



## THE TRANSFORMATION OF RUMOH ACEH PHILOSOPHY IN EDUCATIONAL FACILITIES OF BALAI PENGAJIAN QURAN IN ACEH BESAR

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### ABSTRACT

The phenomena of the Acehese traditional houses philosophy functioned as dwelling houses have shifted into simple educational building design concepts, particularly for the people who live in suburban. The concept is able to be implemented by modern society in Aceh in order to design government buildings, banking offices, and other public buildings. This study aims to identify and analyze how the philosophies of the Acehese traditional dwelling are transformed into a modest educational facility. The focus area of study is educational facilities owned by the local community located in the suburbs. Is the level of comfort suitable for its function? The study used three stages of research methodology: (1) observation which was carried out by using a typomorphological approach; (2) analysis of elements of Acehese traditional house construction; and (3) simulation of the factors that determine the comfort of the building. The results of this study indicate the possibility of adapting the traditional Acehese house design concept into an educational facility. The front porch (Seuramoe Keue) of the space division in Rumoh Aceh can be transformed as Balai Pengajian Quran using wood as primary materials for construction and building.

### KEYWORDS:

Acehese traditional houses; Transformation; Philosophy of traditional houses; Education facility

### INTRODUCTION

A residential building is one of the most well-known functions of traditional buildings because it has values and a close physical relationship with the traditions and culture of the local community. Traditional houses are well-known as vernacular buildings where the construction process is based on local ethnic and cultural characteristics.

Rumoh Aceh, the Acehese traditional house, has a simple construction where the construction techniques are passed down from generation to generation and use natural materials such as wood, river stone, and sago palm leaf midrib. Rumoh Aceh is also proven to have local wisdom (genius loci) in terms of sustainability [1] and health [2] which can still be studied and utilized today.



Figure 1. Front Elevation of Rumoh Aceh

In addition, geographical location (coastal area or highlands) and climate greatly affect the shape of traditional building components and materials [3]. However, along with the times, traditional buildings in Aceh experienced a change in function from residential houses to simple educational facilities for rural communities.

Technological advances greatly affect the development of building materials that influence the quality of the building workforce, especially in the construction of wooden buildings. In the past, cement was a rare material, so people preferred to use wood as a building material. On the other hand, in modern times, wood materials with good quality that have good strength and durability are rare and difficult to obtain, while cement is an affordable building material and has a strong quality for constructing buildings. Therefore, changes in the context affect the formation of development and perception and produce new actions.

This study aims to identify and analyze the philosophies of Rumoh Aceh in designing an educational facility for Balai Pengajian Quran in Aceh Besar District. The object of study is an educational facility whose concept and construction adopted the Rumoh Aceh philosophy. The focus of the study carried

out is community-owned educational facilities located in several villages in Aceh Besar District. This is closely related to shapes, forms, functions, construction systems, and building materials.

### Transformation In Architecture

In simple terms, transformation is a process of changing from one form to a new form through a process of change that is adapted to a certain context [4]. As a process that is carried out in stages, the transformation of Rumoh Aceh into the study center facility includes changing the shape and configuration of the space, function, building method, and the use of materials while maintaining the existing philosophical values.

According to Antoniadis[5], there are three (3) methods for conducting the creative process of transforming an object including:

- a) Traditional Way.  
This method emphasizes changes in form that are carried out gradually through the adjustment to external, internal, and existing a esthetic elements.
- b) Acquiring Method  
This method is conducted by borrowing elements or components from surrounding objects which are then studied and interpreted.
- c) Decomposition/Deconstructive Method  
This method is done by taking the whole part to get a new way of combining its constituent elements, which then develops new possibilities to find a new order in a different composition.

