embedded within themselves and their society. When informants were reluctant to share certain topics, it indicated that either they had no recollection of these memories, were unenthusiastic about discussing them, or did not see the value in sharing those memories. In examining Figure 6.1, it is apparent that a significant portion of their memory is allocated to their historical memory system, as most of the willingness scores were at least 50%, especially concerning



their houses, which was the primary focus of the research. However, this does not necessarily imply that the informants possess less memory about their personal or family history. A more detailed examination of each category is necessary to understand the density of their memories in each area, which can be used to identify patterns and draw relevant information.

In seeing the Figure 6.1, it can be interpreted how the most parts of their memory is in the historic memory system as most of the willingness has at least 50% willingness, especially for the houses as this research focus more on the houses' transformation. This makes sense that they will recollect more about their houses, as this research is more about their houses' transformation, but this does not mean that the informants have less memory in their personal or family history. Next, to look closer into each category is required to understand how dense their memory is in each part, then later an analysis will be done on how to relate these denser memories to the information we need to know.

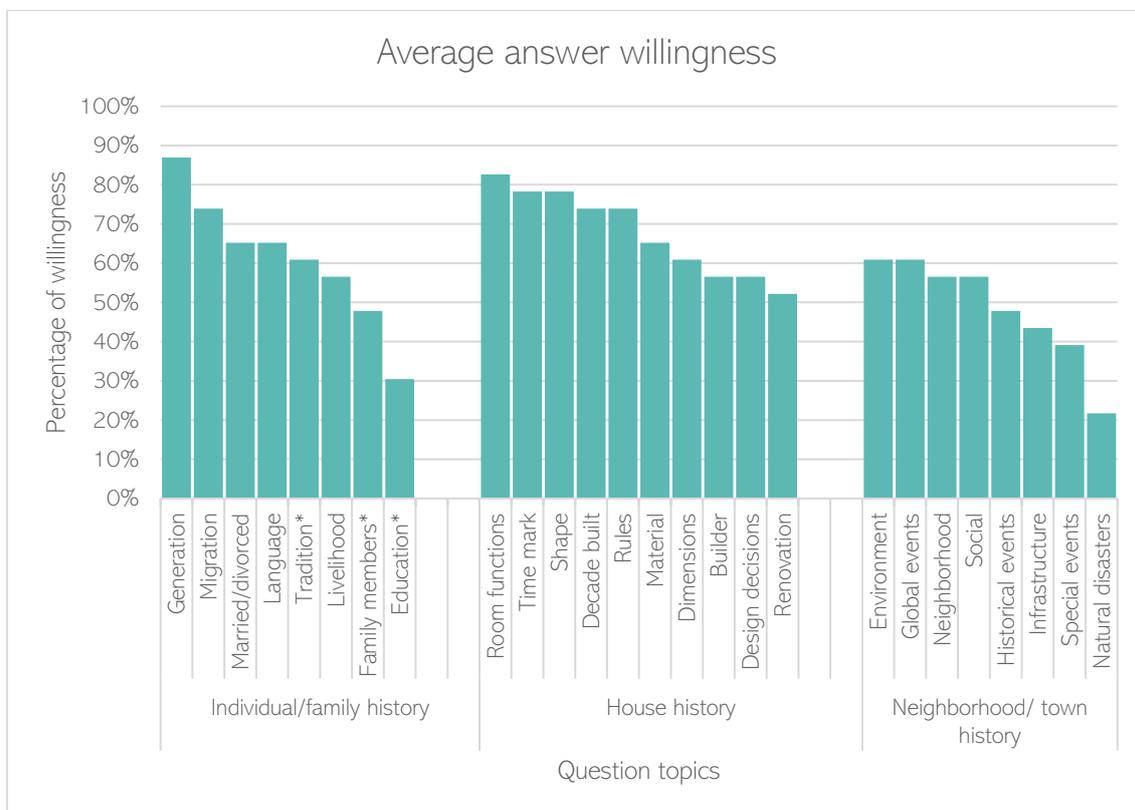


Figure 6.1 Area chart of the willingness to answer

In the research methodology, a pivotal component involves the careful categorization of interview questions and the narratives shared by participants into the three distinct memory system categories, as visually illustrated in Figure 6.2. This categorization serves a multifaceted purpose within the study. Firstly, it enables a structured analysis of the rich tapestry of memories that participants bring forth, classifying them into personal/family history, house history, and neighborhood/town history categories. This framework allows for a comprehensive understanding of the different dimensions of memory that the informants draw upon during the interviews. Secondly, the categorization process

facilitates the assessment of the "density" of stories within each of these categories, shedding light on which aspects of their past elicit the most vivid and detailed recollections. This insight is invaluable in grasping the participants' preferences and tendencies when recollecting and sharing their memories. Moreover, it allows for the optimization of the interview process, enabling the interviewer to strategically navigate the conversation and formulate questions that align with the participants' natural inclination to share memories from a particular category. In essence, this approach not only streamlines the data collection process but also ensures that the research objectives are met by capturing the most pertinent and nuanced data based on the participants' memory tendencies.

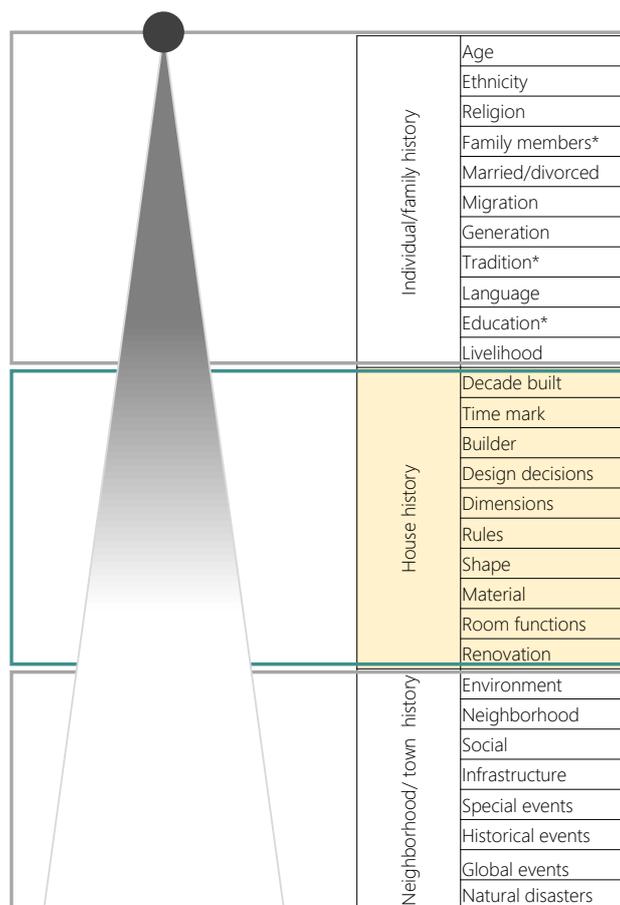


Figure 6.2 Memory structure and the interview questions

The presentation of response numbers in Table 6.3 offers valuable insights into the informants' participation in the interviews. It becomes evident that not all questions were met with answers from the informants, and in some instances, certain topics did not naturally arise during the conversations. This characteristic of unstructured interviews is particularly advantageous, as it underscores the flexibility of this method. It demonstrates that, in understanding the memories and thought processes of the informants, not all questions need to be explicitly posed or answered. Instead, the informants had the agency to introduce topics organically, reflecting their own priorities and recollections. This

unstructured approach, consciously selected for this research, allows participants to be themselves during the interviews, offering an authentic and unfiltered glimpse into their memories and personal narratives. It underscores the significance of what resonates most with them and what they find most accessible to recall and share. Consequently, this methodology not only captures a broad spectrum of memories but also respects the agency of the informants in shaping the narrative, offering a holistic understanding of their lived experiences and cognitive processes.

Table 6.3 List of informant’s answers per question

Memory scale	Question	Total per question	Memory scale	Question	Total per question	Memory scale	Question	Total per question
Individual/family history	Age	12	House history	Decade built	33	Neighborhood/town history	Environment	13
	Ethnicity	13		Time mark	34		Neighborhood	16
	Religion	12		Builder	38		Social	9
	Family members*	38		Design decisions	36		Infrastructure	17
	Married/divorced*	13		Dimensions	33		Special events	16
	Migration	12		Rules	42		Historical events	18
	Generation	12		Structure shape	34		Global events	24
	Tradition*	19		Roof shape	33		Natural disasters	12
	Language	29		Foundation	34			
	Education*	12		Columns	35			
	Livelihood	12		Floor	46			
	Role	9		Walls	40			
		Roof		36				
		Windows		38				
		Interior doors		41				
		Exterior doors		34				
		Room functions		74				
		Renovation		22				

The assessment of the informants' responses is a pivotal aspect of this study, and it is conducted through a thorough analysis of the informative tree map displayed in Figure 6.3. This visualization is instrumental in understanding the distribution and prominence of various types of information shared during the interviews, and it provides a nuanced perspective on the memory recall patterns of the informants.

Interestingly, the analysis reveals that the frequency of shared information aligns with the primary research focus, which is to gather data related to house history. This observation indicates that the informants naturally gravitate toward discussing their houses when prompted. However, what sets this analysis apart is the notable revelation that the size of the "family members" category within the "individual/family history" information is not only substantial but, in some instances, equals or even surpasses the size of the "house history" category.

This finding carries profound significance, as it suggests a strong interconnectedness between the memories associated with their family members and the narratives surrounding their houses. Despite

the research's directed focus on the houses themselves, the informants seem unable to disentangle their recollections of their homes from the stories of their family members. This intricate interplay underscores the integral role that family plays in shaping their experiences and, in turn, the recollection of their houses. This discovery unveils a more holistic understanding of their memories and the intricate tapestry of interrelated narratives that inform their recollections. It reinforces the notion that family, as a core component of their lives, is inextricably linked to their personal and house histories, shedding light on the interconnectedness of their life experiences and the significance of these intertwined narratives in understanding their past.

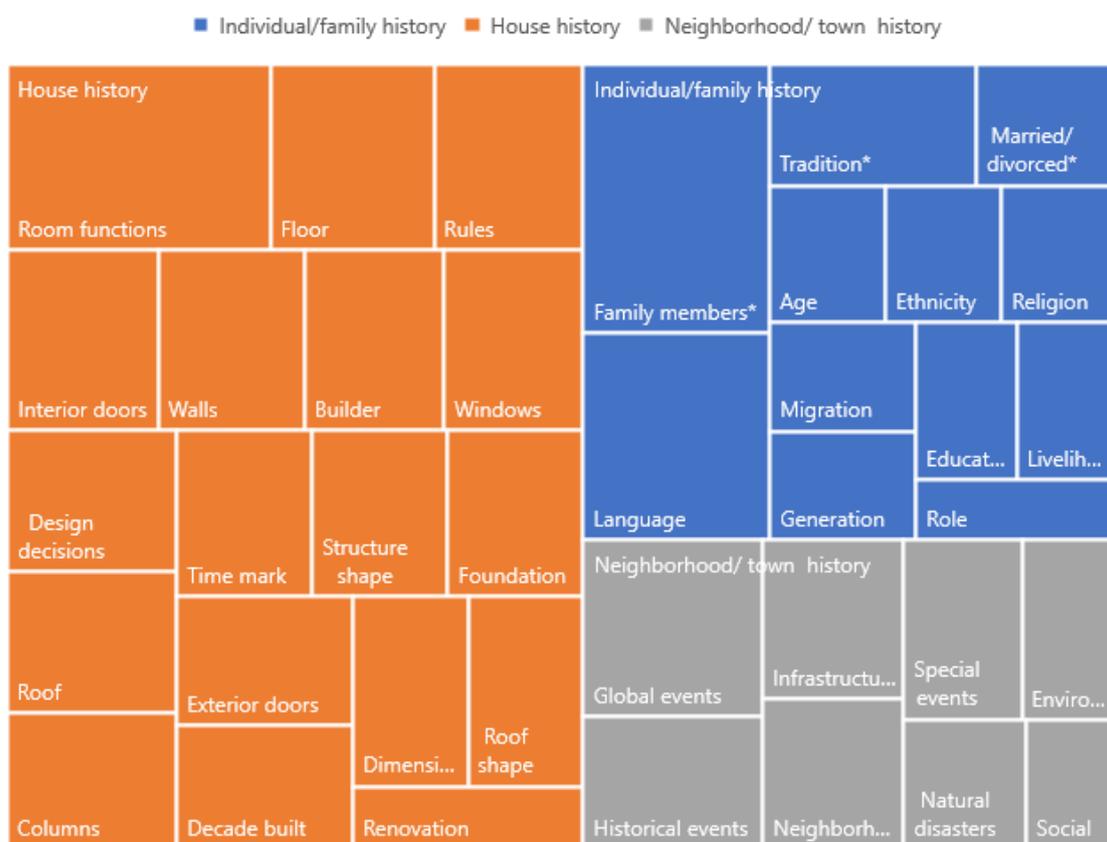


Figure 6.3 Tree map of informants' answers based on the memory scale

The analysis of the informants' responses and the topics they discussed relied on a method called "keyword category analysis." This approach helps organize and make sense of the information. For example, in Table 6.4, the analysis focused on understanding the reasons behind the migration of the informants or their ancestors. Since the answers provided were often not expressed in simple sentences, further examination was needed to group and categorize their stories. The goal was to identify if there were shared experiences among the community members. To do this, the interviews were recorded and later transcribed. These transcripts were then analyzed using the keyword category method to look for common themes or patterns in the responses.

This method of analysis allows for a systematic way of finding similarities and differences in how people recall and share their memories. By examining the transcripts and identifying recurring keywords or themes, researchers can gain valuable insights into the experiences of the informants and potentially uncover shared cultural or historical aspects of their migration stories. This structured approach helps researchers better understand the collective memory of the community and the various factors that have shaped it.

Table 6.4 Keyword-category analysis example on the reason behind migration

Reason behind migration	Categories
Grandfather was <b>hired</b> to help govern the Manggarai kingdom	Work
<b>Fled</b> the rebellion in South Sulawesi	Sanctuary
A <b>folk story</b> about a princess who was lost at sea and <b>sought out</b> by the ancestors of the now Bajo people	Unclear, Better opportunities
<b>Stationed</b> in Labuan Bajo	Work
Born in Nggorang, migration was <b>unclear</b>	Unclear
There was a <b>government directive</b> which forbade clearing of forests	Government instruction
Sailed for <b>trading</b>	Better opportunities
Father was <b>stationed</b>	Work
Change of <b>government</b> established a new system for the head of village (kepala desa gaya baru)	Government instruction
<b>Fled</b> from the Dutch in Bima, fled from the coasts of Labuan Bajo from the Japanese	Sanctuary
Fascinated by the promise of <b>better livelihood</b> in Labuan Bajo	Better opportunities
Grandparents <b>fled</b> from the rebellion in South Sulawesi	Sanctuary
Grandfather was <b>hired</b> to help govern the Manggarai kingdom	Work
<b>Escaped</b> from Bima during hard times	Sanctuary
<b>Invited</b> by a cousin from his wife to stay in Labuan Bajo	Better opportunities
<b>Instructed</b> to come down from his initial village up on the hill	Government instruction
<b>Looking</b> for a better life	Better opportunities
Had a cousin living in Labuan Bajo and wanted to go to <b>highschool</b>	Better opportunities
Grandfather <b>worked</b> with a Chinese tradesman	Work
Change in <b>government</b> after 1965, asked to come down from their villages	Government instruction

Through the keyword-category analysis, the answers to the questions asked during the interview were categorized and compiled from the 23 informants. The first category is the individual/family history, shown in Figure 6.4. The most dominant topic is the family members, language and tradition. It can be interpreted that family members' history and milestones are considered very important to be remembered, recollected and shared. This is followed by language which can be interpreted as the extension of their identity and the awareness of living in a multiethnic environment requiring the ability to talk in different languages. Then tradition can be interpreted as their respect to their culture and identity as an individual and as a part of a community.

The family members most talked about during the interviews were their parents followed by their children. This is logical considering the questions were about their past and current houses. The authority of their past houses will fall in their parents' hands, thus increasing the frequency of them talking about their parents. The frequency about their children is also high, as their current house will be designed to accommodate their children. The dynamics of their children will be tied closely to the transformations of their house. In some cases, their houses had to accommodate three generations which makes it logical for them to discuss their parents' and their children's dynamics along while recollecting memories of their houses' evolution. Their siblings and extended family will sometimes be included in the stories. The tree map indicates that their spouse is the least mentioned person in the family, but it is only because they are mostly mentioned as an extension of themselves and are sometimes also present during the interview and became part of the interview process.

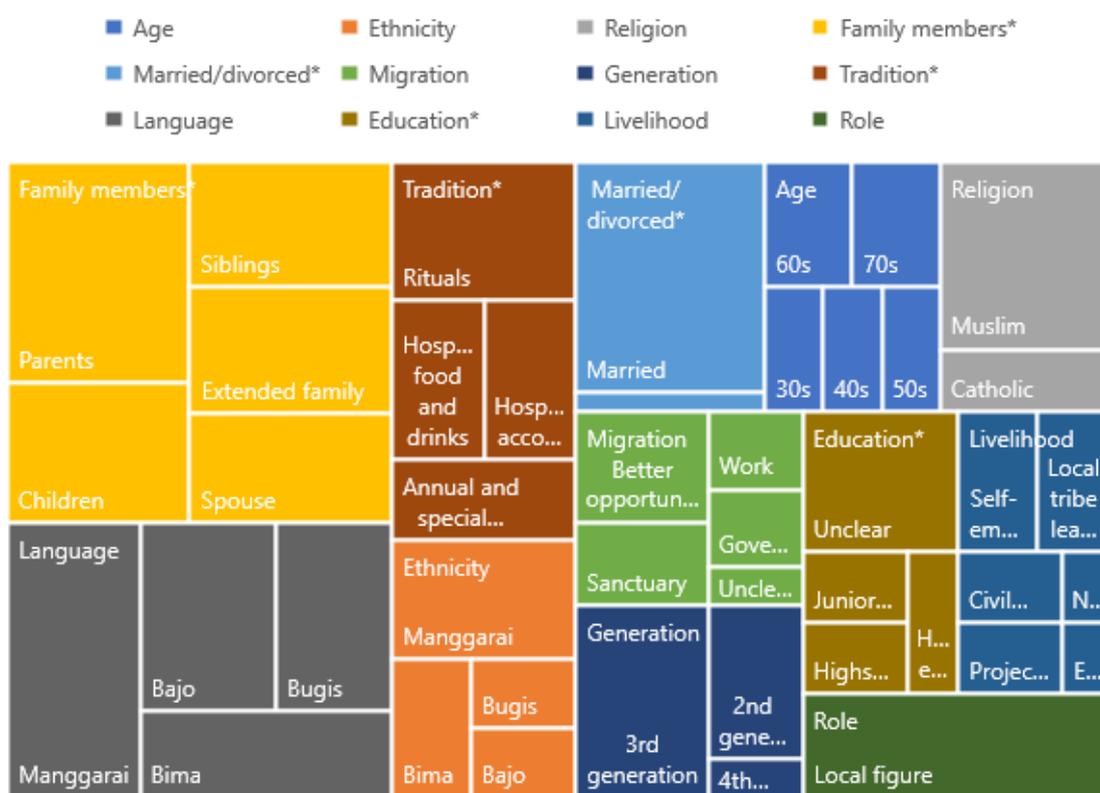


Figure 6.4 Tree map of informants' answers frequency related to individual/family history

The responses provided by the informants concerning their individual and family histories are summarized in Table 6.5. This table utilizes a color-coding system to highlight the frequency of answers. The color scheme distinguishes between the least frequent responses, depicted in red, and the most frequent ones, which are represented in green. Intermediate frequencies are indicated by varying shades of yellow and orange. This color code is applied to each question or topic, facilitating a detailed examination of which responses are most and least prevalent within the dataset. This method

visually aids researchers in quickly identifying the prominence and rarity of specific information in relation to individual and family histories.

