TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

DIPLOMARBEIT

The progress of the architecture concerning the influence of the cultural and social aspects in South – Nias

On the example of Hiliamaetaniha and Sondregeasi

ausgeführt zum Zwecke der Erlangung des akademischen Grades

eines Diplom-Ingenieurs

unter der Leitung

Ao.Univ.Prof. Dipl.-Ing. Dr.techn. Erich Lehner

E251-1 Fachgebiet Baugeschichte und Bauforschung

Institut für Architektur- und Kunstgeschichte, Bauforschung und Denkmalpflege

eingereicht an der

Technischen Universität Wien

Fakultät für Architektur und Raumplanung

von

Andreas Aahs

9927065

Wien, am

The progress of the architecture concerning the influence of the cultural and social aspects in South – Nias

On the example of
Hiliamaetaniha and Sondregeasi

Andreas Aahs

9927065

Vorgartenstraße 122/414
1020 Vienna
Austria

2012-2014

Die Entwicklung der Architektur hinsichtlich der kulturellen und gesellschaftlichen Aspekte in Süd –Nias

An Beispielen der Ortschaften Hiliamaetaniha und Sondregeasi

Die Diplomarbeit handelt über die weltweit einzigartige Architektur auf Nias. Grundlage dieser Arbeit ist eine 2 monatige Forschungstätigkeit vor Ort, die ich im Sommer 2012 zusammen mit Kollegen des Projektes ASSIP (Architecture, Space, and Society in Post-Disaster Built Enviroments in Indonesia) durchgeführt habe.
Nias ist eine Insel westlich von Sumatra, hat eine Größe von ca. 5600 km^2 und bietet ca. 750000 Bewohnern Unterkunft. Die im Indischen Ozean liegende Insel ist Teil der Republik Indonesien.
Die weltweit einmalige Architektur, ist in den Teilen der Insel (Nord-, Zentral- und Süd-Nias) verwandt aber unterschiedlich. Meine Arbeit befasst sich mit der Region Süd-Nias, genauer gesagt mit den Ortschaften Hiliamaetaniha und Sondregeasi, die westlich von Deluk Dalam in der Bucht von Lagundri liegen.
Unterscheiden kann man in traditionelle Ortschaften wie zum Beispiel Hiliamaetaniha und moderne Ortschaften wie Sondregeasi. Anhand dieser Beispiele werden die Entstehung, der Aufbau, die Entwicklung und Verwandtschaften und Unterschiede der Ortschaften hinterfragt und erläutert.
Hiliamaetaniha liegt wie die meisten traditionellen Ortschaften auf einem Hügel. Der Zugang zu der Ortschaft ist ein schmaler, steiler Fußweg, der in eine Treppenanlage endet, welche der direkte Zugang zur Ortschaft darstellt. Die traditionelle Ortschaft besteht aus einem breiten gepflasterten öffentlichen Hauptweg, der von aneinander gebauten Häusern begrenzt ist. Das mittig liegende Freigelände besteht aus einem zentralen, öffentlichen Fußweg, dem Iri Newali; einem gepflasterten Vorgarten, den Halaman; einer im Fussboden eingelassenen Regenrinne, der Elea; einem überdachten, durchgehenden und erhöhten Fußweg, den Mbelembele und den flankierenden Häusern.
All diese Bereiche haben eigene Funktionen, stehen in Abhängigkeit zueinander und stehen in enger Verbindung mit den Leben der Bewohnern. Alle diese Aspekte werden in der Diplomarbeit durchleuchtet und erläutert.
Sondregeasi ist eine in den letzten Jahrzehnten entstandene Ortschaft und liegt im Gegenteil zu Hiliamaetaniha an der Küstenstraße im Tal. Die neue Ortschaft ist vom Aufbau her der traditionellen Ortschaft verwandt, unterscheidet sich aber durch die unterschiedliche Lage, die neuen modernen Anforderungen und durch die geänderte Lebensweise der Bewohner. All diese Entwicklungen und Änderungen werden erläutert.
Weiter hinein gezoomt ist das Haus die nächste interessante Einheit. In den bisherigen Publikationen wurde grundsätzlich nur auf die weltweit einzigartigen traditionellen Häuser, den Omo Hada´s, eingegangen.
Da aber die traditionellen Standardhäuser in ihrer jahrhundertlangen Geschichte sich weiter entwickelten und es auch andere traditionelle Bautypen auf Nias gibt mit denen sich Forscher meines Wissens noch nicht detailliert befasst habe, war ein sehr breitgefächertes Forschungsfeld vorhanden.
Das traditionelle Standard Haus ist ein Stelzenhaus aus Holz, das in geschlossener Bauweise aneinander gebaut wurde. Das Haus kann in drei Ebenen eingeteilt werden; die Unterkonstruktion, bestehend aus vertikalen und schrägen Holzpfählen; die Wohnebene, bestehend aus zwei Haupträumen, dem Tawolo und dem Feröma; und dem hohen offenen Dachbereich. All diese Ebenen zusammen ergeben eine einzigartige Architektur, die eng mit der Struktur der Ortschaft und der traditionellen Lebensweise der Bewohner verbunden ist.

Das traditionelle Standard Haus wurde schon in der Kolonialzeit nach hinten erweitert. Diese Erweiterungen wurden bis zur heutigen Zeit ausgebaut und vergrößert und den gegebenen Anforderungen der Bewohner angepasst. In den letzten Jahren wurde zusätzlich auch die Unterkonstruktion des Hauses ausgebaut. Durch diese Ausbauarbeiten entwickelten sich neue zusätzliche Bereiche mit neuen Funktionen, die den täglichen Lebensablauf im traditionellen Standardhaus änderten. All diese Änderungen und Entwicklungen werden erläutert.
Neben diesem traditionellen Bautyp entwickelte sich ein weiterer verwandten Bautyps, das traditionelle Haus auf kurzen Pfählen gebaut. Dieser Typ ist der traditionelle Standard Haus sehr ähnlich nur stark vereinfacht. Natürlich hat auch hier eine Weiterentwicklung stattgefunden. Die Unterschiede und Entwicklungen werden im Detail durchleuchtet.
Eine sehr seltene traditionelle Sonderform ist eine Vermischung der erwähnten traditionellen Bautypen. Dieser Bautyp ist in Hiliamaetaniha ebenfalls auffindbar und wird dementsprechend erarbeitet.
Durch die Erweiterung der Ortschaft und die neuen verfügbaren Baumaterialien entstand in den letzten Jahrzehnten eines komplett neuen Bautyps, das moderne Haus. Das moderne Haus ist in den Erweiterungen der traditionellen Ortschaft Hiliamaetaniha auffindbar und die neu entstandene Ortschaft Sondregeasi besteht zu Gänze aus modernen Häusern.
Das moderne Haus ist ein meist einstöckiges, ebenerdiges Einfamilienhaus, das in den meisten Fällen aus Beton und Ziegeln gebaut ist.
Obwohl das moderne Haus komplett anders als die traditionellen Häuser aussieht haben sie viele verwandte Aspekte. Trotz der kurzen Geschichte des modernen Hauses hat sich die Raumaufteilung schon stark verändert und befindet sich immer noch in einer fortführenden Entwicklung. Die Verwandtheiten zum traditionellen Haus, die Entwicklungen des Grundrisses und die Raumfunktionen wurden analysiert und ausgearbeitet.
Im Anhang sind die selbst erstellten Lagepläne, Fassadenabwicklungen und die Pläne der vermessenen Häuser angeführt.

Andreas Aahs

The progress of the architecture concerning the influence of the cultural and social aspects in South – Nias

On the example of Hiliamaetaniha and Sondregeasi

This thesis deals with the worldwide unique architecture from the island of Nias in the Republic of Indonesia. It is based on a fieldwork in summer 2012, where colleges from the project ASSIP (Architecture, Space, and Society in Post-Disaster Built Environments in Indonesia) and me explored the island of Nias for two month.

Nias is located west of Sumatra in the Indian Ocean, it has a size of about 5600m^2, and its population is about 750000 people.

In the first part of the thesis, focus is laid on the villages in South-Nias, where two types exist: the traditional and the modern village. We picked Hiliamaetaniha as an example for a traditional village and Sondregeasi as an example for a modern village for our research. We will use these two villages to detail the most important topics, such as the origin of the villages, the development of the villages, the setup and layout of the villages, the relationships and differences between the two villages, and the social living in the villages. Additional focus is laid on the different and unique areas which form the villages as well as their function and usage.

The second part of this thesis deals with the houses in South-Nias. The architecture of the traditional house is, as can be found in the literature, worldwide unique. The houses are built out of wood, stand on pillars, and have an exceptional front facade. They are built next to each other, which results in an incredible picture of a row of house facades.

Besides this famous house type, also other traditional house types are part of the assembly of the traditional village. The development of these different house types, the relationships and differences, the construction, the connection between the houses and the village, the daily living of the inhabitants in the houses, and also the function and development of the different rooms and areas of the house will be explained.

With the growing demand of more space, the inhabitant started to build extensions behind the houses instead of leveraging the substructure beneath the houses. The impact and changes of these new areas are also part of the thesis.
In the last decades a new type of house arose; the modern house. The reasons for this are the availability of new materials as well as the changed lifestyle. However, the modern house has interesting relationships and similarities in comparison to the traditional house. The analysis of these is the last part of this thesis.

The progress of the architecture concerning the influence of the cultural and social aspects in South-Nias - on the example of Hiliamaetaniha and Sondregeasi

Contents Pages

The progress of the architecture concerning the influence of the cultural and social aspects in South-Nias - on the example of Hiliamaetaniha and Sondregeasi

Contents Pages

The progress of the architecture concerning the influence of the cultural and social aspects in South-Nias - on the example of Hiliamaetaniha and Sondregeasi

Contents Pages

The progress of the architecture concerning the influence of the cultural and social aspects in South-Nias - on the example of Hiliamaetaniha and Sondregeasi

Contents Pages

Andreas Aahs

9927065

Vorgartenstraße 122/4/414
1020 Wien

Student der Technischen Universität Wien
Fakultät für Architektur
Institut für Kunstgeschichte, Bauforschung und Denkmalpflege
E251-1 Fachgebiet Baugeschichte und Bauforschung

1. ASSIP

This essay is part of a international project called ASSIP

fig. 01: logo ASSIP

1.1 Description

"ASSIP (Architecture, Space, and Society in Post-Disaster Built Environments in Indonesia) is an interdisciplinary research project that deals with the relations between architecture and society in the context of reconstruction programs after natural disasters. It focuses particularly on changes and interdependencies between the built environment – individual houses and settlements – and local socio-cultural factors. We also examine the influence of these socio-cultural factors on community participation in reconstruction programs and, ultimately, on the social acceptance and sustainability of these programs. The aim is to develop, on the basis of the research results, a database and software tools that will provide easy access to relevant background information about socio-cultural and architectural particularities in regions affected by a natural disaster. This will accelerate the transfer of knowledge and information especially useful in the rebuilding of homes and settlements, between people who need help, the helpers and researchers working in that area."[1]

1.2 Project

"In the past few decades, the number of natural disasters has increased worldwide. Southeast Asia has been one of the regions most strongly affected, and aid organisations have been extensively involved in medium and long-term relief and reconstruction programs. The relevance of community participation in development programs has been long recognised, but under the difficult conditions and tight schedules prevailing in post-disaster contexts it is one of the greatest challenges that government and humanitarian organisations encounter. The aim of ASSIP is to undertake research that will enable the development of effective policies and practices for achieving substantial community participation in post-disaster relief and reconstruction programs.

The research will be conducted in two locations in Indonesia: the island of Nias, west of Sumatra, and the region of Yogyakarta in Central Java. In 2005 and 2006 respectively, strong earthquakes and tsunami devastated large parts of both regions, killing thousands of people and causing severe widespread damage to the built environment. Reconstruction programs were organised and proceeded in remarkably different ways that, according to the research we have so far conducted, were strongly influenced by specific historical, cultural and social conditions in these two regions. The re-building of houses has now largely been accomplished. These new houses and settlements have been integrated within pre-existing local structures, and local people have adapted their lives to these changes in the built environment. ASSIP's interdisciplinary team of technical and social scientists investigates the mutual influences between socio-cultural factors and the built environment in reconstruction areas. An important goal of the research is to determine how these socio-cultural factors contributed to, or may have deterred, community participation in the programs that enabled the reconstruction of the built environment.

The documentation, analysis and comparison of data from two different regions (Nias and Yogyakarta) will provide a broader picture highlighting local characteristics and peculiarities. Moreover, close attention will be given to identifying differences in the political, economic and socio-cultural systems in both regions, as well as in the organisation, structure and activities of the relief and reconstruction operations.

A specially adapted GIS program will be used in the course of this project as a primary tool for research and documentation of earthquake affected regions. While the technical particularities of the buildings themselves are to be investigated, the project focuses on analysing the internal and external spatial organisation within as well as between buildings and entire settlements. Besides gathering factual data about selected settlements, such as layouts, building techniques and materials used, the research team carefully studies people's activities and relations within houses, compounds, neighbourhoods and settlements, and in wider geographical spaces, as well as local perceptions and conceptions of social and natural places.

As we are interested in questions of continuity and change in building techniques, and how they are related to socio-cultural expectations and practices, in this research project we compare the experience of reconstructing the built environment with other present and past settlements and their inhabitants' life-styles in these two regions of Indonesia. In doing so, particular attention is paid to the built environment as a social and 'cultural' space in opposition to the 'natural' environment. This comparative dimension to our research aims to disclose how the relational and often changing

[1] *http://www.assip.org/*

spatial divisions and social domains of the built environment in our two sites of investigation are intimately connected with and shaped by class, gender and other core determinants of social order. The built environment is the setting for the most fundamental of human relationships, between men and women, between family members and between hosts and guests. Consequently, our research investigates how these relationships have been influenced by changes in the built environment and vice versa. It further aims to discover how social relations and hierarchies have influenced perceptions, expectations and willingness to participate in reconstruction programs and how they have affected long-term developments in our two sites of investigation."[2]

1.3 Member of ASSIP

University of Technology
Vienna, Austria
University of Vienna
Austria
Centre for Asian Studies, IHEID
Geneva, Switzerland
Gadjah Mada University (UGM)
Yogyakarta, Indonesia
University of North Sumatra (USU)
Medan, Indonesia
Museum Pusaka Nias
Gunungsitoli, Indonesia[3]

1.4 My assignment in the project of Nias

As mentioned, the ASSIP project investigates two different regions of Indonesia. The team I was a member of worked on the island of Nias in West-Sumatra where we selected two places for fieldwork. The northern area is situated about two and a half kilometres south-west of Gunungsitoli, the capital of Nias, conatining the traditional village of Tumöri and the recently built village Dahana Tabaloho. Bordering on Dahana Tabaloho there is a settlement newly erected by an NGO, which is also subject of our studies.
Our second site is in the South of Nias near the bay of Lagundri, encompassing the traditional village of Hiliamaetaniha and the recently developed village Sondregeasi. On this second place there is also a NGO-built settlement close to Sondregeasi. These new houses were built by the organisation BRR.
These two locations allow a thorough comparison between traditional, modern, and NGO imposed settlement patterns and aspects of daily life within the built environment of these villages.

The basis of every research is a proper site plan. So the first activity was to make these drawings with the help of publicly accessible satellite imagery. However, in villages where the detailed images were not available, it was necessary to conduct survey using a Tachymeter (Geodesy). With proper and up-to date village plans it was possible to do accurate architectural (and anthropological) research on the layout, development, and function of the settlements under research.
Another important topic is the variety of house types existing within the villages. Apart from building types which are completely different in appearance, also the examination of surroundings was vital: the transition from the open village space towards the house and also the entrance situation into the houses. A main topic of the research was the functional analysis of rooms located inside the houses. These rooms of course changed during the development of new or different house types.
The data acquired during the investigations and analysis will be incorporated into a GIS system, which enables easy geo-referenced access for other researchers within the project.

1.5 Fieldwork in Indonesia

The fieldwork started with "The 1st Biennale International Conference on Indonesian Architecture & Planning 2012". The congress was organised by members of our partner university, the Department of Architecture from the Gadjah Mada Universitas in Yogyakarta on Java and was held from the 9th to the 11th of july 2012.
After the congress we met our Indonesian colleagues and examined the area of fieldwork where our second team will work. This area consists of several Javanese villages.
Our research on Nias started on 17th of July. After a short visit of the places in the north, we started our research in the south of Nias. We worked from 20th of July until 12th of August in Hiliamaetaniha and Sondregeasi. Later on we moved back to Gunungsitoli and continued in Tumöri and Dahana Tabaloho from 13th of August to 1st of September.

[2] *http://www.assip.org/*

[3] *http://www.assip.org/*

1.5.1 Timetable of the fieldwork

2012-07-17	
	arrival in Gunungsitoli
2012-07-18	
	visit of Tumöri, Dahana Tabaloho, Sihare Siwahili
2012-07-19	
	move to South-Nias; visit of Hilimondegeraya
2012-07-20	
	visit of Bawömataluo, Orahili, Hilisimuetane, Bawögosali, Hilinewalefau
2012-07-21	
	preparation for the survey; reworking of the data from 2011
2012-07-22	
	First visit to ssond, shiae; compare site plan to village
2012-07-23	
	surveying for the site plan in ssond
2012-07-24	
	surveying for the site plan in ssond; GPS-track
2012-07-25	
	surveying for the site plan in ssond
2012-07-26	
	surveying for the site plan in ssond, ssbrr
2012-07-27	
	surveying for the site plan in ssond, shiae
2012-07-28	
	surveying for the site plan in shiae
2012-07-30	
	work out the questionnaires shaie
2012-07-31	
	survey - interview: shiae 070, 028, 027, 124
2012-08-01	
	survey - interview: shiae 081, 058, 044, 043
2012-08-02	
	survey - interview: shiae 526, 517, 532, 094
2012-08-03	
	survey - interview: shiae 102, 099, 095
2012-08-04	
	survey - interview: shiae 023, 111, 510, 506
2012-08-05	
	save data; work out questionaires ssond, ssbrr
2012-08-06	
	survey - interview: ssbrr 905, 936, 947; ssond 005
2012-08-07	
	survey - interview: ssbrr 928, 925, 921
2012-08-08	
	survey - interview: ssbrr 932, 935, 953; ssond 047
2012-08-09	
	survey - interview: ssond 041, 025, 054, 014, 021, 032
2012-08-10	
	survey - interview: ssond 043, 033, 003; shiae 094
2012-08-11	
	edit Overviewmap shiae. ssond, ssbrr
2012-08-12	
	move to Museum Pusaka Nias in ngusi
2012-08-13	
	rename and overwork data
2012-08-14	
	rename and overwork data
2012-08-15	
	work out the questionnaires ntumo, ntaba; work out site plans ntumo, ndaha, ntaba
2012-08-16	
	survey - interview: ntumo 011
2012-08-17	
	create Memo
2012-08-18	
	work out overviewmap and overviewlist ntumo Dusun 1, 2
2012-08-20	
	work out overviewmap and overviewlist ntumo Dusun 3; survey - interview: ntumo 010, 022, 036
2012-08-21	
	work out overviewmap and overviewlist ntumo; survey - interview: ntumo 572
2012-08-22	
	survey - interview: ntumo 016, 525, 530
2012-08-23	
	arrival Ferenc - review; create Memo
2012-08-24	
	survey - interview: ntumo 035, 526, 561
2012-08-25	
	survey - interview: ntumo 311, 507; create Memo
2012-08-27	
	drawings from ntumo 526, 531, 525
2012-08-28	
	tour ntaba; survey - interview: ntaba 001, 016
2012-08-29	
	tour ntaba
2012-08-30	
	survey - interview: ntaba 041, 050, 091
2012-08-31	
	survey - interview: ndaha 999, 888
2012-09-01	

exchange data; departure to Kuala Lumpur

list 01: timeschedule fieldwork 2012

1.5.2 Team of the fielwork

The main team, which worked in Nias consisted of three people:

Andreas Aahs
Master Student of Architecture – Vienna UT

Dwi Eva Ade Lestari
Master Student of Architecture – UGM

Julian Breuling
Cultural and Social Anthropology – University of Vienna

This main team collaborated during the whole research on Nias. My job was the drafting of the site plans and the surveying of the houses, which included the sketches as well as the photo documentation. It was not possible for me to do any interviews, as none of the people we interviewed spoke English. So this task was carried out solely by Julian Breuling and Eva Lestari. Eva also helped with the sketches and the photo documentation.
While Julian Breuling and Eva Lestari made the interview with the owner of the house, I did the sketch with the measurements and the photo documentation.

fig. 02: team (left-right): Bente Wolff, Julian Breuling, Andreas Aahs, Erich Lehner, Ulrike Herbig

In the initial phase, Erich Lehner, the Project Leader, was part of our team on Nias as well. He helped us to discuss and definde the topics for our research. Ulrike Herbig joined the field team for the time of village surveys using the Tachymeter (Geodesy). She helped us also to organize our current research.

1.5.3 Result of the fieldwork

In South-Nias we worked on two villages, Hiliamaetaniha and Sondregeasi. Together there are 294 houses in these villages, of which we were able to survey and do interviews in 47 houses. This is a sample of 16%, which we consider to be representative, as houses were picked to contain all existing types.

Hiliamaetaniha:
178 existing houses
26 surveyed houses
~14.5%
traditional village:
142 existing houses
21 surveyed houses
~15%
extended village:
36 existing houses
5 surveyed houses
~14%

Sondregeasi
55 existing houses
11 surveyed houses
20%
BRR-Settlement
61 existing houses
10 surveyed houses
~16.5%

The amount of houses in the North-Nias settlements were similar to the south. In Tumöri and the BRR-Settlement in Dahana Tabaloho were 257 houses at the time of the research.
We surveyed 22 of them, which are about 8.5%.

