

# THE HEALTHY HOMES OF THE AMMATOA KAJANG INDIGENOUS PEOPLE, INDONESIA

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## 1. Introduction

At the moment, the world community is dealing with COVID-19, which is transmitted through droplets from people who carry the virus. As a result, health protocols, such as staying at home, maintaining a healthy lifestyle, washing hands with water, using hand sanitizer, wearing masks and social distancing have been initiated by governments all over the world. Even in Indonesia, traditional remote settlements have implemented COVID-19 prevention standards of the World Health Organization (WHO), where clean water is placed outside homes to wash hands, face and feet before entering.

It has only been relatively recently – just over the last one hundred years – that the connection between the buildings where people live, and their physical and mental health, has been linked scientifically. According to the WHO (2001), a home can be said to be healthy when a physiological approach to its construction is taken, so that techniques are used that manage risk factors that take into account a house's orientation, location and adaptation to the environment, as well as its maintenance. Further, Rudi [1] states that a healthy house should have clean water available, with good plumbing and sanitation systems to deal with clean and dirty water, be well lit and have good cross ventilation.

The temperature and humidity of the room should also be adequate, as they can affect the comfort and health of the occupants. Indonesia's Ministry of Health states in its decree (829/Menkes/SK/VII/1999) concerning healthy homes that interior living spaces should maintain a temperature range of 18°C - 30°C with humidity between 40% and 70% to ensure the comfort of its occupants and sets the maximum parameters for air exchange rates to ensure occupant health.

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All these parameters for housing have been known and practiced by indigenous peoples who continue today to live their lives as their ancestors have for hundreds of years, like the Ammatoa Kajang indigenous peoples, who have separated themselves from all forms of modernization.

The Ammatoa Kajang<sup>1</sup> reside on their ancestral lands of 22689.59 hectares<sup>2</sup> in the Bulukumba regency of South Sulawesi province and have separated into two geographically distinct areas, namely those living in the Kajang Dalam (Inner Kajang) customary area – locally referred to in their language, Makassar Konjo, as *ilalang embayya* (inside the fenced area) also known as *rambang seppang* – which covers over 552 hectares, and those living in the Kajang Luar (Outer Kajang) customary area – referred to as the *ipantarang embayya* (outside the fenced area), also known as *rambang luara*. The Kajang Dalam area is where the community maintains all aspects of their heritage, beliefs and way of life, as set by their oral precepts, sayings and principles, collectively referred to as the *Pasang ri Kajang*, while residents of the Kajang Luar have embraced most, if not all, forms of modernity.

The *Pasang ri Kajang* has been handed down from the first Ammatoa or community leader (Ammatoa Riolo) and governs how the Ammatoa Kajang community lives, such as their highly detailed multi-levelled system of governance (customary institutions), the type and colour of clothing that is permitted to be made and worn, how different areas of land must be used, how rituals and traditions should be practiced, and all aspects of housing construction.

The houses within the Kajang Dalam area are strikingly similar and built according to the informal oral transfer of knowledge and customary compliance methods of the *Pasang ri Kajang* to maintain the natural environment. Their stilt houses are, in fact, similar in shape to those of the Bugis, Makassar, and Mandar indigenous peoples of Sulawesi island having floors raised about 180 - 200 centimetres from the ground, as reported by Roxana Waterson [2]. The “H-shaped” frames for the structure of the Bugis and Makassar houses that do not use pegs or nails in their construction, as C. Pelras [3] explains, are commonly found throughout Southeast Asia.

However, it is Amos Rapoport [4] who observes that tradition, custom and culture influence a house, such as the orientation of the Kajang Dalam houses, as well as their shape and other aspects of house design. Passed down from generation to generation, every part of the house, including certain elements that are applied, has been given meaning, even in the case of recently built houses in the Kajang Dalam customary area. The form of customary Ammatoa Kajang house is divided vertically into three parts, namely, the upper level or attic, locally referred to as *pammakkang / rakkeang*, below which is the body of the house called *kale ballak*, and then beneath the house is an open space which is called *awasao / siring*, as Erawati Lewa [5] explains (see Figure 1).