Table 6.5 List of informants' answers related to individual/family history

	Question	Answer	M A	BI	BU	BA	Total	%
Individual/family history	Age	30s	1	0	0	1	2	16.7%
		40s	1	1	0	0	2	16.7%
		50s	1	1	0	0	2	16.7%
		60s	1	0	1	1	3	25.0%
		70s	1	1	1	0	3	25.0%
	Ethnicity	Manggarai	5	0	0	0	5	41.7%
		Bima	0	3	0	0	3	25.0%
		Bugis	0	0	2	0	2	16.7%
		Bajo	0	0	0	2	2	16.7%
	Religion	Muslim	2	3	2	2	9	75.0%
		Catholic	3	0	0	0	3	25.0%
	Family members*	Parents	5	3	1	2	11	91.7%
		Children	2	2	1	2	7	58.3%
		Siblings	3	1	1	2	7	58.3%
		Extended family	3	2	0	2	7	58.3%
		Spouse	1	1	2	2	6	50.0%
	Married/divorced*	Married	5	3	2	2	12	100.0%
		Divorced	1	0	0	0	1	8.3%
	Migration	Better opportunities	1	2	0	1	4	33.3%
		Sanctuary	0	1	2	0	3	25.0%
		Work	2	0	0	0	2	16.7%
		Government instruction	1	0	0	1	2	16.7%
		Unclear	1	0	0	0	1	8.3%
	Generation	2nd generation	2	0	1	1	4	33.3%
		3rd generation	3	3	1	0	7	58.3%
		4th generation or more	0	0	0	1	1	8.3%
	Tradition*	Rituals	2	2	2	1	7	58.3%
		Hospitality- food and drinks	1	1	1	1	4	33.3%
		Hospitality- accommodation	2	1	0	1	4	33.3%
		Annual and special celebrations	1	1	1	1	4	33.3%
	Language	Manggarai	5	3	0	2	10	83.3%
		Bugis	1	1	2	2	6	50.0%
		Bima	1	3	0	2	6	50.0%
		Bajo	1	2	2	2	7	58.3%
		Others	0	0	0	0	0	0.0%
Education*	Elementary school	0	0	0	0	0	0.0%	
	Junior high school	0	0	2	0	2	16.7%	
	Highschool	1	0	0	1	2	16.7%	
	Higher education	1	0	0	1	2	16.7%	
	Unclear	3	3	0	0	6	50.0%	
Livelihood	Self-employed	1	1	1	0	3	25.0%	
	Local tribe leader	2	0	0	1	3	25.0%	
	Civil servant	1	1	0	0	2	16.7%	
	Project based	0	1	1	0	2	16.7%	
	Neighborhood chairman	1	0	0	0	1	8.3%	
	Employee	0	0	0	1	1	8.3%	
Role	Local figure	4	1	2	2	9	75.0%	

The exploration of house history through the analysis of informants' responses, as presented in Figure 6.5, offers valuable insights into the recurrent themes and narratives that surfaced during the interviews. Among the various topics discussed, three specific areas emerged as the most frequently addressed by the informants. These areas include room functions, materials used, and the building rules associated with vernacular architecture. Notably, room functions garnered significant attention,

particularly during discussions centered around house layout and the activities each room served. The interviews delved into how the informants understood the spatial arrangement of their homes and the roles each room played in their daily lives. This inquiry aimed to uncover nuances related to accessibility and the territorial divisions within the houses, providing a deeper comprehension of how owners exercised control over their living spaces.

In addition to room functions, the materials used in constructing these houses constituted another prevalent topic of discussion. Informants frequently shared insights into the evolution of materials used in the houses they had lived in over time. This line of questioning sought to illuminate the reasons behind material transformations and their impact on the houses. Understanding these shifts in construction materials provides valuable context for the study, shedding light on the dynamic nature of house history and the factors that influenced structural changes. Lastly, building rules emerged as a key topic during the interviews, with informants recounting their experiences related to how owners exercised authority in shaping the design of their houses. This facet of the conversation uncovered valuable perspectives on the decision-making processes behind house construction and the extent to which individual agency played a role in determining the architectural features of these vernacular homes.



Figure 6.5 Tree map of informants' answers frequency related to the house history

The responses provided by the informants regarding house history are summarized in Table 6.6. This table employs a color-coding system to represent the frequency of answers. The heat map feature is used to visually highlight responses, with the least frequent ones represented in red, the most frequent in green, and intermediate frequencies in shades of yellow and orange. This color code is applied to each question or topic, serving the purpose of enhancing the clarity of identifying which specific responses within the dataset are either the most prevalent or the scarcest, aiding in a more detailed examination.

Table 6.6 Heat map of informants' answers frequency related to the house history

Question	Answer	MA	BI	BU	BA	Total	%	Question	Answer	MA	BI	BU	BA	Total	%	
Decade built	1940s	0	0	0	1	1	8%	Foundation	Stone	6	4	5	5	20	59%	
	1950s	2	0	0	0	2	17%		RC sloop beam	6	3	2	2	13	38%	
	1960s	2	2	0	2	6	50%		RC blocks	1	0	0	0	1	3%	
	1970s	0	0	1	2	3	25%	Columns	Wooden blocks	7	5	5	6	23	68%	
	1980s	1	1	2	1	5	42%		Reinforced concrete	4	3	2	1	10	29%	
	1990s	5	1	1	0	7	58%		Wooden logs	2	0	0	0	2	6%	
	2000s	1	1	1	1	4	33%	Floor	Ceramic tiles	6	3	2	1	12	35%	
	2010s	1	1	1	0	3	25%		Bamboo	2	2	3	4	11	32%	
	2020s	1	0	1	0	2	17%		Cement	4	2	2	1	9	26%	
Time mark	Family milestones	10	4	5	6	25	74%		Wood	4	2	1	1	8	24%	
	Historical events	1	2	2	0	5	15%		Dirt	1	2	1	2	6	18%	
	Special events	1	0	0	1	2	6%		Walls	Palm leaves	3	3	4	4	14	41%
	No milestones	1	0	0	0	1	3%	Brick		4	3	2	1	10	29%	
	Natural disasters	1	0	0	0	1	3%	Wooden panels		4	0	1	1	6	18%	
	Builder	Self-appointed contractors	6	3	3	5	17	50%		Bamboo	0	0	2	1	3	9%
Neighbors and families		4	3	4	2	13	38%	Brick and wooden panels		2	0	0	1	3	9%	
Self-built		0	1	4	0	5	15%	Wood boards		0	1	1	0	2	6%	
Design decisions	Unclear	2	0	0	0	2	6%	Zinc	1	1	0	0	2	6%		
	Government contractors	1	0	0	0	1	3%	Roof	Zinc	9	4	3	3	19	56%	
	Dimensions	Personal preferences	4	6	6	3	19		56%	Palm leaves	3	2	2	4	11	32%
Following the neighbors		6	0	0	1	7	21%		Reinforced concrete	3	0	0	1	4	12%	
Unclear		3	0	0	3	6	18%		Terracota tiles	0	0	2	0	2	6%	
Rules	Following the contractors	3	0	1	0	4	12%		Windows	Wood and glass	7	3	2	2	14	41%
	Estimated dimensions	6	5	3	4	18	53%			Bamboo or wooden bars	4	1	3	4	12	35%
	Rough estimations	2	0	4	3	9	26%	Wooden boards		2	1	1	1	5	15%	
Structure shape	No estimation at all	5	1	0	0	6	18%	Palm leaves weaving		1	2	1	0	4	12%	
	Traditional building logics	6	4	4	5	19	56%	Curtains		0	0	0	3	3	9%	
	No rules	4	2	3	2	11	32%	Interior doors		Curtains	6	6	4	5	21	62%
Traditional rituals	2	0	0	4	6	18%	Wooden doors		8	2	2	2	14	41%		
Islamic rules	1	1	1	1	4	12%	Wooden boards		1	2	3	0	6	18%		
Unclear	2	0	0	0	2	6%	Exterior doors		Wooden doors	8	3	2	2	15	44%	
Roof shape	Stilt house	6	4	3	5	18			53%	Palm leaves weaving	2	3	2	4	11	32%
	Hipped roof	9	0	2	0	11			32%	Wooden boards	3	1	3	1	8	24%
	Bugis roof	3	0	5	0	8		24%	Room functions	Main bedroom	12	6	6	7	12	35%
Bajo roof	0	0	0	7	7	21%		Daughters' bedroom		11	5	1	6	11	32%	
Bima roof	0	6	0	0	6	18%		Sons' bedroom		7	3	1	6	7	21%	
Renovation	Manggarai perpendicular roof	1	0	0	0	1	3%	Parents' bedroom		3	1	1	0	3	9%	
	Renovation	Additional rooms	0	4	1	1	6	18%		Kitchen	12	6	6	5	12	35%
										Family living room	8	5	3	5	8	24%
Guest living room										12	6	5	6	12	35%	
Renovation	Additional rooms	0	4	1	1	6	18%	Bathroom		8	3	3	2	8	24%	
								Function under the house		0	3	3	4	0	0%	
								Other rooms		7	3	4	5	7	21%	
Renovation	Additional rooms	0	4	1	1	6	18%	Floor renovation		0	1	2	1	4	12%	
								Wall renovation		1	1	3	1	6	18%	
								Roof renovation	1	1	3	1	6	18%		

Lastly, the analysis is done on the neighborhood/town history category. Figure 6.6 shows the tree map of informants' answers frequency related to their recollection in the neighborhood/town history. The most frequent topic shared is about global events, historical events and infrastructure. The neighborhood/town history also includes global events that had impacted the neighborhood/ or town in any way, such as the coronavirus-19 epidemic, the Dutch colonial period and World War II. The historical events mentioned were regarding the Darul Islam movement and the rebellion, the super-premium destination announcement of Labuan Bajo, and the resettlement regulation which instructed them to move nearer to the closest access. Infrastructures were mentioned to inform the

transformations of the town or neighborhood. These infrastructure changes were, among many, road revitalization or expansion, water treatment system implementation, constructions of bridges, pedestrian refurbishment and the introduction of electricity.

From these answers on the neighborhood/town history category, it can be assumed that these topics can be used to recollect their memory in relation to the transformations of their own houses. Global events are shared internationally, making it easy for people to relate to when the timeframe happened and to what extent the impact is felt on peoples' daily lives. Historical events might be only impactful to a certain region, nevertheless it is easy to look up on during the initial or post-survey desk study to understand the impact and repercussions the event had on the daily lives of these people. Lastly, infrastructure is a very local experience but the impact is very direct to the locals. For example, the introduction of electricity is not experienced by all people at the same time and perhaps not even experienced at all, but the stories were shared to describe the milestone and advancement experienced by the locals at the time.



Figure 6.6 Neighborhood/town history

Table 6.7 is an overview of the responses from the informants regarding the history of their houses. The table utilizes a color-coded system to show how often these responses occur. Less common

answers are represented in red, while more frequent ones are indicated in green. Responses that fall in between in terms of frequency are shaded in various hues of yellow and orange. This methodical use of colors is applied to each specific question or topic, with the purpose of making it simpler to identify which responses are either most common or least common within the dataset.

Table 6.7 List of informants' answers related to the neighborhood/town history

	Question	Answer	M	BI	BU	BA	Total	%
			A					
Neighborhood/ town history	Environment	Land reclamation from the government	0	1	2	2	5	41.7%
		Wood sourcing regulation	3	1	1	0	5	41.7%
		Land reclamation for their own house	0	1	2	0	3	25.0%
	Neighborhood	Similarities in houses	3	2	0	0	5	41.7%
		Sudden changes in houses' styles	2	1	0	1	4	33.3%
		Sparse houses	1	0	1	2	4	33.3%
		Increasing density of houses	0	0	1	2	3	25.0%
	Social	New schools	1	0	2	2	5	41.7%
		Shifting of livelihoods to tourism	2	1	0	0	3	25.0%
		New hospitals	1	0	0	0	1	8.3%
	Infrastructure	Road revitalization	2	1	2	2	7	58.3%
		Water treatment system	0	0	2	1	3	25.0%
		Construction/renovation of bridges	1	1	0	0	2	16.7%
		Street fixtures for the pedestrian way	0	0	0	2	2	16.7%
		Electricity	1	0	0	0	1	8.3%
		New port construction	0	0	0	1	1	8.3%
		Waste treatment plant	0	0	0	1	1	8.3%
	Special events	National and regional elections	5	3	2	2	12	100.0%
		Annual religion events	1	1	0	2	4	33.3%
	Historical events	Darul Islam movement and the rebellion	0	1	2	1	4	33.3%
		Super premium destination	2	0	0	2	4	33.3%
		Resettlement regulation	2	0	0	1	3	25.0%
		Visit by the president	1	2	0	0	3	25.0%
		Visit by the vice president	0	0	2	0	2	16.7%
		Sail Komodo 2013	0	0	0	2	2	16.7%
	Global events	Coronavirus-19 epidemic	4	3	2	2	11	91.7%
		Dutch colonial period	4	1	2	0	7	58.3%
		World War II	0	2	2	0	4	33.3%
		Bima and Gowa sultanates' war	0	0	1	1	2	16.7%
	Natural disasters	Regular floods	4	2	2	2	10	83.3%
Big floods		1	0	0	1	2	16.7%	

The comprehensive analysis of the three memory system categories reveals a compelling insight into the memory recollection processes of the informants. It becomes apparent that the oral and historic memory systems play a pivotal role in facilitating their ability to remember and share their past experiences. This finding underscores the significance of these memory systems within the studied communities, highlighting their efficacy in preserving and transmitting vital information. Notably, certain questions and topics, particularly those related to the recollection of their past houses, serve as potent triggers for memory recollection. These topics effectively act as temporal markers, guiding the informants through their recollections and enabling a structured remembrance of significant life events.

In Figure 6.7, we gain further clarity on the role of time marks in memory recollection, as it provides a composition based on the ethnic identities of the informants. It emerges that, when reflecting on their past houses, the informants predominantly rely on family milestones as a means of anchoring their memories within a specific timeline. These milestones not only serve to chronicle their personal histories but also to recall other critical features of their houses. Interestingly, the Manggarai informants exhibit a wider variety in their time mark preferences, indicating the diversity and richness of their memory recall processes. Furthermore, global and local historical events, with a particular focus on World War II and Sail Komodo 2013, are recurrently cited as influential markers in their memory recollection. Additionally, Table 6.8 offers a detailed breakdown of the answer frequencies related to the time marks utilized by the informants in their memory recollection, categorized based on their ethnic identities. This data-rich table provides an even more in-depth understanding of the nuanced ways in which time marks shape their recollections and offers a comprehensive view of the interplay between memory, culture, and historical events within these communities.

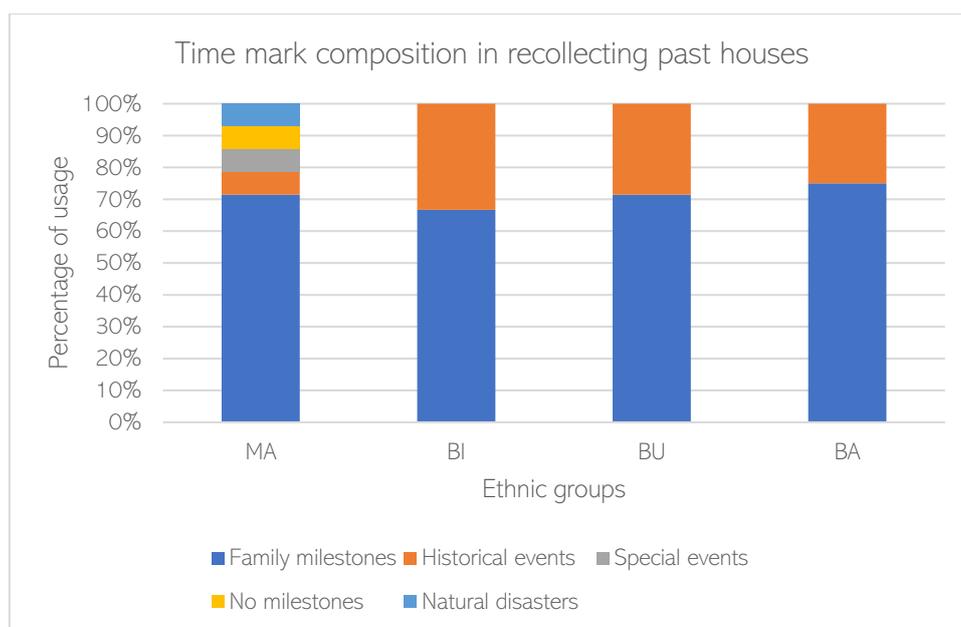


Figure 6.7 Time mark composition in recollecting past houses

The recognition of the significance of time marks in the interview process carries substantial implications for our understanding of memory recollection, especially within communities characterized by an oral-historical memory system. It becomes evident that time marks, such as family milestones and historical events, play a crucial role in accelerating the process of remembering and sharing experiences. By invoking these temporal markers, informants can effectively navigate the vast landscape of their memories and recall specific events, thus enhancing the efficiency and effectiveness of the interview process.

Table 6.8 Informants' time mark in recollecting past houses

Question	Answer	MA	BI	BU	BA	Total	Percentage
Time mark	Family milestones	10	4	5	6	25	74%
	Historical events	1	2	2	2	6	18%
	Special events	1	0	0	0	1	3%
	No milestones	1	0	0	0	1	3%
	Natural disasters	1	0	0	0	1	3%

This finding holds broader relevance and potential for future research endeavors. The use of time marks as a memory retrieval tool can serve as a valuable methodological approach in studies that involve similar memory systems within various communities. Replicating this approach in future research can offer a standardized and systematic way of harnessing the oral and historical memory systems to elicit rich and detailed recollections from informants. It has the potential to unlock a treasure trove of insights into the cultural and historical dimensions of memory, shedding light on how communities perceive and share their past. By recognizing the power of time marks and their utility in memory recollection, researchers can refine their methodologies and achieve a deeper understanding of the intricate tapestry of memories that shape the narratives of these communities, ultimately contributing to a more comprehensive and culturally sensitive body of research.

## 6. 2. Depth analysis of memory recollection in transformation studies

In a survey in 2010, Indonesia had more than two hundred million national citizens composed of more than 1300 ethnic groups, with almost 80% of the population speaking their local language daily (Ananta et al., 2018; Na'im & Syaputra, 2010). There is also a double amount of Indonesian language used daily at home amongst citizens five years and older in 2010 compared to 1990 (Na'im & Syaputra, 2010). These languages are built on different systems according to their society's values and lifestyle. Most of them are based on oral traditions, and as the languages are fading soon, these oral traditions will inevitably fade as well. The lack of an archival system in oral communities has made many forget their history (Hartzell, 2008; Huston & Dastrup, 2020; Wall & Mathieson, 2006).

Locals also shared the story of Labuan Bajo through oral tradition as the trading port between Bajo and Manggarai people, a meeting between people from the sea and the mountain (Ardhyanto et al., 2020, 2022; Kemdikbud, 2018). This mutual exchange shows the importance of their relationship and how they have assimilated and learned from one another (Kemdikbud, 2018; Verheijen, 1987). The extensive research hypothesizes that this assimilation is also seen in their architecture. The

transformation of their vernacular architecture should show how they have adjusted to other cultures living with them and found common ground. Though it will not inevitably lead to a Labuan Bajo architecture, per se, Manggarai or Bajo architecture in Labuan Bajo will differ in forms and values to their places of origin.

The waves of migration were already diversifying the locals, and then international exposure became a part of Labuan Bajo in the 15th century. Currently, Labuan Bajo is under the intense attention of the government to become an international premium tourist destination. Tourism has been known as a catalyst of globalization (Hartzell, 2008; Wall & Mathieson, 2006), thus reinforcing the urgency of understanding the vernacular architecture before it assimilates further.

