

Adaptive Reuse of Vernacular Architecture for Conservation in Indonesia: Case Study of South Nias Village, Bawömataluo Conservation Project

Fanita Pedati Atmanti¹ & Yasufumi Uekita²

¹ Doctoral Program in World Heritage Studies, University of Tsukuba, Japan

² Faculty of Art and Design, University of Tsukuba, Japan

Correspondence: Fanitra Pedati Atmanti, Heritage Studies, University of Tsukuba, Joint Use Office-211, Tennodai 1-1-1, Tsukuba City, 305-8577, Japan. Tel: 070-3630-6534.

Received: December 19, 2022

Accepted: February 7, 2023

Online Published: March 5, 2023

doi:10.5539/ach.v15n1p64

URL: <https://doi.org/10.5539/ach.v15n1p64>

Abstract

Bawömataluo village, which is located in Nias Island, Indonesia, is among the most important National Cultural Properties. The village has the highest number of surviving traditional houses in one village in Indonesia (53% left – Fanitra Pedati A., 2017, p. 64). The architecture is considered to be the finest artistic masterpiece in Indonesia. The change of agriculture type in the 20th century and vast improvement of infrastructure in the 21st century cause poverty and bring difficulties in sustaining the cultural property. Villagers modify their houses by replacing some of the building materials with the ones that are more economical in price, but this contributes to the destruction of the original structure. Most Nias villagers still want to stay in their traditional houses. But, due to the maintenance funding problem and introduction to healthy houses in the 20th century, some materials were changed into industrial materials and some parts were damaged. There is an initiative to use traditional house/*omo hada* as a homestay program which allows villagers to have a close contact with local and international tourists and earn more income. This research observed 30 *omo hada* and took two samples for a deeper space understanding. This paper tries to investigate activities in the two samples of *omo hada* with and without homestay activities. The investigation finds out that *tawolo* (communal space that is located at the front of the house) is a frequently used space which occupies 40% area of the second floor and *föröma* (private space that is located at the back of the house) is the least used space with 60% area of the second floor which is suitable for adaptive reuse in *omo hada*.

Keywords: vernacular architecture, conservation, adaptive reuse, Bawömataluo village, Indonesia

1. Introduction

Indonesia has 14,000 islands and 300 ethnic groups that live in it with diverse native culture. The country has rich forest resources and natural resources. Each ethnic group lives in a specific region and has its own culture and tradition. In addition, each ethnic group profoundly expresses the characteristics of its demographical, geographical and ecological conditions. The wooden buildings, which are unique and diverse from one to another ethnic group found in Indonesia, showed the richness of the culture. In the post-colonial era, industrialization came and the healthful house program from the government in the 20th century caused the replacement of wooden structures and reinforced concrete and brick buildings (Semiarto, p. 606). Aside from having many earthquakes, Indonesia has tropical seasons (e.g., tropical rainforest, savanna and monsoon) that could cause extensive biological damage from termite and insect pests. These reasons make conservation difficult. Other than the vast improvement of infrastructure in the 21st century, the deforestation and change of agriculture type bring poverty and difficulty for the group to maintain their *omo hada*.

It is written on the Decision Letter No. 186/M/2017 of 6 July 2017 that Bawömataluo village becomes a National Cultural Property. It is considered as the first living monument in Indonesia National Heritage Property. Bawömataluo village has the most authentic traditional house left compared to other traditional villages in Indonesia. Its villagers also have authentic carpenter and carving skills. This unique identity attracts some local and foreign tourists to visit Bawömataluo village. Since the village is located approximately 22 km from the city centre, many local and international tourists must travel all the way from the accommodation in the city centre to

Bawömataluo village. Some villagers then have an initiative to accept guests in a homestay program. This paper tries to observe the space and activity inside *omo hada* with and without homestay activities to understand which area is possible to be modified and which area needs to be preserved according to the original function.



Figure 1. Map of Indonesia and the traditional villages in South Nias

Bawömataluo village, which is located in Nias island, is a great example of a living heritage in Indonesia because the village shows the structural genius of its wooden architecture and stone composition in village planning. The traditional wooden housing in Nias Island is considered as the most impressive structure ever produced in Indonesia (Feldman, 1977). The village covers an area of five hectares with an altitude of 270 meters above the sea. Bawömataluo is a new village that is formed after the first traditional village in South Nias, Orahili, which was burnt by the Dutch military.

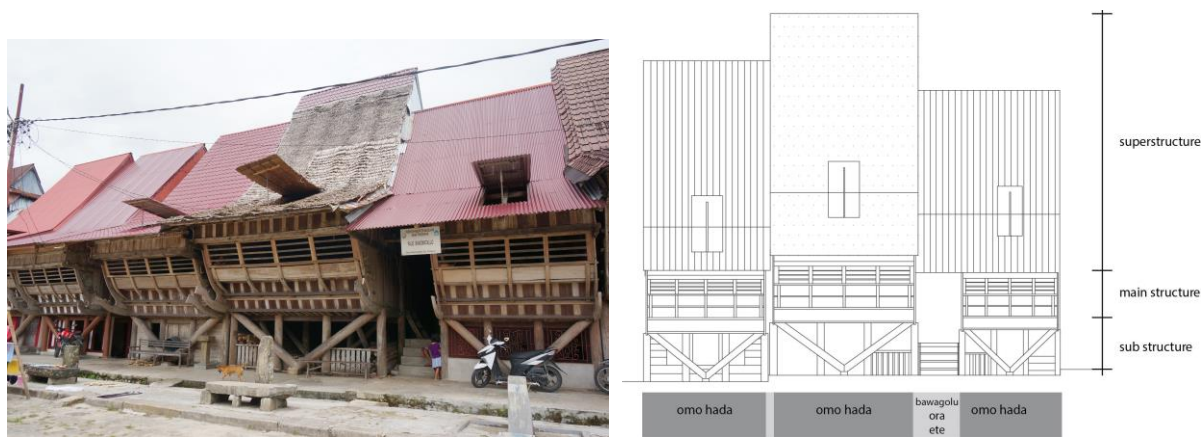


Figure 2. Typical *omo hada* in *raya* aisle and basic three components of *omo hada*