The attic functions as storage for dry goods such as rice, corn and beans. The body of the house functions as a living space for the occupants to carry out their daily activities, while the open area under the house is used to keep agricultural tools, as well as livestock, such as chickens, ducks, cows, buffalo and horses. This parallels Bugis houses, which according to Palembang Nadji [6] also consist of three vertical parts, namely, the attic, the body of the house and the area under the house. The attic (*rakkeang*) is the upper level, which the Bugis indigenous people consider to be a sacred space; the middle part, the body of the house (*alebola*), is used as an area to carry out daily activities, and the lower part (*wasaubola*) is considered to be a “dirty” space (i.e. a space to put work clothes after they have been used for working in the fields and garden, and a space for chickens and ducks, and also guard-dogs).

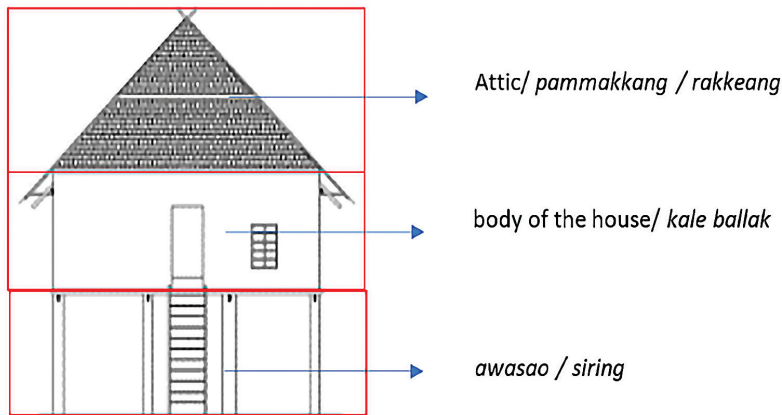


Figure 1. Vertical parts of the home (sketch: Andi Abidah 2020).

The orientation of the house determines the amount of sunlight and air entering it, as natural light and ventilation are essential for a healthy house. Although the Bugis and Makassar indigenous peoples have generally maintained their houses' traditional structure, W. Osman [7] notes that their houses are now oriented toward the road, while the Kajang Dalam maintain their houses' orientation facing west, with the rear of each house facing the sunrise.

In addition to natural lighting and ventilation, other essentials to consider that will ensure a healthy home include building materials, room size, and waste disposal. Moreover, Gallahue, D.L. and J.C. Ozmun [8] observe that temperature, climate and ceiling height also physiologically impact the occupants; such careful consideration of these elements can be seen in Kajang Dalam homes.

## 2. Objective

The deep mental, spiritual and cultural connection the Kajang Dalam have with their environment, their community, and their beliefs are shaped by their strict adherence to the customary rules passed down orally by their ancestors in the *Pasang ri Kajang*. This research examines how these precepts are embodied in the dwellings of the Kajang Dalam community and how these homes influence the physiology of their occupants.

## 3. Methods

The research was conducted in the field using qualitative methods with anthropological approaches which investigate culture, beliefs and behaviour, as highlighted by P. Olive [9]. This is so that the extent of a dweller's physiological comfort within the Kajang Dalam community may be accurately examined. The research area is located within the Inner Kajang (Kajang Dalam) customary area in the Bulukumba district. The distance from the province's capital to the research location is about 190.4 km. The number of research samples is ten houses located in the village of Benteng in Kajang Dalam.

This study is the result of the joint research carried out by three lecturers with expertise in differing fields of study, namely, culture and history of architecture, occupational health and safety, and environmental architecture.

The research process began by conducting a study of the literature found in academic research connected with the Kajang community. This was followed by a field survey of ten objects of study (i.e. the houses) by sketching them, as photography was strictly forbidden and by collecting the measurements of each house's dimensions. These were then transferred to the AutoCAD 2D application. Interviews with the inhabitants of the houses, as well as with community members, were also conducted using the local language, Makassar Konjo. In this case, the researchers were assisted by translators from the local community who understood this local dialect and spoke Indonesian. Some of the questions put to the owners of the respective houses included the age of the house, the position of the kitchen and stairs, as well as the order of the rooms, along with their importance and usage. The data was then correlated, analysed, and discussed.