Tumöri
154 existing houses
13 surveyed houses
~8.5%

BRR-Settlement in Dahana Tabaloho
103 existing houses
9 surveyed houses
~8.5%

Example of a surveyed house:

shiae099 – Traditional Standard House build on short pillar

fig. 03: elevation "shiae 099"

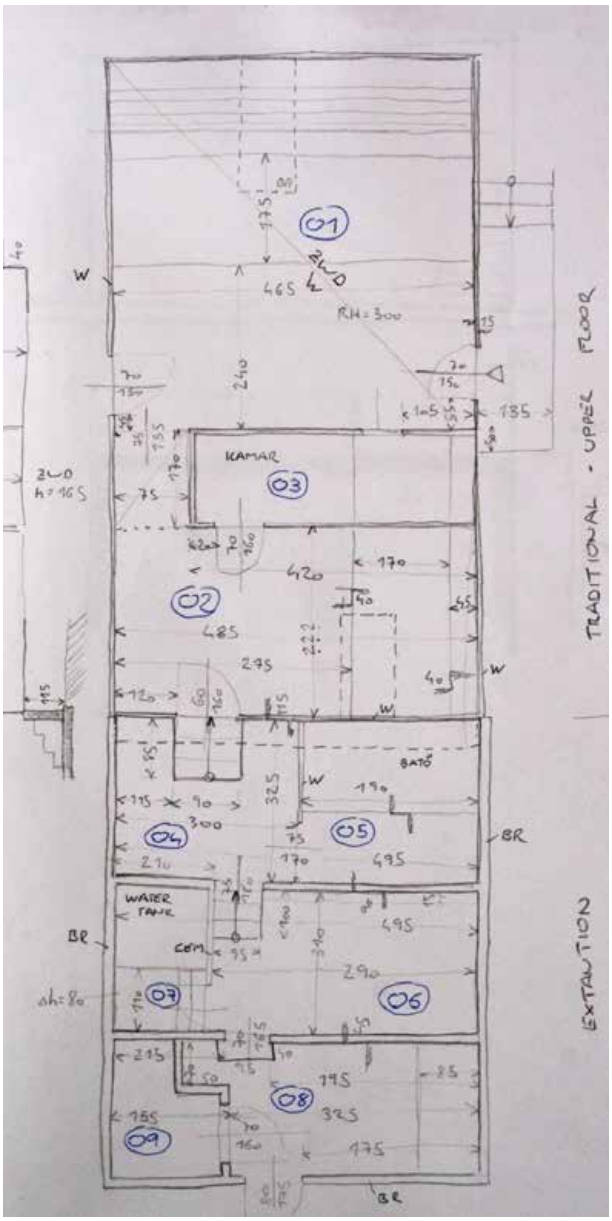


fig. 04: sketch of the groundfloor "shiae 099"

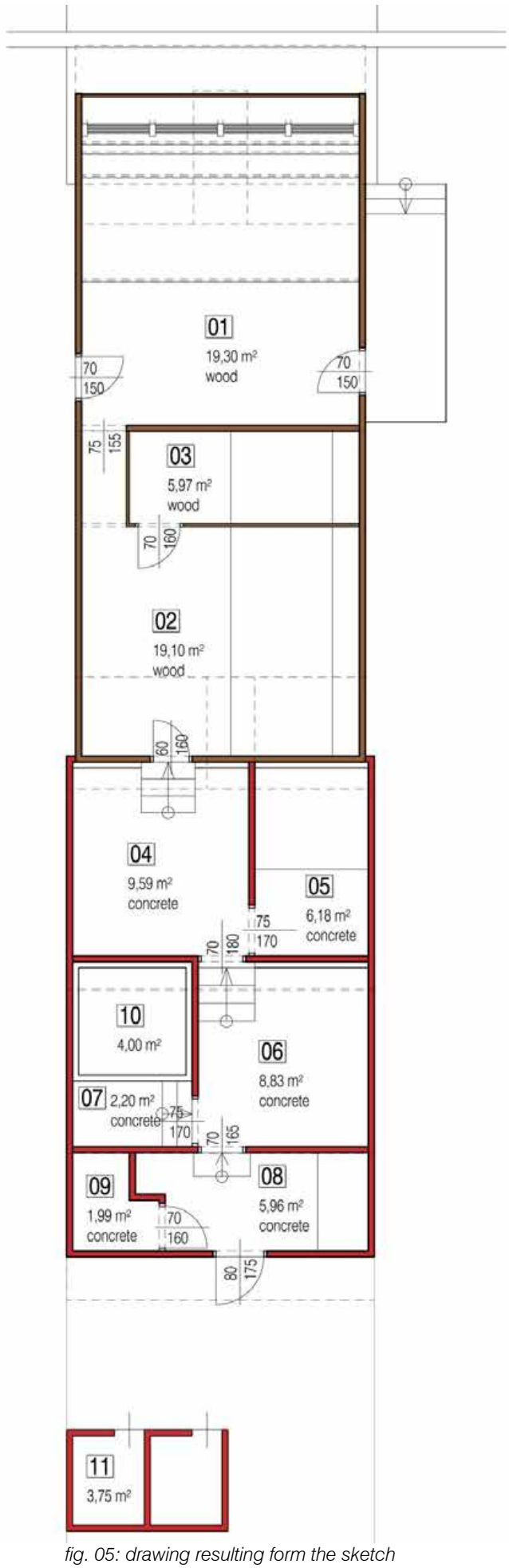


fig. 05: drawing resulting form the sketch

Questionary TSH:

1. Owner and house

1.1. How many people are living in the house?
- 1.1.1. Permanently
- 1.1.2. Some times

1.2. Who build the house?

1.3. Who owns the house?
- 1.3.1. Cost

1.4. How was aquired?
- 1.4.1. Land
- 1.4.2. House

1.5. Who build the modification under the house?
- 1.5.1. Cost

1.6. Who built the modification behind the house?
- 1.6.1. Cost

1.7. Do you have plan to modify the house?
- 1.7.1. What kind of modification?
- 1.7.2. Why did you build the modification?
- 1.7.3. What is the function of the modification?
- 1.7.4. Has the modification changed the function of the other rooms?

1.8. Is your house a traditional house or a new house?
- 1.8.1. How long do you life in the house?
- 1.8.2. Do you have a business in the house?
- 1.8.3. How do you know the borders of your land?

1.9. Do you have a 2nd house?
- 1.9.1. What do you do with it?
- 1.9.2. Where is the house?
- 1.9.3. If you would build a new house, what kind of house would you like to have? – where?
  - 1.9.3.1. What material would you use?
- 1.9.4. For Omo Nrawa with Sichöli only: why did you build the traditional parts on the house?
- 1.9.5. What is a traditional house? – what does it have to have?
- 1.9.6. What is a new house?
- 1.9.7. Would you like to live in a traditional house or in a new one?
- 1.9.8. Advantage – disadvantage of the traditional house / new house?

2. Function

2.1. The name of the rooms?

2.2. The function of the rooms?

2.3. What space is used for man – woman?
- 2.3.1. What space is public – privat?
- 2.3.2. How many kitchen do yo have?

2.4. Is there a different function of the rooms before and after the modification?

2.5. Where do the people sleep?

2.6. What do you do with the space in front of the house?

2.7. Do you put new megalits in front of the house?
- 2.7.1. Who build them, when, why and what function do they have?

2.8. Function of the watertank?
- 2.8.1. For what do you use the water?
- 2.8.2. Why not use the Sumur Umum?

3. Earthquake

3.1. Was there any damage after the earthquake in 2005?
- 3.1.1. What kind of damage?

3.2. Who repaired it?
- 3.2.1. How much did it cost to repair the house?
- 3.2.2. Who paid it? How could you afford it?

3.3. Was there any help by a aid organization?
- 3.3.1. What organization helped you?
- 3.3.2. What was the criteria to receive help?

3.4. Did you receive a house by an aid organization?
- 3.4.1. What organization?
- 3.4.2. How did you receive the house?
  Why did you received the house?
  Who was involved?
  What was the administrative process?

2 NIAS

The island of Nias is located in the Indian Ocean, about 112[4] kilometres west of Sumatra. Its origin is volcanic. The region consists of 131 islands, Nias, with a size of 5625 km²[5], is the largest. In the north the Simeule and the Banyak islands, in the south the Batu-islands can be found. Nias is a part of Indonesia and belongs to the Province of Sumatera Utara.[6]

The Island of Nias is, due to its special culture and architecture, a unique, small and independent world.

fig. 06: map of the Republic of Indonesia

The capital of Nias is Gunungsitoli, which is located at the northern part of the eastern coast.
Nias is a lowland area with heights of about 800 meters above sea level. The climate is tropical with a very high humidity.
According to the 2010 census the population of the island of Nias is 756762. Nias has his own language, Bahasa Niha, but the official language is Bahasa Indonesia.
90% of the citizens are Christians. The other 10% are Animists, Muslim, Hindu or Buddhists.[7]
Politically Nias is divided into two regions:
The first and larger region, Nias, contains 14 districts and encompasses the capital Gunungsitoli.
The second region, called South-Nias, consists of 8 districts with its capital Teluk Dalam.[8]

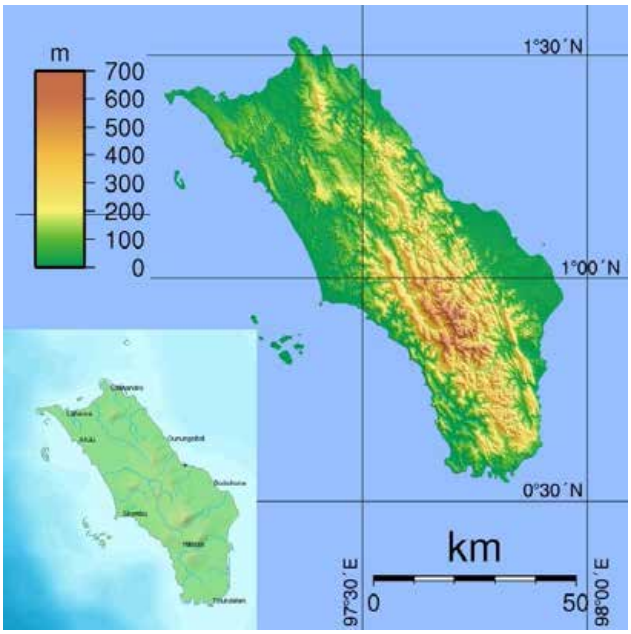


fig. 07: map of Nias

[4] *Pietro SCARDUELLI; Accumulation of heads, distribution of foot; The image of power in Nias; In: Bijdragen tot de Taal-, Land- en Vorkenkunde 146 (1990), no: 4, Leiden, 448-462; p. 448*

[5] *Petra GRUBER, Ulrike HERBIG; Settlements and housing on Nias Island, Adaptation and Development; p. 1*

[6] *http://www.niasisland.com/*

[7] *http://www.nias-ev.de/*

[8] *http://www.nias-ev.de/*

3 The villages in Nias

On Nias the villages are divided into two categories. There are traditional villages, like Hiliamaetaniha in the South of Nias, which have a long history and preserve their shape and layout for more than 100 years now. There are new villages, like Sondregeasi, as well, which have been founded in the last decades. These new villages are located near to the coast and next to the main roads, which were built in the 1970´s[9].

The orientation of the villages are naturally given by terrain and not adjusted to any cardinal direction.[13] [14]

There are several good reasons to build a village on the top of a hill. One reasons for the location on the hill is a mythological aspect, which can be read in the disertation from Achmad Bagoes Poerwono WIRYAMARTO. [15]

The most important reason is security. Each of the South-Nias villages has been in fact a (more or less) autonomous tribal kingdom.

fig. 08: map of South-Nias

3.1 The Traditional Village

3.1.1 Position of the traditional villages

Hiliamaetaniha is, like all the other traditional South-Nias settlements, located on a hill.[10]

"Hili Amaeta Niha [!] Village is situated 1000 feet above the sea level."[11] The perfect location is a level hill crest[12], which is sloping down in every direction.

Of course there happend to be lots of dissensions, and because the Niha were belligerent people by attitude, they fought a lot of wars against each other. The elevated position on top of a hill makes the village easier to defend and harder to conquer. Another reason to build a village on a hill is springs, the so-called lifeline of the village. Also very important for the residents of the villages are the gardens next to the village where they cultivate their food.

---

[9] Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 60

[10] Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 98

[11] www.niasisland.com > Place to Visit > Teluk Dalam > 5. Hili Amaeta Niha

[12] Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 40

[13] Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 44

[14] Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 118

[15] Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 21, 22

fig. 09: Topography of Hiliamaetaniha and Sondregeasi

3.1.2 Hiliamaetaniha

3.1.2.1 The history and name of Hiliamaetaniha:

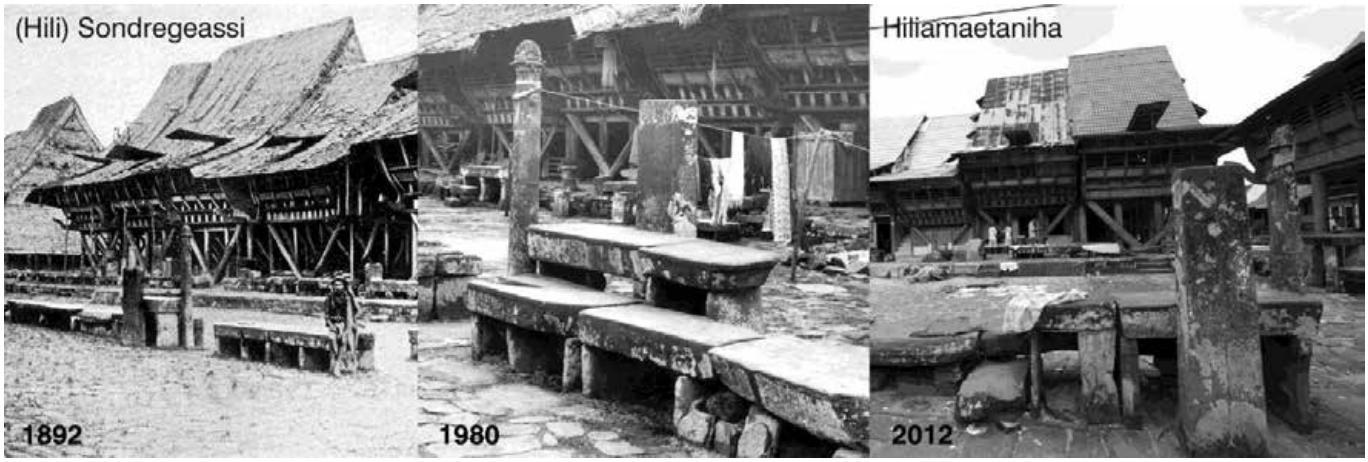


fig. 10: pictures of the village Hiliamaetaniha

The first time the name of Hiliamaetaniha is mentioned in literature is in the journals of Joachin Freiherr von Brenner. He carried out a research expedition on the island of Nias in 1886.
Interestingly, at this time, the settlement of Hiliamaetaniha was called Sondregeassi. Brenners images of the town of Sondregeassi, which show very characteristic megaliths, can be compared with other pictures from Alain Viaro, who did research in the same location in the 1980s and of course the pictures from my own research in 2012. At the time of Viaro´s research the location has already been renamed Hilimaetaniha, but the images proof that it is without doubt the very same place.
Due to that, the original name of the town is Hili Sondregeassi.
In the year 1891 a fire destroyed the whole village. A few people moved on the other side of the bay of Lagundri and founded a new village called Hili Botodane.
Nowadays the name of this village has been changed to Botohilitanö. The rest of the residents founded a new village at the same place with the new name Hiliamaetaniha.[16]
The name “Hiliameitaniha” means “The hill with great population”[17]
The village of Hiliamaetaniha has a long history and it grew step by step. As there was not enough space on the hilltop, a new settlement was founded at the junction of the coastal road and the path leading up to Hiliamaetaniha. The new village was named after the old hilltop village, Sondregeasi.

[16] *Reinhold MITTERSAKSCHMÖLLER (Hg.); Joachim Freiherr von BRENNER-FELSACHER: Eine Reise nach Nias – Die Indonesienexpedition 1887; Böhlau Verlag Wien-Köln-Weimar 1998; p. 328*

[17] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 41*

3.1.2.2 Composition and development of the village Hiliamaetaniha

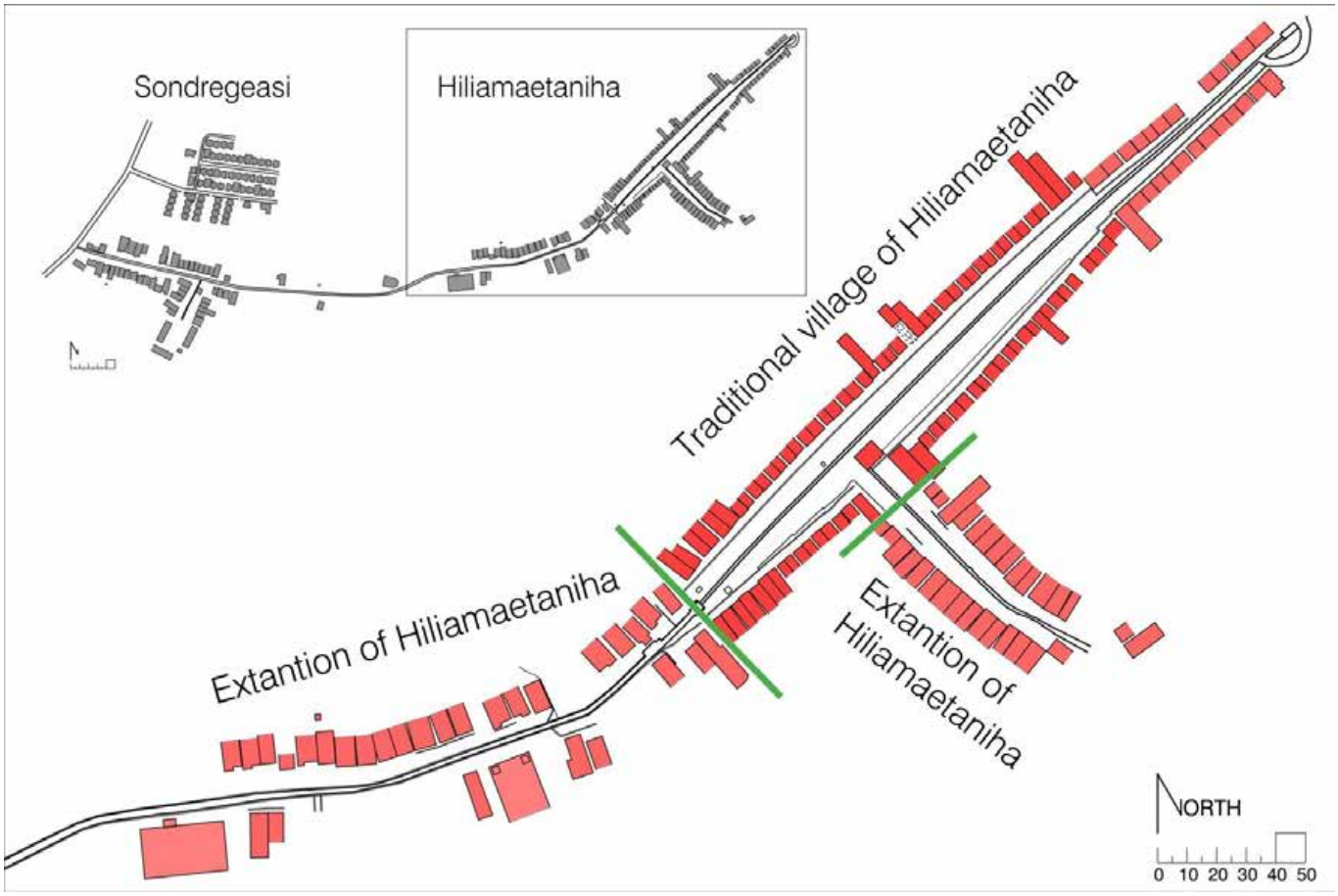


fig. 11: overview plan of Hiliamaetaniha

The first step in the development of the village in South-Nias is the historical-traditional centre.
The historical village consists in fact of a stretch of paved main road on the crest of the hill. The boundaries are defined through the staircases at each end of the hilltop crest. The stairs as an entry to the village are also a typical feature of almost all traditional South-Nias villages.[18] The side of the stairs has a low stone parapet which ends in a sculpture, showing the head of a lion-like animal.[19]
The two entrances have different importance. The entrance which is pointed towards the seaside is the main entrance and the connection to the beach. The other entrance, in form of a staircase, is built at the end of the dead-end road of the village.

The stairs at this end of the town gives access to the forest, where the gardens and the fields are positioned. The way from the sea to Hiliamaetaniha is ascending steeply and straight without any switchback. Due to the extreme steepness in some parts of this road people started to build proper stairs and walkways to simplify the way up. At the stairs towards the forest they changed nothing.
In the past, they also had a wall made of thorny bamboo around the village for their security.[20] The wall contained 2 main-entrances at the top of the stairs.
The main road in the middle of the village connects the two stairs. It is a straight public walkway paved with stone slabs. This central walkway is flanked by the houses, which are built without gaps next to each other.