Nias traditional houses use ironwood piles with large diameter to form the substructure of the house. *Omo hada*, which means *rumah adat* (traditional house), uses special diagonal and vertical V-shaped pair piles called *driwa*, which added resistance to earthquake stresses as well as stability to the structure as a whole. The house has many details in the wood joints and uses two kinds of hardwoods originating from Nias Island called *manawadan ö* and *berua*. There are three main components of the traditional house. The first component is the substructure which has four wide *ehomo* (pillar), seven deeps and six bays. The *ehomo* works as a foundation pillar and it is put above the square stone called *batu gehomo*. There are also 14 transverse *driwa* and 12 longitudinal *driwa* (V-shaped wooden braces). The second structure is the main structure where there is a front room (*tawolo*) and a rear private room (*för öma*). Originally, the main structure was the only space that was used by the villagers for sleeping, eating, conducting traditional ceremonies, chatting, and relaxing. But recently, the population grew and more space is necessary. The front room (*tawolo*) serves as a public room for guests, whereas the *för öma* is a private family quarter. Finally, the top structure is superstructure and refers to the roof structure. The roof scale is two thirds of the total height. The roof structure such as braces is placed in the span of direction. The traditional

roof is shingled with sago palm leaves.

This village was chosen as a special reference for this research because it indicated outstanding historical and great cultural values. Until 2022, 52% of the houses are still traditional and the three main parts still remain although some functions have been modified and developed. Based on the research in 2022, there are 256 houses in the village, 136 of which were built using the traditional construction method. The structural genius of Bawömataluo's traditional architecture is still preserved and some local carpenters are still familiar with the traditional construction technique. The tangible cultural property is still preserved but some traditional activities inside the village have changed due to the influence of modern era. Bawömataluo village, which is located in Nias Island, Indonesia, is among the most important National Cultural Properties. However, there are only 52% of traditional houses left in Bawömataluo village right now and the number might be decreasing in the following year. It is an urgent issue because these wooden cultural properties might disappear soon.

2. Research Method

2.1 Literature Study

The writer conducted literature studies about the preservation of Japanese traditional wooden architecture and the Japanese system of heritage conservation. Literature about conservation of Indonesian wooden cultural properties is also studied to understand the problems and challenges. Studies from previous related research will be useful to enrich this research. The past studies include research from Jerome Feldman (a professor in Hawai'i Pacific University), Alain Viaro and Pastor Josef (missionaries who work on Pusaka Nias Museum) and some Japanese experts who had done research about Bawömataluo village in Nias island.

2.2 On-Site and Offline Survey and Interview in Bawömataluo Village, South Nias Island

During the master's degree program (2016-2018), the writer recorded the architectural drawing of *omo hada* and some of the modification projects held by the village. And during the doctoral degree that began in 2022, the writer contacted Bawömataluo villagers online to record the new modification on traditional house/*omo hada*. Finally, the author visited Bawomataluo village in 2016-2018 to interview some villagers and met them during the pandemic in 2022 through online platform communication such as Whats app application and zoom meetings.

2.3 Data Analysis

Data analysis was conducted to identify the house's typology, area size of *tawolo* and *föröma*, as well as activities inside *omo hada* with and without homestay guests.

3. Overview of Nias Island and Bawömataluo Village

3.1 South Nias Settlement and Bawömataluo Village

During the site survey, five villages were visited, namely Bawömataluo village, Orahili village, Hiliamaetaniha village, Hilimondregeraya village, and Hilinawalö Fau village. The typical village in South Nias shows the following components:

- 1) Independent villages under the authority of the chief of village,
- 2) Continuous rows of houses that are facing each other,
- 3) Straight stone paved street with stairs at both ends,
- 4) *Omo sebua*/chief house, a plaza with centre stone (*fusönewali*) and jumping stone located in the middle of the village,
- 5) Row housings that are attached to each other and separated by a small door named *bawagolu*,
- 6) A zone of megaliths located in *mbele-mbele* between the row housings and the streets.



Figure 3. Map of *omo hada* types in Bawömataluo village (Author, March 2023)