#### 4. Results

The sample of ten houses, located in the hamlet of Benteng in the Kajang Dalam area, were carefully examined. The survey results showed that the houses were generally similar in form. Eight of the houses were of similar dimensions measuring three *lura* by two *latte* with a *tala-tala* (an extension) along the back of the building (see Figure 2), while two houses were slightly larger in size measuring three *lura* by three *latte*, also with a *tala-tala* (see Figure 3). Traditional houses in South Sulawesi are not measured using the more well-known modern-day metric system but using units of measure known as *lura* and *latte* (Kajang) (the module/width of a house is measured in *lura/lurak* and the length is measured in *latte*). The majority of houses use three *lura* and two or three *latte* and no more.

Generally, all houses are designed to ensure air circulation which occurs not only through the standard openings of the house such as doors, windows, and vents but

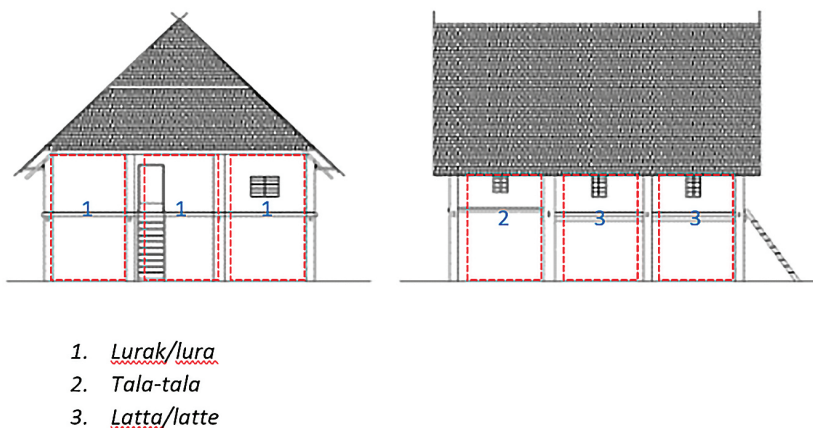


Figure 2. The house measuring three *lura* and two *latte* plus *tala-tala* (sketch: Andi Abidah, 2020).

also through the floor which is constructed with gaps between the slats. Rudimentary oil lamps are used in homes only after dark as the community follows their customary regulations which require them to maintain a simple life (see Figure 4).

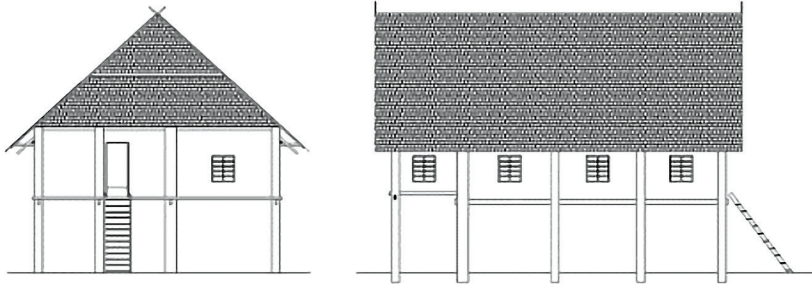


Figure 3. Three lura by three latte plus tala-tala (sketch: Andi Abidah, 2020).



Figure 4. Traditional lamp (pelita: local language). Mustamin's house (photograph: Andi Abidah 2020).

## 5. Discussion

Indonesia's geographical position is on the equator, which means that all islands in the archipelago experience high rainfall and humidity, low wind speed and intense sun, all characteristics of a tropical climate. Each customary dwelling consequently requires a design that incorporates a good amount of ventilation in order to meet the occupants' physiological needs.

