

The Beauty of Toba Architecture Living in harmony with the surrounding natural environment

M. Maria Sudarwani^{1*}, Galuh Widati¹, Situmorang L.Bintang², Faran Sere²

¹lecturer of Architecture Study Program, Universitas Kristen Indonesia

²student of Architecture Study Program, Universitas Kristen Indonesia

Corresponding Author: margareta.sudarwani@uki.ac.id

Abstract

Keywords:

Sigumpar Area;
Toba Architecture;
Toba Samosir.

Toba architecture is one of the most interesting architectural concepts. Toba's architectural house has a charming shape and ornaments equipped with beautiful natural landscapes. Nature has a fairly important meaning for the people of Toba Samosir, where the relationship and orientation between mountains and lakes become the basis of the layout of their home design. One area with a Toba architecture style is located on the shores of Lake Toba, Sigumpar Sub-district, Toba Samosir Regency, North Sumatra. Environmental arrangements with local wisdom that is strong enough in harmony with the surrounding natural environment, namely mountains and lakes. *Jabu* houses and *Sopo* still relatively survive with the style of Toba architecture and have not been affected by modern architecture. Today Toba Architecture is threatened with extinction due to several things, which are also often the cause of the destruction of hundreds of traditional houses throughout the country. The uniqueness of the Sigumpar Area mentioned above is very interesting to study and research. The purpose of the research is to know the characteristics of Toba architecture in the Sigumpar area so that it can be a reference in determining which Toba architectural characteristics need to be maintained in the preservation framework. The writing method used is a descriptive method based on empirical facts in the field. In this study, the research area is divided into four observation units/Huta, and the layout of each observation is varied. The results of this study are expected to provide knowledge about the architectural characteristics of Toba architecture in the Sigumpar area and provide concepts related to building preservation and application in designing buildings.

1. Introduction

Indonesia is known as an archipelago that has about 1,340 tribes. Each tribe has a different architectural style which depends on the geographical location, climate, and how pattern of life of the people. The style of architecture in each tribe continues to undergo an evolution from the beginning of the traditional house to the modern house. Not infrequently in an area only a few traditional houses still remain because of the influence of foreign cultures or the development of the times so that slowly the traditional house is getting smaller enthusiasts. The architectural element becomes one of the important things in developing traditional homes. Home or residence is needed for humans, who initially depart from shelter to become a place to live and then develop into a place for families. It to socialize with each other and until now continue to experience development with new types of activities in the house such as places of exercise, work, and various other supporting facility needs. But if we look back at the traditional house used for various interests that are sacred, usually the activities carried out there are related to the customs of the tribe. Every house built has a concept and contains the philosophy and meaning of each carving, shape, space division, and ornaments.

For example is the Toba architecture house which is located in the Sigumpar Area of Toba Samosir, North Sumatra. Toba Samosir is a regency in the province of North Sumatra, Indonesia, which was formed in 1998 due to the division of the North Tapanuli Regency. Basically, the community only relies on farming and minimal educational facilities. Over time, significant progress has been made in each of its administrative areas. Considerable progress can be seen in the infrastructure sector, such as the construction of Silangit Airport, and the tourism sector, such as Lake Toba. Silangit Airport's building allows tourism areas in Toba Samosir to be easily accessed.

The settlement in the Sigumpar area consists of four *huta*, and the layout of each *huta* follows a two-lined pattern. The orientation of the building is quite strong in harmony with the surrounding natural environment, namely mountains and lakes. *Jabu* houses and *sopo* still relatively survive with the style of Toba architecture and have not been affected by modern architecture. The three of the four *huta* in Sigumpar have the privilege of still applying the house of architecture Toba, and there is independence in the three *huta* in determining the orientation of the architectural building. The roof of the Toba house is erected with the orientation of the axis towards the mountains and lakes with the front of *Bukulan* facing directly to the mountain and open space (Hanan, 2011)). The shape of this building looks sturdy and is in harmony with the surrounding natural environment. Because it is located around a lake and many mountains, the design looks strong, making this Toba traditional house seem sturdy. According to traditional elders, the mountain for the Toba Samosir people is a symbol of the power of nature. It is respected as the orientation of the Toba house. In certain clans, the height of the front that faces directly to the mountain is made higher than the back of the lake that is oriented. While the lake is believed to have negative power, so the lake is positioned as the orientation of the back of the house.