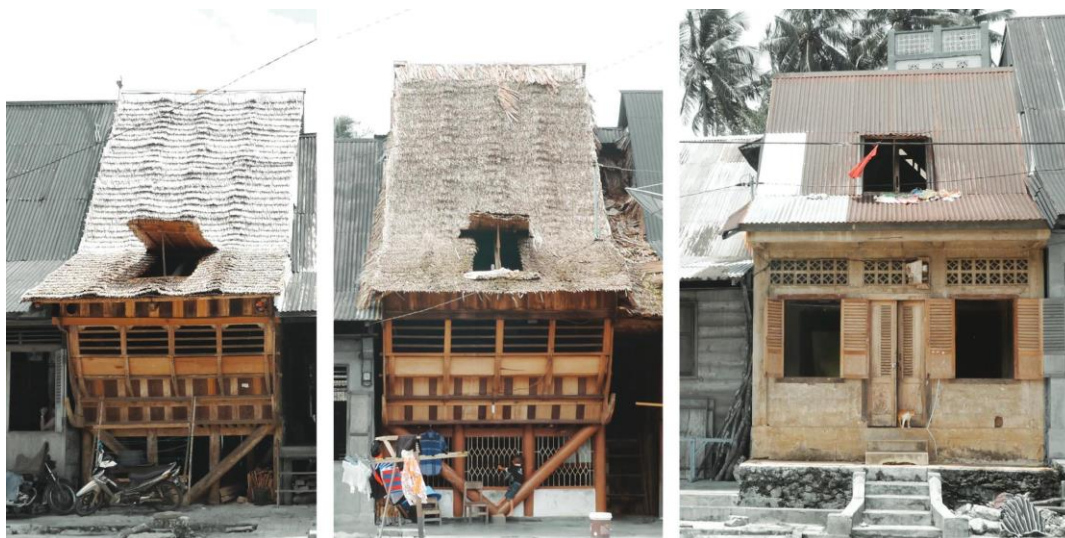


Figure 4. Three types of *omo hada* (left to right: Type A, Type B, and Type C)

This village was constructed in a planned way, from which the residents’ perspective of the world can be interpreted. Most of the villagers are farmers, and the others are civil servants, carpenters, teachers, and fishermen. The total population of this village has recorded a total of 6.200 people which consist of 1.310 family heads (Bawömataluo village archive, 2014). The population growth makes the villagers build new houses that are located on the outside of the traditional village.

The village has an important word that represents the concept of their living heritage. The word is called *banua*. Through this word, South Nias people hold an important meaning for the culture and the development of their residential area. The *banua* means the world of living humans, its culture, domesticated animals, and harvested plants while anything outside the *banua* is the underworld of the dead, wild animals, and undomesticated plants. The *banua* concept appears on the traditional house called *omo hada* while the outside *banua* appears in the form of sculpture in the village street’s megalithic stones. A familiar term that is used is *raya*, but this actually means sunrise and it is located in the eastern part. Meanwhile, *lou* means sunset and is located in the western area. The

words *raya* and *läu* are used to name the streets in Bawömataluo village where their location is exactly at the directions of sunrise and sunset. This concept was mentioned by a professor from Hawai'i Pacific University named Jerome Feldman in his dissertation.

3.1 Survey Activity at Bawömataluo Village

The on-site survey in Bawömataluo Village was held twice in September 2016 and September 2017 while the online survey was conducted one time in June 2022. The survey is expected to record the current housing type, current condition, new construction, and modification activities of *omo hada*. The on-site survey is located only in the uphill area where the most traditional houses *omo hada* are still used.

The survey recorded that there are three types of houses in Bawömataluo Village. Type A (traditional and original) is where the traditional *omo hada* still has full components of V-brace column, sago palm roof, and horizontal lattice ventilation (*zarazara*). Type B (traditional with various modifications especially in façade) shows the modified traditional *omo hada*, with modification on the foundation part that is done by adding new wooden or concrete material and changing the roof material into metal zinc. And the last one is type C (different style of housing). Type C is a different style of housing. Some houses are built with concrete materials while some are still using wooden materials, but the shape is completely different from *omo hada*.

From the map containing the number and locations of different housing types above, it is clear that most traditional preserved houses are located in the centre of settlement. The *raya* area has the most traditional houses among all aisles in Bawömataluo Village. There are three type A houses and 52 type B houses in the *raya* area.

Table 1. Number and percentage of specific types of *omo* building (survey in June 2022)

Type of Building	2017		2022	
	Number of Building	Percentage	Number of Building	Percentage
Type A/Traditional	6		5	
Type B/Traditional Modified	130	53%	131	52%
Type C/Different type of house	120	47%	120	48%
Total	256	100%	256	100%

4. Result: Adaptive Reuse of *Omo Hada* - Vernacular Architecture in Indonesia

The on-site survey consists of the questionnaire and measurement of selected *omo hada* in Bawömataluo Village located at the uphill area. This survey is one of the ways to understand in detail about the activities, circulation, user behavior and spaces inside *omo hada*. The questionnaire was carried out in 30 traditional houses (10 houses in *läu* aisle, two houses in *bagoa* aisle, nine houses in *raya* aisle, and nine houses in *halam ba'a* aisle). The criteria of the chosen 30 houses are:

- 1) Type A (traditional house) and type B (traditional modified house),
- 2) Houses with a maximum of 10 inhabitants.

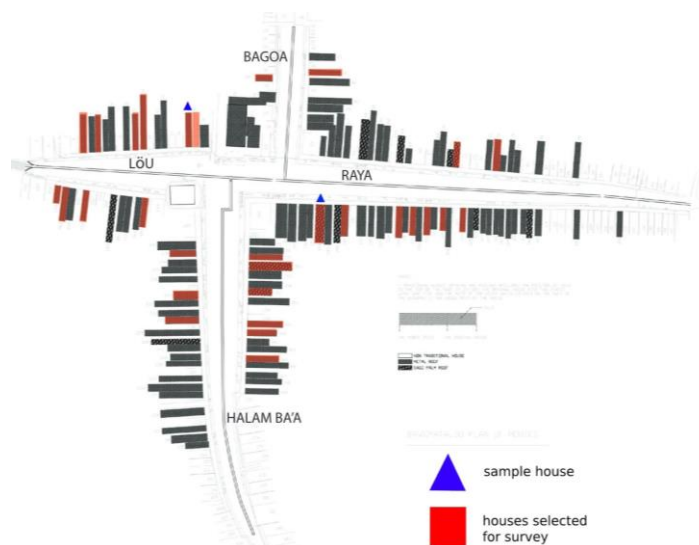


Figure 5. Map of houses selected for survey (Author, 2022)

The interview includes seven questions for the villagers which are the year the house was built, the property owner of the house, number of people staying in *omo hada* with age information, activities in *omo hada*, the most and least frequently used space in *omo hada* (with detailed user and space location), homestay experience in their *omo hada*, and detailed information about guests' purpose of homestay in *omo hada*.