The ancestral land of the Ammatoa Kajang is about a six-hour overland trip of almost 200 kilometers from the Sultan Hasanuddin International Airport in Makassar, South Sulawesi. As all the conveniences of modernization inexorably make their way into the hinterlands of Indonesia's archipelago, it is becoming increasingly rare to find indigenous communities that have chosen to maintain the way of life of their ancestors in toto. This has been achieved, however, by effectively allowing members of the Ammatoa Kajang indigenous peoples to split into two geographically and, in some aspects, culturally distinct communities, which the Ammatoa Kajang refer to in their language as *ilalang embayya* (inside the fenced area), also known as *rambang seppang* or the Kajang Dalam area, and the *ipantarang embayya* (outside the fenced area), also known as *rambang luara* or the Kajang Luar area, as reported by S. Aminah [10].

Those who live in the Kajang Luar area effectively act as a buffer between those living in the Kajang Dalam area and the rest of the world, as they are able to embrace modernity and yet maintain ties to their cultural heritage because they have chosen to only loosely follow a few of the Pasang ri Kajang customs. This can be seen in the Kajang Luar community's use of modern tools and equipment to cultivate their land, in the wearing of modern clothing, and in the interior of their houses, which are often in appearance not very different from homes in suburban areas of Indonesia. The modern houses of various shapes and sizes of the Kajang Luar, are oriented facing the road, use electricity, have modern plumbing and generally incorporate into their construction, cement on wood frames, ceramic tiled floors, zinc roofing and glass window panes with metal bars in the window openings as explained by A. Abidah, M. Yahya, and B. A. Rauf [11].

On the other hand, the Kajang Dalam community's houses are built entirely out of natural materials. This is in strict obedience to every precept of the Pasang ri Kajang, which influences all aspects of daily life including the construction and placement of every thatch-roofed, wood and bamboo home within the environment.

### **5.1. Cultural influences on indigenous dwellings**

The Ammatoa Kajang community has continued to live in a symbiotic relationship with their environment. They are prohibited from cutting wood in their sacred forest. Certain areas are allocated for the planting of trees to be used for firewood and construction, while fruit-bearing and other productive trees are planted closer to their dwellings. When any of these trees are cut down, a tree must be planted as a replacement. Moreover, each house has its own kitchen garden that supplies ingredients for the family's daily meals and is cultivated close to the house by the women. As a result, the Kajang Dalam area remains lush and green. Nature is an ancestral heritage that needs both its quality and balance to be maintained. The resolution of the Kajang Dalam community to preserve their forest and natural surroundings is evident in their firmness in applying their ancestral teachings, called *Pasang ri Kajang*, as I. H. Darmawan states [12]. This approach promotes the necessary balance, enabling this community to live in comfort and harmony with the natural environment, as explained by M. Aarfin, W. Wahidah Osman and S. Wunas [13].

The houses built within the Kajang Dalam area are in strict adherence to all the customary rules including those which deal with all aspects of the form and elements of their stilt homes, such as the size and orientation of each house, the material that may be used for construction, the shape and position of the windows, the location of the kitchen, and the staircase. Even the placement of a house in the Kajang Dalam area and its construction are considered a ritualistic rite as Sukman notes [14]. All Kajang Dalam houses, as



Nurhayati [15] observes, have small dimensions, are simple in form without any ornamentation, and are constructed using similar materials in a standard floor plan that does not reveal any signs of social hierarchy. Houses are oriented facing the sunset with their back against the venerated customary forest and their windows open to the sun, on their north and south walls. All this affects the physiological comfort of the home's inhabitants.

Traditional houses in Indonesia can be seen to have their design, and especially orientation, influenced by Hindu and Islam, as explained by P.J.M. Nas [16]. Hindu practices forbid houses from being built facing the sunset, as the sun is analogous to life. When Islam started spreading its influence – in Aceh – the Hindu-oriented houses changed to face Mecca in a West-Northwest direction. Further evidence of such influences, according to A. Abidah [17], can also be found in the old settlement of the Soppeng-bugis tribe where formerly North-South oriented houses are now oriented toward Mecca. However, after Indonesia's independence and from the 1970's on, new settlements in the Regency of Soppeng no longer followed this rule of orientation according to culture, tradition and beliefs, they followed local government regulations (each Regency has a mayor or regent). This meant that houses had to be oriented toward the road, except in the case of tribes who did not accept modernization, such as the Kajang Dalam.