Similar concerns are now reemerging, starting from the beginning of the 19th century when industrialization progressed so that the cities lacked the space for vernacular artifacts, folklore, and oral traditions (Boyer, 1994). While architecture always shows a highly unique juxtaposition to the city, the built environment is a representation of how as a society, our lived experiences take form in a memory building (Hennessy, 2021; Jo, 2003; Rossi, 1982). With the fading of one's memory and vernacular architecture, and with the additional force of tourism, the town might lose its identity in the mix of cherry-picked culture and tourism strategies (Wall & Mathieson, 2006; Xue et al., 2017).

The research on the issue has increased in recent years, despite the many efforts to agree on the same definition to what is vernacular architecture (Pardo, 2023). In agreement to lessen the energy for debate and instead focus on its significance (Vellinga, 2011) has led this paper to use the term in the same frame as the classification proposed by Hourigan, which sticks to the boundaries of what it is not, it is not made by architects, not built for import or to impress a cultural elite (Hourigan, 2015). The proposition follows the term and boundaries coined by Rudofsky in "Architecture Without Architects," which casually describes the scope of architecture produced by people without an architectural educational background (Hourigan, 2015; Rudofsky, 1964). Anderson also used this definition to distinguish the architecture made by the people with disciplinary memory, in contrast to social memory (S. Anderson, 1999). Hence, the definition suits the research design, where the memory system of a social group will be assessed along with the transformation of their vernacular architecture.

In the Indonesian context, the past generations have used various types of wood, bamboo, and palm families as their primary materials for construction. Wood is rarely used in modern Indonesian houses due to its limited availability or high price compared to reinforced concrete and lightweight concrete blocks (Mogul, 2022; Prasetyo, 2019; Rosary, 2020). Bamboo and palm families are also less opted due to the required labor and time. This condition contrasts with the previous generations' experience, where they could go to the forest and get the wood without any modern monetary or bureaucratic requirements (Rosary, 2020). The term vernacular architecture used in this paper also includes modern architecture, which uses reinforced concrete, lightweight concrete blocks, and other imported fabricated material (Hanan, 2012). This modern vernacular in Indonesia, especially in rural areas or

independently built residential houses, is still constructed by people without an educational background, thus allowing it to be called vernacular architecture.

On the social memory framework, it is argued that Halbwachs' theory on the topic is more relevant today concerning the overwhelming social and political changes (Bilsel, 2017). In reifying past architecture from memory, collective memory is considered one of the best tools, albeit needing a more empirical approach to be explored further (Gensburger, 2016). This paper does not intend to reconstruct a perfectly accurate depiction of past vernacular architecture and focus more on the transformations. Hence interviewing at least one family member suffices.

In studying the vernacular architecture of an area, resources can vary from the existing architecture to various types of literature (University of Wisconsin-Madison, n.d.). Like most places in Indonesia, Labuan Bajo has limited records of their histories. There are documents about Manggarai architecture in the neighboring area and old pictures of some houses in West Manggarai without further descriptions or details. Some houses currently still exist, which can be observed.

Literature reviews and field surveys were required to recollect a community's memory. The literature review took process before and after the field survey to understand the cultural system of a group, the events that took place in and around the area, the local socio-political scene, and the local and neighboring areas' architecture.

Field surveys allowed us to see the current architecture and built environment and to interview the locals to gather the ones in the past. The transformation of vernacular architecture can be measured during the observation and interviews by focusing on the built environment element's classification coined by Habraken, which is to classify the physical order and then later can be further analyzed into territorial and cultural order (Habraken, 2000). The analysis can show how vernacular architecture can act as a historical record, an embodiment of the values of a community and their negotiations throughout time (Bukit et al., 2012; Habraken, 2000; Hanan, 2012; Setián, 2014; Yiwei & Beisi, 2015).

An alternate resource to these limitations is to recall and reify the community's memory. Memory recollection can be done in interviews or observations. This research has limited time to observe, therefore chose to do interviews in the informants' houses. As a part of Southeast Asia, Indonesia is also prominent in its oral traditions, making memory recollection a potential tool for understanding transformations of vernacular architecture when other historical data is limited (Loh et al., 2013).

In this research, it is also noted when conducting interviews that a community's memory system might differ and result in different levels of detail. The memory system might be more literate in some aspects of their life and more oral in others (S. Anderson, 1999). This memory system operating behind memory recollection should be considered when resourcing past vernacular architecture, especially when assessing communities of different ethnic backgrounds.

This paper will focus on analyzing the transformation and retrieving past the past vernacular architecture of Labuan Bajo by recollecting the memories of the Bajo and Manggarai communities.

Only one case of each group will be analyzed, making the findings not represent the whole Manggarai or Bajo community in Labuan Bajo but a starting point for future discussions and an exercise on using memory recollection.

From the interviews, the memory system embedded in their community is observed to be different. The Manggarai community's oral tradition ensures transgenerational education (Allerton, 2012). While the Bajo people also have oral traditions, they do not have a specific system ensuring their continuation. The oral tradition can lead to recordings in the future of their oral history, while the lack of a system threatens its existence.

Combining a high historical tendency and a preserved oral tradition will be an ideal resource for retrieving past vernacular architecture and built environments in places with limited written records. This research is not seen through the historical presentism lens, in which the past is seen from our current perspective and experience. It does not forget or erase the historicity of the past. However, it is indeed explored to search for better solutions for our current problems (Dimock, 2018; Steinmetz-Jenkins, 2020). In learning the past vernacular architecture, a sustainable solution for future developments is hoped to be attainable (Hamza et al., 2021; Salman, 2016).

This research hypothesized that residents in Labuan Bajo could provide knowledge from their memory of their experience living in different forms of vernacular architecture in one generation's lifetime. It also hypothesizes that the changes are perceived and responded to differently by other ethnic identities, following their values, rules, and systems, thus making the characteristics seen in the former fishing town's urban fabric. Their memory system on this issue, which relies on oral tradition, will continue their values.

This research uses both desk study and field survey to make whole pictures of what the vernacular architecture in the past might look like and how it transformed into the common vernacular forms seen today. In coping with the limited resources of historical records of vernacular architecture in the past in many rural places, one needs to turn to alternate options. The alternative sources might be studied from existing architecture and society, records of neighboring societies, and records of the area but of other topics (Douglas, 2003; University of Wisconsin-Madison, n.d.) A field survey can provide the first source, and desk studies can give the latter two.

In the case of Labuan Bajo, the desk studies start from records of the town itself, the current regency of West Manggarai Regency, the former regency and greater region of Manggarai, Flores Island, Nusa Tenggara Timur Province, and lastly, on a national scale. Considering the nature of Labuan Bajo as a town settled and dominated by several ethnic groups, Manggarai, Bajo, Bugis, and Bima (Kemdikbud, 2018; Verheijen, 1987), the desk study also gathered data from these groups in other regions in Indonesia. Historical records under different themes and alternate names are also collected to triangulate the findings from the field survey. For example, some cartography, military or zoological

records mention Labuan Bajo as Laboeangbadjoe (Topografische Inrichting, 1920), Laboehanbadjo (U.S. Army Map Service, 1943), or Baai van Badjo (*Baai Van Badjo (Badjoh) Foto: Expeditie*, 1899).

The field survey is necessary to prove the condition of current vernacular architecture. Other than that, during direct observations, remnants of older architecture, neighboring houses, or other houses in the region can be a reference in reconstructing the image of past architecture from the construction techniques to the material and dimensions. By conducting field surveys, it is possible to do in-depth interviews with locals, which additionally provide insight into the values embedded in the current architecture and the forms and values of the past architecture. These interviews substitute for historical texts typically used in historical or archaeological architecture studies (Douglas, 2003).

The in-depth interviews were unstructured and semi-structured (Bernard, 2006), with the levels of the built environment (Habraken 2000) as the only interview guide used with all the informants. The queries were about the

- informants' data: name, year and place of birth, marriage status, number of children;
- their ethnic identities: their own ethnic identity, their parent's or spouse's ethnic identity;
- migration history: how many generations of their family had been living in Labuan Bajo, their personal, their parents' or earlier ancestors' migration route, whichever is applicable;
- all the houses they have lived in since they could remember.

Only the latter, regarding the house, was semi-structured to cover the levels needed for transformation analysis. This approach to investigating their broader history is adapted from a study of the link between memory and architecture in medieval York (Douglas, 2003).

This research conducted direct observation and in-depth interviews in October 2021 and October 2022. For this paper, only two houses are analyzed, one from a Bajo informant in Kampung Air (Figure 6.8) and one from a Manggarai informant in Nanga Na'e (Figure 6.9). The two houses represent the prominent ethnic groups and are owned by local figures, yet this paper still acknowledges the limitation that this serves as a whole image of the town or the people they represent.

The approaches used in both the survey and desk study are memory recollection as an alternative vernacular architecture record (S. Anderson, 1999; Baker & Rigold, 1977; Khambali & Lukito, 2022); and the theory of transformation in the vernacular architecture (Bukit et al., 2012; Habraken, 2000; Hareedy & Deguchi, 2010; Memmott & Ting, 2020; Michiani & Asano, 2017; Yiwei & Beisi, 2015). The former will test how the existing vernacular architecture can be a source to see past vernacular architecture; and how the memory system of the informants and their ethnic identities can contribute to or hinder the process. On the other hand, the latter theory will help assess the transformations and shifts of control observed from the changes in their levels of the built environment.

In this section, the focus is set on one house in Kampung Air owned by a person of Bajo ethnicity and one house in Nanga Na'e owned by a person of Manggarai ethnicity, as both are shown in



Figure 6.8 Bajohouse in Kampung Air, 2021



Figure 6.9 Manggarai house in Nanga Na'e, 2021

Figure 6.10. These houses represent the two ethnic identities with stilt houses in their past and current vernacular architecture. These houses will also represent the effect of the developments brought by the tourism industry, as the house in Kampung Air is strategically located in the center of tourism activities, and the house in Nanga Na'e is on the periphery road to an upcoming mass-tourism destination in Golo Mori or Tana Mori (*Peraturan Daerah Kabupaten Manggarai Barat Nomor 2 Tahun 2021*, 2021; Kementerian Badan Usaha Milik Negara, 2022). Comparing the findings of these two houses aims to understand the differences and similarities between Labuan Bajo and the surrounding area can showcase to the world and, especially, preserve for their benefit.

Labuan Bajo is the regional capital city of West Manggarai Regency, Nusa Tenggara Timur Province in Indonesia. It is the westernmost seaport of Flores Island, making it an active transit area for locals or visitors now and then. Its geographical location did not make it the most significant port town throughout history, as there were other and bigger port towns on the north and south coast of Flores Island. However, it became a rest stop or home for seafaring and sea trading communities passing by the strait between Flores and Sumbawa Island. These ships will either go north to Borneo, Sulawesi, or other parts of Asia or go south to other islands in Nusa Tenggara Province or Australia.

The name Labuan Bajo itself means the port of the Bajo people. The history of the town's founding is agreed by most as folklore where the Bajo and Manggarai people met on the coasts of Labuan Bajo to trade goods between the two worlds. The Bajo people bear goods from the sea, and the Manggarai bring harvests from the mountains. This mutually beneficial trade happened for an extended period and resulted in a good bond of trust between them. The Manggarai leaders eventually gave some land on the coast for the Bajo people to settle for good instead of just a few nights of rest on land before they went to sea again.

The relationship dynamics between influenced and influencer can be thought of as happening since their first interactions and furthered when they settled together – especially since the Bajo people,

known as sea nomads, decided to settle on the land. They settled on land on many islands in Indonesia on the grounds of other ethnic groups. On another island, on the coast of Bajoe, Bone, South Sulawesi, Hamka described how the Bajo people have acculturated with the local Bugis people in the macro and micro levels of their built environment (Hamka 2017). Hamka found that there are observed changes to the forms of Bajo houses correlated to their geographical context (Hamka 2017). They started building homes above the sea and later gradually settled on the land, with the houses having a sparser sprawl pattern on the sea and a more linear arrangement as they moved inwards to land (Hamka 2017).

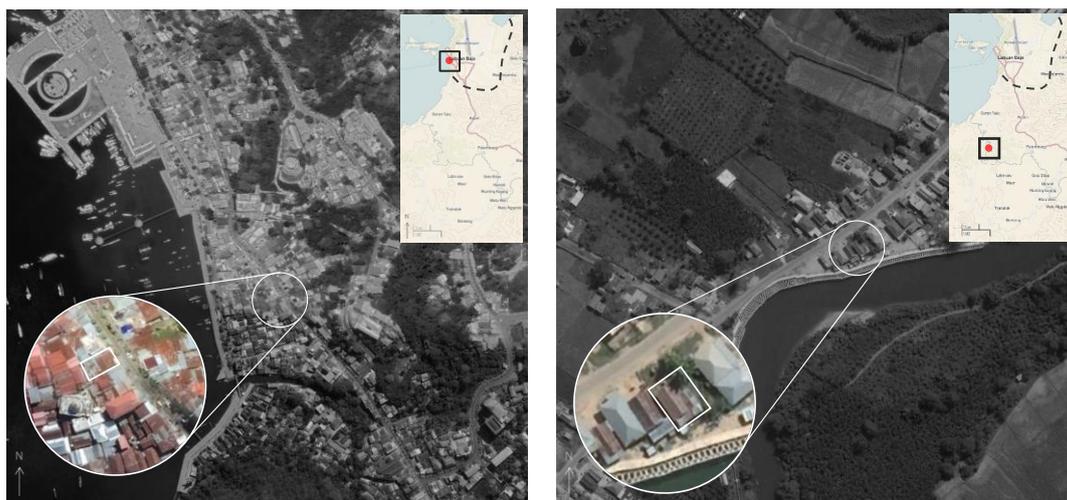


Figure 6.10 Bajo House observed in Kampung Air, Labuan Bajo (left) and Mangarai House observed in Nanga Nae near Labuan Bajo (right)

While the Bajo people in Bajoe are still closely related to those residing in Labuan Bajo, on the other hand, the people settling in Kabalutan Village, Tojo Una-Una, Central Sulawesi, were separated several generations before. Their settlement patterns also differ in their geographical context. Some homes are built on the sea and some on land. The settlement pattern in Kabalutan is similar to what Hamka observed in Bajoe, where the houses on the sea are individual and become more “elongated” as they are located more inwards to the land (Hamka 2017; Syam et al. 2018).

In Labuan Bajo, the first Bajo people were said to settle in Kampung Air. In Kampung Air, before 2012, structures were built on the sea, which was assumed housing as found in other Bajo settlements. This assumption was denied by the Bajo people during the interviews, as they said those structures were “parapara” or “pampara” built for their fish sundry. In 2012 the coast of Labuan Bajo underwent land reclamation, and the “parapara” were disassembled; moreover, the connection between land and sea was severed. Before the reclamation, the water would reach some houses during high tides, boats were attached to their “parapara,” and the houses were oriented to face the land. These houses had to readjust to the new environment after the coastline reclamation. Apart from the changes in residents’ lifestyles, the reclamation is followed by many infrastructure improvements from the local government, such as a rainwater drainage system, neighborhood pathway paving, grey water, and black water treatment facilities. In 2021 just before the observation, amongst many infrastructures constructed, the

main street of Soekarno Hatta had sidewalk aesthetic alterations, lighting installations, landscape renovations, and the improvements and enlargement of the rainwater and sewage system (Rencana Pembangunan Jangka Menengah Daerah Kabupaten Manggarai Barat Tahun 2021-2026, 2021).

Kampung Air and the nearby coastal areas were dominated mainly by Bajo, Bugis, and Bima ethnic groups. In contrast, the Manggarai people initially dominated the higher elevations of the Labuan Bajo area. This has changed since many of the houses in the coastal regions have been bought by business investors to transform the houses into or build a new structure on the plot of land for tourism or another business facility. The residents who sold their houses have moved into the areas with higher elevation in Labuan Bajo, although there is no official statistic to back this fact. Meanwhile, the houses still existing in the coastal area have mainly diversified their functions by sharing some of their space with commercial activities, rented accommodations, and office spaces. Previous research studying the transformation of the townscape in the coastal area of Labuan Bajo (Ardhyanto et al., 2021) supported this, and the direct observations and interviews confirmed this.

As mentioned earlier, the Manggarai people, in contrast to the Bajo people, usually settle in higher elevations, but some exceptions of Manggarai settlements are found in lowland areas. Nanga Na'e is located south of Labuan Bajo and is dominated by the Manggarai ethnic group. They described how they identify as Manggarai but came from a different ancestor than the highland Manggarai tribe. These Manggarai people are from Bima descendants, and their houses are stilt houses, appearing to have similar features to those owned by the Bajo and Bugis.

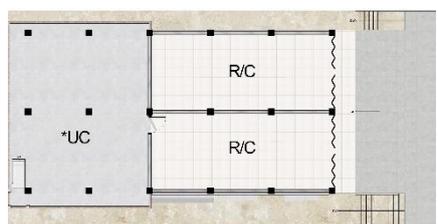
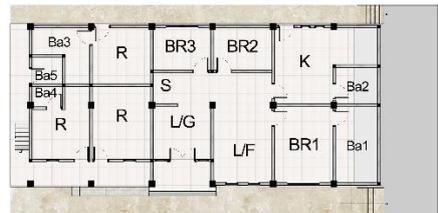
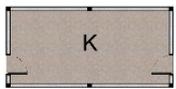
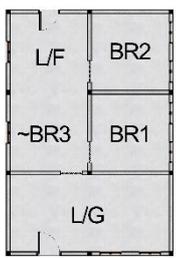
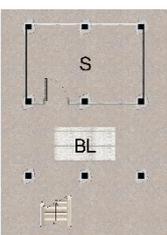
Nanga Na'e neighborhood also underwent an extensive transformation after the observation in 2021. The Nanga Na'e river was under construction to strengthen the riverbanks during the survey in 2021 and was finished by 2022 (Balai Wilayah Sungai Nusa Tenggara II, 2021). In 2022, the main road in Nanga Na'e was widened from a 2-lane street into a 6-lane road (Dain, 2022). Some sources said that the wooden stilt houses along the street were collectively moved back in compliance with the new road size, while some brick-and-mortar houses had to be partly or wholly demolished.

During the survey, several houses owned by Bajo, Bugis, Bima, and Manggarai people were observed. As mentioned, this research focuses on the houses owned and experienced by one person of Bajo identity in Kampung Tengah and another from Manggarai ancestry in Nanga Na'e. The analysis will start with the current house observed during the field survey and continue in reverse chronology.

A.H. is the initials of the Bajo informant who owns the house in Kampung Air. His current house was built in 2004, and he previously experienced living in two houses built in the 1970s and the 1940s. Table 6.9 shows the three houses with their floor plan and the rendered model of the houses with a two-point perspective. A.H. was born in 1978 and recollected how houses were still sparsely built on the current Soekarno Hatta Street coastline. He remembered how they could still play soccer next to his house. He was born in a stilt house owned by his father, MM, and was inherited from his

grandfather, MS. The house was already built by the time MM married AH's mother. The earliest assumption of the year of construction was around the 1940s when MS married AH's grandmother.

Table 6.9 Description of Bajo houses in Kampung Air (AH)

House code	AH01	AH02	AH03
Year built	2004	1970s	1940s
Current existence	Exists, planned for further construction	N/A	wood structures still exist
Built by	AH	MS	MS
Relation to informant	Current residence	Passed down to MM, then to A.H.	Passed down to MM, then to A.H.
3D rendering			
Floor plan <sup>2</sup>	<p>Upper Floor</p>  <p>Bottom Floor</p> 	 	<p>Upper Floor</p>  <p>Bottom Floor</p> 

<sup>2</sup> Floor plan legend: Ba: bathroom; BL: 'bale-bale'; BR: Bedroom; BR1: Main bedroom (parents'); BR2: Unmarried daughters' bedroom; BR3: Unmarried sons' bedroom; ~BR3: also functions as unmarried sons' bedroom; K: kitchen; L: living room; L/F: living room/family room; L/G: living room/guest room; R: room for rent; R/C: rent for commercial space; S: storage; St: study; \*UC: under construction.