[18] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 42*

[19] *Petra GRUBER, Ulrike HERBIG; Settlements and housing on Nias Island, Adaptation and Development; p. 5*

[20] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 41*

fig. 13: access to the traditional villages: (left-right) Onohondrö, Bawomataluo, Hiliamaetaniha

Between the houses and the public walkway *Iri Newali*, the so-called *Halaman* and *Mbelembele* are located. The *Halaman* is a front yard at the same level as the walkway, and the *Mbelembele* is a sheltered walkway a bit higher than the *Halaman.* The houses are build on pillars, so that the ground floor is wholly taken up by the posts. The living level is located on the first floor covered by an impressive rooftop.

fig. 12: village of Bawömataluo

“ Nach eineinhalbstündigem Marsche verwandelte sich unser Pfad in einen breiten Weg der zu dem von Lagundri an der Bucht auf einen Hügel gelegenen Dorfe Sondregeasi führte. Diesem folgend gelangten wir bald zu den steinernen Stufen und auf diesem durch das schmale Stadtthor. Wieder eine gepflasterte breite gerade Straße und zwei Reihen stattlich gebauten Häuser, welche es aber doch nicht vermochten, den verwahrlosten Eindruck, den das allenthalben emporwachsende Gras und der sondstigen Mangel an Reinlichkeit machte aufzuheben. …“[21]

"*After one and a half hours of marching the path turned into a broad road, which lead along the bay of Lagundri to the village of Sondregeasi, located on a hill. Following the road we soon reached a flight of stone stairs, which led through a narrow towngate. Again we encountered a wide paved road flanked by two rows of stately built houses. However, their appearance did not manage to fade out the impression of untidyness and neglect which was caused by grass growing everywhere and a general lack of cleanliness.*"[22]

The traditional village was, due to its geographical conditions and its arrangements of security, a coherent unit. Thus, the possibility of the village to deal with the growing population was limited because of the shortage of space needed for new houses.[23] To solve this problem they started to extend the village outside the centre and the secure boundary. The first extension, which was meantioned by Achmad Bagoes Poerwone Wiryomartono, was explored in 1982. The extension of the village happened along the main axis of the village.

[21] *Alain VIARO; Nias Island traditional houses; p. 96*

[22] *Free translation by Ferenc Zamolyi*

[23] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989;p. 49*

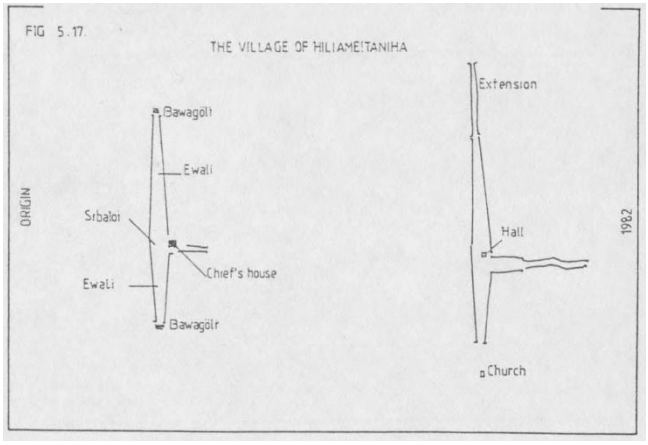


Fig. 14: first extension of Hiliamaetaniha

As time went by, two new extension possibilities emerged. The logical solution was a location outside of the main entrance, along the walkway down to the sea. If there was a raid by another village on Hiliamaetaniha, the villagers could withdraw quickly into the secure centre. The other possibility was the south-east side of the traditional settlement core. Because of the geographical situation the crest here is a bit flatter and makes it possible to build houses along a newly created sideway. The sideway leads to one of the springs. This leads to the assumption that the inhabitants actually used the path for fetching water before they started to build houses there. The possibility of expansion along the sideway was limited by the slope of the terrain. On the way down to the sea these possibilities are better; it was and still is possible to build more new houses there.

3.2 Modern villages

3.2.1 Sondregeasi

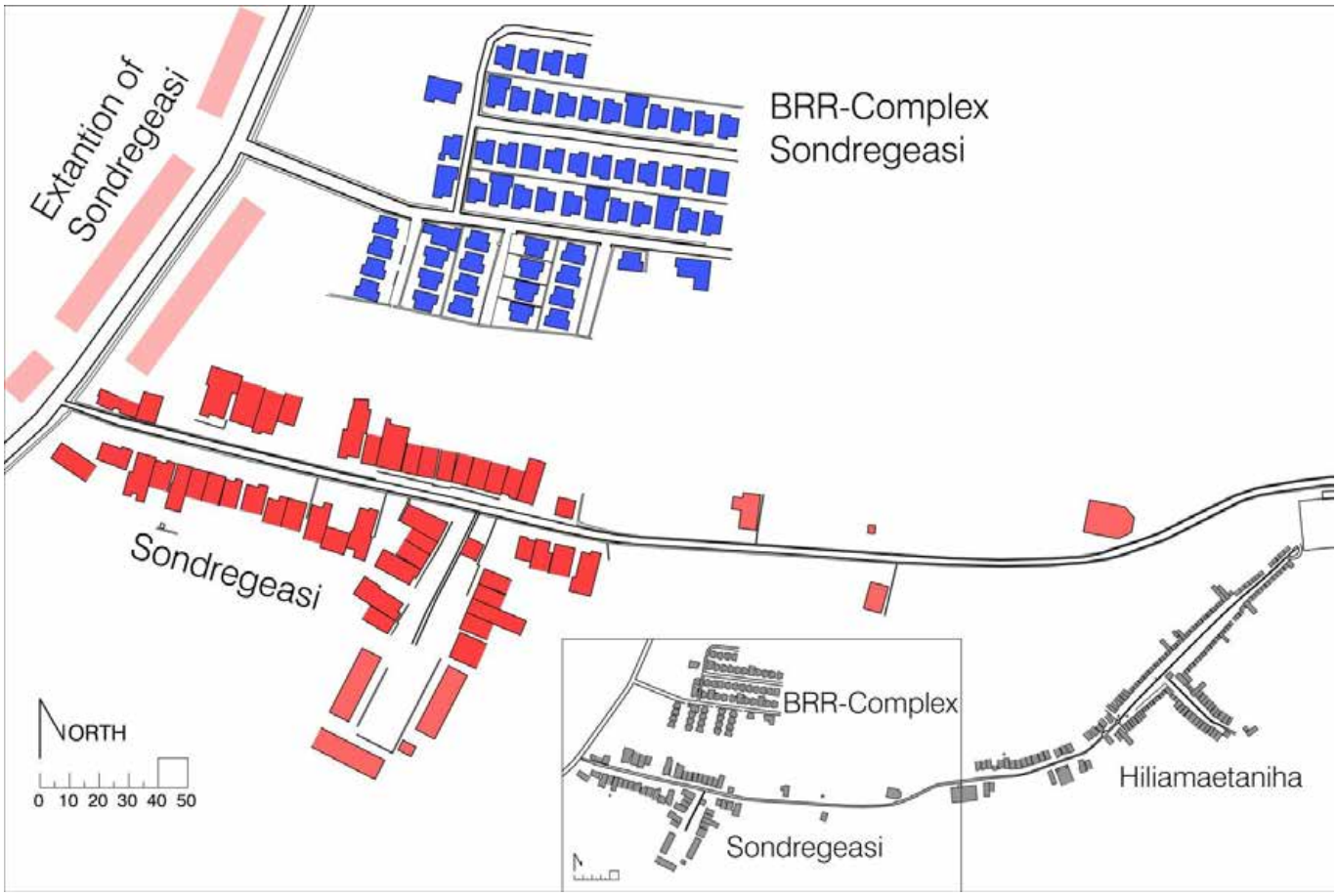


fig. 15: overview plan of Sondregeasi

Sondregeasi is located at the beginning of the way up to Hiliamaetaniha on sea level. After building streets suited for car traffic on Nias the junction with the walkway up to Hiliamaetaniha became a point of interest. At the beginning, there was an area for the people from Hiliamaetaniha to store their goods close to the street.

As the lack of space in Hiliamaetaniha became a more and more pressing problem the people started to build new houses next to the street. As time went by, a new village arose. Its name, derived from the old name of Hiliamaetaniha, is Sondregeasi.

This new village has nearly the same setup like Hiliamaetaniha. The differences will be explained at the chapter “5.1 The layout of the modern village according to the example of Sondregeasi.” It has a long main road and on the south-eastside a small sideway. The houses are built next to each other along the street and sideway. The village starts at the coastal road, and ends on the beginning of the slope up to Hiliamaetaniha. The block of the school is located in a way to close any opening at the end of the sideway. So the space within the present settlement of Sondregeasi is limited, such as in Hiliamaetaniha. As a consequence of the further increasing inhabitant numbers, people started to extend the new village outside its actual centre.

A few *Warungs* (shops) for food, vegetables, and other essentials have been established at the junction between the coastal road and the main road of Sondregeasi. The reason for this location is good accessibility, easy delivery, and also parking in front of the *Warungs*. Also small restaurants settled next to the street. Keeping up with this development people also started to build their houses next to the street. This extension process of the settled area is still ongoing. Also the new BRR-complexes are accessed from nearby main road and, thus, give more momentum to the situation. The drawback of a location next to the street is the heavy and dangerous traffic. During our fieldwork in Sondregeasi we had to abort an interview because a teenager was overrun by a *Bemo* (public

transport bus) and died on the street. Nearly the whole street side from Deluk Dalam to Sorake is at least partially cultivated.
An alternative, if considering building a new house in Sondregeasi, is on the sloped area on the way up to Hiliamaetaniha. The border between the two villages is not clearly visible. The inhabitants told us, that the border is at the first church on the way up to Hiliamaetaniha (or in other words at the church which is located lowest)

fig. 16: village of Sondregeasi

For the obvious reason that the slope is very steep, it is not easy to build there. If rains are very heavy (which they frequently are on this island), the hazard of a landslide is given. That is why only 3 houses have been built in this area so far.

3.2.2 BRR-Complex next to Sondregeasi

On the 26th of December in 2004 the worldwide known Tsunami originating in the Indian Ocean hits Nias. It affected villages and settlements near the water, mainly touristic resorts. More than 150 people lost their life and 3000 people became homeless after the Tsunami.[24] In addition, on the 28th of March in 2005 there was a major earthquake with a recorded strength of 8.9 on the Richter scale near Sumatra. The epicentre was about 90 km south of Sinabang, so the island of Nias was affected very badly. The consequences of the disaster were worse than those of the Tsunami.
More than 700 people lost their life and many more were injured. Local authorities reported that more than 70% of the buildings collapsed in the capital Gunungsitoli. Only traditional houses were not completely destroyed, they had just small damages.[25]
After that natural disaster, many international and national aid organisations came to Nias and started the reconstruction.
BRR (Badan Rehabilitasi dan Rekonstruksi)[26] is a national aid organisation which was founded only to support the aggrieved areas by the government of Indonesia. They bought unsettled land on Nias with the goal to build settlements for homeless inhabitants. The complexes are planned as independent villages which can be built everywhere, in fact, independent of terrain or other factors. The only conditions are water supply and electricity on spot.
One of the BRR-Complexes was built in Sondregeasi for the homeless people from Hiliamaetaniha and Sondregeasi. It is located on the north side next to Sondregeasi. The BRR-settlement consists of 62 identical houses. The only official access to the settlement is from the coastal road. There is no planned connection between the two villages, but as time went by, two non-paved walkways have been created since people needed a direct connection between the two villages.
It is very interesting to observe if or how much the two villages will grow together or they will stay next to each other as two separate villages.

---

[24] *Alain VIARO; Nias Island traditional houses; p. 173*

[25] *Petra GRUBER, Ulrike HERBIG; Settlement and housing on Nias island adaptation and development; p. 2*

[26] *Mia MECHLER; Das Fremde Haus, Die Rolle der Architektur in der Planung und Realisierung einiger Wohnbauprojekte der nationalen und internationalen Hilfsorganisationen auf Nias; Technische Universität Wien, Architektur, 2010; p. 23*

4 Hiliamaetaniha – an example of a traditional village

fig. 17: site plan of Hiliamaetaniha

4.1 The Layout of the traditional village according to the example of Hiliamaetaniha

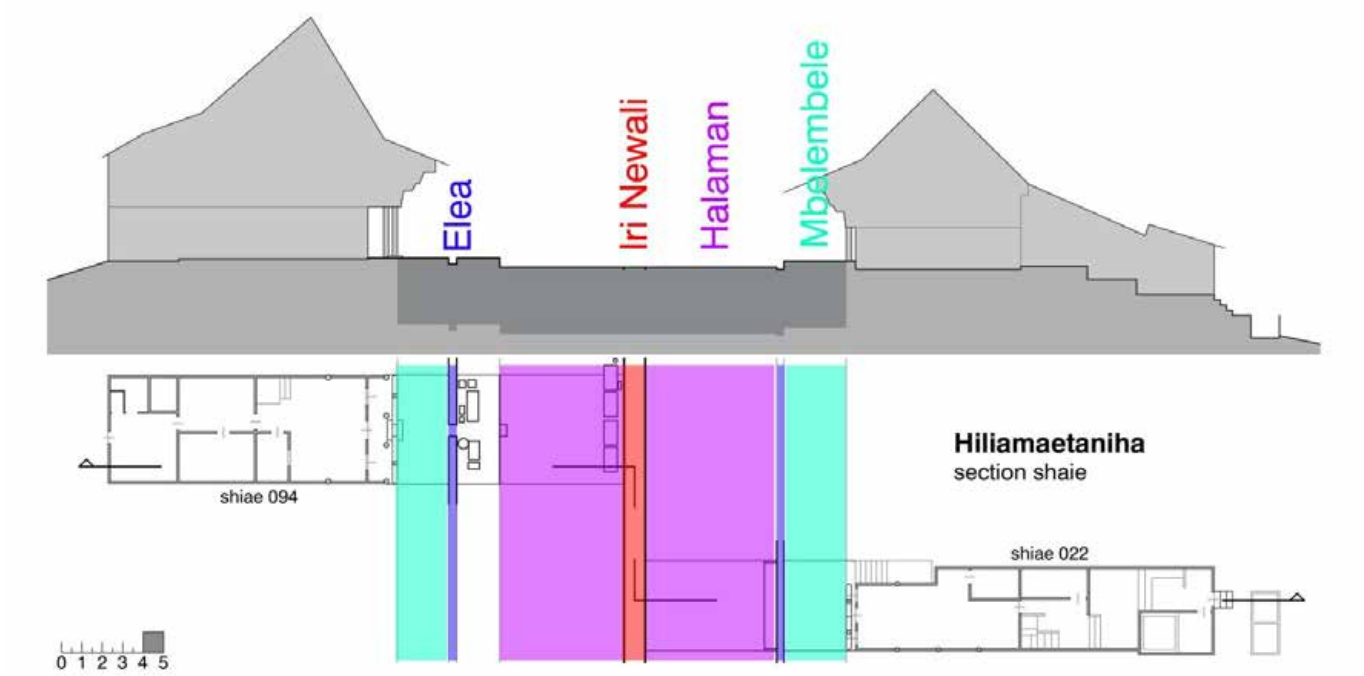


fig. 18: section of Hiliamaetaniha

"The minimal South Nias village consists of a small stairway and a street with two rows of houses."[27]
The traditional villages in South-Nias are not only similarly located, they also have a nearly identical layout. The centre of the symmetrical composition is the public walkway, the *Iri Newali*. The houses are located parallel to the walkway on each side. These are on the one hand, traditional houses called *Omo Hada*[28] and on the other hand, modern houses called *Omo Drava*. Between the public walkway and the houses lies a kind of fore-yard which is separated into different areas. The segments have different functions and the borders between them are noticeable, but not visible everywhere.
The area which is claimed by the owner of the house is divided into three main segments. Next to the *Iri Newali* on the same level the *Halaman*, a kind of front-yard can be found. Attached to the *Halaman* is a rainwater gutter, the so called *Elea*.
One step higher and between the *Elea* and the house is the *Mbelembele*, a semi-private walkway in parallel to the *Iri Newali*.

Fig. 19: village of Hiliamaetaniha

This layout of the traditional village is very characteristic for this specific region, recognisable in every village, and quite unique in the world.

[27] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 98*

[28] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 3*

4.1.1 Elements of the layout

4.1.1.1 Iri Newali – public walkway

"The development of the construction of the village street corresponds the role of the river in the myth ... The river in the myth is like the street which is understood as path of living in continuous process."[29]

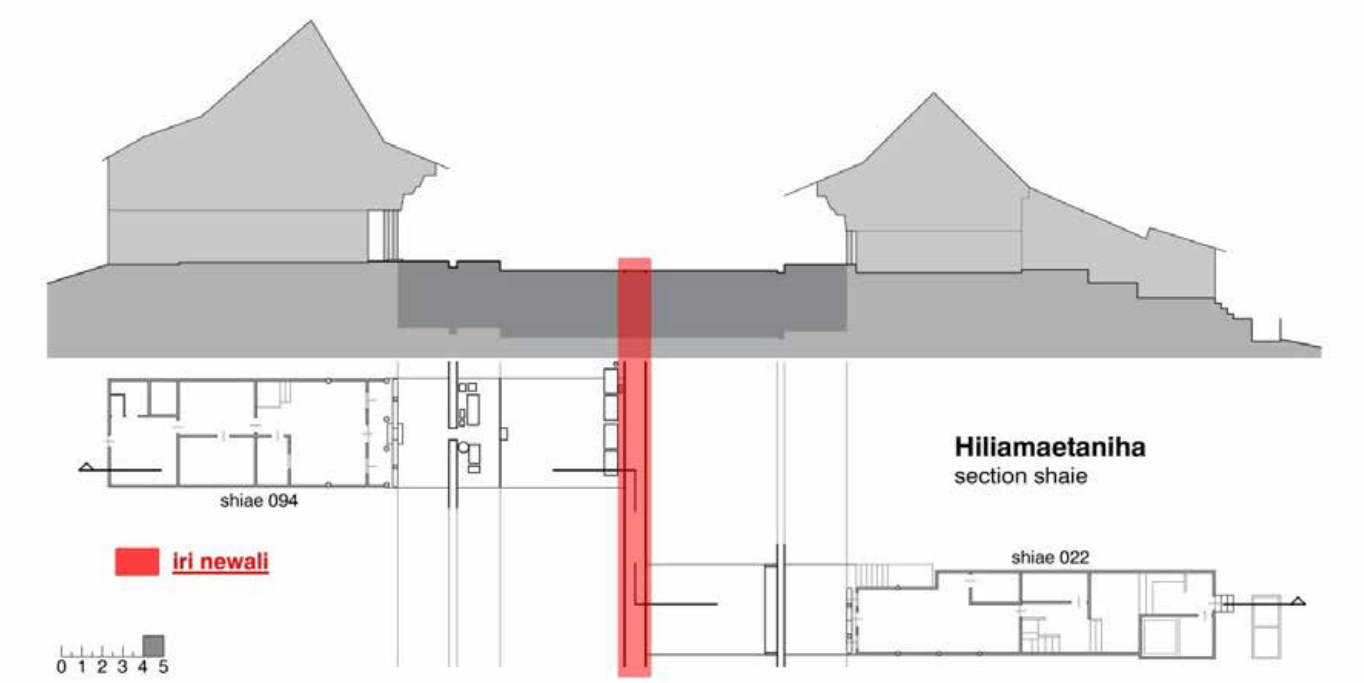


fig. 20: section of Hiliamaetaniha – position of the Iri Newali

The *Iri Newali* is located in the middle of the village, spanning from the main entrance straight to the end of the village, from one staircase to the other.[30] *Iri Newali* means "center line of the street".[31] The walkway is public property, thus, it belongs to the whole community, which is also in charge of cleaning and maintenance. The dimension of the walkway is fitted for pedestrians. It has a width of about 1 meter, so that two people are able to walk next to each other. The lateral boundary to the *Halaman* is marked with narrow borderstones. The boundary is in fact only visual and not physical, and only noticeable if you look for it, because it is plane with the *Halaman* without any height difference. Sometimes the *Halaman* is paved with the same material as the *Iri Newali*, so the border stone is the only recognisable border.

The *Iri Newali* is built with natural stone tiles[32], which were placed on a layer of sand. Later on, they abandoned using sand and changed to using concrete because it is more long-lasting and the weed between the stones cannot grow, so the maintenance is easier. The border stones are natural stones as well with a width of about five centimetres.

Due to the fact that there is no fence or other physical border, the people are used to walk on the small walkway and not on the *Halaman*. So the border is not physically existent, but nevertheless very well established in people´s mind.

The access from the seaside, or with other words, from the main entrance is still a small pathway leading up from the coast to the village on the crest. At the end of the pathway the flight of stone stairs leads you up to the settlement level.

"Often the stairways are very long, steep, ... Poor villages will sometimes have a short stairways with little or no ornamentation."[33] At its end you directly

[29] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p.87*

[30] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 111*

[31] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 42*

[32] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 98*

enter the village and onto the *Iri Newali*. The stairs are also built for easy access during the rain season.
The small steep access to the village made it also difficult for enemies to attack the village.
Another defence work was a wall built around Hiliamaetaniha with two small entrance doors at the staircases.
“Built on hilltops, villages were surrounded by double or triple palisades with narrow ditches, often strewn with piled-up bamboo, completing their defence works.”[34]
This wall has been torn down, as it was not needed anymore, like in most other places in the world.
At the other end of the *Iri Newali* in Hiliamaetaniha there is also a staircase, which similarly defines the end or border of the village. The function and appearance of the exit containing the staircase is the same as at the entrance. The exit is used as an access to the nature, such as the forest, where the inhabitants have their gardens and fields. In the garden they cultivate fodder for the animals and vegetables for themselves. As a "cash crop" they tap rubber trees for natural rubber on their plantations adjoining their gardens and fields.
With the increasing needs arising from technical development and the use of driving vehicles, a second access from the coastal road to the back entrance of Hiliamaetaniha was built. The new road was built primary for motorbikes, the usual means of transport, but it is also useable for *Bemos*, the local public transport vehicle (in fact a minivan) to drive up to Hiliamaetaniha.