### The Philosophy Value Of Aceh Traditional House

The construction of the Acehnese traditional houses has a basic rectangular shape that has an orientation towards the West according to the Qibla direction when praying. Furthermore, Rumoh Aceh has an orientation towards the north-south to avoid high wind pressure, so the shorter side of the building faces East-West [6]. The philosophy of Rumoh Aceh construction is analyzed in the form of a rhyme presented by a Rumoh Aceh handyman (Utoeh) who is experienced and understands the value of the Rumoh Aceh philosophy "na saboeh cieceum di poe u Barat, sayep jieh dua, gaki jieh namlah" which comes from the Acehnese language[7]. The translation is "there is a bird that flies towards the West, has a pair of wings and sixteen legs". The rhyme explains the arrangement of spaces in Rumoh Aceh on the right and left with the same composition of space as a bird's wing. Then the orientation of the house (front of the house) always faces West and has at least sixteen columns or pilotis (legs of the building).

The Acehnese traditional house's structure is mainly comprised of posts and frames, which are joined by using pegs and wedges without using nails [8]. Rumoh Aceh uses a stilts construction that has a pit at the bottom (Figure 1). The spatial plan (plan) for the Rumoh Aceh building consists of 3 ruweung

(spaces), which are bounded by round columns extending East-West (Figure 2).

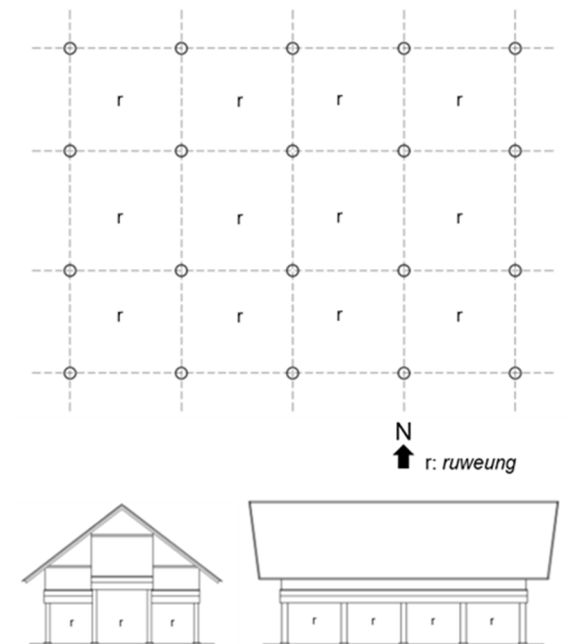


Figure 2. The divisions of space (ruweung) in Rumoh Aceh

The number of ruweung (the part between columns) in ancient times could indicate the ownership status of Rumoh Aceh. The three-ruweung house has 12 columns with the ownership status of ordinary people. The four and five ruweung houses have 15-18 columns with a rich community ownership status. The six ruweung houses have 21 columns with the ownership status of the ulee balang community. The seven ruweung houses have 24 columns with the ownership status of the royal community [3]

The truss construction of Rumoh Aceh tectonically forms the lower part of the house (kolong) as the foot of the building, the middle part of the building as the body of the building, and the upper part as the head of the building (Figure 3). Kolong not only has a philosophical value as a gathering area (social space) but also serves to protect humans from wild animals and floods in the past.

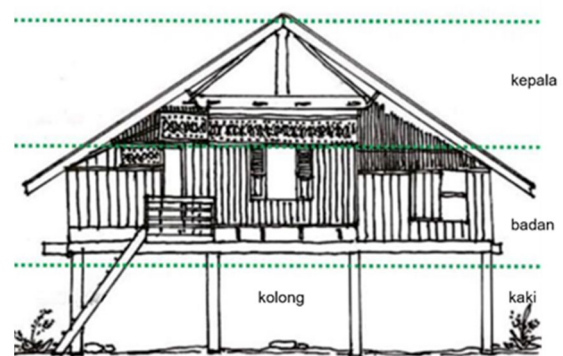


Figure 3. Construction tectonic of Rumoh Aceh

For some people, the existence of the pit is also used as a cage for livestock such as chickens, ducks, goats, and cows. Then, the body part of the house functions as a place for humans to live and carry out daily activities. Furthermore, the head of the building functions as a roof or protection from heat and rain and unites the elements of residential building construction. The Rumoh Aceh type (Figure 4) consists of two types, namely:

1. Rambat type, the Rumoh Aceh which, has a different floor height, up and down;

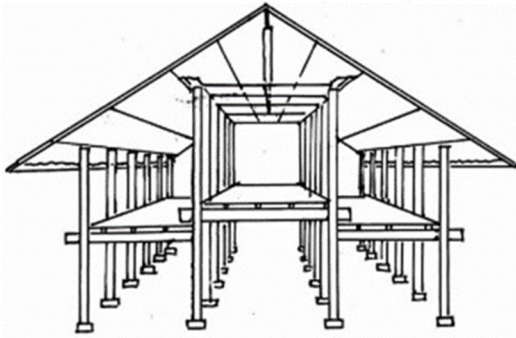


Figure 4. Rambat type of Rumoh Aceh

2. Santeut type, the Rumoh Aceh which has no different floor height;

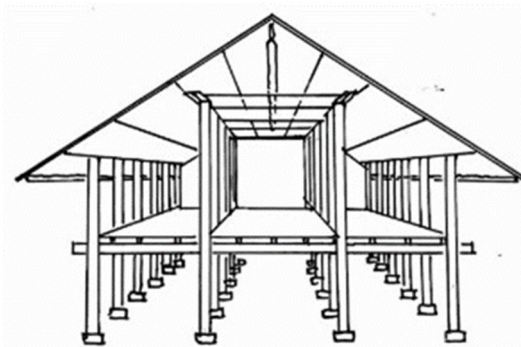


Figure 5. Santeut type of Rumoh Aceh

The philosophy of space division in Rumoh Aceh is based on daily activities that are adapted to the activities of women at home [7]. Therefore, the space is divided into three areas (Figure 6):

1. Front porch (Seuramoe Keu), a space located at the front which functions as a semi-public area for receiving guests, discussing, and reading rooms for men;
2. Living room (Tunggal), a space located in the middle of the house which, is intended for parents and girls. The space called Rumoh Inong (women's house) is the main bedroom for the wife or empress, while the other space is called Rumoh Anjong for girls. Men other than mahrams are not allowed to enter this space;
3. The back porch (Seuramoe Likot), the space at the back of the house, is specifically for women to carry out daily activities such as cooking and educating children.

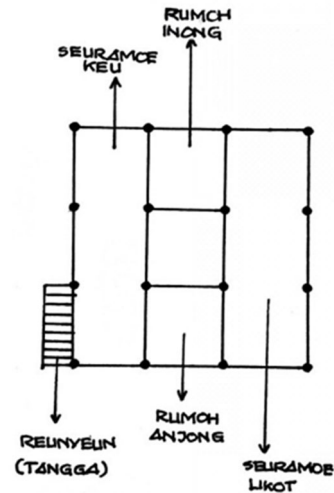


Figure 6. Space divisions in Rumoh Aceh

The living room is wide and elongated without furniture. The guests and hosts sit on the floor on a woven pandanus mat according to the proverb, stand the same height, sit the same low, the same weight to be carried, the same light to be carried. The living room is a bedroom for parents and daughters. Boys, according to local Acehese wisdom, sleep in the Meunasah (small mosque) at night; if sick, they sleep on the front porch on the West or East side facing the living room.

The philosophical value here is that the Acehese people give confidence to boys to be independent and become protectors of women. Furthermore, the kitchen is located at the back with the lowest position of all the spaces, and its size is smaller than the size of Seuramoe Likot.

The name of the column in Rumoh Aceh still uses the traditional Acehese language, which has values and philosophies. It is shown in table 1[9]. Meanwhile, the name of Rumoh Aceh elements other than the column still uses the Acehese language (Table 2).

The structural system in Rumoh Aceh is in accordance with the shape and configuration of traditional houses which have three types of systems, namely the lower, middle, and upper systems, then arranged and assembled to produce a structurally correct connection and construction system and have a high aesthetic value[10]. Rumoh Aceh is constructed on stilts using a simple wooden beam and column construction system.