The current house, seen in Table 1 as AH01, resembles the common modern Indonesian vernacular: a landed home with a reinforced concrete structure, concrete slab flooring with ceramic tiles finishing, brick walls rendered with cement and paint, and a combination of zinc and polycarbonate roofing with wood truss. The upper floor also has plywood walls, a temporary feature needed in rented commercial spaces. The differing factor is the shape of the roof, which is found in many Bajo and Bugis settlements. This roof shape is one of the many features now tied closely to the identities of both ethnic groups and is one of the few aspects preserved from the earlier forms. The material they traditionally use (“alang-alang” or Imperata cylindrical) is no longer available locally as the grass field in Sernaru (where it was locally sourced and made by the Bima people) has been changed into farm fields. It has also lost popularity to zinc which was one of the signs of success in the early 1980s. Now that houses are decorated with plastic roof tiles due to their affordability, A.H. does not find any need to switch back to the previous material, as it needs to be changed every 3–5 years.

As seen in Table 1, the floor plan consisted of two levels. The lower level is the living area which serves the owner and his family’s needs, as well as three rooms rented out as accommodation. The upper level is divided into a rented commercial zone and a future additional living zone. The commercial zone is divided into two almost identical spaces, currently rented to two different tenants. The commercial area is located on the upper floor due to it being on the same level as the main street of Labuan Bajo, Soekarno Hatta Street. The living area can be accessed by going down the stairs from the sidewalk of the main street or from the reclaimed street parallel to the seaside promenade to the neighborhood path network on the lower level.

The last house in which A.H. lived, code name AH-2, was a landed house with a wooden structure, the bottom part of the walls made with brick and cement, the upper part of the walls constructed with wood panels, and a gable made of bamboo weaving or “gedek.” During the several interviews, the material of the floors and roof were not detailed A.H., giving the impression that the details are common knowledge or perhaps unimpressive, compared to ‘gedek, a local and traditional material. These landed houses with half brick, and half wooden board walls are often called “rumah setengah papan” in Indonesian, a literal translation of half-board houses. During the field survey, these houses made from the same time were observed, and many of them either have ceramic tile or bare cement flooring, with the exception of the kitchens, which usually have cement or dirt floor. For the roofs, the half-board houses usually will be found to have corrugated zinc roofs with wooden trusses. These materials will also be assumed to be the case for this house until further research is conducted. On the other hand, the roof shape was a matter of importance. During the sketch, A.H. corrected how the roof had crossing rakes and three-tier gables instead of a simple hipped roof which the Manggarai would call “atap empat air” translating into four water roofs, referring to the four slopes.

The floor plan of AH-2 was simpler than AH-1 as it has one official entrance and a back door to go to the kitchen in a separate building. The entrance is on the gable side of the house, the standard

location observed in similar houses. However, it contrasts with AH-1, where the door offsets the roof. The circulation is almost direct, with no straight door placements. This door placement is also found in Manggarai houses and is believed to prevent misfortune or illness. The living room/guest room is also, according to the Manggarai houses, where it is the biggest room in the house and usually takes up the whole house's width and front grid.

The AH-3 house seems to be the most nostalgic to A.H. The details of the material were explained specifically in various stories and some sketches. The pile or stilt structure is made of wild forest wood called “kayu tanjong”. This wood is said to be only processable when wet and petrifies solid when dry. It is said to deteriorate when in contact with water, but it will last at least some decades before it needs change. These wooden structures still stand in Kampung Air and have been infilled with brick walls under the floor platform, as seen in Figure 6.



Figure 6.11 (Left) the exterior of the current AH03; (middle) AH showing the remaining wood; (right) size approximation of the wooden wedge in 2021.

Other materials from which the house was constructed were bamboo halves for flooring, bamboo ladder, knit palm leaves of the *Borassus flabellifer* or “dinding kajang” for walls, *Imperata* cylindrical grass for roof thatches, and weaved bamboo for the walls of the lower floor. Some parts of the house do not use “kayu tanjong” but opt for “kayu munting.” Some parts of the walls are made of teak wood. These materials were all local and traditionally used in these areas.

These materials were made to be knocked down and reconstructed, in addition to being moved to a different location with the helping hands of the whole village. The construction did not use nails, and the wood was cut with a traditional two-person saw. The materials were sourced in a forest on the island's other side and transported by boats.

The layout is relatively simple compared to the later houses owned by this family. It is divided into two levels; the lower level was further separated into two functions: a public area where there was located a “galampah” in Bajo language or “bale-bale” in Buginese and Indonesian, and a private area used for storing boats and fishing supplies as well as the daily fish caught by the family. The upper floor has one entrance and can be accessed directly with a bamboo ladder perpendicular to the house. The level consisted of three functions, the living room, kitchen, and bedroom.

From these layouts, a scale of the hierarchy of public-private functions can be analyzed and is shown in Figure 6.12. The scale has become more complex after several decades, along with the changes in the scale of the built space. The position of the entrance changed in the AH-1 as the

neighborhood zoning transformed into two different functions on two different ground levels. The door to the roof offside might be due to the multi-phase construction, yet not explained by A.H. In Figure 6.12, the most private space is correlated to the owner's bedroom. As seen here, the location of these bedrooms is always the closest to the public domain compared to other bedrooms, although they are not the closest in their path to the entrance. In wooden structure houses, especially stilt ones, the parents' room must have the center column of the house. Nevertheless, the rule no longer applies to the concrete house, as seen in Figure 6.12.

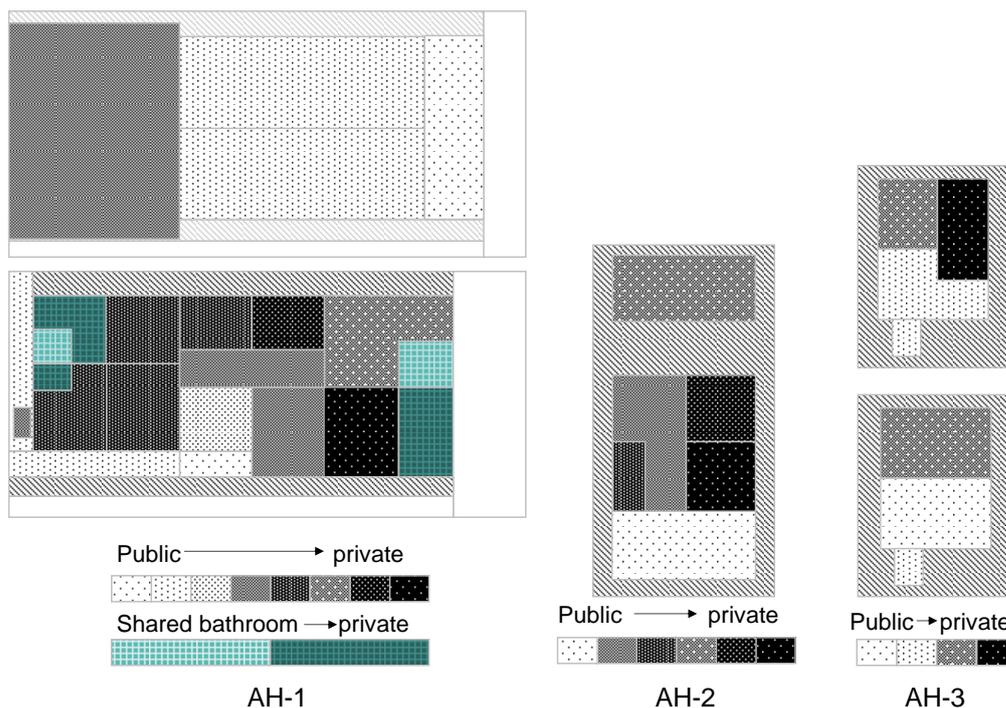
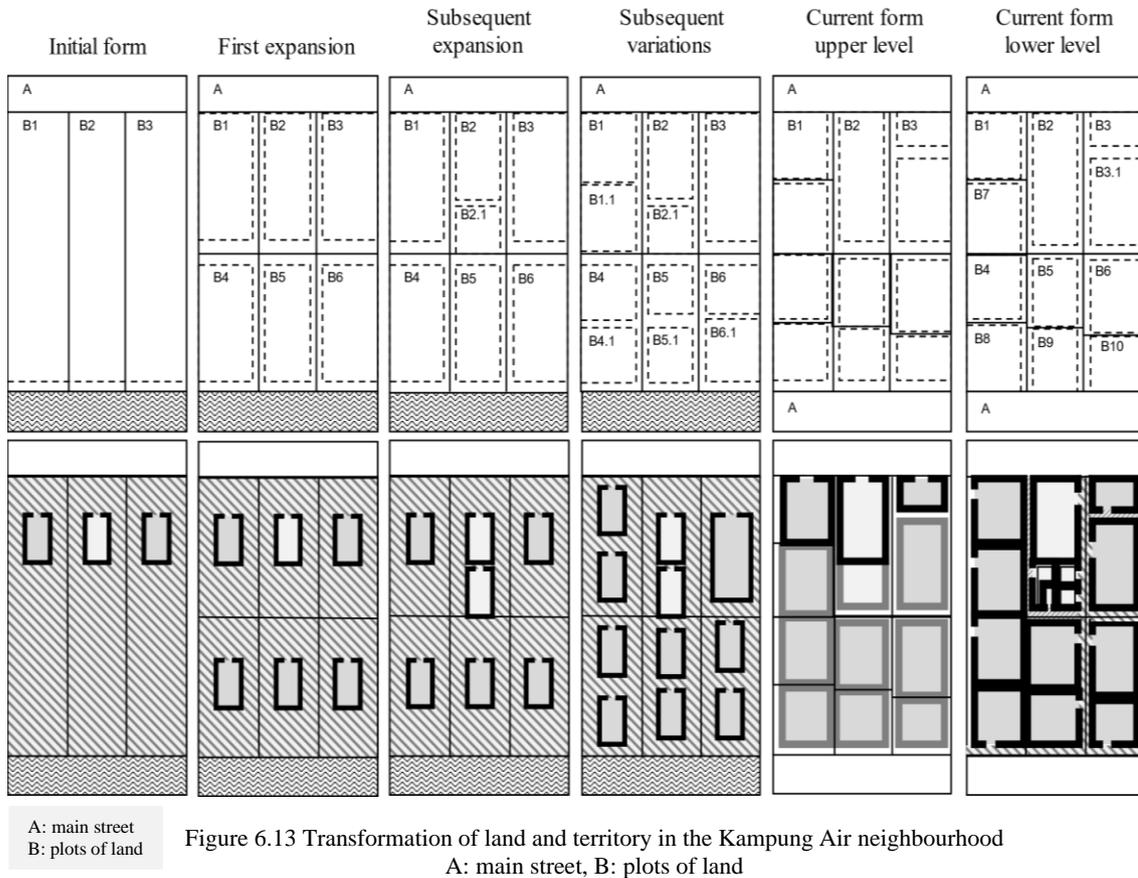


Figure 6.12 Transformation of public-private hierarchy in the layout of a Bajo house

The changes in the territorial order in the neighborhood are seen in Figure 6.13. The initial form of the Bajo settlement houses is a rectangular layout plan arranged with its narrow side perpendicular to the coastline and entrance facing the land. Their land was usually bordered with straight lines from the land to the sea, and the area within some meters from the high tide lines belonged to the public domain. The expansion of a family, along with the addition of new houses, is pictured in the following columns. The area around the houses is considered private. However, the border area between one plot and another is considered a shared area for the villagers. This eventually grew into a network of neighborhood-level pathways now found in Kampung Air. These pathways can be accessed by foot and motorbikes or scooters, especially now with the new reclaimed street adjacent to the reclaimed seaside promenade.

The direction of the houses also adjusted to these new networks of streets. On the lower level, the houses and entrances are oriented to face the neighborhood pathways. On the upper level, the doors must face Soekarno-Hatta Street. These changes can be seen in Figure 6.13. Adding bathrooms in the

newest house reflects the new street network to hide the bathroom locations at the furthest possible from public access.



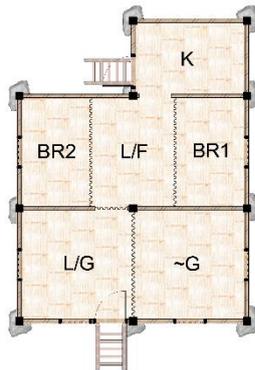
An increase in urbanization allowed an increase in demand for accommodation. The strategic location of this house is attractive for the tenants of the rooms, who are either students or workers from villages far from Labuan Bajo, to get a better education or work opportunities in the booming tourism industry. The street is the biggest economy in the growing town, which helps explain the expansion of houses to maximize the land they have for economic benefits, as seen in Figure 6.13. These diversifications of territories also solidified which pathways are more public and which are more only to accommodate the access of specific entrances.

In the interviews in 2022, before agreeing to meet at his house in Kampung Air again for the purpose of the research, A.H. initially proposed the idea of doing the interview in his other plot of land up in the field area of Labuan Bajo. When asked why he claimed he prefers the upper land because it is less dense. He also casually shared how his next house built on that land would be made of wood. When asked why he said he does not like the feel of a concrete house. This can also be tied to the fact that Kampung Air and Soekarno Hatta Street have become increasingly very busy and also that some floodings have occurred in recent years (Abba, 2022). The flooding is suspected because of poor infrastructure for rainwater drainage. They started to build landed houses because they no longer

needed to anticipate the high tide, but now they have a new problem coming from the poorly built infrastructure.

The informant who owns the Manggarai house in Nanga Na'e has the initials AA. His current house was built in 1982, and he has previously experienced living in one house in the same area built around the 1950s. Table 6.10 shows the two houses with their floor plan and the rendered model of the houses with a two-point perspective.

Table 6.10 Description of Manggarai houses in Nanga Na'e

House code	AA01	AA02
Year built	Built in 1982	Built around the 1950s
Current existence	Still exists	Sold, N/A
Built by	AA	AA's father
Relation to informant	Current residence	Passed down to A.A.
3D rendering		
Floor plan <sup>3</sup>		

A.A. was born in 1947 in Duwe, Flores, and his family initially came from Sulawesi. His father and grandfather were also born on Flores Island, making A.A. the third generation living in the land of the Manggarai people. He shared how people from Nanga Na'e mostly come from Sulawesi (Bugis ancestry) or Bima ancestry (Sumbawa Island), and that is why most houses there are stilt houses and look alike. The houses were also a response to the nearby river, which floods from time to time. The people of Nanga Na'e are primarily fluent in Manggarai, Bima, and Bajo language, and AA himself

<sup>3</sup> Floor plan legend: BR: Bedroom; BR1: Main bedroom (parents'); BR2: Unmarried daughters' bedroom; ~BR3: also functions as unmarried sons' bedroom; ~BR4: bed for his late mother, K: kitchen; L/F: living room/family room; L/G: living room/guest room; G: also functions as guests' room, P/L: pantry and laundry room;

has embraced Manggarai as his identity. He told how when his ancestors decided to settle in Manggarai lands and were welcomed by the Manggarai community, they also became Manggarai themselves. On the other hand, his wife directly acknowledged that her great-grandfather and her other ancestors came from Gowa, Sulawesi, as told by her uncle in Rinca Island.

When asked to recollect the house he lived in before, he and his wife insisted all houses were identical in Nanga Na'e because the people came from Bima ancestry. All houses were stilt, with tiered gable roofs made of grass hatch. When asked to remember the year when it was built, he shared how in the 1940s, his parents had moved out of Nanga Na'e because his mother got attacked by a crocodile, and then after ten years, they returned. In this "makeshift" village, AA was born. The assumption is that the last house in Nanga Na'e that his parents owned, shown as AA02 in Table 6.10, was built in the 1950s.

AA has been married twice, and during his first marriage in 1975-1977, he lived in the AA02 house and had two children from that marriage. After his divorce, he married his current wife in 1977 and had six children. They did not immediately build a new house after their marriage. The wife, who was also present during the interview, remembered the year the current house, AA01, was built because their second child was born in the same year.

As mentioned earlier, not all Manggarai people landed houses in the 1970s when AH's grandfather made the landed "Manggarai house." This might be due to the further ancestry roots. Some Manggarai clans have ancestors from different parts of Indonesia, such as the Minang tribe in West Sumatra, Luwuk in Southeast Sulawesi, Gowa in South Sulawesi, or Bima in Sumbawa Island. Even with the same central beliefs or identity, it can be presumed that their traditions and lifestyle must differ slightly. This also might be analyzed further concerning the distinction between lowland and highland Manggarai.

The house resembles some of the current Nanga Na'e architecture vernaculars: a wooden stilt house perched on concrete blocks, a wooden ladder, a wooden floor platform, wooden and weaved bamboo walls, curtain partitioning, and zinc roofing with wood trusses. The wood used for the columns is "kayu nija", said to be the strongest wood in Manggarai, while beams and lintels were made from "kayu nara." The shape of the roof is also like the stilt houses in the neighborhood, like stilt houses in Bima on Sumbawa Island. It was said to be the first house in Nanga Na'e with corrugated zinc roofing in 1982 when some houses had terracotta tiles or mostly grass thatch roofs. The ladder of the AA01 house has a roof structure and a guest area in front of the main door. This part looks different from most houses in the neighborhood. This may be related to AA's previous position as the head of the village, which is still entrusted by the Manggarai custom leader living in Bima, on the neighboring island of Sumbawa.

It contrasts with the stilt houses experienced by AH in Kampung Air; the AA01 and AA02 houses are only fully functional on the upper level. The lower level in AA-1 is observed to be used for storing

things for gardening or from past constructions. This might be related to the chances of floods invading this space in monsoon season. The upper level can be seen in Table 2 and consists of a spacious living/guest room in the front, a doorway covered with a curtain leading into a living/family room which has a boys' room partitioned by curtains, two bedrooms on the same side of the house, and kitchen-laundry area in the back of the house. The living/guest room can also be partitioned with a curtain to make a more private area for guests to stay over. This house also has an outhouse as their bathroom in the backyard, near the river, as seen in Figure 9.



Figure 6.14 A.A's bathroom in 2021 (left) and 2022 (right)

The earliest house in which A.A. lived in Nanga Na'e, AA-2, was also a stilt house, but it was smaller and had fewer columns or, in Indonesian, "tiang." Getting AA to explain the size of the house, as found, worked well in other interviews in this research; asking, "how many 'tiang' did the house have?" proved to be efficient. This house was significantly smaller, said to have 9 "tiang," and was almost half the size of the current house. Usually, these "tiang" measurements do not include structure for the kitchen in the back of the house.

Like the current house, the specific functions are reserved in the upper level of the AA-2 house. The ladder was placed to lead directly to the front door. The living/guest room was like the AH-2 house, which was the whole width of the house, a characteristic found in other houses owned by Manggarai people in and around Labuan Bajo. This living/guest room can also be divided by a curtain like the current house. Beyond the living/guest area, the rooms were placed on opposite sides of the house, with the living/family room in the middle. The kitchen was in the back and had a back door, as observed in other houses.

From these layouts, a scale of the hierarchy of public-private functions can be analyzed and is shown in Figure 10. The scale has become more complex after several decades, along with the changes in the scale of the built space. However, compared with the Bajo house, the transformations happening here are less contrasting. This might be correlated to a similar type of house, the stilt house. The complexity is more shown in the material used and the technical skills required in producing a finer finish, such as the wooden blocks as columns, beams, lintels, planks, and other wooden parts. The details in the design of the current house are also quite intricate, yet the details of the past house were not questioned to make a better comparison.