Fig. 21: Iri Newali - left: Hiliamaetaniha, right: Bawögosali

The original road was made of asphalt, but because of the climate and natural disasters the condition of the road is very bad with a lot of huge potholes.
Driving up the road with the motorbike is like taking part in a slalom competition: you have to dodge potholes all the time; some of them are dangerously big and deep, so that you risk destroying your tire or causing an accident.
Along the back road there is no settlement similar to the one on the original way to Hiliamaetaniha.
Depending on the type of vehicles used, the road has two different ends. With a car, or a *Bemo*, it is possible to drive up to the beginning of the staircase, however, if using a motorbike direct access to the village is possible through a short stretch of road bypassing the steps. This last curve next to the stairs is so steep and narrow that a car is not able to drive there. If a farmer transports his produce, they have to carry it down the stairs to bring it to the vehicle.
At a traditional meeting from the council of the village, they decided that Hiliamaetaniha is a motorbike-free area, so there is no vehicle traffic allowed within the village proper. Comparing this situation to other traditional villages, where driving in the village is allowed, the driving ban increases the quality of life enormously.
On the downside, the ban of vehicles caused a parking problem in the village. At the end of Hiliamaetaniha subsequently a kind of parking area arose. Nearly all the motorbikes are quite randomly placed on the *Halaman* in front of the first houses. Since the motorbike in South-Nias is a symbol of wealth a few people push their motorbikes to their houses and park them on the *Mbelembele* or in the house. But the majority of the bikes are parked at the end of the road, so that the traditional center is nearly free of bikes and the village still has the original impression and shape.
To conclude, when the vehicle free village of Hiliamaetaniha is compared to other villages, the solution with the driving ban is much better.
A suggestion for improvement would be a dedicated parking space outside the village at the end of the back road.

---

[33] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 98*

[34] *Pietro SCARDUELLI; Accumulation of heads, distribution of foot; The image of power in Nias; In: Bijdragen tot de Taal-, Land- en Vorkenkunde 146 (1990), no: 4, Leiden, 448-462; p. 458*

4.1.1.2 Halaman

The *Halaman*[35] is positioned next to the *Iri Newali*. The name "*Halaman"* derives from bahasa Indonesia and is translated to bahasa Niha *Gorohua Newali* called. In the western countries the *Halaman* is comparable to a courtyard in front of the house. It is placed between the *Iri Newali* and the *Mbelembele*, which is a kind of a patio in front of the house. As afore-mentioned, the *Halaman* is on the same level like the *Iri Newali* and mostly defined by its borderstones. Near the houses the other end of the *Halaman* is cleary visible: The border is defined by the *Elea*, which is the rainwater gutter. The bottom of the gutter is sunk into the ground for about 20 centimetres. The *Elea* is followed by the *Mbelembele*, which is higher locates than the *Halaman*.

After entering the village from the staircase, it seems that the *Iri Newali* and the *Halamans* form a huge conjugated area, only a closer examination reveals the individual areas.
The *Halaman* is part of the property belonging to the owner of the house. The owner is in charge of the area; he has to keep it clean and damage-free.
In the past the *Halaman* was a levelled natural surface. With the passing of time the people started to pave their areas with tiles made of natural stones, thus, using the same design and pattern as the pavement of the *Iri Newali*. Nowadays the tiles are bedded in concrete and not as mentioned in sand as it was common sence in the past.

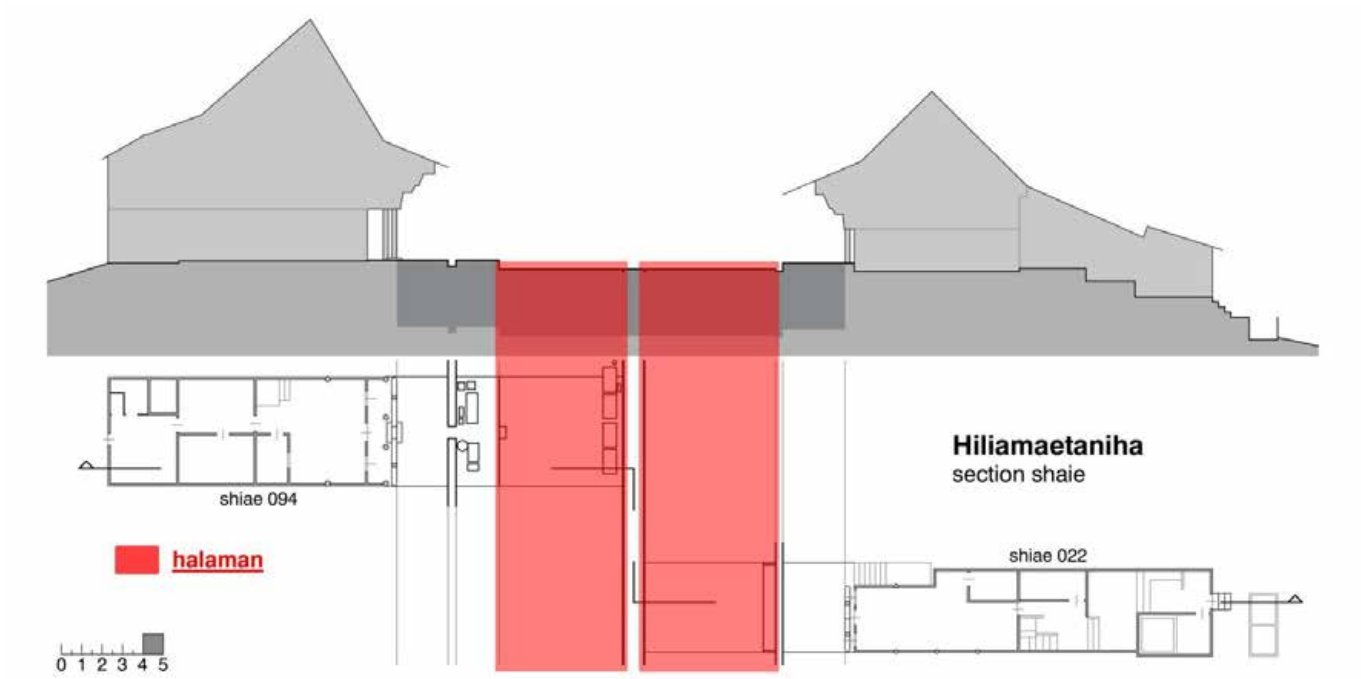


fig. 22: section of Hiliamaetaniha – position of the Halaman

The distance between the *Mbelembele* and the *Iri Newali*, or the length of the *Halaman,* is between 6.00 to 8.00 meters average. In the other direction one *Halaman* is next to another. The borders between the *Halamans* are in extension of the joints between the lateral housewalls. The boundaries of H*alamans* are visible as straight edges between their different pavement surfaces.
The wideness of the *Halaman* is given by the width of the houses, which is in average between 3.50 and 5.50 meters. So the average area of a *Halaman* in Hiliamaetaniha is about 30.00 m².

Function

At first sight the *Halaman* seems just to be another empty public space in front of the houses, but after the observations we can sum up that the *Halaman* has a lot of different functions. It is one of the real multifunctional spaces within the typology of the South-Nias village.
One of the most frequent activities on the *Halaman* is drying things.[36] [37]

[35] *Petra GRUBER, Ulrike HERBIG; Settlement and housing on Nias island adaptation and development; p. 6*

[36] *Petra GRUBER, Ulrike HERBIG; Settlement and housing on Nias island adaptation and development; p. 6*

[37] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 90*

Nearly all the residents of the village dry their laundry after washing on the *Halaman*. The women splay the wet clothes next to each other on the floor of the whole area.

Regarding this activity there was recently heavy discussion amongst the villagers.
The reason for the controversy was the way of drying. Some of the inhabitants want to install a laundry line to hang up the clothes the others want to leave it like it is now. A laundry line would enable easier and faster drying and the clothes would stay clean. Formerly it was allowed to install laundry lines in Hiliamaetaniha, but during a village-council they forbade it, because hanging clothes would disturb the appearance of the traditional village. Since that ban the affected people argue about that decision.
Every village is handling the problem differently. In Hilisimuetane the inhabitants still use the laundry line. In Hiliamaetaniha the residents use the traditional way and lay out the clothes on the *Halaman* and the house roof. In Hilinawalefau the people devised a clotheshorse, so they are able to hang up the laundry and if necessary they can put the device away, so that the view of the village is free. It is everywhere accepted to lay the laundry on the megaliths, so the laundry is not on the floor and not in front on the houses.

fig. 24: example of drying things

fig. 23: possibilities to dry the clothes – (left-right) Hiliamaetaniha, Hilisimuetana, Hilinawalefau

Why residents do not use the space behind the house is simply explained. The space behind the house is a designated “dirty-area” where they have their toilet, pigs, and also the rubbish.
It is important to note, that usual weather in Nias does not allow effective drying of clothes anyway - it rains frequently and there are only short periods of sunshine without dampness. So the issue is important for the local communities and I do understand the different opinions. For me, the solution with the clotheshorse is a really useful compromise.
Not only laundry is laid out on the *Halaman* to dry, also vegetables are spread out there for the same reason. Rice and cocoa are common and are still dried on the *Halaman*. Another frequently needed material is firewood for the kitchen. Because of the very high possibility of rain, people are used to seize every possibility for drying things. The fire wood for the kitchen will be dried over the open fire in the kitchen, and in case of shortage of space over the fire, additionally on the *Halaman* in front of the house.
The roof of the *Omo Hada* was traditionally covered with tiles made from the leaves of the sago palm. After the fabrication the elements have to dry in the sun. That happens also on the *Halaman*. A more detailed description of the roof will be presented later in this text.

As soon as the *Halaman* is used to lay out things to dry, the borders between the properties become visible, because nobody trespasses into his neighbour´s territory to lay out his items.
The function of drying is not new, in fact, it is one of the oldest purposes. The only difference between the past and today is the arrangement of the items. In the past the roof elements and rice were the important items to be dried and now the clothes dominate the view within the villages. The change from essential goods such as food and building elements to clothes is easy to explain, because nowadays most of the roofs are covered with corrugated iron sheets, so the need for sago palm leave roof elements has decreased. Most of the inhabitants buy the rice in the *Warung* and do not produce it themselves. Another reason is that the people have more clothes now than in the past, when they produced them themselves.
But as soon as nobody is drying anything, together with the *Iri Newali* a huge area without

physical borders emerges. The overall distance between the houses is in average about 15.00 meters, and the length of the area stretches through the whole traditional village. If the area is empty and not in use, the *Halamans* are used as a play ground for all the inhabitants of the village.
"The center area is in the afternoon a children play ground. They play here after the school while mothers work in the street. The children can free go anywhere in the inner boundary of the village."[38]
It is a kind of large yard, where kids play with broken tires and other things they find all over the open place and adults use the area as a playfield for different sports.


fig. 25: playing kid

Badminton for example is one of the national sports of Indonesia. On Nias it is a favorite pastime as well and nearly all the people play it in their free time, Hiliamaetaniha being here no exception. For this reason, they painted the markings of a badminton field over several *Halamans* - in this case it seems to be no problem, that the lines cross several individual *Halamans*.
Volleyball is another famous Indonesian sport and, thus, Hiliamaetaniha does have a volleyball court with a permanent net installed.
The game itself and the events surrounding the game are a part of social life and strengthen the village community. Every Sunday morning the inhabitants meet at the court and play against each other. Many people sit around the court, watching the game, chatting with each other and having a good time. They play till right before the holy mass starts, change clothes and go to church.[39]

Another function of the *Halaman* is its use as an event- and ceremonial area, mostly for celebrations within the family. All baptisms, weddings, and funerals are held in the village on the *Halaman*. Roofing and chairs are arranged on the area accordingly. If the space of the own *Halaman* is too small, they normally have an arrangement with the neighbours to use their *Halaman* as well.


fig. 26: wedding in South-Nias: wedding community in Hiliamaetaniha, wedding location in Bawögosali

A still very important ritual on Nias is using a pig as payment method. To show respect and the own wealth to the guests, it is usual to slaughter pigs for the ceremony and share the meat with all guests and family.[40]


fig. 27: slaughter of a pig in Hiliamaetaniha

In our culture is this ritual not usual and it might seem brutal, because they cut through the throat and let the pigs bleed out to death. That scenery also happens on the *Halaman*.

After the pig is dead, they burn up the bristles, and then cut it into small pieces. After the ceremony you can see the blood trail on the *Halaman* for a long time.
After all these unusual applications, the *Halaman* is also used like a conventional front-yard. The open space is utilised as storage for nearly everything like constructionwood, sand, rocks, and a lot more.

[38] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 92*

[39] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 100*

[40] *Pietro SCARDUELLI; Accumulation of heads, distribution of foot; The image of power in Nias; In: Bijdragen tot de Taal-, Land- en Vorkenkunde 146 (1990), no: 4, Leiden, 448-462; p. 452, 460*

4.1.1.3 Megaliths – Öli Batu

The megaliths in front of the *Mbelembele* indicates the social situation of the owner of the house and his family.[41]

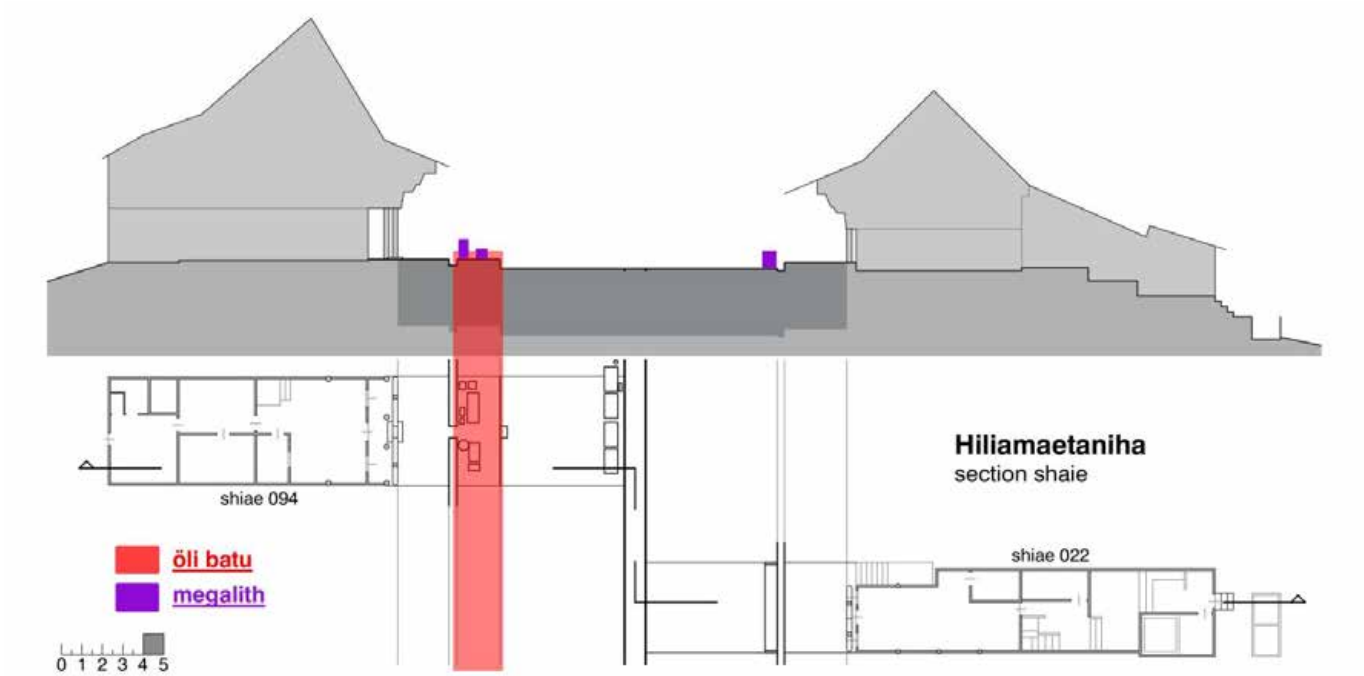


fig. 29: section of Hiliamaetaniha – position of the Öli Batu

Megaliths used to be installed in former times by the owners of houses as a sign of rank and wealth. Also, they showed the progress of certain leading individuals of the community to higher rank. The erection of a stone was marked by feasts and celebrations.

"At this point the system of symbols defining the image of power was complete: the great house of the chief, dominating all the other houses in the village, the megalith, the personal emlems, the severed heads and the gold jewels served the legitimatie the chief´s appointment, together with the prerogatives, rights and privileges of rank with this entainled."[42]

The material of megaliths is usually natural stone in a form of a block or cube. Some of them are decorated with carved humans or natural motives and are also painted in color. In front of bigger houses or the *Omo Sebua* which is the chief´s house, sometimes special megaliths in form of figures can be found. Until today, families still erect new megaliths in front of their houses.

These stones are positioned in front of the traditional houses between the *Halaman* and the *Mbelembele*. In some villages or parts of a village a seperate area is reserved for the megaliths. The *Öli-Batu* is a rectangular piece of pavement like the *Halaman* or the *Mbelembele* and is located between this two areas. The *Elea*, the rain gutter, is between the *Öli-Batu* or the megaliths and the *Mbelembele*. The *Öli-Batu* is one step higher than the *Halaman* and usually on the same level as the *Mbelembele*.

fig. 28: megaliths in Hiliamaetaniha and Bawömataluo

In Hiliamaetaniha only in front of the *Omo Sebua* (chief´s house) an *Öli-Batu* can be found.

In front of the *Omo Sebua* there is in most cases a central place where the biggest and most

[41] *Alain VIARO; NIAS Reconstruction in the respect of the tradition; IUED Geneva; in collaboration with Arlette ZIEGLER, p. 2*

[42] *Pietro SCARDUELLI; Accumulation of heads, distribution of foot; The image of power in Nias; In: Bijdragen tot de Taal-, Land- en Vorkenkunde 146 (1990), no: 4, Leiden, 448-462; p. 460*

impressive megaliths are positioned. Also the chair of the chief is located on this place.
Although the megaliths main purpose is to state prestige, rank, and wealth, they do have some real functionality as well.
They are most commonly used as furniture for sitting.
"In the late afternoon, all villagers usually stand and sit in the front of their houses after going back from the public baths. Men talk and sit together on the stone seat bank or go to the center area for informal discussion."[43]
Some, especially those of lower height, are also in use as a table to work on or to drop items there like the wet clothes to dry. Also knifes are grounded on the megaliths. The sanding marks from the last centuries are still visible.
In the last decades, a new generation of megaliths became fashionable. The residents started to use concrete as building material. These new stones have usually the form of a bench. Another new feature is to tile these benches. As tiles are expensive they show the wealth of the family. They are not only used outside the house, also inside on the floor and sometimes on the walls.

4.1.1.4 Mbelembele

"Directly in front of the row of houses on each side is a raised sidewalk (mbelembele)."[44] It is parallel to the *Iri Newali* and *Halaman* and goes full-length through the whole village. The *Mbelembele* is bounded on one side by the house facades which are built next to each other, and on the other side, by the rain gutter. The rain gutter is positioned between the *Mbelembele* and the *Halaman* or between *Mbelembele* and *Öli Batu*, if it exists. The surface is parallel to the *Halaman* and usually one step higher.
In local language, the bahasa Niha the rain drain is called *Elea*.[45] The rain gutter is not a new architectural feature, it is supposedly older than the recordings of the first explorers, which were made more than 120 years ago. They already mention its existence and do not seem to regard it as a new object.
The dimension of the *Elea* has not changed during the time. It is usually about 20 to 40 centimetres wide and has a depth of between 10 and 50 centimetres, depending whether measured from the lower *Halaman* or the higher *Mbelembele* edge. The rain gutter is still built with natural stones. Nowadays the residents use the *Elea* more and more as a kind of garbage gutter.

fig. 29: section of Hiliamaetaniha – position of the Mbelembele

[43] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 95*

[44] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 98*

[45] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 98*

fig. 30: Mbelembele nowadays and in the past: Bawögosali 2012 – Fondregeossi 1887

Because of the highly frequent rainfalls the *Mbelembele* is slighty sloped towards the rain drain, to prevent the water running off towards the house. Water coming near the house foundations could undermine the columns and seep also into those extensions of the traditional house which are built on the ground.
However, the slope of the pavement is just a kind of "double security" measure, as the *Mbelembele* is always completely sheltered by the protruding roof of the house, so that the rain pours directly into the rain drainage.
The border between *Mbelembeles* belonging to two different households is again only visual and in the same line with borders between respective *Halamans*. If observing from further away, the *Mbelembeles* appear as one area since steps between neighbouring houses are built only if the topography makes it necessary. As mentioned several times above, the natural stone tiles are laid in concrete, in the past they were directly laid into the soil, which is still visible in a few places.
The area of the *Mbelembele* belongs to the house or the owner of the house. So the complete property is composed of the *Halaman*, the *Mbelembele*, the house and the area behind the house. The front border is the *Iri Newali*, and at the back the border is not defined, but given by the topography.

fig. 31: Mbelembele in Hiliamaetaniha

The access authorization is nearly the same as on the *Halaman*. It is private property but the inhabitants of the village are allowed to use it as a walkway. The covered walkway is of course used at most during rain. In that situation the *Mbelembele* becomes not only a public walkway but also a kind of elongated arcade. Since it is an uninterrupted roof, it is possible to walk below it from the beginning to the end of the village without being getting wet, which is very important in the existing climate.
Apart from being a really essential piece of infrastructure, especially in rainy season, the *Mbelembele* does facilitate social interaction, too.
The occupants of the village use the megaliths as a seating to spend time outside the house. Also, to have more space to sit, the residents put benches in front of the houses which are made of wood or stone. Generally, the inhabitants spend a lot of their free time outside on the *Mbelembele*. They meet there, chat, play games, and do also some of their housework.
A connection to the living room of the traditional houses is through the grided window existing. The residents can sit inside and observe the outside of the house at the same time. The most important function of the *Mbelembele* is still to provide access to the houses or to the entrance-platform between the houses.