Today Toba Architecture is threatened with extinction due to several things, including lack of maintenance, termite attacks, and other insect disturbances, as well as damage from fires, lightning attacks, and hurricanes. It is also often the cause of the destruction of hundreds of traditional houses throughout the country. The discussion was conducted to examine the elements in the Toba Architecture in the Sigumpar area, Toba Samosir Regency, which has uniqueness and privileges, as well as the influence of socio-

The Beauty of Toba Architecture Living in harmony with the surrounding natural environment

M. Maria Sudarwani, Galuh Widati, Situmorang L.Bintang, Faran Sere

cultural life on the shape and ornament of the building. The purpose of the research is to know the characteristics of Toba architecture in the Sigumpar area so that it can be a reference in determining which Toba architectural characteristics need to be maintained in the preservation framework.

2. Research Methods

The writing method used in the Study of Toba Architecture in the Sigumpar Area, Toba Samosir, is a descriptive method based on empirical facts in the field. This rationalistic research overview is based on a theoretical framework compiled from a summary of existing research findings, key theories, ideas, and experts. It is built by observing existing phenomena and filling in gaps that need to be studied later. The location of this study is in Sigumpar Sub-district, Toba Samosir, North Sumatra, Indonesia. Sigumpar Area is situated in Sigumpar Sub-district and divided into four observation *huta*. This area consists of three parts: forest area, residential areas, and rice fields.

3. Discussion

Sigumpar area is one of the villages inhabited by Toba Samosir people. This area is near Banua Hulu Village, Sigumpar Sub district, Toba Samosir Regency. This *huta* is in a hilly valley with an altitude of 900m - 1,500 m above sea level. Sigumpar sub-district has 25.20 km² area or 1.25% of the total area of Toba Regency. Sigumpar area is between the hills, so the condition of the land is relatively contoured. This situation resulted from the area being divided into four *Huta* with different levels of land elevation. Although it is at a different level, the architectural shape of the residence for each region remains the same. It is seen from the floor plan of the house in the form of a rectangle and stage type. Toba House in the Sigumpar area has also used manufacturing materials in the form of roofs made of zinc applied to all buildings in the Sigumpar area.

The Settlement Layout

The settlement layout of the Toba villages follows a pattern of two facing each other, axis to the north and south, and forms a village called *lumban* or *huta*. The village has two gates (*bahal*) on the north and south sides. In this study, the research area is divided in 4 observation units which are divided based on the characteristics difference of each *huta*. The interesting thing about the fourth observation *huta* in Sigumpar is the difference in the direction of the site's orientation between *jabu/ruma* and *sopo* houses. In Observation *huta* 1, seven unit houses are facing the north side which four houses are still in Toba Architecture (*Jabu*) while three other houses are modern, and also there is one *sopo* facing the south side of the site (See Figure 1).



Figure 1. Map of Sigumpar Area
(Source: Wikipedia, 2022; Google Maps, 2022)

In Observation *Huta 2*, there are six units of houses facing the north side. Which two houses are still in Toba Architecture (*Jabu*), and the other four houses are modern. Two units of *sopo* in this area and two others changed into modern houses. The modern ones are seen by the roof's shape and color and face the site's south side. In Observation *Huta 3*. Five units of houses facing the north side consist of four *Jabu* house and one *eper* house. See Figure 2. In this area, some parts of the house also experienced changes in function, such as under the house that was originally used as a place for animal livestock now switched functions into a place for a workshop or just for resting. 3 units of *sopo* are still traditional in this area, and all three face the north side with the main material of bamboo blades. On the roof of the *sopo* there are carvings of *gorga* motifs such as those found on the walls of the house with roof coverings that are also made of zinc. . In Observation *Huta 4*, there are five units of *Jabu* houses facing the south side and they are still in Toba architecture. See Figure 3. On the walls of the house, there are carvings of *gorga* motifs and *adep-adep*. This is the best area because in addition to the original houses in this area are also neatly arranged so that the pattern of the village is arranged. Homeownership in Sigumpar was passed down through generations through the last boy. The location of the houses in Sigumpar spread according to the available land. The orientation of the house is lined up and facing each other.