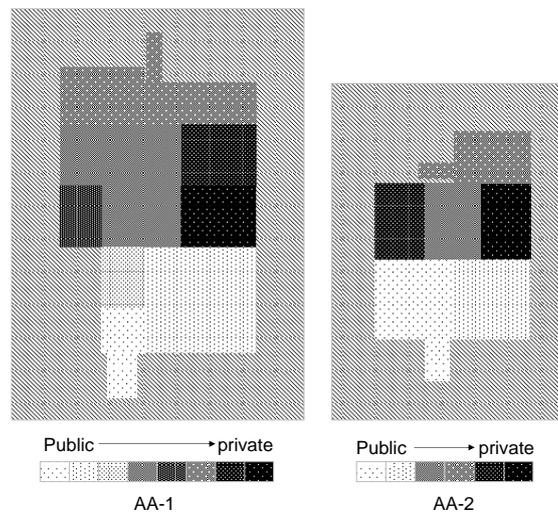


Figure 6.15 Transformation of public-private scale in the layout of a Mangarai house

Changes in the architectural vernaculars in the area were seen in the field survey of 2021. From AA's stories, most houses were initially wooden stilt houses to respond to the flood. Nevertheless, in 2021 brick landed houses were already constructed between the stilt houses. During floods, these houses were unfortunately impacted. Moreover, the street that goes through this village is the closest access from Labuan Bajo to the national development strategic area (Kawasan Strategis Pembangunan Nasional or KSPN) in Golo Mori (Kementerian Badan Usaha Milik Negara 2022). In the field survey in 2022, the street was widened, and some houses needed to adjust to the new boundaries (Dain 2022; Suyatni 2022). These adjustments can be seen in Figure 11. The territory initially is the image on the left, and the right is when their territories are reduced by the public space (A). On the upper diagram, both houses are stilt houses, and they can be moved back some meters with the help of the other villagers. AA-1 house was also moved back by a couple of meters, and as a result, some columns were not placed as firmly as before, as seen in Figure 6.16. When walking into the house, the house was not as stable as before.



Figure 6.16 Columns placed on the cement blocks after the move

This can prove how resilient and flexible the previous vernacular architecture is. The wooden structure's visual condition and instability after the move and after aging more than 40 years shows

the inevitable need to improve material longevity and the technical aspects. It also can be viewed as one of the gaps between modern vernacular architecture and the current governance implementation under these circumstances.

The stilt houses were moved by clasping the columns with large bamboo tied together and became a house-size frame. The villagers then bore the bamboo together and moved them to perch on the new foundations placed before. The brick-landed houses were more unfortunate as they had to demolish the house to adjust to the new boundaries, as seen in Figure 6.17. This also proposes the need to improve the moving techniques of these houses for the future.

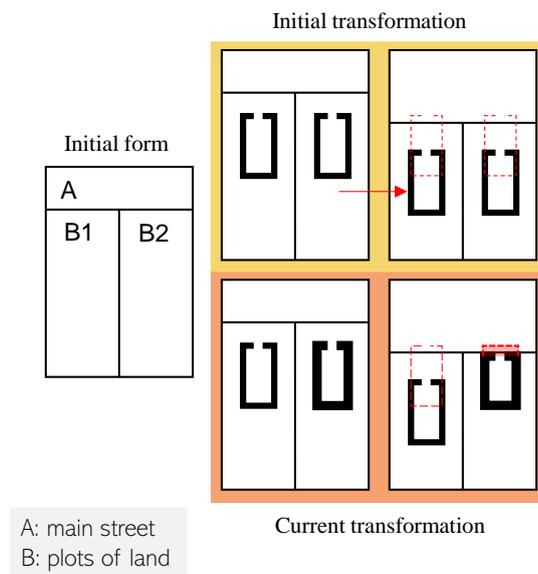


Figure 6.17 Transformation of land and territory in the Nanga Na'e neighborhood

The backyard was also intervened by constructing a river embankment (Balai Wilayah Sungai Nusa Tenggara II 2021). Some crop gardens had to be let go, and the bathroom shown earlier in Figure 9 had its door adjusted to the new smaller backyard layout. A.A. sees this embankment as an improvement to the neighborhood in efforts to reduce the risk of flood, and he said he would opt for a modern brick landed house if given the opportunity in the future. His preference, he explained, was because he believes there is no longer any flood threat with the newly constructed river embankment. He also casually added that he is too old now and wanted to follow the trend of the modern vernacular.

When analyzing the interviews and findings from these two cases, a different memory system appears to be operating between them. This might be useful as an evaluation and can be referred to when designing future research on vernacular architecture transformation with memory recollection as a source of oral history.

In A.H.'s case, the Bajo family signified birth, marriage, and death as essential milestones in their family history, as commonly found in many cultures throughout history. However, in pre-independence and even post-independence Indonesia, the correct year of events in rural areas is often

not recorded officially. The birth of a person might not be documented well, and a person might be born in 1960, but for benefits such as school or other government support that requires a certain age at a certain period of the law or policy being enforced, that said person might state their birth year to be later, like 1963, or sooner than the reality, like 1958. This can happen because in these rural areas, the civil records office might be in a different village or town, and the journey they had to take might take a few days. Hence many would postpone their registration.

Although these milestones in the written official national documents are often found relaxed, their memory seems to correlate these moments to their environmental changes still. When asked about the first house he lived in, AH will remember the house he was born in, as told by others. When asked about the construction time, he would recollect the estimated year of his parents' wedding and his grandparents' wedding year approximation. He would also recall the birth of his children or siblings to remember other milestones in the memory recollection process.

AA's recollection of memories related to his built environment is intricately woven with a series of significant milestones that have marked his life and the community's history. These milestones encompass a wide temporal spectrum, ranging from the pivotal periods of World War II and the era of national independence to more recent events such as the 2015 bridge construction, the introduction of electricity to the village following the bridge's completion, and the major flood that ensued. Each of these milestones serves as a potent trigger for memory, helping AA vividly remember and recount the transformative changes in their physical surroundings over time.

These milestones, including birth, death, marriage, and educational experiences, often act as universally resonant touchpoints that hold relevance across various cultural contexts. However, the significance of local, regional, and national events might require some customization to align with the specific context and sensitivities of each case. By doing so, the oral memory system becomes adept at recollecting even those events that transpired in the distant past. This adaptive approach to memory retrieval not only underscores the power of these milestones but also highlights the rich tapestry of personal and communal experiences that shape the memory landscape within the studied communities.

Different memory systems of a community might also yield varied results. Anderson stated that there are two binaries of the memory systems: oral and non-oral, literate, and preliterate, as seen in the left diagram in Figure 6.18 Memory systems of a community (left), memory system with the historic/non-historic tendency (middle), the memory system range found in the case studies.. Most Indonesian communities have a dominant oral memory system, supported by oral tradition where one generation will share their family history through stories, be it in a specific setting or casual conversations. On the literate-preliterate spectrum, most Indonesians have become literate in the last century. However, not all aspects of their history are written down. Birth, death, marriage, and education are some of the recorded histories that official government records can support. Although most regional or national events are reported in the news nowadays, in previous generations, these

events might have been shared through conversations. This may need some further research after the findings in the field.

According to the findings in the previous subchapter, the memory system in these case studies falls into the ideal balance of oral and historic memory system. A more in depth look into whether the memory recollected by AH and AA were literature or oral is shown in Table 6.11. It is shown how both AH and AA relied solely on their oral memory system to recollect all categories of their history.

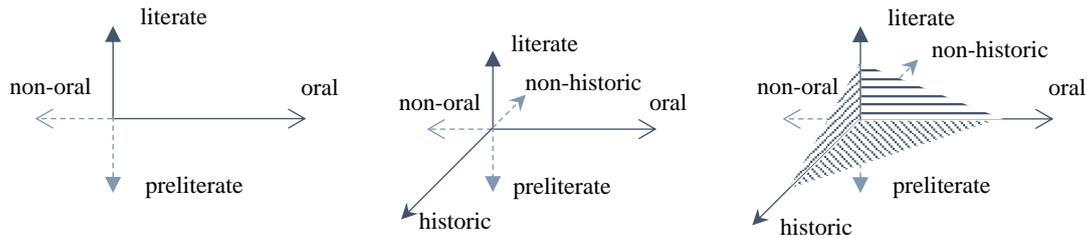


Figure 6.18 Memory systems of a community (left), memory system with the historic/non-historic tendency (middle), the memory system range found in the case studies.

The preceding subchapter's findings shed light on the memory system's fascinating equilibrium observed in these case studies, effectively merging elements of both oral and historic memory systems. However, to gain a deeper understanding of the nature of memory recollection in this context, a more granular examination of two case subjects, AH and AA, is presented in Table 6.11. This table illuminates a compelling facet of their memory recall process, showcasing that both AH and AA primarily rely on their oral memory system for recollecting information across all categories of their history. This observation underscores the salient role of oral traditions and the community's collective memory in preserving and transmitting vital cultural and historical knowledge.

Table 6.11 Memory system analysis of AH and AA

History scale	AH		AA	
	Literature	Oral	Literature	Oral
Individual/family	0%	100%	0%	100%
House	0%	100%	0%	100%
Neighborhood/town	0%	100%	0%	100%

To assess the historic level of AH and AA, a separate analysis on the answering willingness of AH and AA is made and shown in Figure 6.19. AH and AA were more than willing to share their history, which made the memory recollection process easier than some other unwilling informants. This is an important feature of the method and it can affect the findings of the research if not assessed correctly.

At the beginning of the interview, a quick assessment should be done as a feasibility test to ensure whether the interview will yield result in the targeted memory recollection or will the informant redirect the questions to other topics.

This possibility for the informant to redirect the flow of the interview is the negative side of the unstructured interviews. The transcription and data analysis of the interviews might be hard to process if the interview strays often from the main target. If this was to be applied to a small scale project in the future, it should be no problem other than the time wasted on some unfruitful interviews. But if this was to be applied in a big scale project, this assessment should be made into a more efficient method to assess as early as possible whether the informants may share the targeted memory or redirect the flow of the interviews.

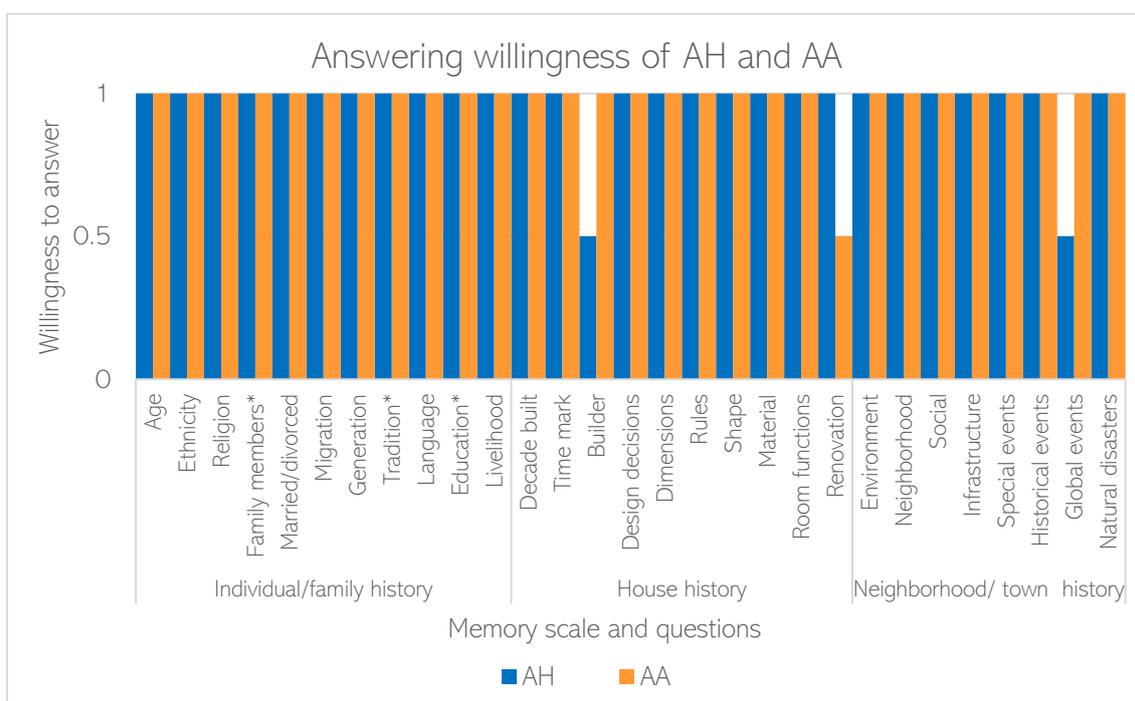


Figure 6.19 Answering willingness of AH and AA

As seen in the middle diagram in Figure 6.20, the historic axis can be an addition to the memory system. In the interviews, A.H. lamented how the younger generations have allowed the Bajo culture, tradition, lifestyle, and language to be eroded. The older generation has also allowed their land to be sold to foreigners outside of Labuan Bajo or even other countries. This leads to belief the historical tendency in their community is less than expected.

The interviews with A.H. were done on a beach nearby and in his house. Some of his family members occasionally joined and left during the interviews at his house. In contrast, the ones with A.A. were solely done in his house and with his wife participating alongside him. This is aligned with the Manggarai customs of host-guest relations and the “kapu manu lele tuak”.

In the Manggarai language, this custom has a literal translation of “chicken on the lap, palm wine under the arm.” It is still performed when requesting a permit, information, or even a plot of land from the customary leader. The pleader will bring a chicken and a bottle of alcoholic drink to the customary leader and humbly inform their purpose of visit in polite Manggarai language. These dialogues are usually attended by the other family members, such as the sons, cousins, or nephews, as well as the wife and female family members, who will be coming and going as they serve hot coffee or tea with some snacks to the guests. These settings are a great medium to spread knowledge from one generation to another through specific events, further continuing their oral tradition. In these settings, it is also often to hear “nunduk” (Manggarai), which are the stories of their village histories or events in the Bible (Allerton, 2012).

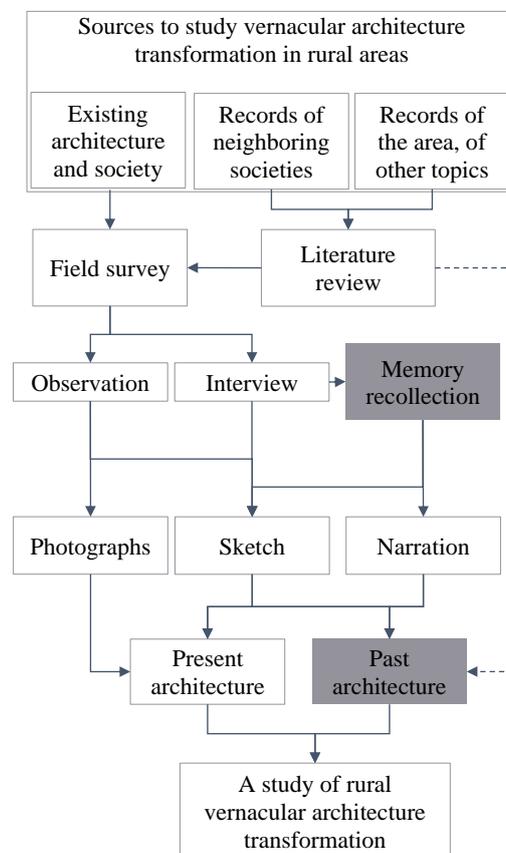


Figure 6.20 Research flow of rural vernacular architecture transformation with ethnography-based intensive architecture memory recollection method

Even though A.A. is not a customary leader, neither a region leader (“dalu”) or village leader (“tu’a golo”), he is well respected as the previous head of the village in 1989–1999, the right-hand man of the current tu’a golo, and the elder of the village. The local history stored in his and his family’s memory is resourceful, and the accumulation of the histories of several families in the village. By implementing these settings of oral tradition, the historical tendency of a Manggarai community can be perceived as having a higher point on the scale.

In evaluating these findings of memory recollection as a source to study the transformation of past generations' vernacular architecture, the ideal will be with a community with a highly oral and historic memory system, which will balance the limited written records. Fortunately, the two case studies as well as the rest of the informants have been observed and analyzed through their answers to be in the category of the shaded area in the diagram on the right in Figure 6.18, the desired area.

These memory recollections and oral history findings show how it can be a source for learning about the transformation of vernacular architecture. The flow of the research is shown in Figure 14, where memory recollection is used in the interview part of the field survey. In these two cases, the informants were relaxed during the interviews, and their family members were also willing to join. This condition provided an honest conversation between the interviewer and interviewee. A good rapport was also owed to the local researcher, who had assisted the team in navigating the culture.

### **6. 3. Chapter conclusion**

The analysis of vernacular architecture transformation resulted in a more complex transition in Bajo architecture, be it in the material, form, the scale of public-private hierarchy, and territorial changes. This might be related to the increase in economic opportunities available at Kampung Air. Manggarai architecture in Nanga Nae has experienced a sudden increase in interventions. Further observations of environmental changes in the coming years will be insightful to see the trend.

Fortunately, the memory systems of both case studies were ideal for providing images of past vernacular architecture and the lifestyle required to build them. This method has a time limitation as a person's memory is limited to up to two generations before theirs. Notably, the urgency to apply this method is that the older generations are still alive and healthy. The deterioration of memory will hinder the process, although the presence of other family members might be helpful. The milestones of their own family history or local, regional, and national events and knowledge of local terms might help form a sharper research tool in the future.

Furthermore, even with some inefficient stumbles, these case studies have yielded the desired results. Figure 14 shows that memory recollection can help sketch and narrate past vernacular architecture. This will help future researchers to conduct studies of rural vernacular architecture transformation in areas with limited written records.

By recollecting the memory of the past houses, they are directed to recall their past values and traditions. Most were lost in their adaptation process with the changing of time. This will intervene in an oral memory system and close the distance between them and their past. In making their history tangible in written form, it is hoped that in the future, their vernacular architecture will embed more of their values when adapting to new materials and techniques. At the very least, the method used here can be used in documenting the transformation of vernacular architecture before it inevitably, sooner or later, changes again.

The greater aim is for architects and builders to improve their understanding of their past identity, values, and sustainable lifestyle. Suppose Indonesia's current material availability will still limit traditional local material use. In that case, it is inevitable that in the future, more people will choose houses with reinforced concrete, bricks, plastic sheet roofs, and ceramic tiles and become the vernacular architecture of more places. Indeed this is a complicated issue involving various actors in the supply and demand chain, the policymakers and practical workers, the architects building on disciplinary memory, and the builders building on social memory. It is not about how to design flawless architecture, but how will the current vernacular architecture be seen as an artifact, as a source of memory in the future? Will it have traces of our ancestors' values and wisdom? Most importantly, what legacy will be passed on?

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**CHAPTER 7**  
**DISCUSSION**



## 7. 1. Analysis of the overall methodologies and findings

In this research, a comprehensive approach was employed, encompassing desk study, direct observation, and in-depth interviews, with a specific focus on the role of memory recollection in the study of vernacular architecture. The culmination of these methods has yielded a multitude of findings that merit analysis and reflection. This chapter will provide a discussion of the overall methodologies and findings, drawing insights from the interdisciplinary research approach employed.

The examination of history and social context has proven to be a robust and successful avenue of inquiry. This approach has enabled a nuanced understanding of the historical and sociocultural underpinnings that influence the architectural practices and transformations within the studied communities. It has further illuminated the power dynamics at play, offering insights into the dynamics of influencer and influenced. This understanding is invaluable for comprehending regional identities and the contested narratives that shape them.

One of the finding was that there was a continuation of land-owner to newcomer hierarchy that still applies in some extent during the time of the survey. The power dynamics started with Manggarai tribe leader at the top of the pyramid and in some neighborhoods the hierarchy has shifted to the ones who ‘was there before’ and was authorized to give land. There is a sense the one who got there first has the higher power and the ethnic identity a person bring does not define their position in the pyramid.

Yet in contrast, there is a sense of power brought by people who are foreigners or from the central government or as simple as coming from the capital city (Allerton, 2013). The limited part of their literate memory system allowed them to be overwhelmed with the more literate memory system these foreigners seem to have. The oral memory system they have are considered not as strong as the tangible literature these foreigners have.

These two dynamics of the ‘first settlers’ and the ‘capable foreigner’ resulted in new developments in the region that is not representative of the locals. An example is the Creative Hub at Puncak Waringin which consists of a souvenir center and a weaving center shown in Figure 7.1. This creative hub complex is owned by the government and designed by an architecture firm from Jakarta, the capital city of Indonesia. The design is heavily influenced by the highland Manggarai architecture.