Each question of the questionnaire is analyzed and the results with explanations from each question are as follows: 30 samples of *omo hada* were taken to understand about the ownership, homestay experiences, as well as activities in *tawolo* and *för öma*. Among 30 houses, there were nine houses that have ever experienced homestay.



Figure 6. Modification of *för öma* of *omo hada* traditional house
(The image is 3D image of house 144 in *raya* area)

Among 30 *omo hada*, only two houses were selected to be the main sample house for this adaptive reuse research. These *omo hada* were chosen because they are:

- 1) still having original components of *omo hada*
- 2) actively receiving homestay activities from around the world
- 3) having the most complete house utility

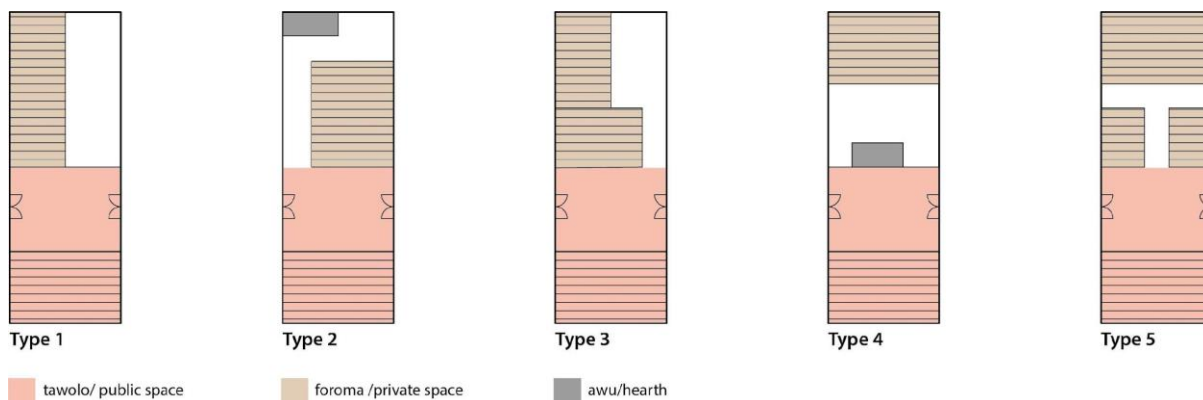


Figure 7. Typical space of *för öma* (private space) and *tawolo* (communal space) in *omo hada* traditional house

Table 2. Result on questionnaire activities on 30 omo hada at Baw ömataluo village

Omo hada (traditional house) information												
No.	Type of Building	Aisle (Loc.)	Code	Year	Name	Family Member	Ownership	Homestay	Homestay Freq.	Guest Countries	Guest Purpose	Most Freq. Actv.
1	Type B	lou	5	1930	Moinafakhe Wau	2	inherited land	NOT YET				föröma
2	Type B	lou	7	1920	Yustinus Wau	2	inherited land	NOT YET				föröma and tawolo
3	Type B	lou	12	1800	Linda Tambunan	5	inherited land	NOT YET				tawolo
4	Type B	lou	13	1800	Faigiduhu Wau	2	inherited land	NOT YET				tawolo
5	Type B	lou	19	1948	Litur Zagöto	5	inherited land	YES	12	DE, AUS, JPN, USA, ROC, FR, NL, YGY	research, holiday	all spaces
6	Type C	lou	20	1800	Mesiu Nehe	1	inherited land	YES	2	YGY, JP	research	föröma
7	Type B	lou	245	4th generation	Sarododo Luahambowo	7	inherited land	NOT YET				tawolo
8	Type B	lou	253	unknown	Siti Fatima Lase	5	inherited land	NOT YET				tawolo
9	Type B	lou	256	1964	Rumina Wau	2	inherited land	NOT YET				Arönomo
10	Type A	lou	257	1952	Tonafö Nehe	2	inherited land	YES	2	JP, JKT	holiday, promotion	tawolo
11	Type A	Bagoa	29	1949	Merlina	5	inherited land	NOT YET				tawolo
12	Type B	Bagoa	45	unknown	Fajokhi Haria	6	inherited land	NOT YET				Arönomo
13	Type A	Raya	71	1977	Famoutohu Fau	2	bought from Sabe	NOT YET				tawolo
14	Type B	Raya	76	1929	Yuni Manao	4	inherited land	YES	2	NIAS	holiday	tawolo
15	Type B	Raya	126	1800	Aohashigölö Sihura	2	inherited land	YES	1	NIAS	school volunteer	Arönomo
16	Type B	Raya	129	5th generation	Tibeli Bali	3	inherited land	NOT YET				tawolo
17	Type B	Raya	131	3rd generation	Ria Wau	4	inherited land	YES	2	JP, CA	holiday	föröma
18	Type B	Raya	133	3rd generation	Amati Wau	4	inherited land	NOT YET				tawolo
19	Type B	Raya	135	1956	Khalisman Zagoto	3	inherited land	NOT YET				tawolo
20	Type B	Raya	141	1947	Andreas Fahuwusa	2	inherited land	NOT YET				tawolo
21	Type B	Raya	144	unknown	Hernisiah Wau	5	inherited land	YES	5	ESP, NIAS, JKT	holiday, research	tawolo
22	Type B	Halam Ba'a	153	1800	Seto Zisökhi Buulölö	5	inherited land	NOT YET				all spaces
23	Type B	Halam Ba'a	154	1950	Sawölöna Wau	8	inherited land	YES	1	AU	holiday	tawolo
24	Type B	Halam Ba'a	157	2013	Taniagöföna Fau	3	inherited land	NOT YET				all spaces
25	Type B	Halam Ba'a	161	1800	Sarinulo Laowö	6	inherited land	NOT YET				tawolo
26	Type B	Halam Ba'a	162	1970	Timihati Zagöto	3	inherited land	NOT YET				all spaces
27	Type B	Halam Ba'a	165	1870	Nitolo Zagöto	4	inherited land	NOT YET				all spaces
28	Type B	Halam Ba'a	231	1700	Hasaro Ziduhu Zagöto	2	inherited land	NOT YET				tawolo
29	Type B	Halam Ba'a	234	1880	Ritimani Wau	2	inherited land	NOT YET				föröma and tawolo
30	Type B	Halam ba'a	239	1910	Taandro Manao	5	inherited land	YES	2	DE, NL	holiday, surfing	föröma