4.1.2 Public – Semi-Public – Semi-private – Private

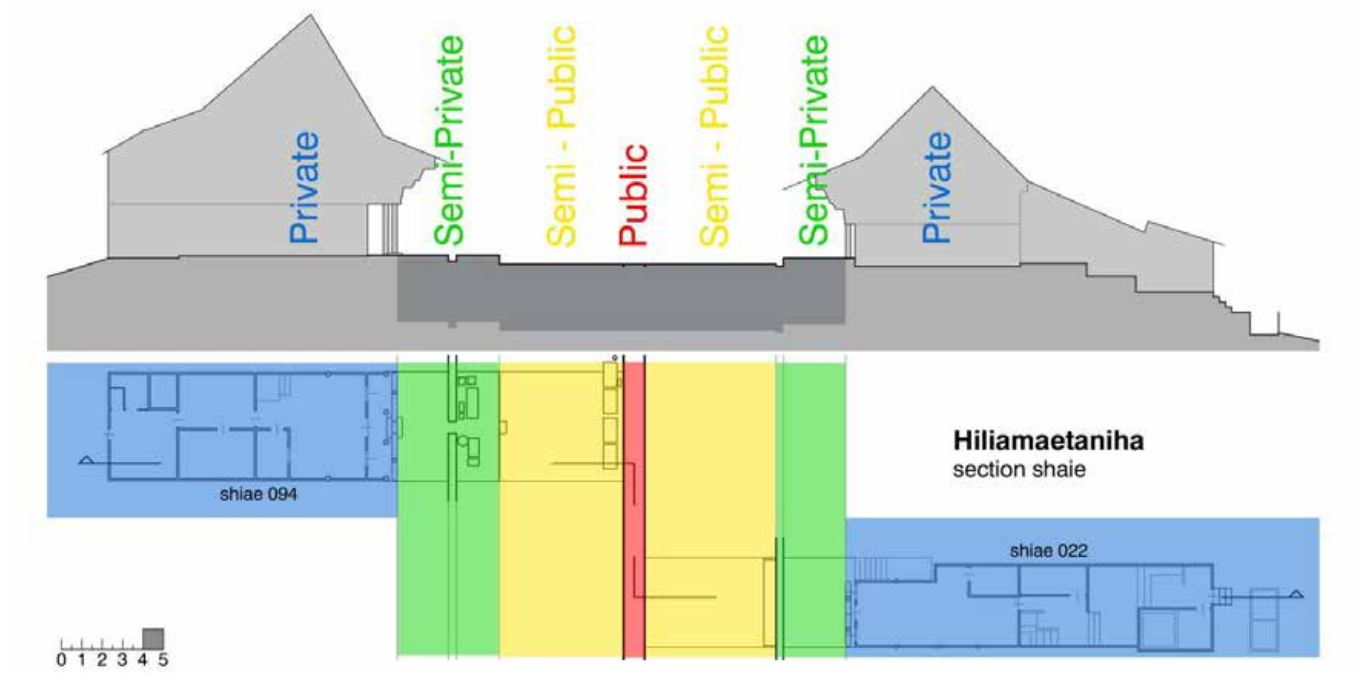


fig. 32: section of Hiliamaetaniha – from Public to Private

To understand how a traditional South-Nias village is designed, we have to consider which spaces are public, which are private, and which are something in between. There are a lot more classes and subdivisions as we usually encounter in Western countries. Also in the Western world, especially nowadays in urban or suburban context, there are explicit borders between public and private property, usually physical such as fences or walls. Additionally, there is much less (or sometimes none at all) space treated as "semi-private".
In Indonesia, in this case South-Nias, the situation is different: As already mentioned, areas like the *Halaman* or the *Mbelembele* are a mixture between public and private property and we find also other areas which are semi-public and semi-private.
Not only the areas are classified, also the houses and shops are divided according to this arrangement.

4.1.2.1 Public spaces

One of the most obvious public spaces are streets. This category not only encompasses the *Iri Newali* in the traditional village, but also the access-roads and stairs to the villages, the ways to the waterplaces or springs and the walkways to the gardens.

Another important public infrastructure is the water supply and all necessary facilities connected to it.
In South-Nias different ways of water supply are known. The most traditional way was to fetch water with buckets or bottles from the natural springs, which were usually outside of the village. The public water places are called *Sumur Ummum*.

fig. 33: Sumur Ummum in Hiliamaetaniha

In Hiliamaetaniha the *Sumur Ummum* are still in use. In 2012 one of these natural springs was equipped with a concrete watertank and also a washing facility. The original infrastructure was destroyed by the earthquake in 2005. Since then, there was only a water outlet but no tank there.[46]
"Foot paths connect the street with the bath."[47]

[46] *Interview Julian Breuling: Assip-Fieldwork July 2012*

[47] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-*

The path to the water place is not paved, which makes it very difficult to carry the buckets of water to the houses. Responsible for the water acquisition are the kids or the grandmothers. For them is even more difficult to walk on the slippery, uneven natural walkway.
The first modernisation of the water supply was the development of a centrally located public waterstation in the middle of the village. A large reservoir was installed and a permanently installed pump lifts the water from a natural spring directly into the tank. A public central water reservoir is also used in Bawomatalu, with the benefit that the distance to carry the water to the individual houses is significantly shorter and work therefore easier.
A new system which is usually used now and introduced in many villages in South-Nias is similar to the solution above, with the difference that several water outlets are installed all over the village and not only at one central place. The taps are disguised in traditional sculptures, so that they do not disturb the appearance of the tradition village.

fig. 34: public central watertank in Bawomataluo (left), water supply with public water taps in Bawogosali (right)

One very characteristic public space of a traditional village is the *Bale*. The *Bale* is the convention hall. It is located in the centre of the village, and is a rectangular building which is open to all sides. It is furnished with benches all around.[48] The *Bale* is used for communal and public assemblies, which are called *Orahu*, a vital component of the village life.[49]

fig. 35: Bale in Hiliamaetaniha (left), Bawomataluo (right-up) and Sondregeasi (right-down)

To emphasise its function as a meeting place, the *Bale* is located in the middle of the village square, with a distance apart the closed rows of the houses, so that it can be seen from nearly every vantage point within the settlement.[50]
Traditionally, its structure is open and made of wood with short pillars. Newly built *Bale* are mostly made of concrete, where the builder tried to preserve the traditional appearance of the building.

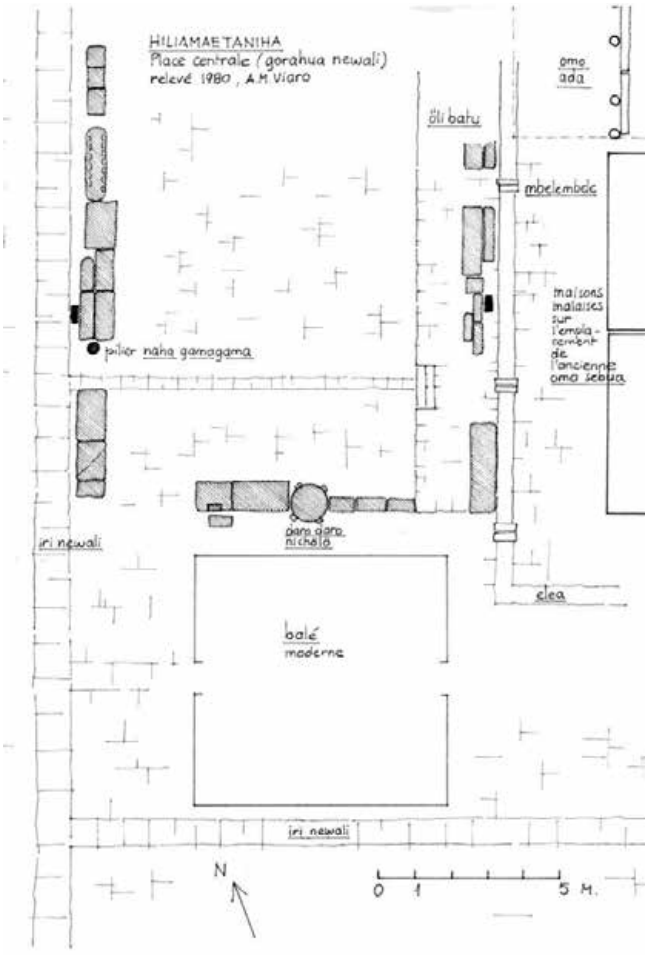


fig. 36: Gorahua Newali in Hiliamaetaniha 1980

Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 66

[48] Alain VIARO; NIAS Reconstruction in the respect of the tradition; p.3

[49] Alain VIARO; NIAS Reconstruction in the respect of the tradition; p.3

[50] Petra GRUBER, Ulrike HERBIG; Settlement and housing on Nias island adaptation and development; p. 6

The hall is not only used as a convention center for the village council, it is also used as a meeting and communication point. The men of the village of every age meet and talk there[51]. The inhabitants use it as a secure shelter from the sun or the rain.
In traditional societies there is also a strong issue of gender connected to the use of space. This could be observed during fieldwork, where we had the opportunity to see where men and women spent most of their time. Women meet and spend their free time on the *Mbelembele* and the men in and around the *Bale*. Of course this separation is not strict or a rule, so men and women also spend time together, but only in or in front of the houses. The *Bale* remains even nowadays the domain of men.
Another forum for political life within a village happens in the *Gorahua Newali*.[52] It has essentially the same function as the meeting hall and is located in front of the chief´s house and next to the *Bale*. The *Gorahua Newali* is the assembly square which is surrounded by megaliths presided by the throne of the chief which is usually also made of stone, and thus a monument in itself.

4.1.2.2 Semi-public spaces

Another very important building in the traditional village is the chief´s house, or in bahasa Niha the *Omo Sebua*. "The omo sebua is the tallest house in the village and occupies a special position in the village plan in keeping with the social rank of the owners."[53] The *Omo Sebua* is the living house of the chief of the village and is positioned like the *Bale* in the centre of the village. The chief if the village is called *Si´ulu.*[54]
"The si´ulu sit on the highest stone, live in the highest land in the village, and have the tallest houses. Si´ulu, therefore is both a name and a physical description of a social position."[55]

The chief´s house is designed in a very similar fashion as all traditional buildings in the village, with the only difference, that the building is the biggest and highest in the settlement.

fig. 37: Omo Sebua in Bawomataluo (left) and Hiliamaetaniha (right)

In South-Nias all houses have nearly the same dimension, approximately 4 meters width by 12 meters height.[56] [57] The *Omo Sebua* in comparison can be up to 10 meters by 30 meters, which is more than the double size of a common house. In Hiliamaetaniha, the houses are a bit smaller with a width of 4 meters and a height of 9 meters. The new *Omo Sebua* is "only" 6 meters wide and 12 meters high. In comparison to the other villages I visited like Bawömataluo, Hilimondegeraya or Hilinawalefau it is a very small edifice, but the inhabitants are nevertheless very proud of their *Omo Sebua*. Before 2011 they did not have a chief´s house for a long time.
In 1980 Alain Viaro was in Hiliamaetaniha for a research and at this time was no *Omo Sebua* existing. I was not able to find out what happened to the old chief´s house. In 2011, the village community decided to build a new chief´s house in the traditional way.
It is still the living place for the family of the king, but it is also used to receive guests (especially official and inofficial guests of the whole village) and as a representative room. In Hiliamaetaniha the *Si´Ulu*, the head of the village, told us, that all the inhabitants of the village are allowed to use the building and that the building is open for everyone, including guests. In fact in this respect it is much like a town hall in Europe.
However, the *Omo Sebua* is also private living house. Most of the time it is a living house like all

[51] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 90*

[52] *Alain VIARO; NIAS Reconstruction in the respect of the tradition; p.2*

[53] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 2*

[54] *Pietro SCARDUELLI; Accumulation of heads, distribution of foot; The image of power in Nias; In: Bijdragen tot de Taal-, Land- en Vorkenkunde 146 (1990), no: 4, Leiden, 448-462; p. 449*

[55] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 104*

[56] *Alain VIARO; NIAS Reconstruction in the respect of the tradition; p.3*

[57] *Alain VIARO; Nias Island traditional houses; p. 196*

the other houses, but if visitors are in the village or arrangements are planned, the *Omo Sebua* changes its function to a public building. We were invited to visit all the *Omo Sebuas* in the villages during our short village tour in the near countryside.
Another very important items for infrastructure are *Warungs*. *Warungs* are the shops in the village, where the inhabitant can buy necessities for everyday consumption like food, sanitary wares, tobacco goods, and sometimes even clothes. Normally the occupant of the *Warung* does not have a separate sales building or sales room, they use the guestroom for the business. So the sales room equals the private living room, and is basically a private area which changed its function to a public area. In the small home *Warungs* owners does not have business hours like we do, they sell their goods whenever they are needed.
In most of the *Warungs* is it possible to sit down to drink and eat.


fig.38: Warung in Orahili

Pigs were and still are a very important part in the traditional economic system of South-Nias villages. Pigs are a symbol of wealth and rank of the family and if the family celebrates a ceremony they usually butcher pigs. Pigs are also a kind of business, because the people pay traditionally in pigs, for example for a wedding.
During the ceremony they butcher several pigs and every guest gets a piece of uncooked fresh meat. Also live pigs are given as a present to other villages or families.
In the past the animals were allowed to run around freely in the village. Underneath the house in the substructure there was also a space for the animals (usually an enclosure or stable). In the last few years the owners started to build stables behind the house for the pigs. Not every property has enough space behind the house or the space is irreclaimable. As a solution for this problem all the concerned persons started to use a piece of land outside the village to host the pigs. That area is open to the public, but each owner is in charge of his own animals.
The largest representative of a semi-public area is the *Halaman*. As already mentioned, the *Halaman* is private property. It is used as a private and public area at the same time. For a foreigner is it usually not possible to see a border between the private and public property.

4.1.2.3 Semi-private spaces

The largest semi-private area is the *Mbelembele*.
It is comparable with a patio or terrace in front of a European house. It is in private use as a transitional area, mainly for free time and communication. The most significant difference to Europe is that the area is never hidden behind a fence. Everyone has a free view and (physical) access to that area. Sometimes residents meet on the *Mbelembele* to chat and play.


fig. 39: Mbelembele in Hiliamaetaniha

A complete different situation emerges during rain. In that situation the *Mbelembele* changes to a covered public walkway, as all other traffic on unsheltered areas is very unpleasant due to the heavy downpours.

4.1.2.4 Private spaces

Private domains in the traditional villages in South-Nias are the houses of the inhabitants, or in other words the living space. On the one hand a clear border is posed by the facade of the house.
On the other hand, the house, and thus the private domain, does not begin abruptly. It actually stretches some way towards the *Mbelebele*, which is a real transition zone in many respects. The borders between street/*Mbelebele* and house interior/facade are more transient than seem to be at a first glance. We will go into more detail when discussing the houses.

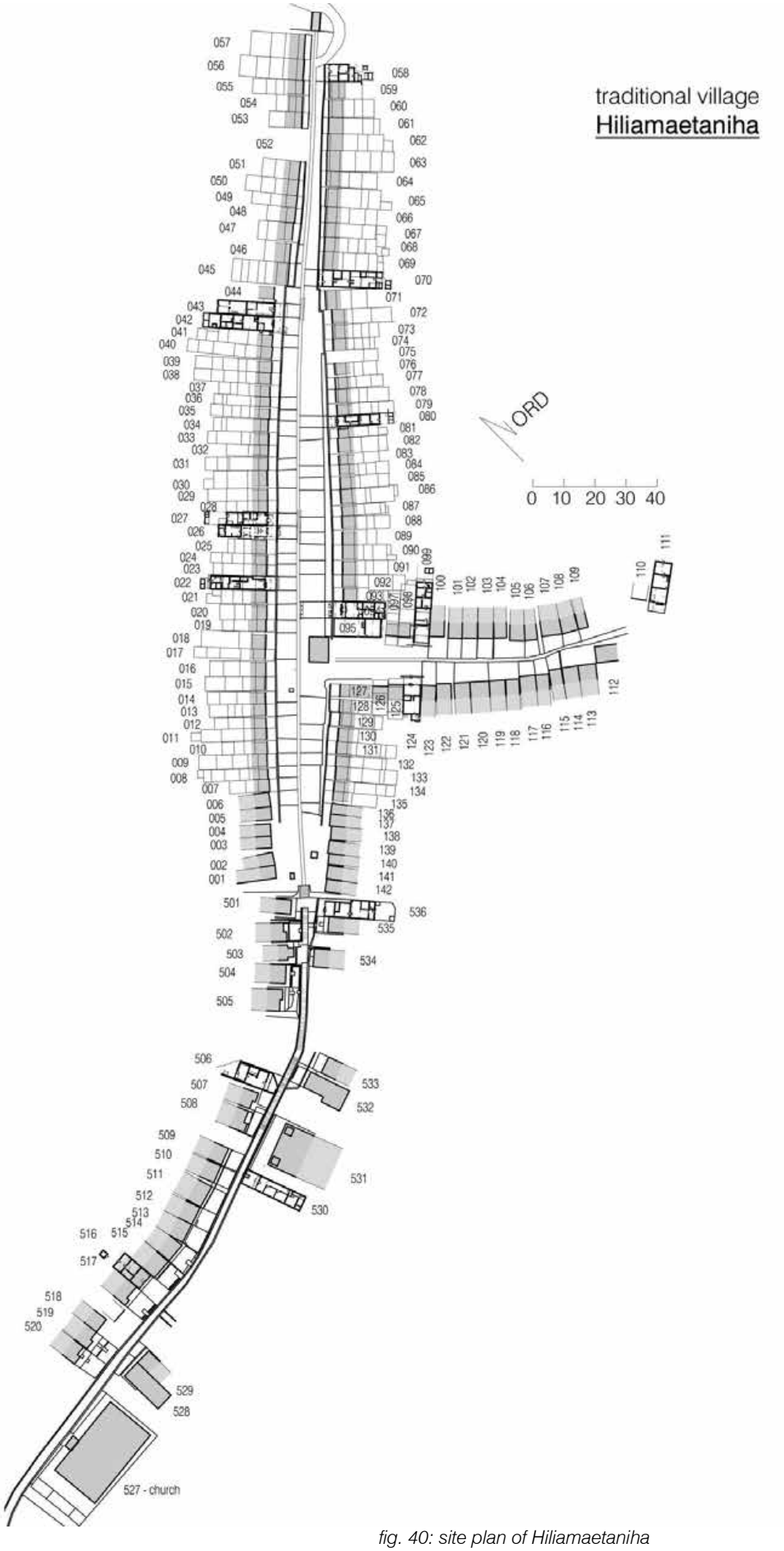


fig. 40: site plan of Hiliamaetaniha

village	house-number	TSH	TH-SP	TSH-SP	MH-COBR	MH-WOCO	2nd Floor	extantion	modefication	sago roof	metal roof
shiae	001				1					1	
shiae	002	1							1	1	
shiae	003	1							1		1
shiae	004	1							1	1	
shiae	005					1	1			1	
shiae	006	1						1	1		1
shiae	007		1					1			1
shiae	008	1						1	1		1
shiae	009	1						1	1		1
shiae	010	1						1	1		1
shiae	011	1						1	1		1
shiae	012	1						1			1
shiae	013	1						1	1		1
shiae	014	1						1	1		1
shiae	015	1						1	1		1
shiae	016	1						1	1		1
shiae	017	1						1	1		1
shiae	018	1						1	1		1
shiae	019				1			1			1
shiae	020	1						1	1		1
shiae	021	1						1	1		1
shiae	022	1						1	1		1
shiae	023	1						1	1		1
shiae	024	1						1			1
shiae	025	1						1			1
shiae	026	1						1			1
shiae	027	1						1	1		1
shiae	028	1						1			1
shiae	029	1						1			1
shiae	030	1						1			1
shiae	031	1						1	1		1
shiae	032	1							1		1
shiae	033	1						1	1		1
shiae	034					1	1	1			1
shiae	035	1						1	1		1
shiae	036	1						1	1		1
shiae	037	1						1	1		1
shiae	038	1						1	1		1
shiae	039	1						1	1		1
shiae	040	1						1	1		1
shiae	041	1						1	1		1
shiae	042	1						1	1		1
shiae	043	1						1	1		1
shiae	044	1						1	1		1
shiae	045				1			1			1
shiae	046		1							1	
shiae	047		1					1			1
shiae	048				1						1
shiae	049				1			1			1
shiae	050				1			1			1
shiae	051				1			1		1	
shiae	052										
shiae	053		1					1			1
shiae	054		1					1		1	
shiae	055					1		1			1
shiae	056					1		1			1
shiae	057					1		1			1
shiae	058				1		1	1		1	
shiae	059					1		1			1
shiae	060		1					1			1
shiae	061		1					1			1
shiae	062		1					1			1
shiae	063		1					1			1
shiae	064		1					1			1
shiae	065				1			1			1
shiae	066				1			1			1
shiae	067				1			1			1
shiae	068				1			1			1
shiae	069				1			1			1
shiae	070				1			1			1
shiae	071		1								1
shiae	072	1						1	1		1
shiae	073	1						1	1		1
shiae	074	1						1	1		1
shiae	075									1	
shiae	076	1						1	1		1
shiae	077				1			1			1
shiae	078	1						1	1	1	
shiae	079	1						1	1		1
shiae	080	1						1	1		1
shiae	081		1					1		1	
shiae	082	1						1	1		1
shiae	083	1									1
shiae	084	1						1	1		1
shiae	085	1						1	1		1
shiae	086	1						1			1
shiae	087	1						1	1		1
shiae	088	1						1	1		1
shiae	089	1									1
shiae	090	1						1	1		1
shiae	091	1						1			1
shiae	092					1	1	1			1
shiae	093	1						1	1		1
shiae	094	1						1	1		1
shiae	095	1						1			1
shiae	096							1			1
shiae	097	1						1			1
shiae	098	1						1	1		1
shiae	099			1				1			1
shiae	100			1						1	
shiae	101				1						1
shiae	102		1					1	1		1
shiae	103		1								1
shiae	104			1							1
shiae	105		1								1
shiae	106			1					1		1
shiae	107				1						1
shiae	108				1						1
shiae	109				1						1
shiae	110				1						
shiae	111	1					1	1	1		1
shiae	112				1					1	
shiae	113				1					1	
shiae	114					1	1				1
shiae	115		1								1
shiae	116		1							1	
shiae	117				1						1
shiae	118		1							1	
shiae	119				1						1
shiae	120		1				1				1