As the use of modern material is forbidden, the Kajang Dalam houses are constructed of wood and bamboo. They are topped with box gable roofs that have a 45-degree pitch and covered with a thatch roof made from cogon grass (*Imperata Cylindrica* Sp.); strands of this grass are assembled and tied to bamboo sticks to form sheets of a specific size, making the houses much cooler than those in the Kajang Luar area, where zinc is used as a roofing material.

Generally, the walls and floors are constructed with a combination of wood and bamboo, while some houses do not use any bamboo at all. The staircase to the front door, which is centred at the front of the house, is open to the elements, so the wood used for constructing the stairs is of noticeably better quality to withstand weathering. At the top of the stairs everyone who enters must step over a plank that has been fitted lengthwise across the threshold called a *kappa-kappang*.

The ten objects of this study were similar in size and shape, as anthropometry is used to set the dimensions of each house, and the terms *lura* for width and *latte* for length are used as measurements. The dimensions of one *lura* / *latte* are taken using the body of the owner. A *depa* is another measure of length and is the equivalent of the span of one man's body with outstretched arms measured from fingertip to fingertip. A *hasta*, on the other hand, is measured from the elbow to the tip of the middle finger. Anthropometry is commonly used by many indigenous peoples as a way to measure different things. It can include, as P. Oliver [9] explains, the length from the fingertip of the little finger and its base, the span of a hand, the length of an arm, as well as other parts of the body including the torso, each representing a different unit of measurement.

Anthropometry also occurs in many other cultures in Asia. The measurements of Malay houses, as Z. Zain [18] states, are based on the human body to determine the height of doors, windows, fences and so on. Furthermore, Balinese house dimensions, as I. M. Bidja [19] explains, use the human body to calculate the size and scale of buildings to ensure that a balance between the environment and humans is maintained. In the Bugis house, a special method of using the torso of the human body to dictate the width and length of a home, is also used, as Andi Abidah [17] writes. All the study objects also had a *tala-tala*, which is a narrow extension along the back of the house with a slightly higher floor height. Eight of the ten houses measured three *lura* by two *latte* and had a *tala-tala*, while two houses were wider by a third, at three *lura* by three *latte* with a *tala-tala* along the rear, as shown in Figures 5,6,7 and 8.





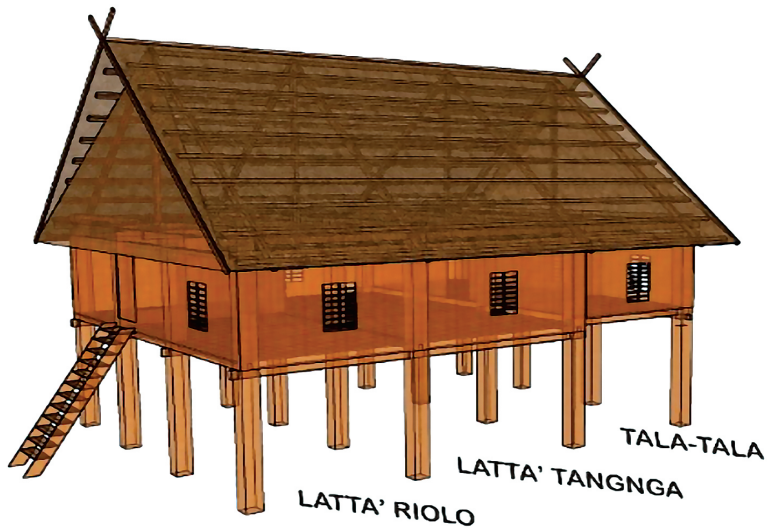


Figure 7. Latte or latta' of the house (source: Andi Abidah 2020).