Figure 7.1 A tourism facility owned by the government in a highland Manggarai style in contrast of a Bajo roof (left), the tourism facility on top of a hill amongst the contrasting zinc plane and hipped roofs (right)

This inspiration is not wrong to say the least, the Manggarai is the de facto leader of the area, but the absence of literature of the Manggarai vernacular architecture in the area made the design to be referenced in an insensitive way for the locals. The Manggarai informants in this case study explained how they never built a conical house like they do in highland Manggarai. There is a distinction on the culture, tradition and values of the lowland Manggarai compared to the highland Manggarai. The absence of lowland Manggarai literature has forced the highland literature to be the only resource architects can refer in a project with limited time like this.

The locals shared how there is a taboo in building a Manggarai highland architecture like this and was seen as an ill bringer to the area. It can lead to the history of the area not being a place for just Manggarai people, but Bajo people and Bugis and Bima people as well. Historically, in their oral recollections, the story of Labuan Bajo started with the trade between Bajo and Manggarai people, exchanging goods from the sea and the mountains. Later on the good business deal led to the Manggarai people giving the Bajo people land to settle in so that they do not need to live far from the trading area. Therefore many people believe that a different set of rules apply in the lowlands of the Manggarai region, a set of rules that comes from the fusion of the culture and tradition of Manggarai, Bajo, and even Bugis and Bima people as well (Ardhyanto et al., 2022; Kemdikbud, 2018).

Designing for Labuan Bajo means to design with inspirations from the shared history and vernacular architecture of the locals with their distinct backgrounds. Figure 7.2 shows how Labuan Bajo is a mix of culture from these four ethnic groups which have changed in their own ways as they

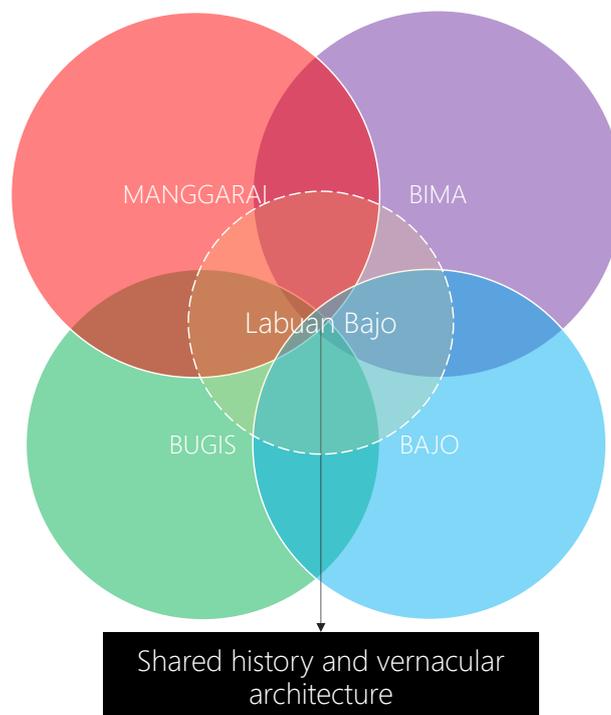


Figure 7.2 Shared history and vernacular architecture of Labuan Bajo

assimilated and adapted to one another during their interaction and migration. The culture valued in highland Manggarai societies may not be the same with the ones in Labuan Bajo. The same rule applies to the Bima, Bugis and Bajo communities. Their value here might have been adjusted according to the context of this town, and might differ slightly or extremely from their places of origin. Therefore this parcel of their shared history and vernacular architecture is what is needed to be understood in cultural sensitive design.

The highlight of Labuan Bajo is tolerance and assimilation, not forcing one culture's form to dominate the limelight in the tourism development scheme. Yet this is mostly not the case in the massive government tourism development projects. However, some boutique accommodations owned by international foreigners have shown more assimilation to the local vernacular architecture as shown in Figure 7.3. The inability to not blend with the locals or sensitive to their values is what creates conflicts against tourism and other foreign influences (Erb, 2005, 2015).

The chance to do an extensive research like this is not often and thus a more effective method is needed to be explored in the future. Yet it is highly important to note that it is needed especially for cultural sensitive design. To design something with a heavy cultural reference yet not being sensitive to the local people is not a great decision. As mentioned earlier in this research, "As an architect, you design for the present, with an awareness of the past for a future which is essentially unknown" but is it wise to design something for the present without an awareness of the past in the area?



Figure 7.3 An example of tourist accommodation blending in with the local vernacular

However, in the assessment of houses' transformations, certain challenges emerged, as not all informants were equally effective in recounting the changes they had witnessed from one house to another. An exploration of the factors influencing these transformations—such as ethnic identities, the time of construction, and the impact of tourism development—revealed that the decade of construction played a more prominent role in material transformations than other factors. This finding underscores the importance of carefully selecting criteria for informant inclusion during the research planning stage. While this study initially focused on the memory systems of distinct ethnic groups, it highlights the need for a more context-specific approach based on the factors influencing architectural changes.

Nevertheless, this research has demonstrated the efficacy of memory recollection in documenting vernacular architecture transformations, serving as a valuable resource in situations where written documentation is limited. The memory systems of the informants have played a pivotal role in facilitating the detailed recall of past built environments, underscoring their ability to preserve and transmit cultural and historical knowledge.

By analyzing the built environment from different ethnicities' perspectives, the finding proven to be richer as they complete the pictures of one another. Figure 7.4 represent the memory of three different people and how the depth and density of their memory on their vernacular architecture varies from one another. However, they can fill in each other's memories and the narration can be more inclusive for all the local communities of the town.

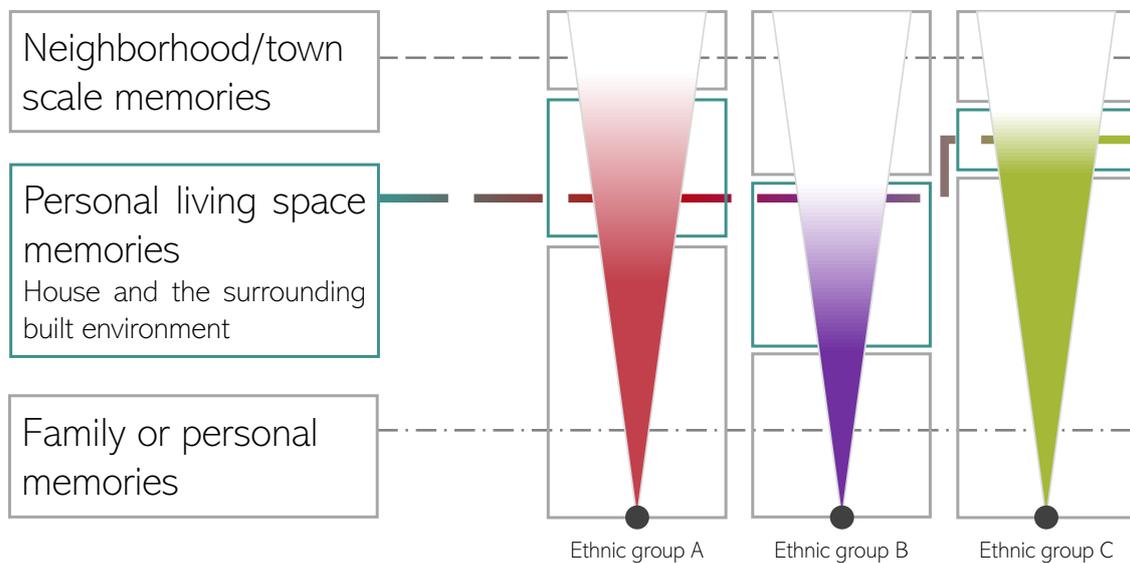


Figure 7.4 Benefit of various memory systems in recollecting objects experienced together

In the context of vernacular architecture transformation studies, this methodology has proven to be particularly effective, particularly in the unstructured segments of the interviews. The informal and casual environment created during these interviews has enabled informants to reminisce about their past experiences, recalling memories from the most readily accessible to the more intricate details. This relaxed atmosphere has been instrumental in gauging the depth and density of informants' memories across various categories, allowing for a comprehensive analysis of their memory systems' functioning. The memory system itself emerges as a central element in this methodology, serving as the key determinant of the quantity and quality of data that can be gathered.

In conclusion, the research's multidisciplinary approach has yielded significant insights into the intricate relationship between memory recollection and vernacular architecture. It has not only deepened our understanding of how memory systems operate within these communities but also highlighted the critical role of memory in preserving cultural heritage and facilitating the documentation of architectural transformations. These findings underscore the importance of context-

specific approaches in future research and the need for a nuanced understanding of the factors shaping memory recollection. Ultimately, this research contributes to the broader discourse on memory, culture, and architecture, offering valuable insights that can inform future studies in this field.

## **7. 2. Detailed analysis of the overall methodologies and findings**

This subsection will analyze and evaluate the research based on its strength, weakness, opportunities and threat. Strength of this research is the interdisciplinary approach which uses the amalgamation of two theories, the memory system in memory recollection and theory of transformation mixes ethnographical perspectives and architecture perspectives. The research derives strength from its interdisciplinary approach, which combines desk study, direct observation, and in-depth interviews, thereby providing a holistic examination of the topic. This approach results in the collection of rich and detailed data, particularly in the unstructured interview segments, facilitating a nuanced understanding of memory recollection in vernacular architecture studies. Furthermore, the research offers valuable cultural insights into the role of memory in architectural preservation and transformation, enhancing the broader understanding of the subject. It also emphasizes the importance of considering the sociocultural context in architectural research, shedding light on the role of history and power dynamics in shaping architectural practices.

However, the research exhibits certain weaknesses. It predominantly focuses on memory recollection and its role in architectural studies, potentially overlooking other aspects of vernacular architecture, such as accurate measurements or construction methods. Additionally, the study encountered challenges in assessing house transformations, as not all informants were equally effective in recounting changes, possibly introducing bias and limiting the comprehensiveness of the findings. The number of sample is also not a representative of the whole of Labuan Bajo and the communities represented by the informants in this study.

On the bright side, the research opens up opportunities for further investigation into the role of memory in architectural studies, providing a solid foundation for future research in this field. There is potential for conducting comparative studies across different cultural contexts to understand how memory and vernacular architecture vary across regions and communities.

Nevertheless, there are potential threats to the research. Aspects of the study may involve sensitive topics or personal narratives, raising ethical concerns related to informed consent and the protection of informants' identities and privacy. Moreover, the cultural dynamics that influence memory and architecture may evolve over time, potentially impacting the relevance of the findings and the methodologies used. The presence of competing research in the field offering different perspectives or challenging the research's findings and conclusions is also a threat to consider. Finally, resource limitations, such as time and funding constraints, could affect the depth and scope of the research.

Another significant threat to this research arises from the evolving nature of vernacular architecture itself, particularly the shift towards concrete landed houses. These contemporary architectural developments have introduced a significant shift in the communal lifestyle of the studied communities. Figure 7.5, which presents a reverse chronological order of the transformations in public-private distinctions, draws from samples of all four ethnic groups in Labuan Bajo. This transition towards more private spaces and reduced communal areas has the potential to diminish the communal memory recollection associated with past vernacular architecture.

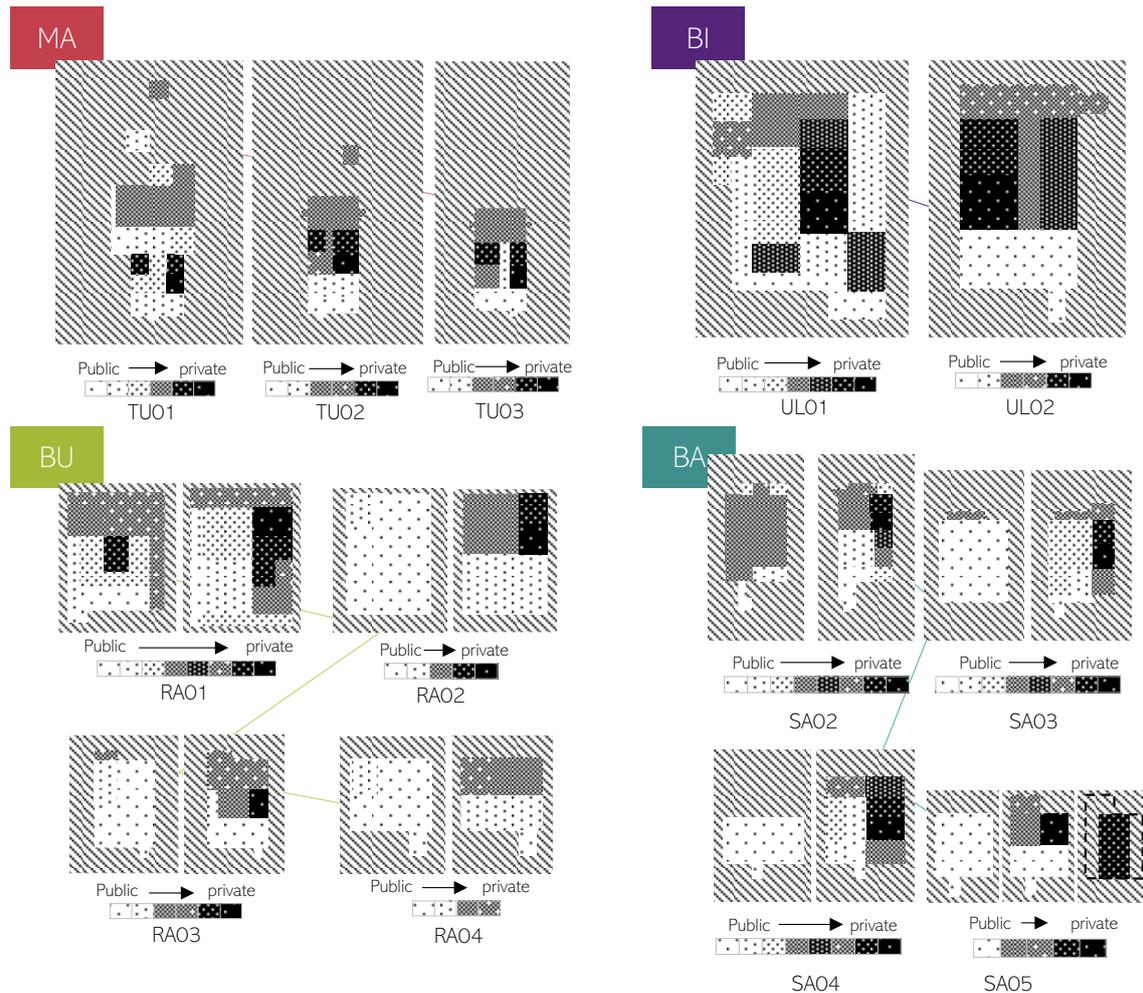


Figure 7.5 Increase of individual spaces and decrease of communal space in the case studies

The consequence of this shift is particularly concerning for future generations. As the communal lifestyle decreases and traditional architectural features are replaced with modern alternatives, the risk of losing memory recollection of their ancestors' past experiences, especially related to vernacular architecture, becomes apparent. The architectural, spatial, and social changes may disrupt the transmission of cultural knowledge and shared memory, jeopardizing the preservation of cultural heritage and architectural traditions. As such, it is crucial to recognize this threat and consider

strategies to document and safeguard these disappearing architectural and cultural elements to ensure their continuity in the face of contemporary developments.

Local communities have demonstrated a commendable commitment to preserving their rich history, culture, and traditions through grassroots initiatives. These collective endeavors inspire optimism, as they suggest that even modest efforts to document local vernacular architecture have the potential to yield significant benefits for future generations. By actively engaging in the recording of their architectural heritage, these communities are not only safeguarding their ancestral legacies but also ensuring that this valuable knowledge is passed down to posterity (Gosseye et al., 2019). This proactive approach to heritage preservation fosters a sense of continuity, enabling forthcoming generations to connect with and appreciate their cultural roots while building upon this foundation to shape their own futures. Ultimately, these grassroots movements are instrumental in perpetuating the profound wisdom encapsulated within vernacular architecture, ensuring that it remains a source of inspiration and guidance for generations to come.

### **7. 3. Discussion conclusion**

In this research, a multifaceted and comprehensive approach was employed, encompassing desk study, direct observation, and in-depth interviews, with a specific focus on the role of memory recollection in the study of vernacular architecture. This interdisciplinary research approach has yielded a multitude of findings, offering a holistic understanding of the intricate relationship between memory, culture, and architecture. This chapter provides a discussion of the overall methodologies and findings, drawing insights from the amalgamation of theories and perspectives used in this study.

The examination of history and social context proved to be a robust and successful avenue of inquiry, illuminating the historical and sociocultural influences on architectural practices and transformations. Furthermore, it provided a nuanced understanding of power dynamics, shedding light on the roles of influencers and influenced parties within these communities. The research revealed that the hierarchical power structure transcended ethnic identities, emphasizing the importance of contextual factors in understanding the power dynamics. Additionally, the influence of external forces, such as foreigners and the central government, was evident in shaping the architectural landscape. The contrast between the strong literate memory system of these external actors and the oral memory system of the locals created a notable power dynamic, highlighting the need for sensitivity in design.

One notable example of this dynamic is a government-owned tourism facility inspired by highland Manggarai architecture. While this inspiration may be well-intentioned, the absence of literature on lowland Manggarai architecture led to an insensitive design, as it inaccurately represented the local culture and traditions. This highlights the importance of understanding and respecting local context and traditions in design processes, especially in culturally sensitive projects. The history of Labuan

Bajo itself is a testament to the fusion of different cultures, including Manggarai, Bajo, Bugis, and Bima people, each contributing to the shared history and vernacular architecture of the area.

The research emphasizes the importance of designing with inspiration from the shared history and vernacular architecture of the local communities, ensuring that the design is culturally sensitive and context-specific. The significance of tolerance and assimilation, rather than imposing one culture's dominance in tourism development schemes, is highlighted. Tourism facilities serving as a positive example of harmonizing modern developments with traditional culture can be studied further.

The study reveals opportunities for further research, particularly in the exploration of the memory-architecture relationship in different cultural contexts. Comparative studies across various regions and communities could yield valuable insights into the variations in memory and vernacular architecture. The research also underscores the need for future studies to adopt context-specific approaches, accounting for the factors influencing architectural changes.

Nonetheless, the study is not without its weaknesses. It primarily focuses on memory recollection and its role in architectural studies, potentially neglecting other essential aspects of vernacular architecture. Challenges in assessing house transformations, including variations in the effectiveness of informants in recalling changes, present limitations and potential biases in the findings. The limited number of informants may not fully represent the diversity of Labuan Bajo's communities.

Additionally, the diligent efforts by local communities to document their local history, culture, and vernacular architecture through grassroots movements offer a glimmer of hope for the future. These initiatives signify that even small-scale endeavors in heritage preservation can have a significant impact on subsequent generations. By actively participating in the documentation of their architectural heritage, these communities are not only preserving their ancestral legacies but also ensuring the transmission of knowledge to the generations to follow. This proactive approach fosters a sense of continuity, allowing future generations to connect with their cultural roots and utilize this foundation as a source of inspiration and guidance in shaping their own destinies.

In conclusion, this research contributes to our understanding of memory, culture, and architecture, emphasizing the need for context-specific approaches in architectural studies. It underscores the crucial role of memory in preserving cultural heritage and documenting architectural transformations. These findings pave the way for future research in this field, offering valuable insights for more culturally sensitive and context-aware designs. However, potential threats include ethical considerations, evolving cultural dynamics, competing research, and resource constraints. Another substantial threat emerges from the evolving nature of vernacular architecture, particularly the shift towards more private and less communal spaces, which may endanger the memory recollection of past vernacular architecture, especially for future generations. Recognizing and addressing these challenges is essential to preserving cultural heritage and architectural traditions in the face of contemporary developments.