shiae	121				1					1	
shiae	122		1					1			1
shiae	123		1					1			1
shiae	124		1							1	
shiae	125		1					1		1	
shiae	126					1	1				1
shiae	127	1						1			1
shiae	128	1						1	1		1
shiae	129		1					1			1
shiae	130	1								1	
shiae	131	1						1	1	1	
shiae	132	1						1			1
shiae	133	1						1			1
shiae	134	1						1	1		1
shiae	135	1								1	
shiae	136	1							1		1
shiae	137				1					1	
shiae	138	1							1	1	
shiae	139				1						1
shiae	140		1								1
shiae	141					1					1
shiae	142				1					1	
		72	25	4	28	10	8	98	56	25	115

shiae	501		1								1
shiae	502				1					1	
shiae	503		1								1
shiae	504				1						1
shiae	505				1						1
shiae	506				1						1
shiae	507				1						1
shiae	508				1						1
shiae	509				1						1
shiae	510				1						1
shiae	511				1						1
shiae	512				1						1
shiae	513				1						1
shiae	514				1					1	
shiae	515				1						1
shiae	516				1						1
shiae	517				1					1	
shiae	518				1						
shiae	519				1						1
shiae	520				1						1
shiae	521										
shiae	522										
shiae	523				1						1
shiae	527				1						1
shiae	528				1						1
shiae	529				1						1
shiae	530				1			1			1
shiae	531				1						1
shiae	532				1						1
shiae	533				1						1
shiae	534				1						1
shiae	535		1								1
shiae	536		1					1			1
		0	4	0	27	0	0	2	0	3	27
		72	29	4	55	10	8	100	56	28	142

list 02: list of buildings in Hiliamaetaniha

5. Sondregeasi - an example of a modern village

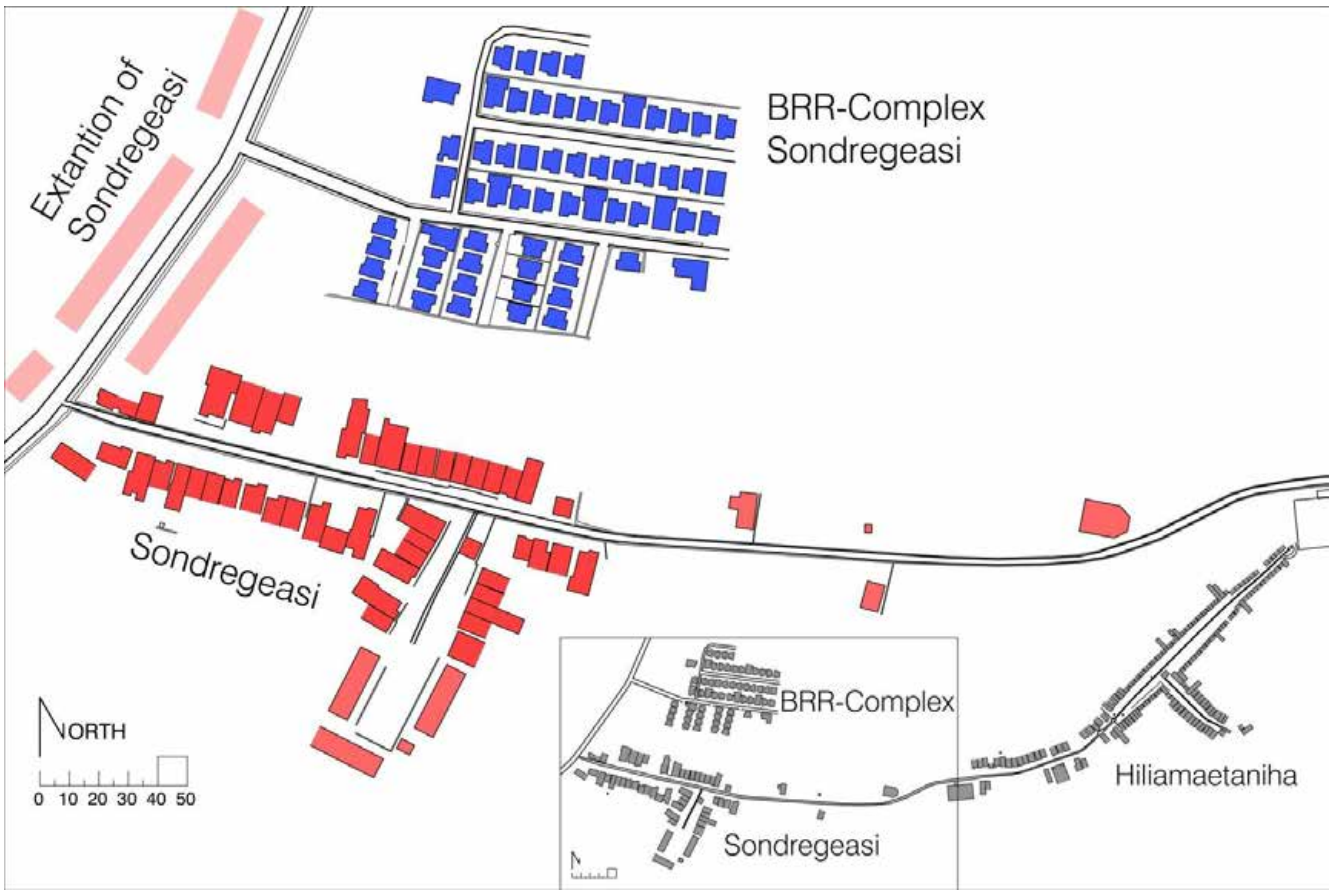


fig. 41: overview plan Sondregeasi

Sondregeasi is a new village in South-Nias in the neighbourhood of Hiliamaetaniha. To be more precise Sondregeasi is located near the main coastal road and stretches up towards Hiliamaetaniha. Its location is along the access road which leads to the traditional village. The terrain of the new settlement is mostly flat; a piece of land still belonging to the low coastal strip. Only the end of the village ascends a little, but the terrain is not too steep. The slope changes after the last houses and rises more and more.

Although Sondregeasi is an autonomous village, it is historically related to Hiliamaetaniha. Nearly all the residents of Sondregeasi originate from Hiliamaetaniha and moved down to the new village in the recent past.

According to local South-Nias tradition, the oldest son of the family inherits the traditional house. Younger brothers have to move out when they grow up, and if they want to found their own family, they have to build a new house. The daughters move out to live with their husbands -as the husbands are usually from another village, a daughter leaves her old settlement.

As a result, all the younger sons try to get their own piece of land close to the traditional village and build a new house for themselves and their new family. As mentioned above, the space around the traditional village of Hiliamaetaniha got settled by people, who built new houses. The properties next to the access road are pretty steep and it is difficult and dangerous to build on this land.

So the people started to use the free properties down the hill by the main road.

The position next to the street is also very advantageous. The easy access through the road and the ease of development makes it cheaper and easier to build new houses. Other reasons to build at the foot of the hill is the existing infrastructure with the access from the main road. Passage is also possible during heavy rains. Water supply is easier and electricity is available already.

village	house number	period	ancestry of the father	ancestry of the mother
ssond	003	17	Hiliamaetaniha	Bawömataluo
ssond	005	30	Hiliamaetaniha	Orahili
ssond	014	(6)	Hiliamaetaniha	Hiliamaetaniha
ssond	021	20	Hiliamaetaniha	Hiliamaetaniha
ssond	025	40	Hiliamaetaniha	Guningsitoli
ssond	032	4	Hiliamaetaniha	Hilimanomele
ssond	033	14	Hiliamaetaniha	
ssond	041	30	Guningsitoli	Hiliamaetaniha
ssond	043	7	Hiliamaetaniha	Hiliamaetaniha
ssond	047	12	Hiliamaetaniha	Hilisimaetane
ssond	054	18	Hiliamaetaniha	Hiliamaetaniha

List 03: ancestry of the house owner

As mentioned is the name Sondregeasi the historic name of the traditional village Hiliamaetaniha, because the original name of Hiliamaetaniha was Hili Sondregeassi.
In 1891, the whole settlement burned down and the newly rebuilt place was named Hiliamaetaniha.[58]
Thus, not only the residents, but also the name Sondegeasi has a direct connection to Hiliamaetaniha.

fig. 42: foundation of Sondregeasi

The exact date of foundation of the modern village is not known. However, in the last 30 years it grew into an own settlement. At the beginning, a few inhabitants built their houses next to the road to Hiliamaetaniha. The first houses like ssond 005 were built 30 years ago[59].
On the other hand it is likely, that the first settlement in this area started long before. As mentioned previously, the South Nias traditional villages were always built inland on the top of hills. However, during the colonial occupation settlements and fortresses were founded next to the beach at sea level, usually near a bay, where the ships of the colonial power where able to anchor. The bay of Lagundri, next to Sondegeasi, was one of the bays where ships were able to anchor securely, that is why the bay was used as an embarkation point.[60]
Thus, it might be possible that there was a settlement on the area of today´s Sondregeasi even before the recent decades. Colonial power might have encouraged people to settle in more accessible locations at the shore, as that also meant better control from the sea.

[58] *Reinhold MITTERSAKSCHMÖLLER (Hg.); Joachim Freiherr von BRENNER-FELSACHER: Eine Reise nach Nias – Die Indonesienexpedition 1887; Böhlau Verlag Wien-Köln-Weimar 1998; p. 328*

[59] *Interview Dwi Eva Ade Lestariwith the owner of the house "ssond 005"; 06.08.2012*

[60] *Reinhold MITTERSAKSCHMÖLLER (Hg.); Joachim Freiherr von BRENNER-FELSACHER: Eine Reise nach Nias – Die Indonesienexpedition 1887; Böhlau Verlag Wien-Köln-Weimar 1998; p. 79,104)*

5.1 The layout of the modern village according to the example of Sondregeasi

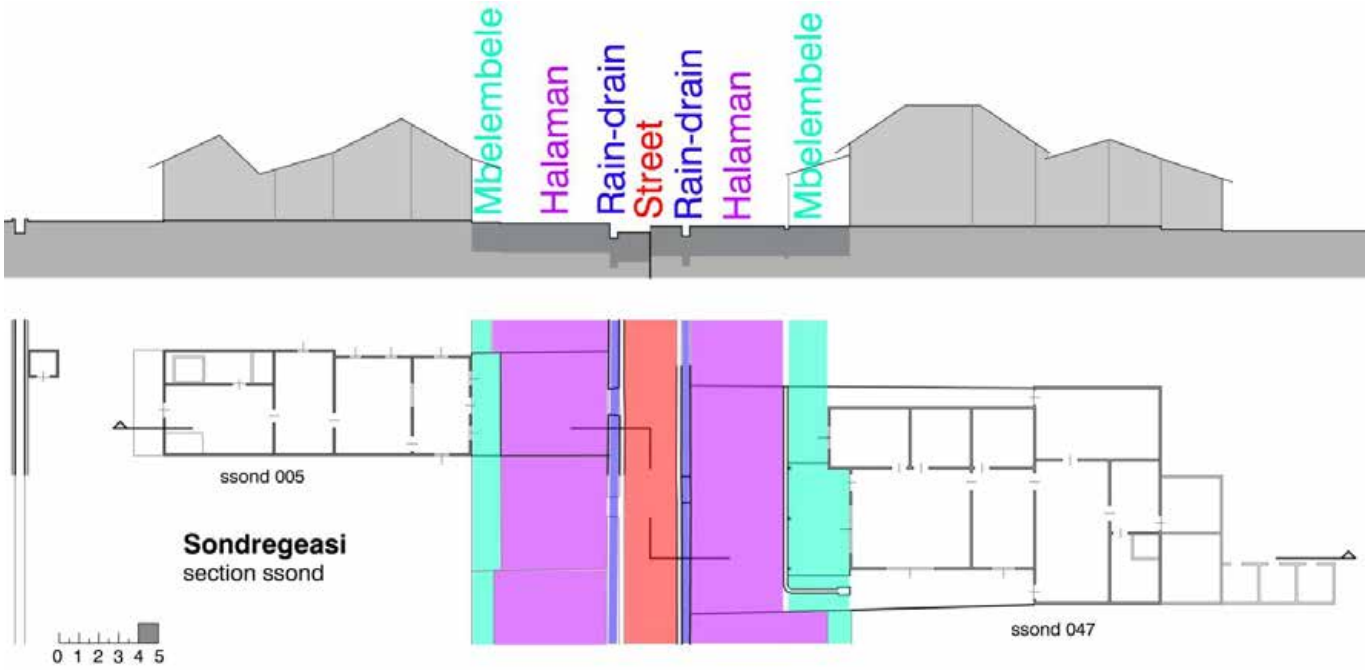


fig. 43: section Sondregeasi – layout of the village

The structure of the "modern" village is similar to the traditional village. A lot of rules used in the layout of a traditional village have been kept and adapted to the modern village and buildings.
Sondregeasi is built along a straight main axis, the street. The street is comparable to the *Iri Newali* in Hiliamaetaniha but is conceived for cars and wider then the pathway *Iri Newali*. The size of the settlement is defined through the beginning and the end of the village. At the traditional villages the borders are formed with staircases. In the modern village the beginning and the end are defined on one side by the coastal road and on the other side by the topography, where the landscape starts to slope steeply upwards to Hiliamaetaniha.
Another recognisable aspect is the village structure. Around the street there is a symmetric sequence of section. It starts with the *Iri Newali* in the middle of the settlement. Both sides of the street are flanked by the *Halaman*, followed by the *Mbelembele* and the houses, ending with the backyard behind the house.
So the specific areas are the same as in the traditional villages, but the usage and the proportions differ a little because of the changing lifestyle of the people, which introduced new requirements.

In Sondregeasi there is a process of modernisation clearly discernible and still in progress. From the foundation of Sondregeasi until now, different steps can be observed.

At the beginning of Sondregeasi, the property owner built in the same layout like in the traditional village.
One example is the house "ssond 041" which was built 30 years ago.

The comparable points are:

The Street as a central public walkway with the difference that the street is built for cars.

The *Halaman* is built in the same level, without a border next to the street. The rain drain which is positioned between the two areas, is stepped down.

Between the *Halaman* and the *Mbelembele* a second raingutter is situated. In front of the *Elea* is a seating accommodation which is made of concrete instead of the usual megalith.

The *Mbelembele* is also a covered area in front of the house and is also connected to the adjoining *Mbelembele*.

The house has a straight facade.

About 15 years later a new and more modern layout of the village with small changes developed.

One example, where the changes are noticeable, is the house "ssond 043" which is 7 years old. The changes are also visible on other properties like “ssond 021” and “ssond 047”.

A visible border between the public and the private property has emerged. The very important main rain gutter was running partly underground. On this property, the covering of the *Elea* is missing and makes the *Elea* visible, thus, it serves as a fence.

The *Elea* and megaliths between the *Halaman* and the *Mbelembele* vanished completely and are not built anymore.

The *Mbelembele* has undergone the biggest change. The covered walkway changed to a covered terrace.

The facade is not straight anymore. The half of the house with the entrance is stepped back. This receding part of the house facade allows the creation of a terrace which is also covered. The remainder of the former *Mbelembele* is nothing more but a small strip in front of the foremost facade line.

The most recent development in the ongoing process can be seen on only one house and has happened only a few years ago. The house “ssond 032” was build in 2008 and is one of the youngest houses in Sondregeasi.

The border between the public and the private property does not only exist in form of the main rain drain, it is also demarcated by a balustrade. The balustrade is 0.90 meters high and is made of concrete.

The space behind the fence is more a front yard of the house than a *Halaman*.

The *Mbelembele* is getting smaller and smaller and lost also the function of a patio and changed to a narrow entrance area.
The reason for the whole process is the search for more privacy and, thus, the retreat into the private property.