Figure. 2. The area situation of Observation Huta 3
(Source: Personal Documentation, 2021)

The Beauty of Toba Architecture Living in harmony with the surrounding natural environment

M. Maria Sudarwani, Galuh Widati, Situmorang L.Bintang, Faran Sere



Figure 3. The area situation of Observation Huta 4
(Source: Personal Documentation, 2021)

In all observations *huta*, Toba houses are in the form of stilt houses and have the same architectural style even though the facades are different. In one Toba village, there is always a *Sopo* (rice barn) in front of each Toba *Ruma*. The open space between the *ruma* and *sopo* is used for many purposes, especially for ritual ceremonies and for the working area. The layout of the *ruma* is lined up with the other *ruma* while on the front side facing each other, there is a row of *sopo* (rice barn) of the *ruma*.

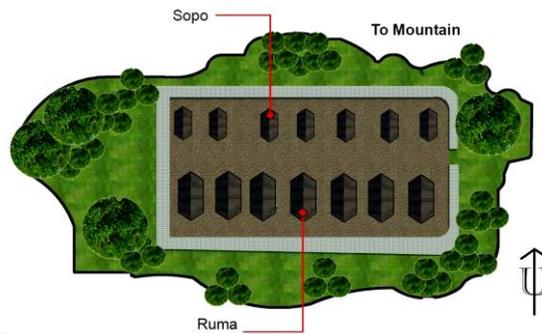


Figure 4. The Settlement Orientation of Observation *Huta* 1 and 2
(Source: Personal Documentation, 2021)

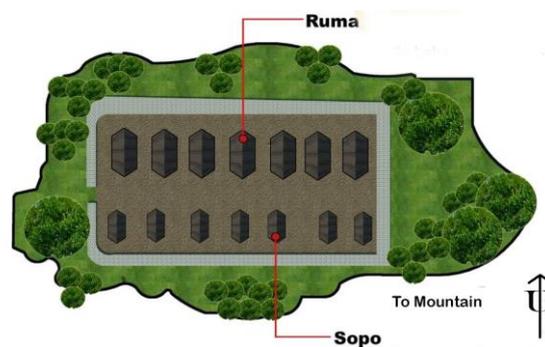


Figure 5. The Settlement Orientation of Observation *Huta* 3 and 4
(Source: Personal Documentation, 2021)

The orientation of the building is quite strong in harmony with the surrounding natural environment, namely mountains or hills. The roof of the Toba house is erected with the orientation of the axis towards the mountains, with the front of *Bukulan* facing directly to the mountain and open space. There is a different orientation between Huta 1-2 and Huta 3-4 (See Figures 4 and 5). It shows that the independence of the *huta* really exists in determining the direction of orientation of the architectural building (Simanjuntak, 2020). See Table 1.

Table 1. The Settlement Orientation of Observation *Huta*

Description	1 st huta	2 nd huta	3 rd huta	4 th huta
The Orientation of Jabu	North	North	South	South
The Orientation of Sopo	South	South	North	North

The Floor Plan and Facade

Jabu House, or *Bolon* House, has a rectangular building shape that is the type of stilt house. The floor height reaches 1.75 m above the ground, and the bottom is used as an animal cage. As for the various rooms as follows: a) *Jabu bona*: This section is occupied by the host family; b) *Jabu Soding*: This section is for the family of the host's daughter; c) *Jabu suhat*: This section is used for the oldest married boy; and d) *Jabu Tampar Piring*: Reserved for guests and phobias related to drinking and other food needs (Nurmala, 2012). See Figure 6. In addition there are two more partition spaces, *Jabu tonga-tonga ni jabu bona* is the area between *jabu bona* and *jabu tampar piring* and *Jabu tonga-tonga ni jabu soding* is between *jabu soding* and *jabu suhat*. Basically, the Toba house has three important parts, known as the three cosmos chambers (*banua na tolu*) with their respective functions and philosophies. The three main parts are a) *Banua Ginjang*, is a world where the gods live consisting of seven levels of the sky, with the highest level as the place of *Ompu Mulajadi Na Bolon*; b) *Banua Tonga*, which is the middle part that is likened to the earth where humans move. This part of the house is in the form of a large room without a sealing wall; and c) *Banua Toru*, is the bottom of the place of King *Padoha / Begu*, namely the world of subtle beings. See Figure 7. In the traditional *batak toba* house this section is likened to a cage that serves as a cattle pen.