The shape of Rumoh Aceh extends from East to West, where the wide side faces North and South. The arrangement is intended so that the intensity of light and ventilation in the building becomes comfortable. The foundation used is a pedestal made of river stone. The column (Tameh) is a type of log (merbau wood/jackfruit tree), then the poles are connected by beams in a longitudinal direction (Rhok) and a cross direction (Thoi). Floor beams (Lhue) are put along from the East-West side on which a floor (Aleu) is laid. Aleu is made of small planks of jeumpa tree or nibung tree.

Table 1. The Philosophy of the column of Rumoh Aceh

No	Rumoh Aceh Elements	Function	Philosophy	Meaning
1	Tameh	Column / pilotis that functions as a support for the body of the house.	“Kreuh beu beutoi kreuh, beulagee kreuh kayee jeut keu tamèh rumoh; Leumoh beu beutoi leumoh, beulagee taloe seunikat bubông rumoh” meaning: If it is hard, it must be as hard as the wooden columns of the house; if it is flexible, it must be as flexible as the rope for the roof of the house.	Firm stance but have a soft heart is the philosophy of Acehnese.
2	Tameh raja	As the main column on the right side of the entrance	“Kong titi saweueb seuneumat; kong adat ade raja” meaning: The bridge is strong because there is a place to hold it; hold the custom because of the king's justice.	Called the king's column because its size is larger than the other columns.
3	Tameh putroe	As the main column on the left side of the entrance	“Kong titi saweueb seuneumat; kong adat ade raja” meaning: The bridge is strong because there is a place to hold it; hold the custom because of the king's justice.	It is a pair of the king's column because its position is next to the king's column

Table 2. Rumoh Aceh elements and its functions

No	Rumoh Aceh elements	Meaning	Function
1	Gaki Tameh	Baseboard	Supporting wooden column from sinking into the ground and made of river stone.
2	Rhok	Locking beam (regular).	Strengthen the relationship between the corners / ends of the beam.
3	Thoi	The locking beam is perpendicular to the rhok.	Helps strengthen the rhok.
4	Peulangan	The place where the wall rests on the inside of the house (interior).	Withstand the load of the inner walls of the house.
5	Kindang	Place where the wall rests on the outside of the house (exterior).	Withstand the load of the inner walls of the house.
6	Aleue	Floor in the interior of the house.	As the floor of the house is made of small-bladed planks arranged tightly.
7	Rante Aleue	Floor fastener	Rattan or rope is used as a floor binder.
8	Lhue	Support beam frame.	Supports floor.
9	Neudhuek Lhue	The focus of Lhue	The focus of Lhue
10	Binteh	Wall	Become a wall and a building divider.
11	Binteh Cato	Chess wall	Insulation in the form of a braid on the wall.
12	Boh Pisang	Small board	Become a partition above the kindang.
13	Tingkap	Window	The main windows are on the right and left sides of the house which are made in small sizes.
14	Pinto	Door	As an entrance and exit access of Rumoh Aceh.
15	Rungka	Roof truss	The roof structure of Rumoh Aceh.
16	Tuleueng Rhueng	Wuwung beam	As a place to rest the rafters on the upper end is made of light wood to reduce the load on the roof.
17	Gaseue Gantong	Trestle	The part of the roof structure that supports the roof load.
18	Puteng Tameh	The end of the chiseled pole.	Functions as a beam connector.
19	Taloe pawai	Roof straps	Tie the tip of Bui Teungeut.
20	Bui Teungeut	Neudhuek Gaseue retaining lumber.	Neudhuek Gaseue retainer.
21	Tulak angen	A cavity through which wind (air circulation) can pass.	Ventilation on the side of the top of house in the shape of a triangle

The roof construction uses the midrib of sago palm leaves or palm leaves that have been dried, then twisted tightly and arranged in layers as a roof covering material. The rafters and battens use wood from mangrove trees tied with fibers or rattan ropes. The connection system in the Rumoh Aceh construction is a continuous connection, namely pens and holes reinforced with the use of pegs, palm fiber ropes, and red and white cloth (a cultural symbol).