fig. 44: key of fig. 45

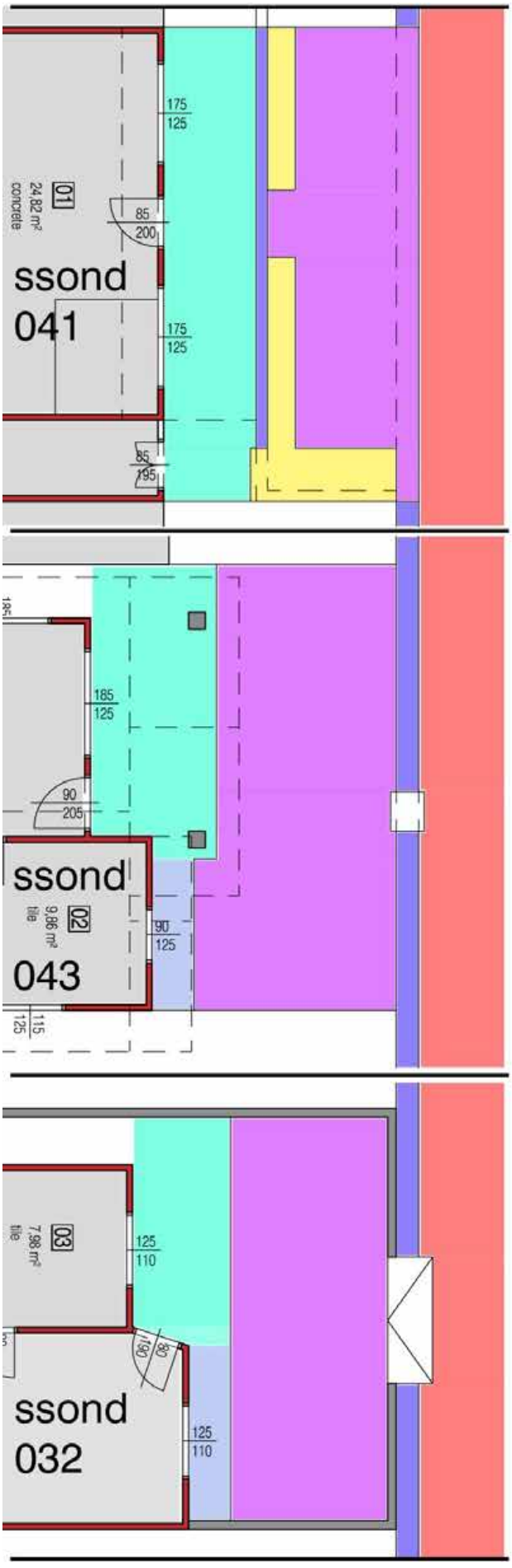


fig. 45: development of the village layout in Sondregeasi

5.1.1 Elements of the layout

5.1.1.1 Public street - *Iri Newali*

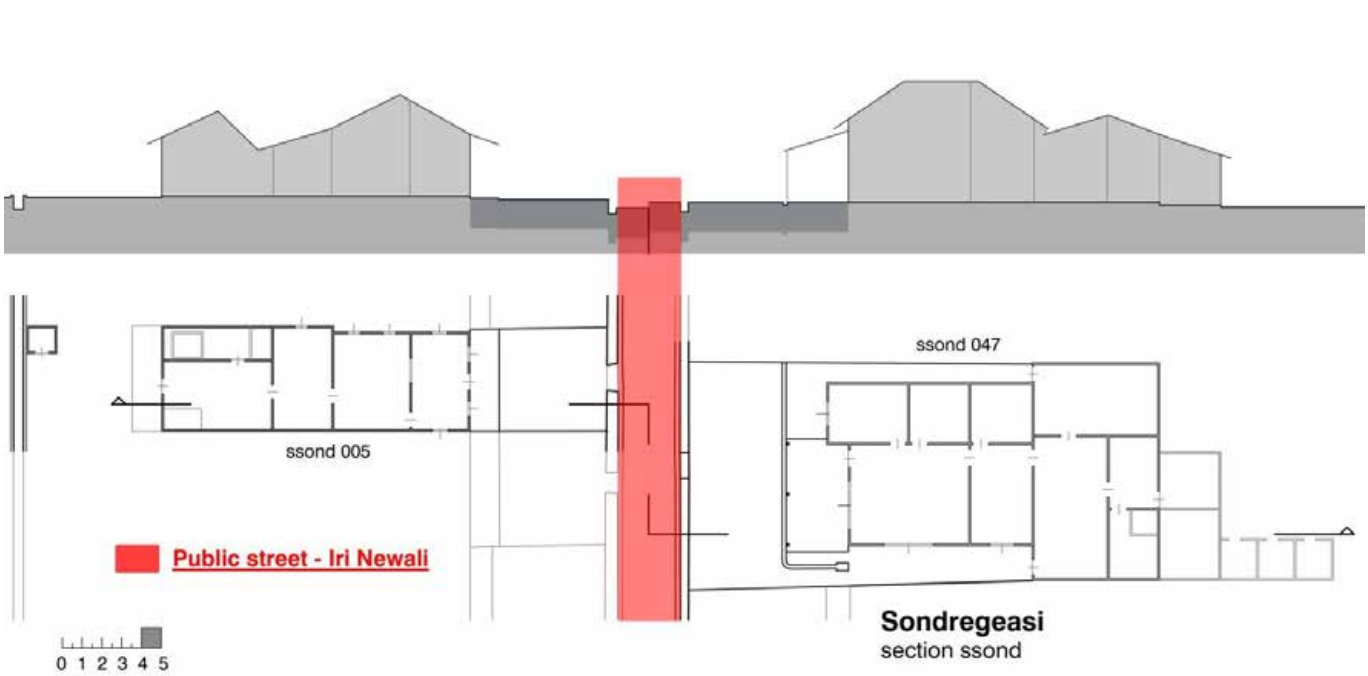


fig. 46: section of Sondregeasi – position of the Iri Newali

The public street in Sondregeasi is comparable to the *Iri Newali* in the traditional village, and forms a central, straight axis which is the "lifeline" of the town. The main function of the street is still the same, but after the development in the last decades also different requirements emerged.
So the old, traditional small walkway in the middle of the village changed to a proper main road and is far more dominant in the layout of the new village. In former times it was designed to walk through the village. Nowadays the street is not only used as a walkway, it is also used by motorbikes, cars, and trucks. For the new requirements the dimension and the material had to change. The width of the walkway, which is about 1.00 meter in Hiliamaetaniha has changed to a width of 2.70 meters. The material and the structure of the road has now to tolerate heavy load of vehicles and, thus, a change to modern material was mandatory. Like nearly all the other new roads in South-Nias the street in Sondregeasi is made of concrete and a layer of bitumen.
Positive effects of the new street are easy delivery to and from the village and the comfortable and quick access. But also negative aspects can be noticed: more noise from the passing vehicles and motorbikes and danger for the inhabitants resulting from the traffic.
Another result of the easy access through the street is the change in the isolation and seclusion of the village. The traditional village positioned on the hill is a self-contained unit, with the consequence that people, who live in that unit have well developed feelings of social cohesion and solidarity towards each other. So everyone shows interest but is also careful when foreign people enter the village. In Sondregeasi this very important and strong feeling of community is decreasing because of the easy access for foreign people. It is also possible that this progress is a result of the modernization and the new lifestyle of the people. Due to the cheap and easy possibility to extend the village, foreign people move from the surrounding area to the village.
This serious change of social structure and behaviour has also a lot of impact on the physical layout of the modern village Sondregeasi.
A consequence is the position of the rain drain which moved from being in front of the house in the traditional village towards being next to the street in the middle of the modern village.
This might seem to be just a small difference for an outsider, but in fact it tells a lot about change in the settlement and, thus, is very significant on a local level. Why this enormous intervention has happened has a logical explanation:
As soon as proper streets for vehicles were built on Nias, a huge channel on both sides of the road was planned and dug to drain away rain in order to prevent flooding and undermining the road. The

main road of Sondregeasi was built as the access road to Hiliamaetaniha before the first modern houses were erected. In fact, it was never planned to be the main street of a settlement.
That is why the rain drain has been built next to the road, as usually done for overland roads. So this change developed over time during the erection of Sondregeasi and is not a planned change.
As mentioned earlier, the first residents started to cover the rain drain next to the street and built a separate drain channel in front of their houses. With these changes the traditional appearance of the village was re-established.
As time went by, inhabitants stopped to design the front of the house according to the layout known from the traditional village. Not aware of the effects of the adjustment, they left the rain drain at its place beside the road and started to set up houses next to the drain.
The change has an enormous impact on the entire village. As already explained, between the *Iri Nawali* and the *Halaman* in Hiliamaetaniha no border is really noticeable; there is a fluent transition between the public and the semipublic area. In the modern village, a strict border can be seen and felt. The rain drain generates a very physical border between the public and the private property. The drain acts as a clearly visible "negative" fence, so that people have to trespass it deliberately. Instead of doors as an entrance to the property inhabitants build little bridges over the drain. They are also used as a driveway for the motorbikes.

fig. 47: partition of the village layout through the Elea

5.1.1.2 *Halaman*

If we proceed outwards from the *Iri Newali* (keeping the old expression for the central road), the next area to be investigated in the modern village is the *Halaman*, which is still comparable to its old version in the traditional village.
The *Halaman* is acting as a courtyard and is a component of the modern village, which is planned with the following purpose: Between the street and the house, bounded by the rain drain and the *Mbelembele*, the *Halaman* is always found at the same location.
Compared to Hiliamaetaniha the average dimensions are a bit smaller. The width of the *Halaman* is defined by the width of the house, which usually equals to the width of the property. It is usually 5.00 meters of width and, thus, is comparable to Hiliamaetaniha. The length of the *Halaman* is different. Whereas the length of the *Halaman* in Hiliamaetaniha is in average 7.00 meters, in Sondregeasi it is a bit shorter with an average length of 5.00 meters. On a few properties like “ssond 041” the *Halaman* is only 3.00 meters long.
As explained the *Halaman* at the traditional village is a semi-public area, without a clear border to the *Iri Newali*. With the two *Halaman* facing each other, and the *Iri Newali* in the middle, a large central space goes through the whole village and is used by everybody.
In Sondregeasi a typical modern village-style emerged with a central street and the adjoining properties with a front yard. We still use the term *Halaman*, but it is actually treated differently than the traditional *Halaman*. Contrary to Hiliamaetaniha, in Sondregeasi the lateral borders towards the neighbours are clearly defined in most cases. Because of the topography, the succession of the even *Halamans* is terraced and each individual *Halaman* is separated from the next by a step. The steps (from 0.05 m up to 0.50 m) define the border between the properties. In one case the resident built a fence around his property to define it.


fig. 49: example of Halaman in Sondregeasi

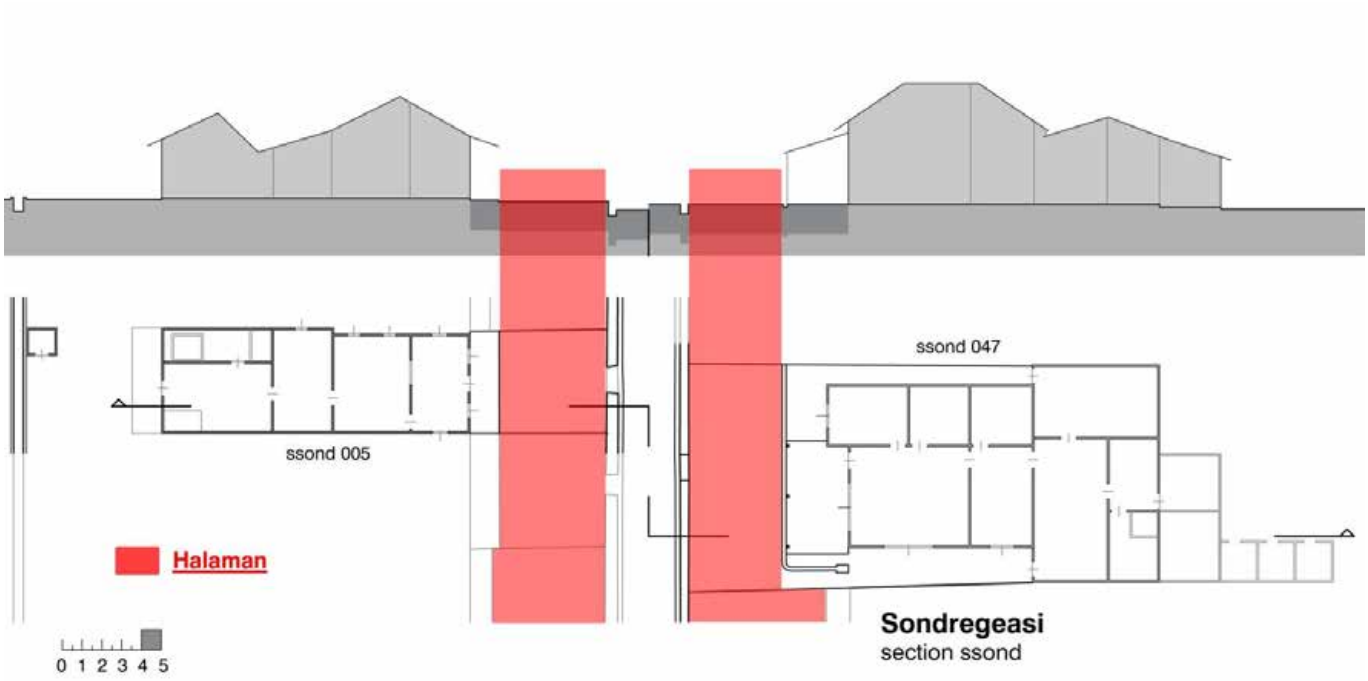


fig. 48: section of Sondregeasi – position of the Halaman

The borders are also clearly visible due to the different materials used. The traditional pavement consisting of natural stone tiles is rarely used in Sondregeasi. Usually the areas of the *Halaman* are levelled, straightened, and covered with concrete.
A couple of owners started to plant their *Halaman* with grass to have a proper garden in front of their house.
The fencing and greening of the *Halaman* are steps in the development towards a modern setup of a settlement with fences and green front yards.

Function

The function of the *Halaman* has basically not changed as it is still used as a drying area, playing ground, working space, event area, storage space and for all the other functions which have been mentioned earlier in the explanation of the traditional village. However, in Sondregeasi they are additionally used as a parking area for the motorbikes, which are the most common vehicles in Nias.

Fig. 50: usage of the Halaman

5.1.1.3 Megaliths

Megaliths are a very remarkable sign in the traditional village and of great importance for cultural and social life. During our fieldwork in 2012, only one megalith could be found in Sondregeasi, which was in front of the house "ssond 005". The megalith is not positioned on an *Öli Batu* like in Hiliamaetaniha or between the *Halaman* and the *Mbelembele.* It is located in the front of the *Halaman*, next to the street. Also the owner seems to do not use it as a traditional megalith, but more as a sitting place made of a rock.[61]
In front of several houses ("ssond 036, 037, 039, 041") on the north side of the village modern megaliths are noticeable. The owners of the houses built benches between the *Mbelembele* and the *Halaman*. They stretch over the whole width of the property with a small gateway in the middle. These benches are similar to those in Hiliamaetaniha. They do not possess the cultural and symbolic meaning of a real megalith. Instead they are stones which are made to fulfill the purposes megaliths are used in everyday life: to sit down or to put things on them to dry.
There are no consecration ceremonies for the erection of these stones and they do not commemorate important persons or events.

[61] *Interview: ssond 005; 06.08.2012; fieldwork ASSIP- Dwi Eva Ade Lestari, Andreas Aahs*

The owner of the house "ssond 041" built the bench 30 years ago not as megalith, he built it explicitly as a furniture for sitting.[62]
These megalith-benches are also build with rocks and concrete and are used as a space to dry clothes and to sit and relax.
This is a very good example, that while a traditional function is lost (due to loss of hierarchy and social change within the village community), the material and the most everyday and mundane functions are preserved. People do not abandon old forms, but they reduce them. This could be seen as a very far and much less elaborate parallel to the discarding of ornaments at the beginning of modern architectural movements in Europe (of course the Nias people do it much more unconsciously, but the basic idea is similar).
In the northern part of the settlement the facades are among the oldest in Sondregeasi. 30 years ago the inhabitants still tried to build like they did in a traditional village. The *Öli Bato* and the megaliths form a very important part of the layout and so the concrete benches were also built in Sondregeasi following ancient purposes.

fig. 51: Megalith in Sondregeasi

However, all the later established houses discarded the old approach and the concrete benches were not built. The wish to install a megalith as a memorial or monument was never existing in Sondregeasi.

[62] *Interview: ssond 041; 08.08.2012; fieldwork ASSIP- Dwi Eva Ade Lestari, Andreas Aahs*

5.1.1.4 *Mbelembele*

The area of the *Mbelembele* shows the largest changes in the modern village. The transformation of the *Mbelembele* is still on going and at the moment a further step is planned.
The traditional *Mbelembele* is a continuous stripe in front of the house, which is used as a covered walkway and a semi-private front yard.
As the first buildings were erected in Sondregeasi, the inhabitants planned their houses equally to the layout of the traditional village. The *Mbelembele* has the same function and appearance. The depth of the *Mbelemele* is between 1.20 and 2.00 meters and is, such as the new *Halaman,* smaller than the original in the traditional village.
With the need of more privacy, people started to segregate the *Mbelembele* to have some area on their own. Some of them built a balustrade around the *Mbelembele* as visible on the properties "ssond 009" and "ssond 034".
With newly erected houses, the layout of the *Mbelembele* changed.
A new floor plan has been introduced and the front part of the buildings has been modified. Instead of the straight facade, a part of the front wall was set back. As a result, a terrace was created, which is comparable in most aspects to the *Mbelembele*. This terrace is covered by the roof. Only a small stripe without any specific function remains from the old *Mbelembele*. In my opinion, this small area will disappear and the *Mbelembele* will change completely into a roofed terrace.
The *Mbelembele* in the traditional or modern style is, such as in the traditional settlement, a bit higher than the *Halaman*.
The step between the two areas is normally between 0.05 and 0.20 meters high and thus somewhat smaller than in the traditional village. The reason for this is the position of the rain drain. In Sondregasi the rain drain is right in the middle of the village and the *Halaman* and *Mbelembele* is sloped towards the drain. In Hiliamaetaniha the rain drain is between the *Mbelembele* and the *Halaman*. The higher step is important if the rain drain is blocked, because then, the water floods the *Halaman* but not the house.
In Sondregeasi the rain drain is farther away. Because of the long slope, the danger of flooding is not too high. This is the reason why the step between the *Halaman* and the *Mbelembele* is lower. Actually it is not necessarily needed anymore, but because of preserving tradition it is still built. Anyway, it is a last barrier against water.
The usage as a covered walkway disapeared completely as time went by.

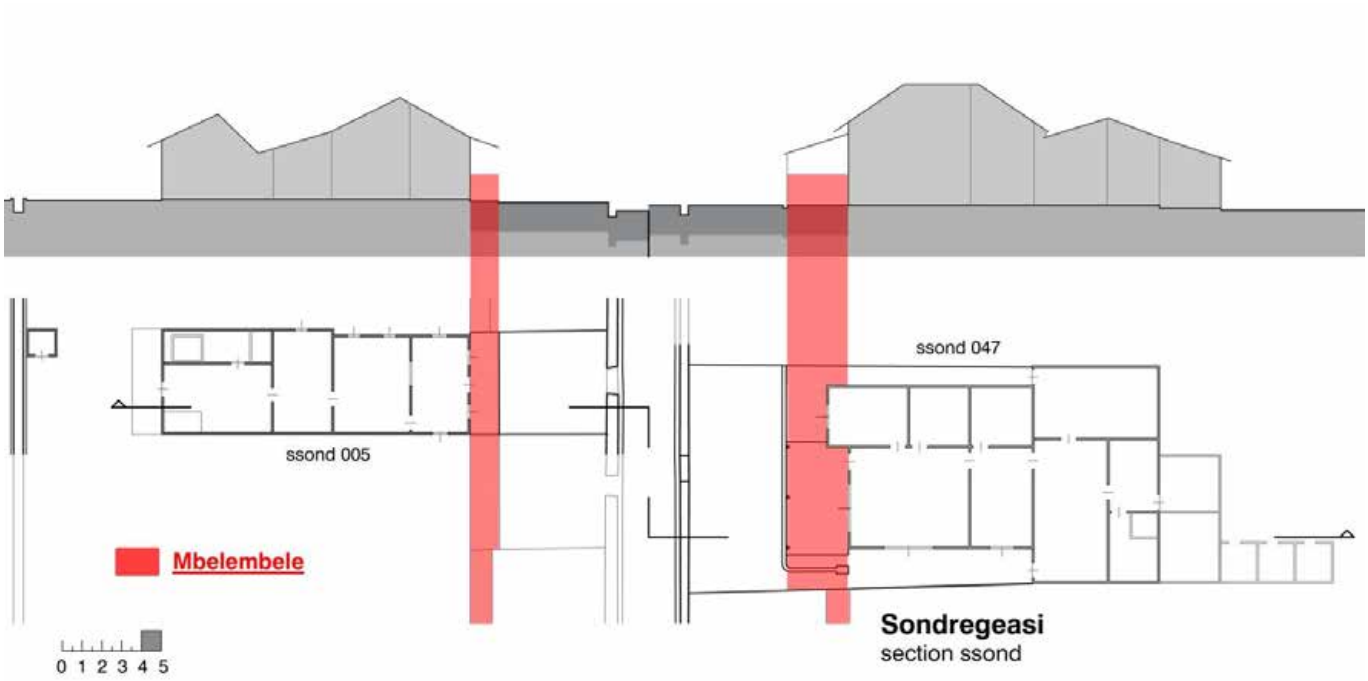


fig. 52: section of Sondregeasi – position of the Mbelembele

The area is only used as a sitting and relaxing area now, such as a terrace in western countries.
The *Mbelembele* or terraces in Sondregeasi are nearly all made of concrete. At some newly built houses, the *Mbelembele* was even tiled with glazed tiles.
In the last decades, tiling became an indication of wealth and opulence. A lot of house owners told us they are busily saving money to tile the inside and the outside of their house.

fig. 53: examples of different Mbelembeles in Sondregeasi: ssond 041 (left), ssond 006 (middle), ssond 045 (right)

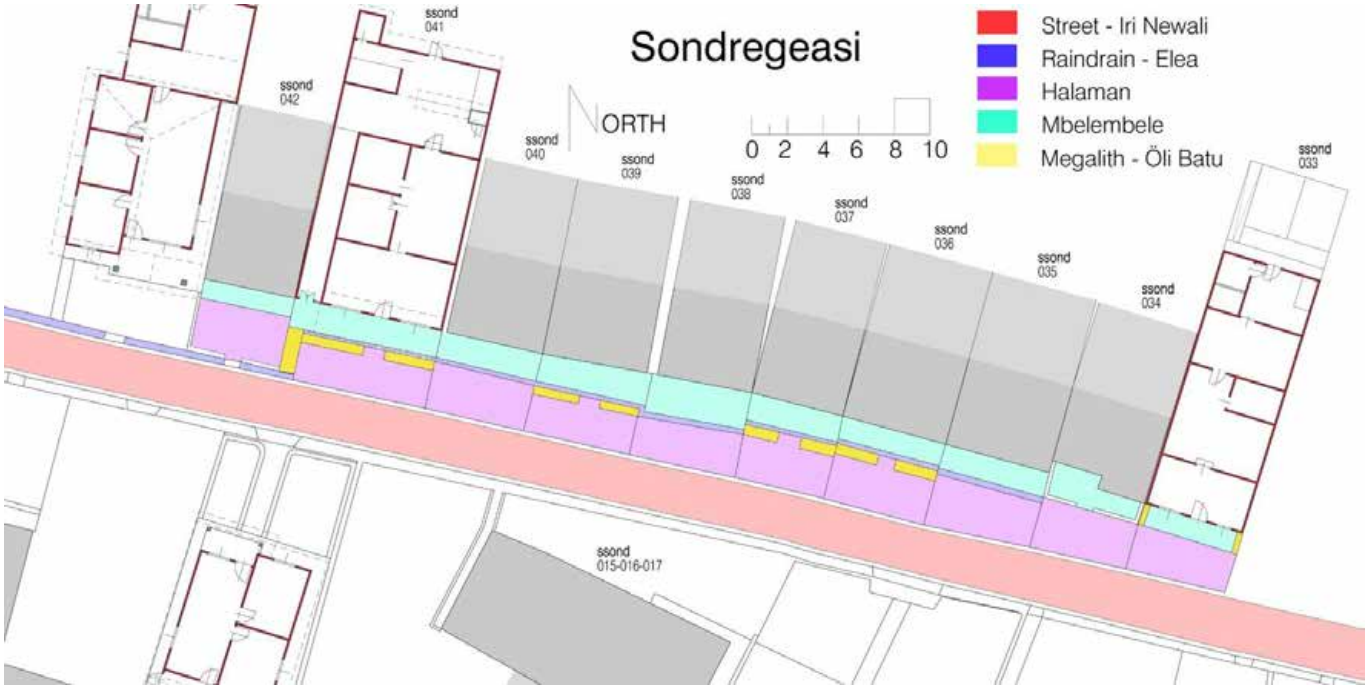


fig. 54: site plan of Sondregeasi

5.1.2 Public – Semi-public – Semi-private - Private

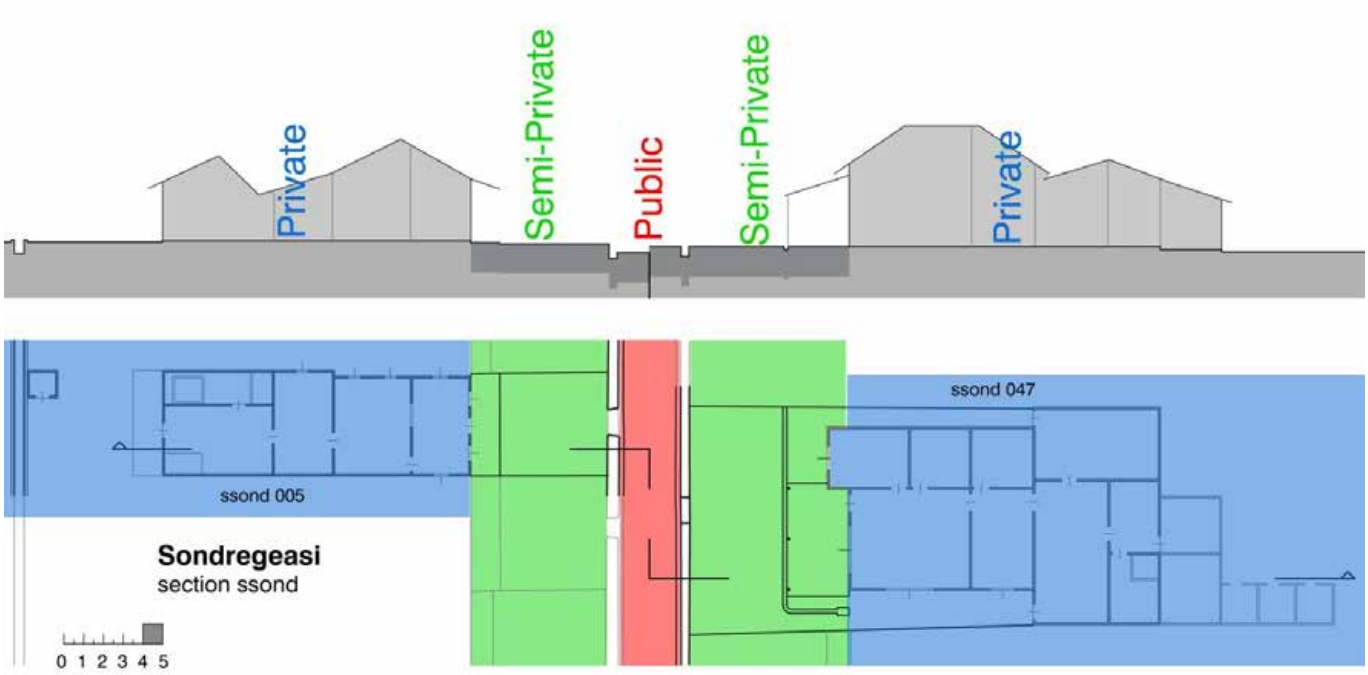


Fig. 55: section of Sondregeasi – from public to private

The graduation from public to private areas has a similar layout in Hilimaetaniha and in Sondregeasi. There are only minor changes, but these small changes in layout reflect changes in function.
The modern street and the change of the position of the rain gutter caused the largest change. The village is divided in the area of the street, the front yard, and the house.