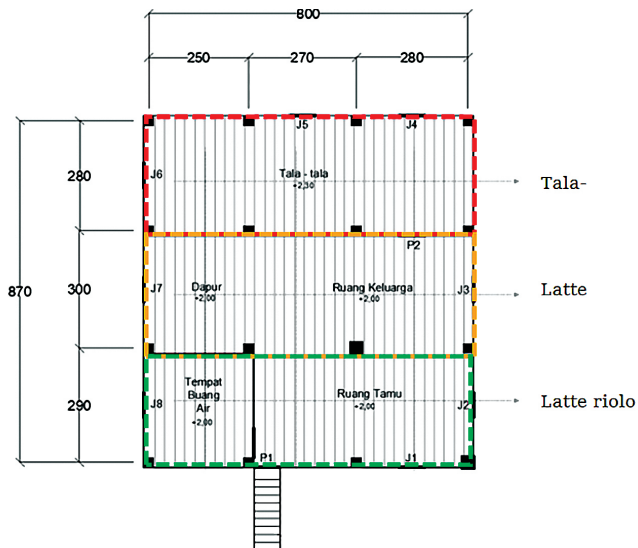


Figure 8. Latte and tala-tala in room plan (sketch: Andi Abidah 2020).

The placement of the kitchen is unusual and yet it has remained in this position, unchanged, for generations in every Kajang Dalam house. It is located at the front of the house to the left of the entrance in the third *lura / lurak* of the first *latte* so that it is always visible to guests in the sitting room to the right of the front door, as seen in the floor plans of Figures 6 and 8. This indicates the openness of the occupants about their food,

as nothing is hidden. The kitchen is like a cube in its dimensions. Cooking is done on a low wooden table on which large stones, or sometimes simple furnaces, are placed to burn firewood. Over the cooking area, close to the ceiling, is a shelf which is used to store firewood. Next to the cooking area, which also occupies the first *lura* and third *latte*, is a simple washing area where a relatively large water container is placed to supply water for cooking and cleaning. This area is also used by the occupants as a place to wash before going to sleep, as well as a convenient place to urinate at night. By comparison, the kitchen in a Bugis house, as C. Pelras [20] explains, is located in the *lontang*, or in the last part of the house (*lontang* in the Bugis language or *lura / lurak* in the Makassar Konjo language / the language of the Kajang). It is rare to have the kitchen situated within the main part of the house in Indonesia, as J. Forshee [21] verifies. This is because Indonesians in remote areas still cook using traditional methods which produce smoke.

Storage is constructed as a shelf along the interior of the north and south walls of the house that extends under the eaves like a soffit and is referred to by the Ammatoa Kajang as a *para-para*. In the kitchen, this is used for the storage of cooking equipment, buckets and plates, while the *para-para* on the opposite side is used to store floor mats, bedding and clothing. A similar storage shelf can be found in Bugis houses built before the 1970's, according to And Abidah [17], and are referred to as *tanre-tanreang* in Bugis. However, this element is slowly disappearing.

## 5.2. Indigenous techniques to maximize ventilation and light

The customary rules concerning windows allow for these to be placed along both sides of the house with each *latte* having two windows – one on the left side and the other on the right of the door (Figure 9).



Figure 9. Cross ventilation (sketch: Andi Abidah 2020).

The number three is significant in Ammatoa Kajang culture, so every house is constructed with three windows along its north and south sides respectively. Each window

of the studied houses differed slightly in size, but their rectangular shape, style and material were uniform. All windows are fitted with wooden bars, as glass is forbidden to be used. They must be kept open during the day and closed only at night with a sliding wooden panel set between upper and lower wood guide rails fitted onto the interior wall of the house. This style of window closure, depicted in (Figures 10 and 11), is unique to Ammatoa Kajang dwellings.

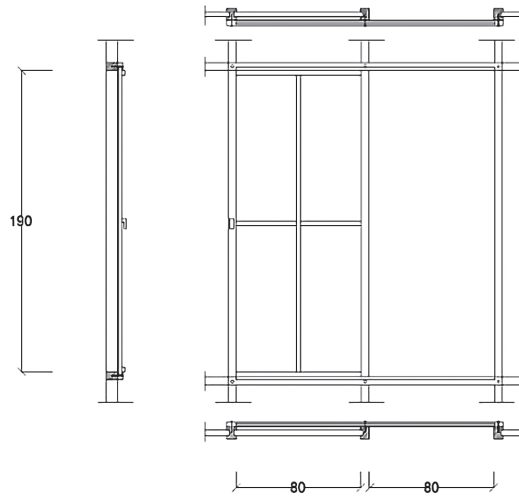


Figure 10. Sliding window model (sketch: Andi Abidah 2020).