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**CHAPTER 8**  
**CONCLUSION**



## 8. 1. Overall conclusion

Chapter 1: Vernacular architecture, architecture not made by architects, is always changing, and rarely documented. However, vernacular architecture is theorized to be stored within the memories of the people. The research will use that theory and the theory of transformation to analyze the vernacular architecture evolutions experienced by the people with the hypothesis that a person will remember at least two houses in their lifetime. Apart from traditional architecture, vernacular architecture is rarely documented. The only record of architectural transformations is from the macro analysis of poverty in Indonesia which showed the trend of area increase and material changes in the past 10 years. But what will architects base their design on if there are no records of the past? The national agenda of tourism destination development in Indonesia has encouraged many architects to design tourism facilities inspired by the local architecture to be built to boost the tourism industry and the local economy. Nonetheless, among the 10 prioritized destinations, the poorest region was chosen to become the super-premium destination and has since been developed in many parts of its built environment. This made it crucial to document the vernacular architecture transformation before it changes even further and beyond the capacity of people's memories. This is why Labuan Bajo, amongst many towns in Indonesia, is selected to be the geographical scope of the research. The town is also known for its oral tradition and various ethnic groups which should be ideal for the memory recollection process.

Chapter 2: The two base theories in this research are the theory of transformation and the theory of memory recollection and vernacular architecture. Theory of transformation helps the analysis of built environment transformation by categorizing them from the smallest scale to the largest scale manageable by a person. In this research the memory of a person is also divided from the smallest to the biggest scale, from individual or family history to the house history and lastly the town or neighborhood memory. Memory recollection ability depends on what type of memory system is embedded in a person or, to an extent, in society.

Chapter 3: Both the transformation of the vernacular architecture and memory system of the community will be analyzed through desk study, direct observation, and in-depth interviews. The desk study was done before the survey to collect data on historical events, social contexts, records of vernacular architecture of Labuan Bajo and the neighboring regions within Indonesia; and after the survey to cross-check and analyze the findings on site with supporting documents. The period of the survey was 11-25 October 2021 and 15-22 October 2022. 23 informants from four different ethnic groups were interviewed for an average of two hours, and they were filtered to 12 informants who permitted the observation of their house and had experienced more than 1 house in Labuan Bajo.

Chapter 4: Before the analysis of the houses' transformation and memory system, the historical and social contexts of Labuan Bajo are gathered and analyzed. These contexts relate to the control and authority over built environment, and the power dynamics between the influencer and the influenced.

The power hierarchy in Labuan Bajo started from the first stage of the settlement. The year is unknown, but it started in the land division when newcomers migrate and want to settle in the Manggarai region. The locals were the Manggarai, and they have a traditional ritual when a newcomer asks for land to reside in. Regardless of their ethnicity, when a newcomer receives land and becomes a landowner, they will then be in the position to be asked for land by the next applicant. Then they will choose to either continue the Manggarai ritual or enforce their own ritual. But this next applicant will be under the hierarchy of the person they received land from. This is the first power dynamic and the shifts in their history. The second intervention is an external power from the government, especially when the town was declared as a prioritized tourist destination and later as a super-premium tourist destination. These two power dynamics are the factors used in further analysis of vernacular architecture transformation as they translate into time, ethnic groups, and proximity to tourist activities.

Chapter 5: Vernacular architecture transformation is assessed to see how potent memory recollection is in retrieving past architecture. In the physical level, the analysis included transformations of area, material, and number of rooms. In the territorial level, the analysis was conducted on the shifts in public-private scales within a house. The cultural level was to analyze the two previous levels with the factors of ethnic group, time and proximity to tourist activities and to gain understanding on the culture that built these houses. The data on physical levels of the house was able to be recollected and the analysis resulted in area increase throughout time and in all ethnic groups, houses changed into landed house with more industrial materials faster in the coastal areas and even faster after the national tourism development started, and the number of rooms increased along with the switch to landed house which relates more to the year rather than proximity or ethnic group. The data on the territorial level was also able to be gathered and the analysis resulted in the public-private scales related to the number of rooms and to the lifestyle of the informant. This lifestyle correlates with their ethnic identity, time, and proximity to tourism. The cultural understanding behind these transformations concluded that even if the attribute of ethnic groups does not relate much to many of the physical transformations, the territorial level relates to the ethnic identity and even more so to their position in the local power hierarchy. In conclusion, memory recollection was quite effective to probe the houses' transformations experienced by the locals and the reasons behind it.

Chapter 6: In this chapter the interviews were analyzed to determine which kind of memory system the informants operate on and how useful it is in vernacular architecture transformation studies. The interviews were conducted in a casual manner to allow the informants to share their history in an organic way. The interview questions or topics are divided into three categories, based on the relation to individual/family history, house history or neighborhood/town history. The recordings of the interviews are transcribed, and the answers analyzed through to get keywords. The method of how they recollected their memories to answer the questions from the three categories were assessed to get an estimate on how literate or oral are their memory systems. It is concluded that the memory system

most of the informants have been oral to more than 95% of the questions were recollected through oral history they acquired and shared orally, too. Some of them have written records of their ancestry and some of them had started writing down their migration and the history of their ancestors' ruling period. The informants' willingness to answer was analyzed as the historic level of their memory system and it concluded that more than 50% of the questions were answered willingly. This shows that they see the value in sharing their history, especially these topics from the interviews. These analyses prove that the informants have an oral-historic memory system, and this is a great memory system to substitute as a resource of past vernacular architecture.

Chapter 7: Overall, the choice to use a multifaceted approach is analyzed as able to enhance our comprehension of the relation between memory, culture, and architecture. The analysis of history and social context reveals the historical and sociocultural influences on architectural practices and power dynamics, extending beyond ethnic identities. The influence of external factors, such as the central government and foreigners, underscores the need for sensitivity in design. The study points to opportunities for future research, advocating for context-specific methodologies. However, it has limitations, including a primary focus on memory recollection, potential bias from varying informant effectiveness, and a limited sample size. Notably, grassroots efforts by local communities to document their heritage offer hope for the future, preserving ancestral legacies and facilitating knowledge transmission. This proactive approach ensures cultural continuity and provides inspiration for future generations to shape their destinies. In summary, this research enriches our understanding of memory, culture, and architecture, guiding more culturally sensitive and context-aware designs, despite potential threats like ethical concerns, evolving cultural dynamics, competition from other research, and resource constraints. The changing nature of vernacular architecture, shifting toward less communal spaces, poses a significant threat to memory recollection, especially for future generations. Addressing these challenges is crucial for preserving cultural heritage amid contemporary developments.

## **8. 2. Research limitations**

While this research has made significant strides in exploring the role of memory recollection within vernacular architecture studies, it's important to acknowledge its limitations. One of the notable limitations lies in its predominant focus on memory recollection, which might overshadow other essential aspects of vernacular architecture. The study's emphasis on memory may have inadvertently diverted attention from critical elements, such as the precise measurements, construction methods, and elements of passive design in local wisdom that contribute to the architectural heritage. A more comprehensive approach could have delved deeper into these aspects, offering a more holistic understanding of vernacular architecture.

Furthermore, the research faced challenges when assessing house transformations. The sample of the informants is relatively small, introducing a potential source of bias. These imbalance aspects of role in society as well as the power dynamics among informants could have implications for the comprehensiveness and accuracy of the findings. The study's ability to provide a well-rounded perspective on house transformations may have been hindered by the limited number of informants. Future research might consider strategies to mitigate these challenges, ensuring a more balanced and comprehensive assessment with a larger number of informants and house samples. The findings are based on a select group of informants, and while they offer valuable insights, they might not capture the diversity and nuances of the broader community. A sample with more extensive and diverse power dynamic could have provided a more comprehensive view of the vernacular architecture and memory systems within Labuan Bajo.

Finally, the constraints of time impacted the research's sample size and scope. The limited timeframe might have prevented the inclusion of more informants and a more extensive analysis. Additionally, the labor-intensive nature of the research methodologies may have limited the ability to analyze a more extensive data set. In future studies, addressing these constraints and improving the efficiency of data collection and analysis could lead to a broader and more in-depth exploration of vernacular architecture and memory recollection within Labuan Bajo.

### **8. 3. Future research**

Considerations to be taken in furthering this research on the use of memory recollection in vernacular architecture transformation studies in the future is to decide which factor plays the biggest part in the context of the research scope. This should be done in the first phase of the research. In this research, cultural plurality was deemed as the biggest factor in the memory recollection process. Whether this is the case in the next studies is for the desk study to determine.

This research still needs to be proven on a larger scale as it is now very limited in data, due to the labor-intensive process. Future research should develop methods which are more effective in collecting the same data while also providing a casual environment during the in-depth interviews. These more effective methods can be explored through digital platforms or other everyday home tools. The tricky part is how to mix the sketch and oral part in a large scale and to get trusty data without having a face-to-face interview.

In summary, the research is just a small steppingstone in providing more access to learn about past vernacular architecture, be it for designers, architectural preservationists, historians, and enthusiasts alike. It is hoped that in the future, this would help to inspire many more movements to do the very least in recording the vernacular architecture around us before it is replaced and lost in the memories of older generations passed before us.

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## **APPENDIX**



**Area transformation based on decade of construction**

Basic Data				Attributes		Area	
No	Year built	Ethnicity		Total rooms	Total scales	Total area	Average per decade
1	1940s	BA		4	4	20.41	20.41
	1940s	BA	average	4	4		
2	1950s	MA		7	7	85.89	76.93
3	1950s	MA		6	6	67.96	
	1950s	MA	average	6.5	6.5		
4	1960s	MA		6	6	39.23	69.25
5	1960s	MA		6	7	76.43	
6	1960s	BI		4	5	74.85	
7	1960s	BI		5	7	49.21	
8	1960s	BA		6	8	131.89	
9	1960s	BA		5	5	43.87	
	1960s	MA,BI,BA	average	5.3	6.3		
10	1970s	BU		2	4	38.17	54.41
11	1970s	BA		6	6	65.37	
12	1970s	BA		6	7	59.69	
	1970s	BU,BA	average	4.7	5.7		
13	1980s	MA		7	7	131.24	110.49
14	1980s	BI		5	6	70.36	
15	1980s	BU		1	4	32.81	
16	1980s	BU		4	4	58.56	
17	1980s	BA		22	8	259.48	
	1980s	MA,BI,BU,BA	average	7.8	5.8		
18	1990s	MA		7	6	120.60	105.86
19	1990s	MA		5	5	67.86	
20	1990s	MA		6	6	74.81	
21	1990s	MA		12	8	164.87	
22	1990s	BI		10	8	127.66	
23	1990s	BU		4	5	79.38	
	1990s	MA,BI,BU	average	7.3	6.3		
24	2000s	MA		13	7	145.32	134.43
25	2000s	BI		12	7	110.66	
26	2000s	BU		5	5	52.84	
27	2000s	BA		16	8	228.92	
	2000s	MA,BI,BU,BA	average	11.5	6.75		
28	2010s	BI		14	8	121.04	132.28
29	2010s	BU		21	8	143.52	
	2010s	MA,BI,BU,BA	average	17.5	8		
30	2020s	MA		5	4	24.88	51.14
31	2020s	BU		5	4	77.40	
	2020s	MA, BU	average	5	4		

**Area transformation within the houses based on ethnic backgrounds**

Basic Data			Attributes			Area		
No	House code	Ethnicity	Year built	Total rooms	Total scales	Total area	Average per person	Average per ethnic group
1	AA01	MA	1980s	7	7	131.24	85.23	91.08
2	AA02	MA	1960s	6	6	39.23		
3	MS01	MA	2020s	5	4	24.88	71.11	
4	MS02	MA	1990s	7	6	120.60		
5	MS03	MA	1990s	5	5	67.86	85.89	
6	RI 03	MA	1950s	7	7	85.89		
7	SB 01	MA	2000s	13	7	145.32	110.06	
8	SB 02	MA	1990s	6	6	74.81	103.09	
9	TU01	MA	1990s	12	8	164.87		
10	TU02	MA	1960s	6	7	76.43		
11	TU03	MA	1950s	6	6	67.96	92.30	
12	MT01	BI	2010s	14	8	121.04		95.70
13	MT02	BI	1980s	5	6	70.36		92.75
14	RL 01	BI	2000s	12	7	110.66		
15	RL 02	BI	1960s	4	5	74.85		88.43
16	UL01	BI	1990s	10	8	127.66		
17	UL02	BI	1960s	5	7	49.21		77.14
18	RA01	BU	2010s	21	8	143.52		
19	RA02	BU	2000s	5	5	52.84		
20	RA03	BU	1990s	4	5	79.38		
21	RA04	BU	1980s	1	4	32.81		
22	SU01	BU	2020s	5	4	77.40	58.04	
23	SU02	BU	1980s	4	4	58.56		
24	SU03	BU	1970s	2	4	38.17		
25	AH01	BA	2000s	16	8	228.92	104.90	114.32
26	AH02	BA	1970s	6	6	65.37		
27	AH03	BA	1940s	4	4	20.41		
28	SA 02	BA	1980s	22	8	259.48	123.73	
29	SA 03	BA	1970s	6	7	59.69		
30	SA 04	BA	1960s	6	8	131.89		
31	SA 05	BA	1960s	5	5	43.87		

### Area transformation based on proximity and to tourism activities

Basic Data				Attributes				Area		
No	House code	Ethnicity	Year built	Location	Tourism potential	Total rooms	Total scales	Total area	Average per location	Average per tourism potential
1	TU03	MA	1950s	Lancang	Periphery	6	6	67.96	103.09	99.08
2	TU02	MA	1960s	Lancang	Periphery	6	7	76.43		
3	TU01	MA	1990s	Lancang	Periphery	12	8	164.87		
Lancang average						8	7			
4	UL02	BI	1960s	Sernaru	Periphery	5	7	49.21	90.59	
5	RL 02	BI	1960s	Sernaru	Periphery	4	5	74.85		
6	UL01	BI	1990s	Sernaru	Periphery	10	8	127.66		
7	RL 01	BI	2000s	Sernaru	Periphery	12	7	110.66		
Sernaru average						7.75	6.75			
8	SB 02	MA	1990s	Wae Mata	Periphery	6	6	74.81	110.06	
9	SB 01	MA	2000s	Wae Mata	Periphery	13	7	145.32		
Wae Mata average						9.5	6.5			
10	AA02	MA	1960s	Nanga Na'e	Access	6	6	39.23	85.23	
11	AA01	MA	1980s	Nanga Na'e	Access	7	7	131.24		
Nanga Na'e average						6.5	6.5			
12	MS02	MA	1990s	Nggorang	Access	7	6	120.60	71.11	
13	MS03	MA	1990s	Nggorang	Access	5	5	67.86		
14	MS01	MA	2020s	Nggorang	Access	5	4	24.88		
Nggorang average						5.666667	5			
15	AH03	BA	1940s	Kampung Air	Strategic	4	4	20.41	82.40	92.33
16	SU03	BU	1970s	Kampung Air	Strategic	2	4	38.17		
17	AH02	BA	1970s	Kampung Air	Strategic	6	6	65.37		
18	MT02	BI	1980s	Kampung Air	Strategic	5	6	70.36		
19	RA04	BU	1980s	Kampung Air	Strategic	1	4	32.81		
20	SU02	BU	1980s	Kampung Air	Strategic	4	4	58.56		
21	RA03	BU	1990s	Kampung Air	Strategic	4	5	79.38		
22	RA02	BU	2000s	Kampung Air	Strategic	5	5	52.84		
23	AH01	BA	2000s	Kampung Air	Strategic	16	8	228.92		
24	MT01	BI	2010s	Kampung Air	Strategic	14	8	121.04		
25	RA01	BU	2010s	Kampung Air	Strategic	21	8	143.52		
26	SU01	BU	2020s	Kampung Air	Strategic	5	4	77.40		
Kampung Air average						7.25	5.5			
27	RI 03	MA	1950s	Kampung Tengah	Strategic	7	7	85.89	116.16	
28	SA 05	BA	1960s	Kampung Tengah	Strategic	5	5	43.87		
29	SA 04	BA	1960s	Kampung Tengah	Strategic	6	8	131.89		
30	SA 03	BA	1970s	Kampung Tengah	Strategic	6	7	59.69		
31	SA 02	BA	1980s	Kampung Tengah	Strategic	22	8	259.48		
Kampung Tengah average						9.2	7			

### Material transformation based on ethnic identities

Basic data				Foundati on		Columns		Floor				Walls					Roof				Windows			Interior doors		Exterior doors													
No	House code	Ethnicity	Year built	Stone	PC roof beam	PC blocks	Wooden logs	Wooden blocks	Reinforced concrete	Bamboo	Wood	DTT	Cement	Ceramic tiles	Bamboo	Palm leaves	Wooden panels	Wood boards	Brick and wooden panels	Zinc	Brick	Palm leaves	Ferrocila tiles	Zinc	Reinforced concrete	Curtains	Bamboo or wooden bars	Palm leaves	Wooden boards	Wood and glass	Curtains	Wooden boards	Wooden doors	Palm leaves	Wooden boards	Wooden doors			
1	AA01	MA	1980s			1										1	1	1						1														1	
2	AA02	MA	1960s	1						1												1																1	
3	MS01	MA	2020s		1			1														1			1	1												1	
4	MS02	MA	1990s	1									1				1	1	1									1										1	
5	MS03	MA	1990s	1			1						1																									1	
8	RI 03	MA	1950s	1																		1																1	
9	SB 01	MA	2000s		1			1					1									1																1	
10	SB 02	MA	1990s		1								1	1																								1	
11	TU01	MA	1990s		1								1	1	1																							1	
12	TU02	MA	1960s	1													1																						1
13	TU03	MA	1950s	1			1																																1
Manggarai				6	6	1	2	1	4	2	4	1	4	6	0	4	3	3	2	1	4	3	0	9	3	0	4	1	2	7	6	1	8	2	3	8			
14	MT01	BI	2010s	1	1			1	1			1	1	1								1	1															1	
15	MT02	BI	1980s	1																																			1
16	RL 01	BI	2000s		1			1						1																									1
17	RL 02	BI	1960s	1																																			1
18	UL01	BI	1990s		1			1	1				1	1	1																							1	
19	UL02	BI	1960s	1																																			1
Bima				4	3	0	0	5	3	2	2	2	2	3	0	3	0	1	0	1	0	1	3	2	0	4	0	0	1	2	1	3	6	2	2	3	1	3	
20	RA01	BU	2010s		1				1					1		1	1					1																	1
21	RA02	BU	2000s	1																																			1
22	RA03	BU	1990s	1																																			1
23	RA04	BU	1980s	1																																			1
24	SU01	BU	2020s		1				1					1	1																								1
25	SU02	BU	1980s	1				1																															1
26	SU03	BU	1970s	1																																			1
Bugis				5	2	0	0	5	2	3	1	1	2	2	2	4	1	1	0	0	2	2	2	3	0	0	3	1	1	2	4	3	2	2	3	2			
27	AH01	BA	2000s		1				1					1																									1
28	AH02	BA	1970s	1																																			1
29	AH03	BA	1940s	1																																			1
31	SA 02	BA	1980s		1																																		1
32	SA 03	BA	1970s	1																																			1
33	SA 04	BA	1960s	1																																			1
34	SA 05	BA	1960s	1																																			1
Bajo				5	3	0	0	6	2	4	1	2	1	2	1	4	1	1	1	0	2	4	0	3	2	3	4	0	1	3	5	0	3	4	1	3			