- has ever experienced homestay
- sample taken for adaptive reuse research

Table 3. Results of the questionnaire about the most favourite space in Baw ömataluo village

No.	House Code	Fave Space									
		Tawolo		Föröma		Ewali		Kitchen		Arönomo	
		Child	Parents	Child	Parents	Child	Parents	Child	Parents	Child	Parents
1	5	√			√						
2	7			√	√						
3	12	√							√		
4	13	√	√								
5	19			√	√						
6	20			√	√						
7	245					√					√
8	253	√	√								
9	256									√	√
10	257	√	√								
11	29		√			√					
12	45									√	√
13	71	√	√								
14	76	√			√						
15	126									√	√
16	129	√	√								
17	131		√	√							
18	133	√	√								
19	135	√				√					
20	141			√	√						
21	144	√	√								
22	153	√	√								
23	154	√	√								
24	157			√	√						
25	161	√	√								
26	162			√	√						
27	165	√					√				
28	231	√	√								
29	234		√	√							
30	239		√	√							
Total		16	15	9	9	2	1	0	1	3	4

Table 4. Results of the questionnaire about the most frequent used space in Bawömataluo village

No.	House Code	Most Frequently Used Space		
		tawolo	föröma	arönomo
1	5		✓	
2	7		✓	
3	12	✓		
4	13	✓		
5	19	✓	✓	
6	20		✓	
7	245	✓		
8	253	✓		
9	256			✓
10	257	✓		
11	29	✓		
12	45			✓
13	71	✓		
14	76	✓		
15	126			✓
16	129	✓		
17	131		✓	
18	133	✓		
19	135	✓		
20	141	✓		
21	144	✓		
22	153	✓	✓	
23	154	✓		
24	157	✓	✓	
25	161	✓		
26	162		✓	
27	165	✓	✓	
28	231	✓		
29	234		✓	
30	239		✓	
	Total	20	11	3

The data below are the two samples of *omo hada* taken to understand more about the activity inside the house and the alteration of space when they receive homestay activities.

4.1 Sample 1

Sample 1 is an *omo hada* number 144 which is located in the *raya* area. There is no information about the year built and renovation work. There are five inhabitants in this *omo hada* which is the husband and wife with two male children and a grandmother. This house is built on inherited land. This house has had a homestay experience and received guests from Spain, Jakarta and Nias. The purposes of the guests are holiday and research activity.

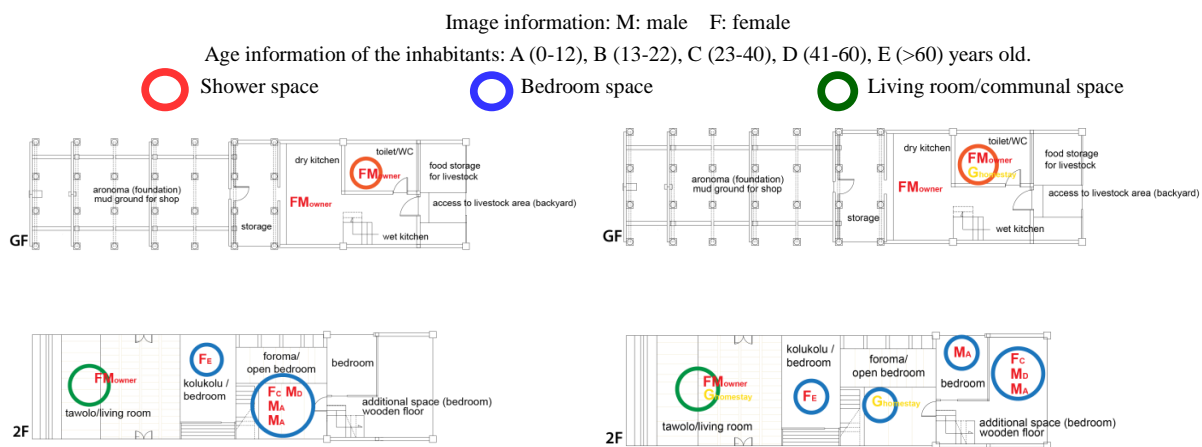


Figure 8. Original without homestay activity (left) and Model 2 with homestay activity(right)