The typology of traditional buildings in the Sigumpar area is based on the shape of the Toba house, including: *Ruma* (Dwelling House) and *Sopo* (Rice Barn) typology. *Ruma* and *Sopo* are separated by a large courtyard that functions as a common space for the *Huta* residents. *Ruma* is usually occupied at night until the morning, while *sopo* is usually for activities from afternoon to evening. *Sopo* (Rice Barn) is used as a storage area or barn that contains rice that has been harvested. Another typology of dwellings is *Ruma Eper* (of wood). See Figure 8.

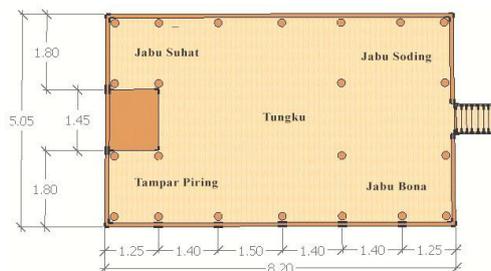


Figure 6. The Floor Plan of Jabu in Sigumpar (Source: Personal Documentation, 2021)

The Beauty of Toba Architecture Living in harmony with the surrounding natural environment

M. Maria Sudarwani, Galuh Widati, Situmorang L.Bintang, Faran Sere

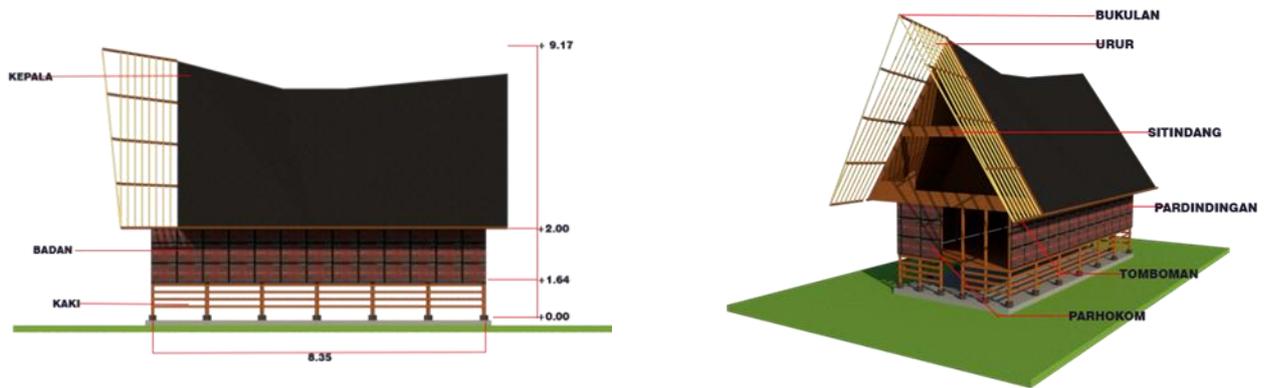


Figure 7. The Schetch of Jabu in Sigumpar
(Source: Personal Documentation, 2021)



Figure 8. The Building Typology of Sigumpar (Jabu; Sopo; Ruma Eper)
(Source: Personal Documentation, 2021)

The Housing Construction

The beauty of Sigumpar architectural house (*Ruma*) lies in the sharp roof on the front and back. The front is made longer and higher than the back, with the belief that it will pray for the descendants of the owner of the house to be more successful than the current one (Siahaan, 2019). See Figure 9 and 10. The description below is the elements of Toba architectural house:



Figure 9. The Beauty of Jabu in Sigumpar
(Source: Personal Documentation, 2021)



Figure 10. Sopo in Sigumpar
(Source: Personal Documentation, 2021)

The Poles and The Foundation

Sigumpar housing structure used the frame of wood. The housing wall's function is non-bearing, just as a partition made of wood, with the umpak. Sigumpar houses are characterized by *panggung* houses with the *umpak* foundation (the foundation made of a single stone) and wood columns. The foundation of the Toba house uses a ring foundation type, where the stone is the foundation of the wooden column that stands on it. Poles of the house have a diameter of 42 - 50 cm, standing on a rock with a flexible structure so that it is resistant to earthquakes. There are 18 poles that contain the philosophy of togetherness and sturdiness. The reason for using a pedestal foundation is that there were still a large number of ojan stones and logs at that time. And no adhesive tools such as cement have yet been found. The distance between the poles is 90-100 cm. The shape is round. The poles are only on the sides so as to create an empty space in the middle. The empty space is used as a place for livestock.