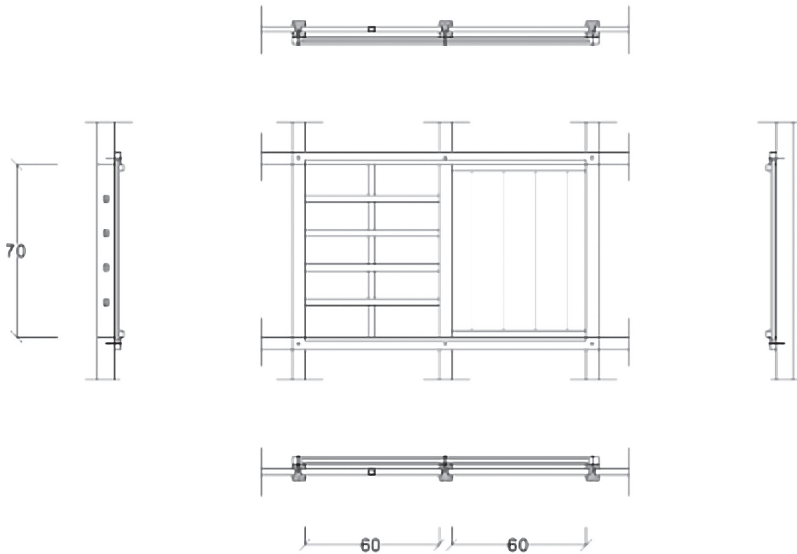


Figure 11. Sliding window model (sketch: Andi Abidah 2020).

Generally, the floor is made of wood and bamboo. Bamboo slats are used in the first and second *latte* while the *tala-tala* has a wooden floor. The flooring throughout each house has gaps of approximately one centimetre between each wooden plank and bamboo slat, to allow air circulation also at night, when the windows and door have been closed. The gaps also allow for liquid waste to pass through in the washing area beside the kitchen. This use of materials, according to S. Chuki, R. Sarkar, and R. Kurar [22], can be seen in traditional Thai houses that use bamboo, wood planks, and thatch, the difference being that bamboo is used not only in the corridor of the house but also in the construction of the roof to support the thatch.

The other factors that maintain physiological comfort are the attention to the layout of the house's mass, and the density or distance between the dwellings and any other barriers, such as vegetation, that would decrease air quality and flow. The distance between houses is between three to five meters with well-maintained foliage surrounding each house, said T. E. Swasti [23]. Furthermore, Dipl. Ing. Y.B. Mangunwijaya [24] observes that such cross ventilation promotes the flow of outdoor air into the house as a result of the difference in pressure or temperature between the interior space and the exterior environment.

### **5.3. Indigenous management of clean and black water**

One of the factors that affect physiological comfort is the presence of odours. Washing and bathing are daily activities that require a lot of water and therefore the Ammatoa Kajang have found ways to ensure that water does not stagnate and smell.

Clean water does not flow to the residents' homes. Instead, householders carry fresh water by bucket to their respective houses. The Ammatoa Dalam area has only one source of clean water, positioned at 5°19'27.7" S 120°17'56.5"E, that serves three villages (see Figure 12).



Figure 12. Source of fresh water (source: Internet 2020).

The spring water is channelled through bamboo to a location specified by the Ammatoa which is a public space where interaction between residents takes place every morning and evening. Here communities gather to bathe, wash clothing and equipment, and take clean water for drinking and cooking. In the first *latte* behind the kitchen, there is a small space for black water to drain where it falls directly to the ground on the left side of the house, then flows into a low area and seeps into the ground.