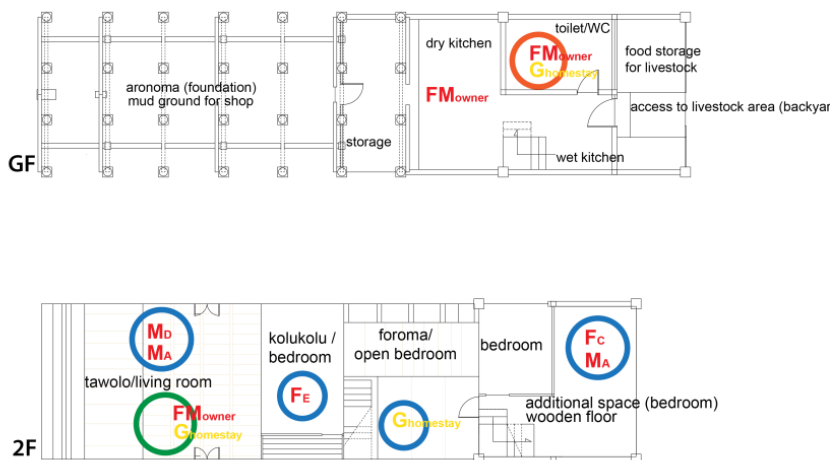


Figure 9. Model 3 homestay activity

Table 5. Area used in Sample 1 *omo hada* (with and without homestay activities)

Sample of House 1	Without Homestay Activity			With Homestay Activity					
	Model 1		Space Name	Model 2		Model 3		Space Name	
	Area (sqm.)	%		Area (sqm.)	%	Area (sqm.)	%		
Living and communal (owner)	26	37	tawolo 2F	26	37	tawolo 2F	13	18.5	tawolo 2F
Sleeping (owner 1)	44	63	föröma 2F	30	40	föröma 2F	43	58.5	föröma & tawolo 2F
Sleeping (owner 2)	-	-	-	-	-	-	-	-	-
Living and communal (guest)	-	-	-	26	37	tawolo 2F (shared)	13	18.5	tawolo 2F (shared)
Sleeping (guest 1)	-	-	-	14	23	föröma 2F	14	23	föröma 2F

4.2 Sample 2

Sample 2 is an *omo hada* number 19 which is located in the *läu* area. The house was built in 1948 with no record of renovation work. There are five inhabitants in this *omo hada* which are the husband and wife with three children. This house is built on inherited land. This house has had homestay experiences and received guests from Germany, Australia, Japan, USA, China, France, Netherland, and Yogyakarta. The purpose of the guests are holiday and research activity.

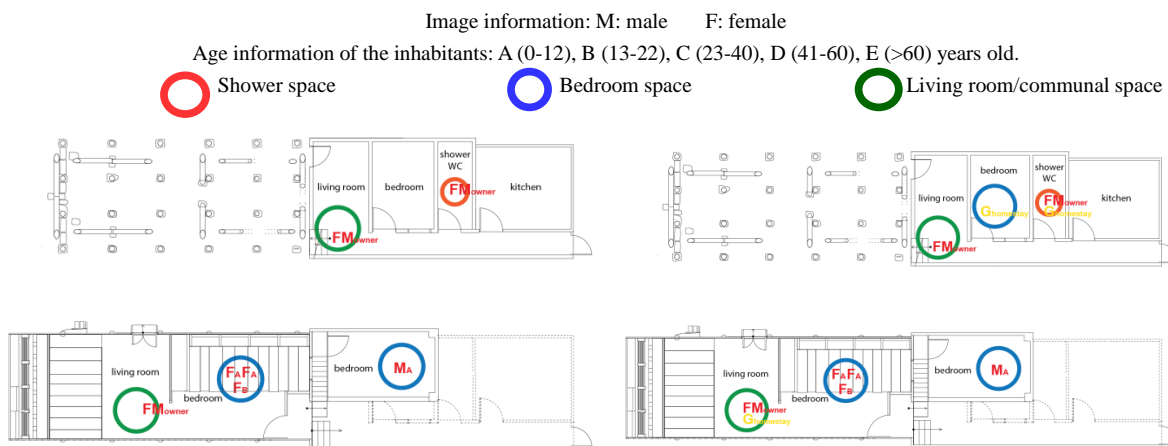


Figure 10. Model 1/original without homestay activity (left) and Model 2 with homestay activity(right)

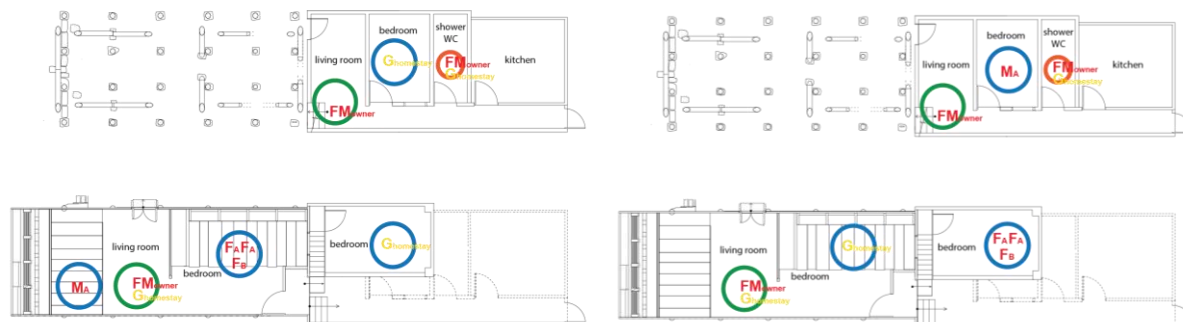


Figure 11. Model 3 and Model 4 (both with homestay activity)