## Material transformation based on decade built

Basic data		Foundation		Columns			Floor			Walls						Roof			Windows				Interior doors		Exterior doors										
Ethnicity	Year built	Stone	RC sloof beam	RC blocks	Wooden logs	Wooden blocks	Reinforced concrete	Bamboo	Wood	Dirt	Cement	Ceramic tiles	Bamboo	Palm leaves	Wooden panels	Wood boards	Brick and wooden panels	Zinc	Brick	Palm leaves	Terracota tiles	Zinc	Reinforced concrete	Curtains	Bamboo or wooden bars	Palm leaves	Wooden boards	Wood and glass	Curtains	Wooden boards	Wooden doors	Palm leaves	Wooden boards	Wooden doors	
BA	1940s	1	0	0	0	1	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0
MA	1950s	2	0	0	1	1	0	1	1	0	0	0	0	1	0	0	0	1	0	1	0	0	1	0	1	1	0	0	2	0	1	1	0	1	
MA, BI, BA	1960s	6	0	0	0	6	0	5	1	0	1	0	0	5	1	0	0	0	0	4	0	2	0	2	4	1	1	0	6	1	0	5	1	0	
BU, BA	1970s	3	0	0	0	3	0	1	0	2	1	0	1	1	0	0	1	0	0	1	1	1	0	1	1	1	1	0	2	1	0	1	2	0	
MA, BI, BU, BA	1980s	3	1	1	0	5	0	1	3	0	1	0	0	4	2	2	0	0	0	2	1	2	0	0	1	1	1	2	2	1	2	2	1	2	
MA, BI, BU	1990s	3	4	0	1	5	2	1	1	2	4	4	1	2	1	2	2	0	2	2	0	5	0	0	3	0	1	4	4	1	4	1	2	4	
MA, BI, BU, BA	2000s	1	3	0	0	1	3	1	1	0	0	3	0	1	0	0	0	0	3	0	0	4	1	0	1	0	0	3	2	0	3	0	1	3	
MA, BI, BU, BA	2010s	1	4	0	0	1	4	0	1	1	1	4	0	0	1	2	0	1	4	0	0	3	2	0	0	0	1	4	2	2	3	0	1	4	
MA, BU	2020s	0	2	0	0	0	2	0	0	0	1	2	0	0	0	0	0	0	2	0	0	2	1	0	0	0	0	2	0	0	2	0	0	2	

### Material transformation based on decade built in details per person

Basic data				Foundation		Columns		Floor				Walls					Roof			Windows			Interior doors		Exterior doors													
No	House code	Ethnicity	Year built	Stone	RC slab beam	RC blocks	Wooden logs	Wooden blocks	Reinforced concrete	Bamboo	Wood	Dirt	Cement	Ceramic tiles	Bamboo	Palm leaves	Wooden panels	Wood boards	Brick and wooden panels	Zinc	Brick	Palm leaves	Terracotta tiles	Zinc	Reinforced concrete	Curtains	Bamboo or wooden bars	Palm leaves	Wooden boards	Wood and glass	Curtains	Wooden boards	Wooden doors	Palm leaves	Wooden boards	Wooden doors		
1	AH03	BA	1940s	1			1	1		1	1			1	1							1					1			1			1					
			1940s	1	0	0	0	1	0	1	0	1	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0	
2	RI 03	MA	1950s	1			1			1									1					1						1							1	
3	TU03	MA	1950s	1			1		1	1					1						1						1			1			1		1		1	
			1950s	2	0	0	1	0	1	1	0	0	0	0	1	0	0	0	1	0	1	0	1	0	2	0	1	0	0	2	0	1	1	0	1	0	1	
4	AA02	MA	1960s	1			1			1					1							1								1							1	
5	TU02	MA	1960s	1			1			1		1				1							1							1							1	
6	RL02	BI	1960s	1			1		1	1						1						1							1								1	
7	UL02	BI	1960s	1			1		1	1						1						1							1								1	
8	SA 04	BA	1960s	1			1		1	1						1						1							1								1	
9	SA 05	BA	1960s	1			1		1	1						1						1							1								1	
			1960s	6	0	0	0	6	0	5	1	0	1	0	0	5	1	0	0	0	0	4	0	2	0	2	4	1	1	0	6	1	0	5	1	0		
10	SU03	BU	1970s	1			1			1					1							1							1								1	
11	AH02	BA	1970s	1			1			1	1											1							1								1	
12	SA 03	BA	1970s	1			1		1	1						1						1							1								1	
			1970s	3	0	0	0	3	0	1	0	2	1	0	1	1	0	0	1	0	0	1	1	1	0	1	1	1	1	0	2	1	0	1	2	0		
13	AA01	MA	1980s		1		1			1					1	1	1					1						1			1						1	
14	MT02	BI	1980s	1			1			1						1						1						1			1						1	
15	RA04	BU	1980s	1			1		1	1						1						1						1			1						1	
16	SU02	BU	1980s	1			1			1						1						1						1			1						1	
17	SA 02	BA	1980s	1			1		1	1						1						1						1			1						1	
			1980s	3	1	1	0	5	0	1	3	0	1	0	0	4	2	2	0	0	0	2	1	2	0	0	1	1	1	2	2	1	2	2	1	2		
18	MS02	MA	1990s	1			1			1					1	1	1					1						1			1						1	
19	MS03	MA	1990s	1			1			1						1						1						1			1						1	
20	RI 02	MA	1990s	1			1			1					1							1						1			1						1	
21	SB 02	MA	1990s	1			1			1					1							1						1			1						1	
22	TU01	MA	1990s	1			1			1	1	1				1						1						1			1						1	
23	UL01	BI	1990s	1			1		1	1						1						1						1			1						1	
24	RA03	BU	1990s	1			1		1	1					1	1						1						1			1						1	
			1990s	3	4	0	1	5	2	1	1	2	4	4	1	2	1	2	2	0	2	2	0	5	0	0	3	0	1	4	4	1	4	1	4	1	2	4
25	SB 01	MA	2000s	1			1			1						1						1						1			1						1	
26	RL 01	BI	2000s	1			1			1						1						1						1			1						1	
27	RA02	BU	2000s	1			1		1	1						1						1						1			1						1	
28	AH01	BA	2000s	1			1		1	1						1						1						1			1						1	
			2000s	1	3	0	0	1	3	1	1	0	0	3	0	1	0	0	0	0	0	3	0	0	4	1	0	1	0	0	3	2	0	3	0	1	3	
29	RI 01	MA	2010s	1			1			1						1						1						1			1						1	
30	MT01	BI	2010s	1			1		1	1	1	1				1						1						1			1						1	
31	RA01	BU	2010s	1			1		1	1						1						1						1			1						1	
32	SA 01	BA	2010s	1			1		1	1						1						1						1			1						1	
			2010s	1	4	0	0	1	4	0	1	1	1	4	0	0	1	2	0	1	4	0	0	3	2	0	0	1	4	2	2	3	0	1	4			
33	MS01	MA	2020s	1			1			1						1						1						1			1						1	
34	SU01	BU	2020s	1			1			1						1						1						1			1						1	
			2020s	0	2	0	0	0	2	0	0	0	1	2	0	0	0	0	0	0	0	2	0	0	2	1	0	0	0	2	0	0	2	0	0	2	0	2

### Room number transformation based on proximity and to tourism activities

Basic Data				Attributes				Area				
No	House code	Ethnicity	Year built	Location	Tourism potential	Total rooms	Total scales	Total area	Average per location	Average per tourism potential		
1	TU03	MA	1950s	Lancang	Periphery	6	6	67.96	103.09	99.08		
2	TU02	MA	1960s	Lancang	Periphery	6	7	76.43				
3	TU01	MA	1990s	Lancang	Periphery	12	8	164.87				
Lancang average						8	7					
4	UL02	BI	1960s	Sernaru	Periphery	5	7	49.21	90.59			
5	RL 02	BI	1960s	Sernaru	Periphery	4	5	74.85				
6	UL01	BI	1990s	Sernaru	Periphery	10	8	127.66				
7	RL 01	BI	2000s	Sernaru	Periphery	12	7	110.66				
Sernaru average						7.75	6.75					
8	SB 02	MA	1990s	Wae Mata	Periphery	6	6	74.81	110.06			
9	SB 01	MA	2000s	Wae Mata	Periphery	13	7	145.32				
Wae Mata average						9.5	6.5					
10	AA02	MA	1960s	Nanga Na'e	Access	6	6	39.23	85.23		76.76	
11	AA01	MA	1980s	Nanga Na'e	Access	7	7	131.24				
Nanga Na'e average						6.5	6.5					
12	MS02	MA	1990s	Nggorang	Access	7	6	120.60	71.11			
13	MS03	MA	1990s	Nggorang	Access	5	5	67.86				
14	MS01	MA	2020s	Nggorang	Access	5	4	24.88				
Nggorang average						5.67	5					
15	AH03	BA	1940s	Kampung Air	Strategic	4	4	20.41	82.40			92.33
16	SU03	BU	1970s	Kampung Air	Strategic	2	4	38.17				
17	AH02	BA	1970s	Kampung Air	Strategic	6	6	65.37				
18	MT02	BI	1980s	Kampung Air	Strategic	5	6	70.36				
19	RA04	BU	1980s	Kampung Air	Strategic	1	4	32.81				
20	SU02	BU	1980s	Kampung Air	Strategic	4	4	58.56				
21	RA03	BU	1990s	Kampung Air	Strategic	4	5	79.38				
22	RA02	BU	2000s	Kampung Air	Strategic	5	5	52.84				
23	AH01	BA	2000s	Kampung Air	Strategic	16	8	228.92				
24	MT01	BI	2010s	Kampung Air	Strategic	14	8	121.04				
25	RA01	BU	2010s	Kampung Air	Strategic	21	8	143.52				
26	SU01	BU	2020s	Kampung Air	Strategic	5	4	77.40				
Kampung Air average						7.25	5.5					
27	RI 03	MA	1950s	Kampung Tengah	Strategic	7	7	85.89	116.16			
28	SA 05	BA	1960s	Kampung Tengah	Strategic	5	5	43.87				
29	SA 04	BA	1960s	Kampung Tengah	Strategic	6	8	131.89				
30	SA 03	BA	1970s	Kampung Tengah	Strategic	6	7	59.69				
31	SA 02	BA	1980s	Kampung Tengah	Strategic	22	8	259.48				
Kampung Tengah average						9.2	7					

**Heatmap of public-private scales' transformation in each house**

Basic data				Attributes		Public-private scales							
No	House code	Ethnicity	Year built	Total rooms	Total scales	API-1	API-2	API-3	API-4	API-5	API-6	API-7	API-8
1	AA01	MA	1980s	7	7	5.00	32.76	6.67	32.22	7.26	23.46	11.94	11.94
2	AA02	MA	1960s	6	6	8.12	8.63	0.00	6.73	0.00	5.37	5.32	5.06
3	MS01	MA	2020s	5	4	6.88	6.37	1.13	0.00	10.49	0.00	0.00	0.00
4	MS02	MA	1990s	7	6	29.97	0.00	17.38	23.20	23.70	14.50	0.00	11.85
5	MS03	MA	1990s	5	5	18.00	8.92	0.00	0.00	18.03	14.04	0.00	8.88
8	RI 03	MA	1950s	7	7	10.29	13.39	22.28	14.71	0.00	3.53	10.84	10.84
9	SB 01	MA	2000s	13	7	9.05	24.69	37.80	9.99	37.19	19.18	0.00	7.43
10	SB 02	MA	1990s	6	6	15.58	13.07	0.00	7.04	9.88	21.71	7.54	0.00
11	TU01	MA	1990s	12	8	24.99	21.35	18.01	36.13	5.94	41.37	11.40	5.70
12	TU02	MA	1960s	6	7	5.65	15.21	0.00	5.09	8.14	22.77	12.13	7.44
13	TU03	MA	1950s	6	6	15.21	0.00	0.00	5.49	7.44	23.01	12.13	4.68
Manggarai			average	7.27	6.27	13.52	13.13	9.39	12.78	11.64	17.17	6.48	6.71
14	MT01	BI	2010s	14	8	8.27	28.83	18.79	11.96	10.85	7.48	27.25	7.62
15	MT02	BI	1980s	5	6	24.05	15.64	0.00	7.67	0.00	7.67	7.67	7.67
16	RL 01	BI	2000s	12	7	17.59	15.75	17.59	16.13	17.34	18.48	0.00	7.79
17	RL 02	BI	1960s	4	5	25.07	16.72	0.00	5.30	0.00	16.76	0.00	11.01
18	ULO1	BI	1990s	10	8	8.95	20.66	29.93	19.64	22.71	6.37	9.70	9.70
19	ULO2	BI	1960s	5	7	16.23	9.30	0.00	3.10	6.20	5.36	4.52	4.52
Bima			average	8.33	6.83	16.69	17.81	11.05	10.63	9.51	10.35	8.19	8.05
20	RA01	BU	2010s	21	8	12.86	18.56	20.15	28.50	8.84	23.04	25.33	6.24
21	RA02	BU	2000s	5	5	23.49	6.65	0.00	14.97	0.00	0.00	3.87	3.87
22	RA03	BU	1990s	4	5	37.40	8.20	0.00	2.82	0.00	16.89	0.00	14.08
23	RA04	BU	1980s	1	4	15.04	9.57	0.00	5.47	0.00	2.73	0.00	0.00
24	SU01	BU	2020s	5	4	21.36	14.82	0.00	0.00	0.00	29.09	0.00	12.13
25	SU02	BU	1980s	4	4	18.87	13.46	0.00	0.00	0.00	11.78	0.00	14.45
26	SU03	BU	1970s	2	4	3.95	17.21	0.00	0.00	0.00	8.60	0.00	8.41
Bugis			average	6.00	4.86	18.99	12.64	2.88	7.39	1.26	13.16	4.17	8.45
27	AH01	BA	2000s	16	8	16.21	72.46	12.61	78.07	5.99	26.75	5.99	10.85
28	AH02	BA	1970s	6	6	16.67	0.00	0.00	12.50	4.17	15.79	8.12	8.12
29	AH03	BA	1940s	4	4	3.13	4.44	0.00	0.00	0.00	9.39	0.00	3.45
31	SA 02	BA	1980s	22	8	7.16	41.27	17.54	145.22	18.61	8.21	10.73	10.73
32	SA 03	BA	1970s	6	7	19.58	4.14	20.23	3.98	0.00	3.78	3.98	3.98
33	SA 04	BA	1960s	6	8	70.02	12.42	8.28	8.23	8.23	8.23	8.23	8.23
34	SA 05	BA	1960s	5	5	16.47	0.00	0.00	3.98	0.00	2.51	16.93	3.98
Bajo			average	9.29	6.57	21.32	19.25	8.38	36.00	5.29	10.67	7.71	7.05

### Heatmap chart of public-private scales based on decades

Basic data			Attributes		Public-private scales							
Ethnicity	Total houses	Year built	Average rooms	Average scales	API-1	API-2	API-3	API-4	API-5	API-6	API-7	API-8
BA	1	1940s	4	4	3.13	4.44	0.00	0.00	0.00	9.39	0.00	3.45
MA	2	1950s	6.5	6.5	12.75	6.69	11.14	10.10	3.72	13.27	11.48	7.76
MA, BI, BA	6	1960s	5.3	6.3	23.59	10.38	1.38	5.40	3.76	10.16	7.85	6.71
BU, BA	3	1970s	4.7	5.7	13.40	7.12	6.74	5.50	1.39	9.39	4.03	6.84
MA, BI, BU, BA	5	1980s	7.8	5.8	14.02	22.54	4.84	38.11	5.17	10.77	6.07	8.96
MA, BI, BU	7	1990s	7.3	6.3	22.48	12.03	10.89	14.80	13.38	19.15	4.77	8.37
MA, BI, BU, BA	4	2000s	11.5	6.75	16.58	29.89	17.00	29.79	15.13	16.10	2.46	7.48
MA, BI, BU, BA	2	2010s	17.5	8	10.56	23.70	19.47	20.23	9.84	15.26	26.29	6.93
MA, BU	2	2020s	5	4	14.12	10.60	0.56	0.00	5.25	14.55	0.00	6.06
overall			7.6	6.1	17.13	15.31	8.01	16.39	7.45	13.48	6.57	7.44

**Details of the public-private area transformation in chronological order**

Basic data			Attributes		Public-private scales							
Ethnicity	Year built		Total rooms	Total scales	API-1	API-2	API-3	API-4	API-5	API-6	API-7	API-8
BA	1940s		4	4	3.13	4.44	0.00	0.00	0.00	9.35	0.00	3.45
BA	1940s	average	4	4	3.13	4.44	0.00	0.00	0.00	9.35	0.00	3.45
MA	1950s		7	7	10.29	13.39	22.28	14.71	0.00	3.53	10.84	10.84
MA	1950s		6	6	15.21	0.00	0.00	5.49	7.44	23.00	12.13	4.68
MA	1950s	average	6.5	6.5	12.75	6.69	11.14	10.10	3.72	13.20	11.48	7.76
MA	1960s		6	6	8.12	8.63	0.00	6.73	0.00	5.30	5.32	5.06
MA	1960s		6	7	5.65	15.21	0.00	5.09	8.14	22.70	12.13	7.44
BI	1960s		4	5	25.07	16.72	0.00	5.30	0.00	16.70	0.00	11.01
BI	1960s		5	7	16.23	9.30	0.00	3.10	6.20	5.30	4.52	4.52
BA	1960s		6	8	70.02	12.42	8.28	8.23	8.23	8.23	8.23	8.23
BA	1960s		5	5	16.47	0.00	0.00	3.98	0.00	2.50	16.93	3.98
MA,BI,BA	1960s	average	5.3	6.3	23.59	10.38	1.38	5.40	3.76	10.10	7.85	6.71
BU	1970s		2	4	3.95	17.21	0.00	0.00	0.00	8.60	0.00	8.41
BA	1970s		6	6	16.67	0.00	0.00	12.50	4.17	15.70	8.12	8.12
BA	1970s		6	7	19.58	4.14	20.23	3.98	0.00	3.70	3.98	3.98
BU,BA	1970s	average	4.7	5.7	13.40	7.12	6.74	5.50	1.39	9.30	4.03	6.84
MA	1980s		7	7	5.00	32.76	6.67	32.22	7.26	23.40	11.94	11.94
BI	1980s		5	6	24.05	15.64	0.00	7.67	0.00	7.60	7.67	7.67
BU	1980s		1	4	15.04	9.57	0.00	5.47	0.00	2.70	0.00	0.00
BU	1980s		4	4	18.87	13.46	0.00	0.00	0.00	11.70	0.00	14.45
BA	1980s		22	8	7.16	41.27	17.54	145.22	18.61	8.20	10.73	10.73
MA,BI,BU,BA	1980s	average	7.8	5.8	14.02	22.54	4.84	38.11	5.17	10.70	6.07	8.96
MA	1990s		7	6	29.97	0.00	17.38	23.20	23.70	14.50	0.00	11.85
MA	1990s		5	5	18.00	8.92	0.00	0.00	18.03	14.00	0.00	8.88
MA	1990s		6	6	15.58	13.07	0.00	7.04	9.88	21.70	7.54	0.00
MA	1990s		12	8	24.99	21.35	18.01	36.13	5.94	41.30	11.40	5.70
BI	1990s		10	8	8.95	20.66	29.93	19.64	22.71	6.30	9.70	9.70
BU	1990s		4	5	37.40	8.20	0.00	2.82	0.00	16.80	0.00	14.08
MA,BI,BU	1990s	average	7.3	6.3	22.48	12.03	10.89	14.80	13.38	19.10	4.77	8.37
MA	2000s		13	7	9.05	24.69	37.80	9.99	37.19	19.10	0.00	7.43
BI	2000s		12	7	17.59	15.75	17.59	16.13	17.34	18.40	0.00	7.79
BU	2000s		5	5	23.49	6.65	0.00	14.97	0.00	0.00	3.87	3.87
BA	2000s		16	8	16.21	72.46	12.61	78.07	5.99	26.70	5.99	10.85
MA,BI,BU,BA	2000s	average	11.5	6.75	16.58	29.89	17.00	29.79	15.13	16.10	2.46	7.48
BI	2010s		14	8	8.27	28.83	18.79	11.96	10.85	7.40	27.25	7.62
BU	2010s		21	8	12.86	18.56	20.15	28.50	8.84	23.00	25.33	6.24
MA,BI,BU,BA	2010s	average	17.5	8	10.56	23.70	19.47	20.23	9.84	15.20	26.29	6.93
MA	2020s		5	4	6.88	6.37	1.13	0.00	10.49	0.00	0.00	0.00
BU	2020s		5	4	21.36	14.82	0.00	0.00	0.00	29.00	0.00	12.13
MA, BU	2020s	average	5	4	14.12	10.60	0.56	0.00	5.25	14.50	0.00	6.06
overall	average		7.6	6.1	17.13	15.31	8.01	16.39	7.45	13.40	6.57	7.44