Rumoh Aceh uses ornaments that have one of three functions as a technical and constructive function. This function makes Rumoh Aceh thermally comfortable. The philosophy used in this ornament is

the existence of moral values, especially customs that show Islamic cultural identity in the Acehnese people [11].

#### Factors Influencing Thermal Comfort In Aceh Traditional House

Rumoh Aceh is equipped with natural ventilation system on the wall [12]. The form of the house has two long sides directed to North and South, and the other two shorter sides directed to West and East. A Gable screen on the house's long side acts as natural ventilation, allowing airflow to decrease hot air coming from the roof space (Figure 7). The gable screen

installed slightly outward was hollowed and carved, letting the wind enter the house [13]. The shape of the house is symmetrical and divided at the center of the shorter side, causing the airflow to spread equally throughout the house. Therefore, the shape and form of Acehese traditional provide thermal comfort inside.

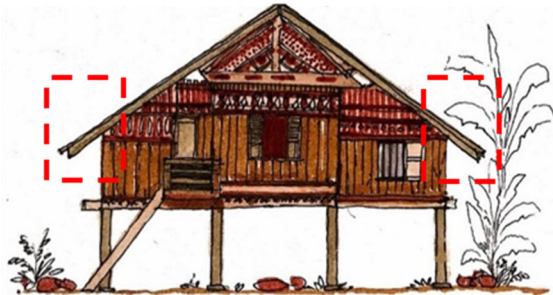


Figure 7. Natural ventilation is made by wooden-hollow ornament

The primary materials of Rumoh Aceh are wood for main structures and walls and thatch leaves covering the roof. Both materials have a small U-value building materials and lower time lag [14]. Therefore, the materials generate better building thermal conditions. This study conducts airflow simulation to assess thermal comfort inside *Balai Pengajian* as it uses both materials.

#### Balai Pengajian (Al Quran Reciting Place) As A Means Of Traditional Education For The Acehese People

*Balai pengajian*, Al Quran reciting place, is a place where Islamic religious studies are conducted and the practice of reciting Iqra and the Qur'an. *Dayah* and *Balai Pengajian* are the oldest Islamic educational institutions in Aceh that have long been involved in building human resources (HR) [15]. In shaping the character and mindset of the people to bring humans closer to Islam, educational institutions such as the *dayah* and *balai pengajian* play a major role in Acehese people's lives, especially in the *gampong* (village).

The function of *balai pengajian* is a place and a means to educate and develop people to become human beings who believe and fear Allah SWT and are virtuous in living their daily lives. *Taman Pembelajaran Al-Quran (TPA)* or *Balee Beut* in Acehese terms is a recitation institution for children to study outside their formal school hours using the mosque and *meunasah* systems and facilities as in classical times [16]. Meanwhile, the recitation center acts as a community development facility to improve human resources, the basis for nurturing and honing the intelligence of the Islamic generation, especially children and adolescents who will become successors in the future.

#### METHOD

The research method consists of three stages, namely observation using a typo-morphological approach, analyzing elements of Rumoh Aceh

construction, and simulating the factors that determine the comfort of the building. The object of the research is simple educational facilities that apply the Rumoh Aceh concept located in eight *gampong* located in Aceh Besar and Banda Aceh, Aceh Province, which are experiencing rapid development which have increased the construction of *balai pengajian* in village community (Figure 8).



Figure 8. The Simple Educational Facilities for Village Communities as Research Objects (a) *balai pengajian* Gampong Bakoy (b) *balai pengajian* Gampong Lamrabo (c) *balai pengajian* Gampong Lamseupeung (d) *balai pengajian* Gampong Siem (e) *balai pengajian* Gampong Lampuuk (f) *balai pengajian* Gampong Miruek Taman (g) *balai pengajian* Gampong Lamceu (h) *balai pengajian* Gampong Baitussalam

#### RESULT AND DISCUSSION

The study was conducted in three stages, starting with the observation of the shift in the function of traditional buildings known as dwellings or houses into simple educational facilities in rural communities. Rumoh Aceh has an adaptive concept of construction and function in accordance with cultural developments [17]. This shows that the philosophy of the Acehese traditional house design concept is flexible because some of the functions and forms of space can be used as the basic typology of a new building.