The main poles of the *sopo* are laid on a large slate stone 40 cm (16 inches) in diameter and taper down, 20 cm (7.9 inches) in diameter. The main poles are supported by small poles (supporting poles). All posts are bounded by rail anchors arranged in four narrow tiers. Each anchor level is named (from bottom to top): stimulation beam, *galapang* beam, *sumban* and *gulang-gulang*. Unlike the *sopo*, the traditional house has three layers of anchors instead of four. The difference between the Toba architecture house (*ruma*) and the *sopo* lies in the space system and the shape of the poles. The main poles of the *Jabu* house are built like a tree that shrinks from the bottom up. The opposite is seen in the *sopo*, the main poles are enlarged upwards. The walls of the Toba architecture house are made wider at the top, with the aim that people in the house can easily see down and towards the road. The bigger *sopo* has a fence made of wooden planks, while the simple *sopo* has no fence. Toba house building is a type of stilt house building, which is a house that is supported by poles that are the main structure of the building and also to withstand the burden of the floor that is above the pole and also the roof construction load (Balai Litbang Perumahan Wilayah I Medan, 2019).

Toba house building is a type of stilt house building, which support by poles that are the main structure of the building and also to withstand the burden of the floor that is above the pole. The structure of poles and pedestals creates adaptive buildings against earthquakes and land contours. All the building poles rest on loose pedestals so that during an earthquake, they can move but not damage the construction. Another reason, with loose foundations, architecture does not damage the ecological balance of the earth, and at the same time, does not allow the earth to be damaged by planting foundation stones (Josef, 1998). *Umpak* also prevents the rotten wood poles exposed soil moisture and soil insect attack. See Figure 11.



Figure 11. The Poles of Sigumpar House
(Source: Personal Documentation, 2021)

The Beauty of Toba Architecture Living in harmony with the surrounding natural environment

M. Maria Sudarwani, Galuh Widati, Situmorang L.Bintang, Faran Sere

The Walls

Like the function of walls in general, the walls of batak houses serve as space dividers. This wall is made of *Simartolu* wood. Walls that bind to each other with peg joints or by being tied (Balai Litbang Perumahan Wilayah I Medan, 2019). The floor is made of wooden planks that are installed parallel to the direction of the entrance to the house. The wall of *jabu*, when seen from the looks of it, forms a trapezoid with the wall position not upright but tilted. Because the main structure is wood, the walls are more of a filler that serves to cover the outside of the house, separating the inside and outside of the house.

The lowest part, which is slanted and decorated in a very complex way, is located on the roof of the front wall. Here there is a *dorpi* which is also decorated. Above the *dorpi* there is a *Tombonan* (the middle is sticking up). It is a triangle that is hollowed out in the middle and complexly scored once erected vertically. The Toba house's walls are slanted so the wind can easily enter. The slanted wall ties, called *ret-ret* ropes, are made of palm fiber or rattan. This strap forms a pattern like a lizard with 2 heads opposite each other, meaning that the lizard is depicted as a house guard, and the 2 heads are opposite each other, symbolizing that all house residents have the same role and respect each other. All exterior walls can be carved and colored. See Figure 12.