For the construction of their toilets, the Kajang Dalam community uses local wisdom and traditional methods because the use of modern materials for building are forbidden. Similar to an outhouse, their outdoor toilet, locally referred to as a *cemplung*, is placed next to each dwelling. The walls surrounding the 1.5 x 1.5 meter area are woven from sago palm fronds, and there is no roof. The toilet itself consists of a hole approximately one meter in diameter, dug 2 to 3 meters deep into the ground and covered with two sizeable flat rocks placed with a gap between them for the disposal of solid waste. There have been several Life Cycle Analysis studies conducted in recent decades concerning this particular way of dealing with black water, as F. Boano *et al* [25] explain, which actually receives good marks in terms of environmental and energy advantages when such processing systems are integrated into green structures.

## 6. Conclusion

Even though the Ammatoa Kajang indigenous community in the Kajang Dalam area strictly adhere to centuries old customary rules, it is the holistic perspective of the Pasang ri Kajang together with the directives of their customary institutions that regulate the community's interactions with the environment and each other for their physical, mental, and spiritual well-being. The Kajang Dalam residents have maintained and sustained the natural environment, which provides them with many necessary elements for their daily living. Their houses, where they admit to living comfortably, are constructed with materials that are readily available from their surroundings. They have a symbiotic relationship with nature, as what they take from the environment is given back, for example, by planting one or two trees when one has been cut down; this is also because the Kajang Dalam peoples believe that nature will be angry if they violate any of their customary rules.

## Acknowledgments

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## Notes

<sup>1</sup> Ammatoa is the local language of the head of customs or leader of the customs of Kajang Dalam; the Kajang Dalam area is the area that still preserves its tradition, culture, and religion, and has not undergone any modernisation, whereas Kajang Luar is already accepting modernization. The communities in the Kajang Luar area are gradually avoiding tradition, culture, and religion and already accepting modernization; and do not follow the rule of the Ammatoa in Kajang Dalam.

<sup>2</sup> The results of the Ammatoa Indigenous Participatory Map processing Kajang\_ UKP3 AMAN Sulsel. AMAN (Aliansi Masyarakat Adat Nusantara / Alliance of Indigenous Peoples of the Archipelago).

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### Biographical notes

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### Summary

Even today, there are communities of indigenous peoples in Indonesia that have chosen to live as their ancestors have. Their lives are strictly governed by customary rules that have been handed down for hundreds of years and set out in detail every aspect of how their dwellings are constructed; they take into consideration where and how their houses are built, and the effects of their dwellings on the physiology of the occupants, as well as the social, spiritual and cultural relations within their community, well-integrated into their system of beliefs and their environment. One of these indigenous communities that lives this way of life and has shunned all forms of modernization, is the Ammatoa Kajang, who inhabit a remote area of the South Sulawesi province. Their traditional homes, even today, are built adhering to centuries old oral precepts that incorporate many of the scientific principles that have been proven only in the last one hundred years to link house construction to its occupants' physical and mental health. This is a qualitative study using both anthropological and architectural approaches to examine the homes of the Ammatoa Kajang indigenous community.

## Riassunto

Ancora oggi in Indonesia ci sono comunità indigene che hanno scelto di vivere come hanno fatto i loro antenati. La loro vita è rigorosamente disciplinata da regole consuetudinarie che si tramandano da centinaia di anni. Tali regole descrivono in dettaglio ogni aspetto relativo alla costruzione delle loro abitazioni; prendono in considerazione dove e come sono costruite le loro case e gli effetti delle loro dimore sulla fisiologia degli occupanti, sulle relazioni sociali, spirituali e culturali all'interno della loro comunità, ben integrate nel loro sistema di credenze e nel loro ambiente. Una delle comunità indigene, che vive in questo modo e ha evitato ogni forma di modernizzazione, è l'Ammatoa Kajang insediata in un'area remota della provincia del Sulawesi meridionale. Le loro case tradizionali, ancora oggi, sono costruite aderendo a precetti orali secolari che incorporano molti dei principi scientifici che solo negli ultimi cento anni hanno dimostrato di collegare la costruzione di case alla salute fisica e mentale dei propri occupanti. Lo studio di tipo qualitativo, oggetto del presente lavoro, utilizza approcci antropologici e architettonici per esaminare le case della comunità indigena Ammatoa Kajang.