Next, the second stage is to analyze the suitability and the differences between Rumoh Aceh structural system and *balai pengajian*. Finally, the third stage is an analysis of user comfort in the *balai pengajian* due to the shift in function, the differences in the structural system, and its materials in the object of research.

**Observation**

The approach taken during observations in this study is typo-morphological, observing specific and concrete things from the elements and philosophies of Acehnesse traditional houses in the object of research. Observations were made on the function, construction system, and building materials on the object of research. Based on the function of Rumoh Aceh philosophy, the nature of space is divided into two functions, semi-public and private as shown in Table 3.

**Table 3. Space function of Rumoh Aceh**

No	Rumoh Aceh Elements	Meaning	Function
1	Front porch (Seuramoe Keue)	- Receive guests, - Discuss, - Reading room for men.	Semi-public
2	Living room (Tunggai)	- (Rumoh Anjong) - Master bedroom (Rumoh Inong), - Girls' bedroom (Rumoh Anjong)	Private
3	Back porch (Seuramoe Likot)	- A special room for women, - Cooking, Educating	Private

**Analysis Of Rumoh Aceh Construction**

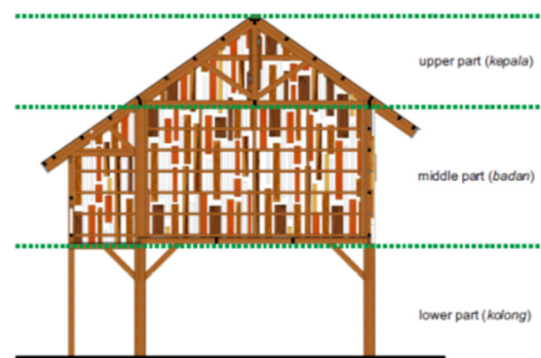
In this study, the construction system for the object of research has the same construction system as Rumoh Aceh, except that the space and material construction differ according to the conditions and needs of the user's space. In addition, the use of different types of materials, both the type of wood and its size, is adjusted to the dimensions of the building and the natural resources available in the construction environment (Table 4).

**Table 4. Analysis of the Construction System at Rumoh Aceh**

Construction System	Space Construction	Material
Lower System	Kolong (open)	merbau wood/ nangka tree
Middle System	Living Space	Small planks from the jeumpa tree or nibung tree
Upper System	Roof	Leaf midrib of sago palm or palm leaves
Connection System	Reinforced pins and holes with the use of dowels	Ijuk rope and red and white cloth (a symbol of culture)

**Table 5. Analysis of the Construction System at Balai Pengajian**

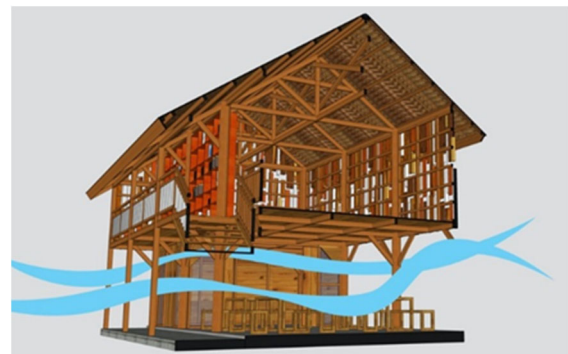
Construction System	Space Construction	Material
Lower System	Kolong (open and close)	Locally available wood and boards
Sistem Tengah	Educational facilities/ places of worship	small planks of trees available locally
Middle System	Roof	Leaf midrib of sago palm or zinc
Connection System	Pens and holes reinforced with bolts and nuts or nails	Bolts and Nuts, Nails