Figure 12. The carved and coloured Wall of Sigumpar House
(Source: Personal Documentation, 2021)

The Roof of The House

The roof of *Ruma/Jabu* takes the basic idea of a buffalo's back. Its curved shape adds to its aerodynamic value against strong lake winds. The roof is made of *ijuk*, an organic material easily available in the local area. The Toba Samosir people consider the roof as something sacred, so it is used to store their heirlooms. The type of construction and the roof used to be very genial in solving site characteristics and local climate. On the roof, roof beams serve as a fulcrum of the building's roof construction. The roof construction is propped up on beams and then reinforced and held by rattan ropes and *ijuk* ropes (Balai Litbang Perumahan Wilayah I Medan, 2019). The roof of the Toba house is a separate structure that is erected on the floor/base; the roof retaining poles are not continuous from the ground. *Sopi-sopi* of the roof is rich with decorations and carvings both with paint and without the paint (See Figure 13). *Sopi-sopi* is a structure above the wall that serves to support the roof.



Figure 13. The Sopi-sopi Ornaments of Sigumpar House
(Source: Personal Documentation, 2021)

The Stairs of The House

There are odd numbers of stairs in *Jabu* House. It is based on the people's belief that odd numbers are lucky numbers. The number of stairs has an odd rule usually amounted to 5 or 7 stairs. This is because of the belief that the number of odd rungs means luck (Balai Litbang Perumahan Wilayah I Medan, 2019). See Figure 14. The Main Door juts in with a width of 80 cm and a height of 1.5 m, surrounded by carvings, paintings and writings, and two lion heads on the doorway.



Figure 14. The Stairs of Sigumpar House
(Source: Personal Documentation, 2021)

The Ornament and Colour Usage

Carved house ornaments can be found from the outside to the inside of the Toba architecture house. Many typical Toba Samosir carvings can be found in the house, which have a meaning as a repellent to reinforcements (danger, disease, and others). This ornament is often called *Gorga*. The colors of the carvings are generally red, white, and black. Except for the house's poles, roof and floor, all exterior walls can be carved and colored. According to various sources, the color is taken from natural materials. Thus, the color itself was created from materials provided by nature. The ancestors of the Toba Samosir people created the color in the following way: a) Red paint is taken from hula stone, a kind of red natural stone that cannot be found in all areas. This stone is ground into a fine powder like flour and mixed with a bit of water, then smeared on the carvings; b) White paint is taken from white soil, fine and soft soil, and ground until smooth and mixed with a little water; and c) Black paint is made from a type of plant that is ground

The Beauty of Toba Architecture Living in harmony with the surrounding natural environment

M. Maria Sudarwani, Galuh Widati, Situmorang L.Bintang, Faran Sere

until smooth and mixed with pot or cauldron ash. The ash is scraped from the pot or pot and put into the crushed leaves, then roasted to produce black paint.

Based on how it is done, the Toba *gorga* consists of two types: *gorga* carving (chiseled *gorga*) and *gorga dais* (painted *gorga*). *Ruma* with many ornaments (*gorga*) carved and painted, is called *Ruma Gorga Sarimunggu* or *Jabu Batara Guru*. At the same time, the Toba house that is not carved and without paint is called *Jabu Ereng* or *Jabu Batara Siang* (Soeroto, 2003). Based on the shape of the ornament, *gorga* has many types. Important carving symbols are lizards, snakes, or buffalo, which have certain meanings. *Gorga* lizard means survival and a solid and unbroken sense of brotherhood. At the same time, the shape of the snake ornament is associated with the belief that a house entered by a snake signifies that its inhabitants will get abundant blessings. *Gorga* and the shape of the buffalo's head have the meaning of gratitude for the hard work of the buffalo, which has helped humans in working in agricultural fields. The types of *Gorga* Toba include: *Gorga Ipon-Ipon*, *Gorga Desa Naualu*, *Gorga Ogung*: *Ogung*, *Gorga Sitompi*, *Gorga Simataniari*, *Gorga Singa-singa*, *Gorga Jorgom*, *Gorga Boraspati dan adop-adop*, *Gorga Gaja Dompok*, *Gorga Dalihan Natolu*, *Gorga Simeoleol*, *Gorga Sitagan*, *Gorga Sijonggi*, *Gorga Silintong*, *Gorga Iran-iran*, *Gorga Hariara Sundung di Langit*, *Gorga Hoda-Hoda*, *Gorga Ulu Paung*. See Figure 15.