Table 6. Area used in Sample 2 *omo hada* (with and without homestay activities)

Sample of House 2	Without Homestay Activity				With Homestay Activity							
	Model 1		Model 2		Model 3		Model 3		Model 4		Model 4	
	Area (sqm.)	%	Space Name	Area (sqm.)	%	Space Name	Area (sqm.)	%	Space Name	Area (sqm.)	%	Space Name
Living and communal (owner 1)	17	40	tawolo 2F	17	40	tawolo 2F	8.5	20	tawolo 2F	17	40	tawolo 2F
Living and communal (owner 2)	6.5	20	living room GF	6.5	20	living room GF	6.5	20	living room GF	6.5	20	living room GF
Sleeping (owner 1)	25.34	60	föröma 2F	25.34	60	föröma 2F	25.34	60	föröma & tawolo 2F	25.34	40	föröma 2F
Sleeping (owner 2)	-	-	-	-	-	-	-	-	-	6.5	20	arönöma GF
Living and communal (guest)	-	-	-	25.34	40	tawolo 2F (shared)	8.5	20	tawolo 2F (shared)	17	40	tawolo 2F (shared)
Sleeping (guest 1)	-	-	-	6.5	20	arönöma GF	8.5	20	föröma 2F	6.5	20	föröma 2F
Sleeping (guest 2)	-	-	-	-	-	-	6.5	20	arönöma GF	-	-	-

Table 7. Comparison of layout and house activities in *omo hada* Sample 1 and Sample 2

Information	Sample 1	Sample 2
Floorplan		
Comparison	<ol style="list-style-type: none"> <i>Kolukolu</i> is only for house owner; no guest is allowed to enter this space. <i>Kolukolu</i> is part of <i>föröma</i>. <i>Kolukolu</i> and private room are separated by wall House owner choose <i>tawolo</i> as their favorite space because this space has good air circulation and is comfortable for staying there to relax and chat with people in daylight. There is a time that house owners sleep in <i>tawolo</i> when they receive many guests who stay in the <i>föröma</i> area. However, they will avoid sleeping in <i>tawolo</i> because it is uncomfortable. GF/<i>arönöma</i> still have original structure until June 2022. Right now the house owner of sample 1 modify this area for shop area. 	<ol style="list-style-type: none"> This sample don't have <i>kolukolu</i> space. All private room are one space without separation. House owner choose to sleep in <i>föröma</i> area instead of GF bedroom. Guest from homestay will be served bedroom in GF area first and if they need more room then room in 2F will be offered. House owners share <i>tawolo</i> with guests for the living room and communal space. <i>Tawolo</i> is considered as the most frequently used space because they spend most of the time in <i>tawolo</i>. House owner try to avoid sleeping at <i>tawolo</i> because it is really cold at night. <i>Zarazara</i> is an open lattice window and it makes the temperature in <i>tawolo</i> become colder at night time. Since the rooms are limited, house owners use <i>tawolo</i> (living room) as a bedroom if many guests come and stay at <i>omo hada</i>.

The site survey shows that *tawolo* (front area) is the most frequently used space while *föröma* (back of the house where there are private rooms) is the least used. The villagers also put as *tawolo* the most favourite space in *omo hada*. It leads to the idea that the *tawolo* can be used as a semi-public area for house owners and guests. *Tawolo*

occupies 40% space of the second floor but sometimes if the number of guests is too many, they also use half of *tawolo* for the sleeping space. The *föröma* can be used as a bedroom for house owners and guests because the space is wide, and they rarely use this area in daylight. The proportion of *föröma* is around 60% of the total area of the second floor and guests usually use 20% of *föröma*.

Furthermore, the floor plan recorded from Bawomataluo villages shows that the villagers modify the *föröma* instead of the *tawolo* area. It means that the *föröma* area is possible to be modified for a homestay area with some adjustments without disturbing the privacy of the house owner and the guest. In the Sample 2 case, *föröma* is flexible except for the *kolukolu* area. The house owner never allows this place for the guest because it is always used by the oldest member of the family. In ancient area, *kolukolu* is a private place and usually a space for newlywed couple.

There are two possible accesses from the original *omo hada* system which is from the side of *tawolo* and from the *arönoma* or the ground floor area. Through the ground floor, *arönoma*, people can directly access new additional space so this access will be suitable for the house owner. Meanwhile, the original access from the side of the *omo hada* is suitable for the guest.

5. Conclusion

There are some problems related to preservation in Indonesia's cultural heritage such as less awareness of the heritage cultural property because of the vast improvements of infrastructure in the 21st century, introduction to healthy houses using industrial materials in 20th century, introduction to a new religion which changes the way of life, and changes in agriculture type into commercial agriculture. It results in the minimum discussion about Indonesia's living heritage and the lack of experts. The economic disparity between the central region and other small islands also creates a poverty problem which brings difficulty in sustaining the native culture.