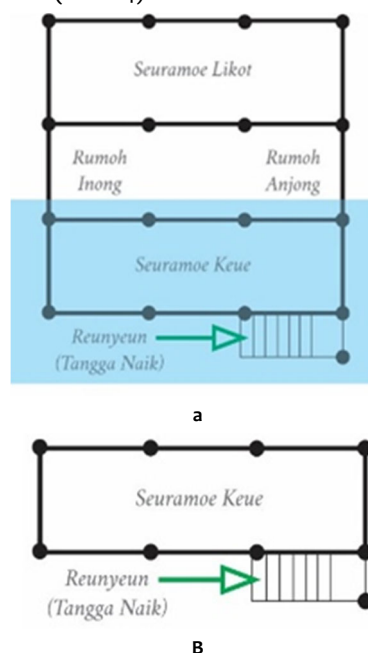
**Figure 10. Construction tectonic of Balai Pengajian**

**Comfort Factor Simulation**

On the comfort factor, thermal comfort is reviewed through the movement of wind or cold and hot air in balai pengajian. The stilt construction ensures proper air movement occurs due to pressure differences. In addition, the design of balai pengajian that does not use massive walls: the use of wooden lattices as walls, provides an opportunity for air movement to enter to support thermal comfort.



**Figure 11. Wind Movement at the lower part of the balai pengajian**



**Figure 9. Spatial Planning Typology (a) Rumoh Aceh (b) Balai Pengajian**



Figure 12. Wind Movement at the upper part of the balai pengajian

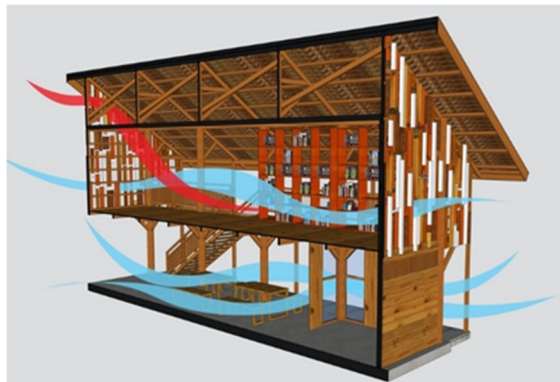


Figure 13. Movement of cold (blue) and hot (red) wind in balai pengajian



Figure 14 Analysis of the Shadow in March at 12.00, 15.00, 17.00 WIB at balai pengajian



Figure 15. Analysis of the Shadow in June at 12.00, 15.00, 17.00 WIB at balai pengajian



Figure 16. Analysis of the Shadow in September at 12.00, 15.00, 17.00 WIB at balai pengajian



Figure 17. Analysis of the Shadow in December at 12.00, 15.00, 17.00 WIB at balai pengajian

Another convenience factor is the formation of shadows throughout the year so that it supports educational activities. One of which is reciting the Al Quran. The simulation is done through 3D modeling in

SketchUp by providing a shadow of the sun. Shadowing is simulated in March, June, September, and December at 12.00, 15.00, and 17.00 WIB according to the coordinates of the location of balai pengajian.

This particular time is the time used by the Acehese, especially children, to recite the Al Quran. Based on the results of the simulation, it was obtained data that throughout the year a shadow forms over the study room on the top floor. This shade ensures that thermal comfort is achieved in balai pengajian.

## CONCLUSION

The results of this study show that the philosophy of Rumoh Aceh, the Acehese traditional house is flexible so that it can be adapted to the shift in function. It was originally a residential house turned into a simple educational facility with changes such as building dimensions without changing the typology of the basic form, namely rectangles, openings, and placement of circulation paths, as well as the use of construction materials. Therefore, a shift in function is still possible in a larger scope and scale, such as office buildings (banks, schools, and shopping centers) within the scope of urban space.

The process of transforming the philosophical values of Acehese traditional house that occurs in educational facilities was conducted in a simple manner by emphasizing changes in form. The change was carried out gradually through the adjustment to various existing factors.

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