Figure 15. The Ornament and the Colour of Gorga
(Source: Personal Documentation, 2019)

The Preservation Concept

Seeing the tourism development in the Toba Samosir area, the Ministry of Tourism began revitalizing three traditional villages in the Lake Toba area. It aims to boost the value of regional tourism by carrying the theme of traditional customs. The three traditional villages that have been revitalized are a) Ragi Hotang Traditional Village in Meat, Tampahan District, Tobasa Regency; b) Hutagaol Sihujur Traditional Village in Silaen District, Tobasa Regency; and c) Traditional Village of Rumah Bolon Gunung Malela, Simalungun Regency. This revitalization program is also carried out on the basis of cultural preservation because culture and tourism are two inseparable parts. In addition to the Toba architectural and Simalungun architectural houses located in the three areas of the traditional village. There are still around 4000 traditional houses throughout Toba Samosir, which have a unique design with the characteristics of a stilt-shaped building with sturdy piles, size designs, and distinctive red, black and white ornaments.

Damage to buildings that commonly occurs in Toba architecture is a) in the roof of the building, occurs due to lack of maintenance and is difficult to repair, unavailability of original building materials. The roof covering, the fibers are too old, and there is no rejuvenation. The roof of the building is overgrown with fern trees, where insects and

birds nest, causing the fibers to rot and fall off, eventually being replaced with a tin roof; b) in building structures, due to lack of maintenance and also expensive building repairs on the discovery of several damaged Toba houses especially in the structure of the building on the poles of the building. Traditional houses are built on earthquake-resistant stone, but not enough from weathering because of rain, moisture, and insects (termites). As a result, eroded the stone base, the foundation poles of the building could fall; and c) in building carvings, both carving and painting, are difficult to obtain experts. Recently there has been a Gorga school of carving and painting in North Tapanuli (Siahaan, 2019). Gorga's carvings and paintings are rotten and not rejuvenated, so they are easily damaged. It also often happens that lions, important symbols of the Toba architectural house, are stolen and traded to the island of Bali. For that, the lions were chained to the building to prevent theft.

According to the Undang-undang Republik Indonesia Nomor 11 (2010), preservation is a dynamic effort to maintain the existence of a Cultural Conservation and its value by means of protection, development, and utilization. Protection is an effort to prevent and overcome damage, destruction, or destruction by means of Rescue, Security, Zoning, Maintenance, and Restoration of Cultural Conservation. Development is an increase in the potential value, information, and promotion of Cultural Conservation and its utilization through Research, Revitalization, and Adaptation in a sustainable manner and does not conflict with the objectives of preservation. Utilization is the utilization of Cultural Conservation for the greatest benefit of the people's welfare while maintaining its sustainability. The proposed conservation concept for the Sigumpar area: make a government regulation regarding the designation of Traditional settlements as conservation areas, coordinate with owners/customers of traditional houses to obtain cooperation agreements, and rearrange the physical condition of the environmental area (improvement of the landscape and environmental vegetation), reconstruction traditional houses that have been extinct, relive long-lost customs, be it traditional ceremonies or traditional events such as *manotor* so that it is expected to attract tourists, and socialization of the creative economy for traditional house owners so that it can be a source of income for the community, in the form of selling souvenirs or *ulos* which are very famous in the Toba Samosir (Fadli & Aulia, 2019).

Among other things, the preferred method of maintaining and caring for Toba houses traditionally can use natural ingredients such as tobacco and cloves that are boiled and soaked for 2x24 hours and rubbed with banana stems once a year. Another traditional way is the smoking method. However, with the rate of decline in environmental conditions, residential areas have been built so that the termites' habitat is disturbed, and they look for food in Toba houses and people's houses made of wood. The danger of termite attack on wooden construction is an organic material that cannot last long. Especially in tropical areas such as Indonesia, wood has the main enemy, namely moisture and insects, especially termites, because wood is used as the main food. This condition causes the weathering of the wood to accelerate. Methods that can be done to conserve wood materials such as using insecticides to kill termites, paints, varnishes, and smearing wood materials with 'kerosene', 'diesel', and 'used oil'. However, applying to objects or buildings of cultural heritage is very risky. Up to date with the use of the latest method, namely the bait method in the indoor and outdoor environment. The basic material for bait is wood as food which has been pre-coated with the hexaflumuron chemical, which makes the termite queen and her colony castes die within 5 months without polluting the groundwater environment. Furthermore, it is feared that Cultural

The Beauty of Toba Architecture Living in harmony with the surrounding natural environment

M. Maria Sudarwani, Galuh Widati, Situmorang L.Bintang, Faran Sere

Conservation will be threatened with damage due to conflicts of interest, for example, development pressures, the rate of land expansion, land use for settlements, etc. The Toba Samosir regional government needs to make a breakthrough in limited cooperation with the families of the owners of several *jabu* to ensure the maintenance and sustainable care of Toba architectural houses.