Through the literature survey about Bawömataluo Village in the 1860 era and on-site survey from 2017 until 2022, it is understood that the living space of Nias people in *omo hada* has evolved and transformed due to modern space necessity and financial ability. Some villagers decide to open their own businesses such as grocery shops inside the village in order to provide modern necessities such as soap, toothpaste, detergent, book, stationery, etc. They started to modify the ground area of the house called *arönoma* for the grocery shop, wood carving shop and photocopy service area. Other than retail space, villagers also start to accept guests to stay with them during the visit.

Bawömataluo village has become Indonesia's National Cultural Property since July 2017. The reuse of cultural property should be considered carefully by understanding the history of the traditional house, local culture, as well as villagers' behaviour and understanding the modern living necessities. To reuse the cultural property, detailed research about utilization and activities inside *omo hada* is necessary. In Law No. 11 of 2010 article 78 number 3, it is mentioned that the development of National Cultural Property is possible for improving the quality of life of the inhabitants and for preserving the cultural property. The development might add new space and function that should be harmonized with the local activities in the cultural property area. As for the appropriate use of the traditional house *omo hada*, modifying *omo hada* for new functions is possible in order to continue the living and preserve the cultural property. One idea is the homestay program, which allows the villagers to receive money for maintenance and at the same time preserve their daily life and tradition.

The homestay program keeps the basic concept of *omo hada* where there are three sections in a building, which are substructure, main structure and superstructure. From the sample of space layout taken in South Nias village, *föröma* (private space) in *omo hada* is often modified while *tawolo* (public space) remains the same. The on-site survey shows that the *föröma* area is often modified by changing the layout because the number of families is increasing and then some rooms are added. As a result of observing 30 houses and two sample houses, *tawolo* is found to be a frequently used space and it has 40% of the total space of the second floor. Therefore, it is better not to do many modifications. Meanwhile, *föröma* occupies 60% of the second-floor area and is used only for sleeping areas at night. Therefore, adaptive reuse can be made possible in a *föröma* area.

This idea of homestay came up after many foreigners and Indonesians came to Nias Island for research activity and holiday. As we see in research sample, *omo hada* has flexibility of the space arrangement. This adaptive reuse of *omo hada* allows them to continue their living culture that is mixed with modern necessities while at the same time preserving the cultural property.

Acknowledgments

The authors acknowledge Bawömataluo's chief of village and villagers for their cooperation and help during the research activity. We would like to say thank you to Professor Koji Sato who was a researcher at the Center for

Cultural Resource Studies at National Museum of Ethnology Japan for his guidance during survey and research in Bawömataluo village. Also would like to thank to Dini Aiko Subiyantoro who helped a lot during the site survey in Bawömataluo village. This work is supported by JST SPRING scholarship with Grant Number (JPMJSP2124).

References

- Ando, K., Inui, N., Yamashita, K., & Inoue, K. (1982). The form of the Villages in Nias, Indonesia. *Summaries of Technical Papers of Annual Meeting* (pp. 869-870). Retrieved from <http://ci.nii.ac.jp/naid/110004154578>
- Atmanti, F. P., & Uekita, Y. (2016). *Finding the Structural Genius of Bawömataluo's Architecture for Tourism Development Part 14* (pp. 649-650). Technical Papers of Annual Meeting of Architectural Institute of Japan Architectural Historical Design. Retrieved from <https://www.aij.or.jp/paper/detail.html?productId=377401>
- Atmanti, F. P., Uekita, Y., & Shigeo, O. (2017). *Appropriate Use of Traditional House Omo Hada in Bawömataluo, Nias Island, Indonesia for Architecture Preservation and Tourism Development - Conservation for Wooden Buildings of Traditional Villages in Nias Island Indonesia Part 16* (pp. 623-624). Technical Papers of Annual Meeting of Architectural Institute of Japan Architectural Historical Design. Retrieved from <https://www.aij.or.jp/paper/detail.html?productId=609001>
- Feldman, J. (1977). *The Architecture of Nias, Indonesia with Special Reference to Bawomataluo Village*. PhD diss. Columbia University.
- Feldman, J. (1989). *The Design of the Great Chief's House in the South Nias, Indonesia in Dwellings, Settlements, and Tradition: Cross-Cultural Perspectives*. University Press of America.
- Hanazato, S., Uekita, Y., Ono, K., Nitto, K., & Odaira, S. (2014). Survey of Structure, Construction and Deterioration-Conservation of Groups of Traditional Wooden Houses in South Nias, Indonesia Part 1. *Journal of Architecture and Planning*, 698, 1055-1062. <https://doi.org/10.3130/aija.79.1055>
- Nitto, K., Uekita, Y., Hanazato, T., Ono K., Hanazato, S., Odaira, S. (2014). The building character and the repair method of the Omo Sebua building: Conservation for Wooden Buildings of Traditional Villages in Nias Island, Indonesia. *Summaries of Technical Papers on Annual Meeting* (pp. 713-714). <https://www.ccsenet.org/journal/index.php/ach/article/view/57824>
- Purwanto, S. A., & Indraini, H. (2018). The Story of Building Healthful House in East Nusa Tenggara, Indonesia. *Saude Soc. Sao Paulo*, 27, 605-614. <https://doi.org/10.1590/s0104-12902018170819>
- Subroto, T., & Yoyok, W. (2013). *Why Should Bawomataluo in Nias Island be Preserved*. Draft of Bawomataluo Preservation Master Plan.
- Uekita, Y. (2013). *Requirement Conditions of a Traditional Village as Cultural Heritage*. Draft of Bawomataluo Preservation Master Plan.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).