Application of Toba Architectural Design

Today's architects should equip themselves with knowledge of Indonesian vernacular architecture to have sufficient basic knowledge to maintain its sustainability of it in the post-modern architectural era. The concept of application of Toba architectural design can be seen in the Silangit Airport design in North Sumatra. See Figure 16. Silangit Airport is located at Jalan Silangit, Silando Muara, Silando Siborong-borong, North Tapanuli Regency, North Sumatra 22476. The airport has a runway size of 2,650 m x 45 m. The airport adopted the Toba Architecture implemented on several sides of the building. The table below is the application of the concept of Toba Architecture at Silangit Airport.

Table 2. The Application of Toba architectural Design in Silangit Airport

The Application	The Explanation
	The façade at Silangit Airport adopts the shape of the roof on Toba Architectural House, made to adjust the existing stretch of the building. The façade pattern is made repeatedly.
	Ornaments at Silangit Airport use Gorga ornaments made on triangles found on the building's facade.

In Figures 16-19 below are the examples of post-modern Indonesian architectural works that have aspects that are still based on Toba architecture, especially on sensitivity to nature (local wisdom), namely: Silangit Airport design in North Sumatra, Church of HKBP Sudirman Jakarta, Church of HKPB Tebet, Jakarta, and the Catholic Church of St. Mikael Pengurusan, Samosir which all carries the theme of Toba architecture.



Figure 16. Silangit Airport Images
(Source: Kompasiana, 2021)



Figure 17. Church of HKPB Sudirman, Jakarta
(Source: Lawi, 2020)



Figure 18. Church of HKPB Tebet,
Jakarta
(Source: HKBP Tebet, 2020)



Figure 19. Church of St. Mikael Pangururan,
Samosir
(Source: Lawi, 2020))

4. Conclusion

Sigumpar's research area is located in a hilly area with a contoured topography. The settlement layout of Sigumpar follows a pattern of two facing each other, axis to the north and south, and forms a village called *lumban* or *huta*. The contoured topography resulted in this area is divided into four *huta* with different levels of land elevation. Nevertheless, the architectural form of the residential houses for each *huta* remains the same in the form of a row of *Jabu* (for one family) and a row of *sopo*. The interesting thing about the four *huta* in Sigumpar is the difference orientation between one *huta* to another. Every *huta* has an agreement about the direction of the *jabu* orientation but still axis to the north or south. The orientation of the *jabu* and *sopo* is quite strong in harmony with the surrounding natural environment, namely mountains and lakes. The beauty of Sigumpar architectural house (*Jabu*) lies in the sharp roof on the front and back. The front is made longer and higher than the back, with the belief that it will pray for the descendants of the owner of the house to be more successful than the current one.

Today Toba Architecture is threatened with extinction due to several things, which are also often the cause of the destruction of hundreds of traditional houses throughout the country. The roof material in Sigumpar has changed from organic roofing to a fabricated material in the form of a roof made of zinc applied to all buildings in Sigumpar Village. This is because the palm fiber roof is flammable and often overgrown with ferns, becoming a place for insects and birds to nest, causing the fibers to rot, break, and eventually be replaced with a tin roof. Seeing the condition of cultural heritage in North Sumatra is so alarming that it is necessary to collect data on residents' problems in

The Beauty of Toba Architecture Living in harmony with the surrounding natural environment

M. Maria Sudarwani, Galuh Widati, Situmorang L.Bintang, Faran Sere

maintaining these sites, make a situation map of the existing conditions, and look for ways to overcome them. Finally, efforts to update the Toba architecture and maintain the sustainability of the Toba architecture in the Post-modern Architecture scene are needed especially based on the sensitivity to nature (local wisdom).

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