These different areas and the borders between them are clearly noticeable and visible. The fluent passage of different areas characteristic for Hiliamaetaniha is completely lost. The rain gutter is a very distinct border between the public and private – semi-private area. As a consequence the *Halaman* changed from a semi-public to a semi-private area.

5.1.2.1 Public spaces

The biggest public area is the main street of Sondregeasi in the middle of the village. The street is, in difference to Hiliamaetaniha, a proper street for cars and other vehicles. Its advantage width is 2.70 m and it is used by vehicles, primary by motorbikes but also as a walkway for the inhabitants. The inhabitants, who own a motorbike drive their motorbike over the small driveway to their own property and park it there.
Another public area is the *Sumur Umum* of Sondregeasi. It is located at the end of the village on the right side, just before the way to Hiliamaetaniha starts to climb up hill. The *Sumur Umum* is hidden behind trees and the last house in Sondregeasi and is not properly accessible. The reason is the public waterstation is not often used.
With the position of the village at the foot of the hills on sea level it is possible to dig a well and get fresh ground water. Most of the houses in Sondregeasi already have a well or plan to build one. So they have fresh water whenever they need it and do not depend on the rain.

Watersupply in Sondregeasi							
	village	house number	build-in tank	well	Sumur Umum	Area of tank	
1	ssond	003		1			m²
2	ssond	005		1			m²
3	ssond	014	1			1,88	m²
4	ssond	021		1			m²
5	ssond	025	1			2,93	m²
6	ssond	032		1			m²
7	ssond	033		1			m²
8	ssond	041			1		m²
9	ssond	043		1			m²
10	ssond	047		1			m²
11	ssond	054	1			5,73	m²
			3	7	1		

List 4: water supply in Sondregeasi

Another water supply used is the built-in water tank in the house to collect rainwater.
Only a few inhabitants do not have their own water supply and use the *Sumur Umum*. For example the house “ssond 041” is the only house we surveyed with no water supply at all. They still use the *Sumur Umum*, but the inhabitants started already to build a water tank.
In a few years all the houses will be self-supporting and the *Sumur Umum* will only be used as a backup.
Another public building in Sondregeasi is the *Bale*. The house for the village council is, like in Hiliamaetaniha, located in the centre of the village. The simple layout is also comparable to the *Bale* in Hiliamaetaniha. It is a squared area with a length of 6.00m, surrounded by a 1.00m high concrete wall with an in-built concrete bench. The *Bale* is covered with a roof made of corrugated iron imitating the appearance of the roof from a traditional house.
New and important public buildings are *Warungs*. The shops are located in Sondregeasi next to the national primary road (the coastal road). The *Warungs* are in contrast to Hiliamaetaniha proper shops and are not used as a living room at the same time. That is why the *Warung* changed from a semi-public to a public building. In Sondregeasi there are 2 shops: One *Warung* is a kind of a supermarket where you can get all items for daily living. The second *Warung* sells vegetable and fruits. The inhabitants of Hiliamaetaniha also use the *Warung* in Sondregeasi because of his abundant supply.
Another new public area in Sondregeasi is a restaurant. It is like the *Warung* located on the national primary road and offers typical traditional Nias food.
Another new area is the school of Sondregeasi, which is located at the end of the side road.

fig. 56: aerial image of Sondregeasi with public houses

5.1.2.2 Semi-public spaces

As already mentioned, the *Halaman* changed into a semi-private area and, thus, lost its semi-public status.
Interestingly, there is also no "official" semi-public building in the modern village of Sondregeasi. While the chief´s house or *Omo Sebua* in the traditional village is very important for the coherence and character of the village, the house of the *Kepala Desa* (major; which is “ssond 001”) is less important in the modern. Because of its short history the modern village only has a *Kepala Desa* but no King or *Si´Ulu*. That is why a *Omo Sebua* is missing.

5.1.2.3 Semi-private spaces

The semi-private area in the traditional village encompasses the *Mbelembele*. In the modern village, the semi-private area is considerably larger than traditionally so that it becomes the largest area within the village. The huge difference to Hiliamaetaniha is the status change of the *Halaman* from semi-public to a semi-private area. The new resulting semi-private area is in fact the whole front yard of the houses, consisting of the *Mbelembele* and the *Halaman*. As mentioned above, the trend is to copy typical western settlements, with the layout: street – fence - frontyard – house.
The *Mbelembele* completely lost its function as a covered walkway and a communication area.
Now the front yard is only bordered by the street with the rain gutter. That is why the village still looks very open and communicative. The inhabitants of Sondregeasi still have a communal spirit which is very important.

5.1.2.4 Private spaces

In Sondregeasi, like in Hiliamaetaniha, the private areas are the houses, or in other words, the permanent living spaces of the residents.

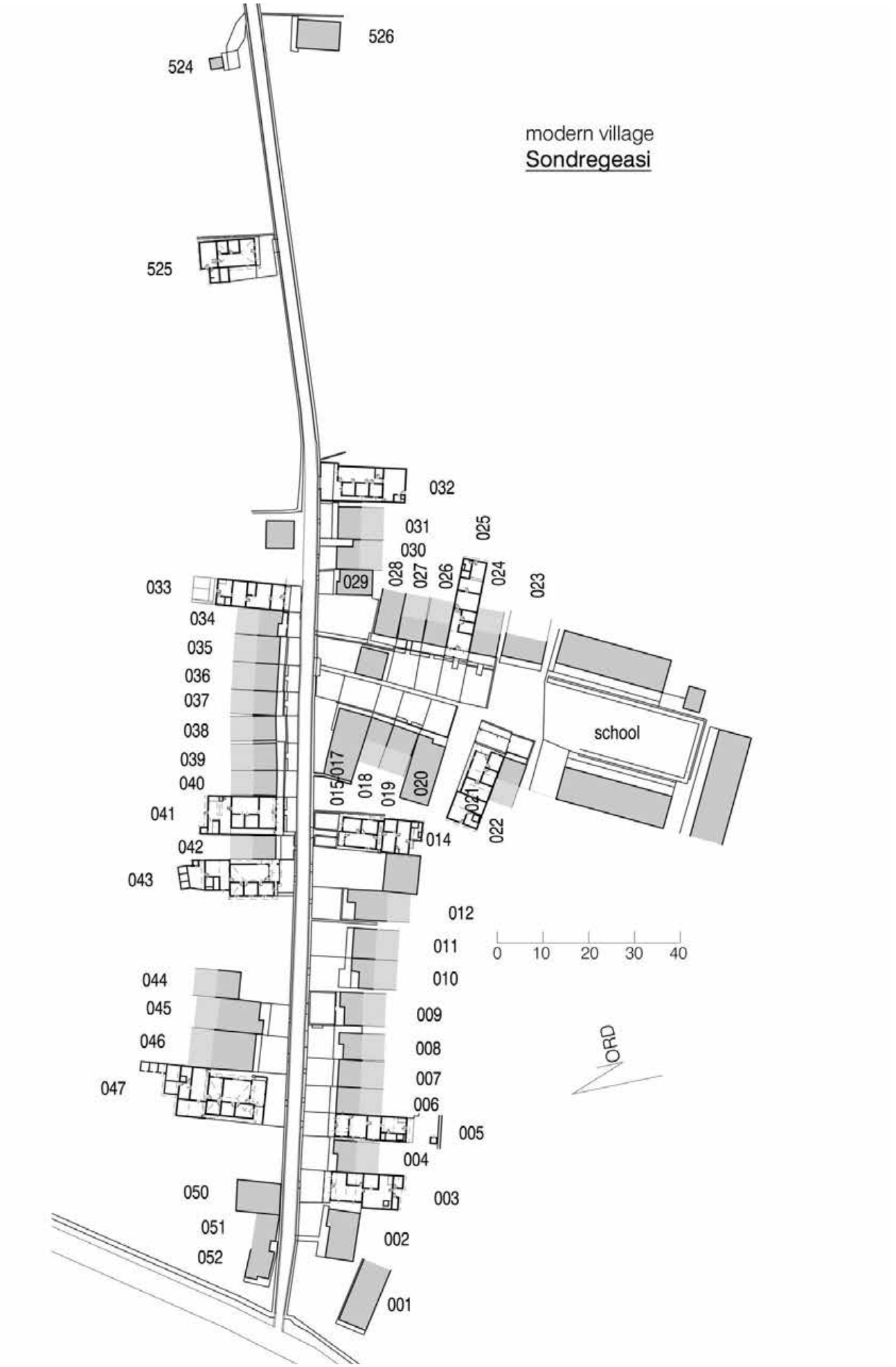


fig. 57: site plan of Sondregeasi

village	house-no.	TSH	TH-SP	MH-COBR	MH-COWO	MH-WO	BRR	2nd Floor	extantion	modefication	sago roof	metal roof
ssond	001			1				1				
ssond	002			1								1
ssond	003			1								1
ssond	004			1							1	
ssond	005				1			1	1			1
ssond	006			1								1
ssond	007			1								1
ssond	008			1								1
ssond	009			1								1
ssond	010			1								1
ssond	011			1								1
ssond	012			1								1
ssond	013			1								1
ssond	014			1					1			1
ssond	015			1								1
ssond	016			1								1
ssond	017			1								1
ssond	018			1								1
ssond	019			1								1
ssond	020			1								1
ssond	021			1					1			1
ssond	022			1								1
ssond	023				1							1
ssond	024				1			1				1
ssond	025			1					1			1
ssond	026			1								1
ssond	027			1								1
ssond	028			1								1
ssond	029			1								1
ssond	030			1							1	
ssond	031			1								1
ssond	032			1								1
ssond	033			1					1			1
ssond	034			1								1
ssond	035			1								1
ssond	036			1								1
ssond	037			1								1
ssond	038				1			1				1
ssond	039				1			1				1
ssond	040			1								1
ssond	041			1								1
ssond	042			1								1
ssond	043			1						1		1
ssond	044			1								1
ssond	045			1								1
ssond	046			1								1
ssond	047			1								1
ssond	048			1								1
ssond	049											
ssond	050			1								1
ssond	051			1								1
ssond	052			1								1
ssond	524					1					1	
ssond	525			1					1			1
ssond	526			1								1
		0	0	48	5	1	0	5	6	1	3	50

list 05: list of buildings in Sondregeasi

6. Houses in the traditional village

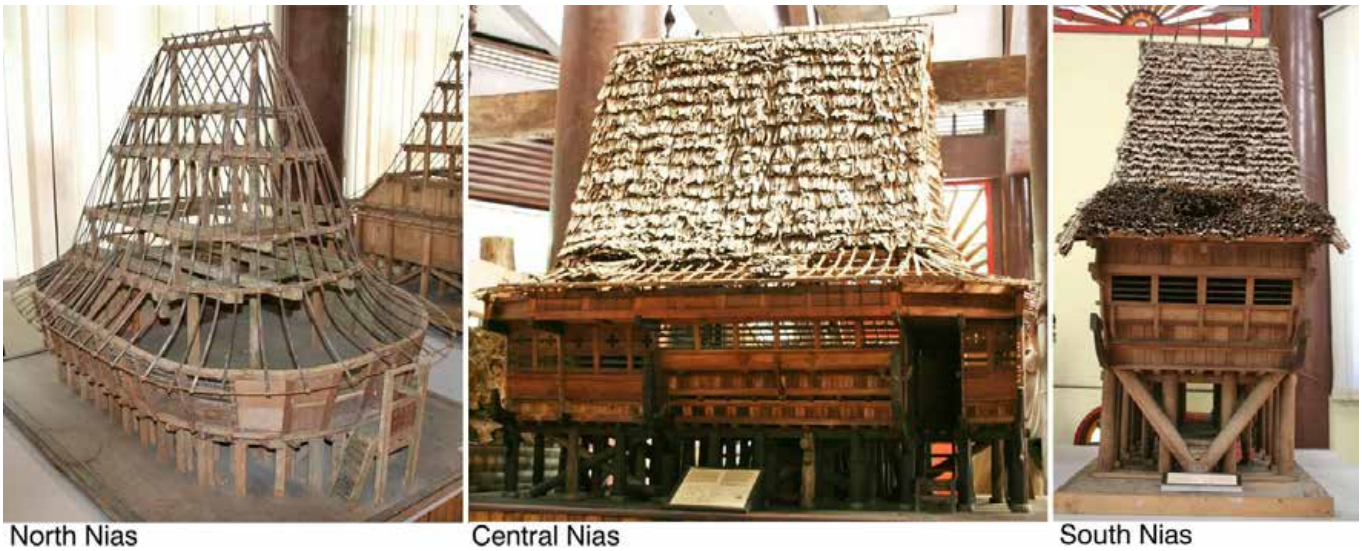


fig. 58: model of Nias houses from the Museum Pusaka Nias

This part of the thesis describes the next smaller unit of living within the village, the houses. The topic "house" is maybe the most interesting in the architecture of Nias. Especially the traditional houses in Nias are very special in many points. There are different traditional building styles in North-, Central-, and South-Nias. They are very different from each other in visual appearance, structure, form, and ground plan layout. Also their location within the village is different, and thus, they influence the open space differently within a settlement.

"The houses of South Nias have been justifiably called "the most beautiful creations of Indonesian architecture" (Heine-Geldern 1935, p. 309). Of all the regions of Nias, it is in the South that one finds the greatest scale, attention to structure, detail, finish, and composition."[63]

Not only the appearance of the houses within Nias is different, also their inner arrangement, function, and design of the rooms are not comparable to a European house. The house has to be adapted to the different lifestyle in Nias. However, life changed, like everywhere else in the last decades and with that, the inner layout of the house. As a consequence of the new lifestyle and the new available building materials, modern houses with a very different ground plan have been built.

Unlike the traditional house where the ground plan and the position of the rooms are more or less fixed, the development in modern houses is still in progress.

Detailed investigations about the structure of the traditional and modern houses are not primary goals of this thesis. Only a short introduction about the most interesting facts will be included here. If more details the structure and construction of the houses in Nias, can be found in the publictions which can be found at the bibliography.

This thesis should help to understand the development of spatial needs of living, room arrangements, functions, etc in and around the house in South-Nias, and thus, includes structural details only as far as they are necessary to understand spatial arrangements.

[63] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 90*

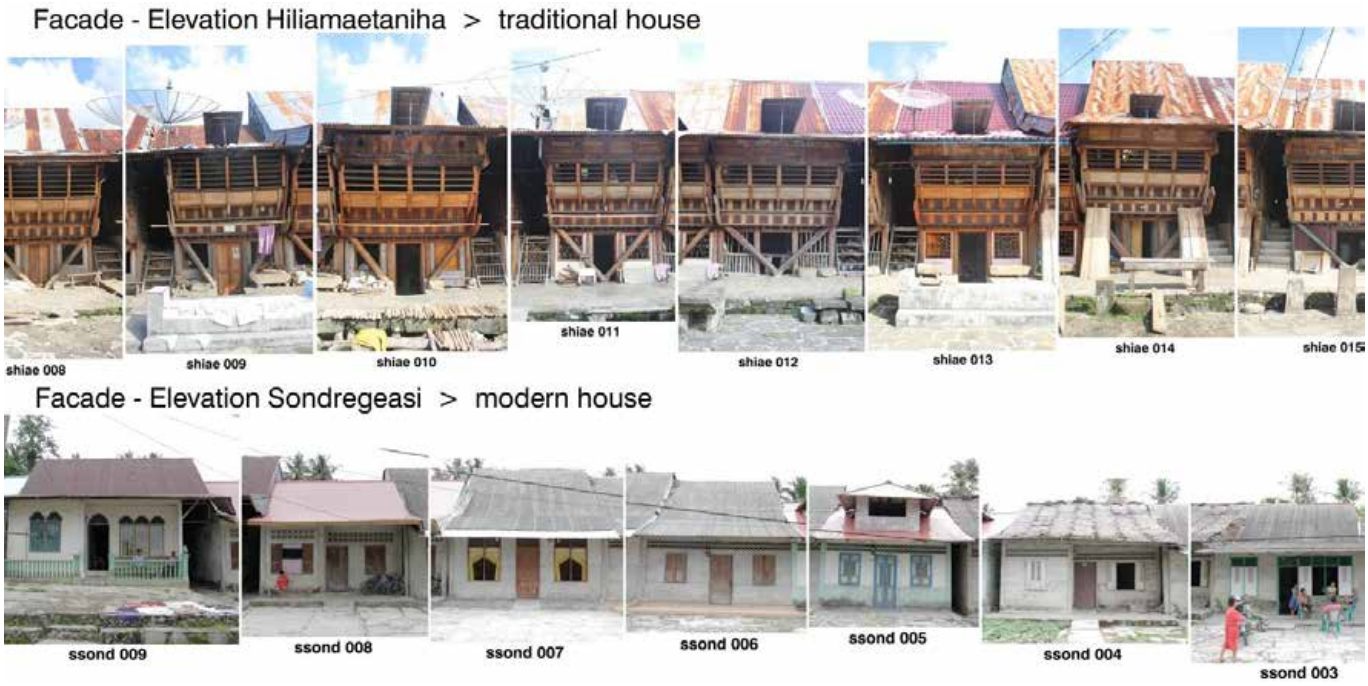


fig. 59: Elevation of Hiliamaetaniha and Sondregeasi

6.1 Types of houses

Basically houses can be divided into two fundamental types, the traditional and the modern houses. The two house types have a different structure and appearance, but they have a lot of similarity in the distribution of rooms and their functions. Of course the arrangement and the function of room changed with the new lifestyle, but there is still a strong relation to the traditional house layout.

6.1.1 Traditional house type

The category of traditional houses is subdivided in three traditional house types. All these three traditional house types can be derived from one original traditional design, which we will be called Traditional Standard House or "TSH". That archetype of the South Nias house has not changed in the last century.
The TSH is called *Omo Hada* and means: "Omo Hada means adat house or a house which is built according to the societal laws (hada)."[64]
As all the drawings and the pictures from the first explorers and missionaries on Nias show, the TSH has exactly the same design today.
The other types of the traditional house are developed from the TSH and can be considered as comparably variants.

The second type of the traditional houses emerged because of a shortage of money and the needed material. They started to build a smaller, simpler house on short pillars. The houses are also made of wood with the same precision and craftsmanship like their large counterparts.
The third house type is a mixture of these two types. It is a TSH on short pillars. That house type emerged because of the location of the house. If the bordering houses are traditional houses on short pillars it is easier and in my opinion more secure to build on the same height as the neighbour.
In Hiliamaetaniha and in all the other traditional villages I visited, the traditional house is still the majority of village houses.

Hiliamaetaniha:

Buildings		
	142	100%
Traditional buildings		
	101	71.1%
Modern buildings		
	38	26.8%
Empty properties		
	3	2.1%

[64] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 90*

fig. 60: Overview of the traditional village Hiliamaetaniha

The traditional buildings are split, as mentioned above, into three types:

The “Traditional Standard House”, which is the oldest and original type, is still the most occurring house.

The smaller and simpler type, the “Traditional House build on short pillar”, can also be seen very often in the village.

The mixture between these two types, the “Traditional Standard House build on short pillar”, is a very rare type.

I am not sure if this type is only a phenomenon which can be seen in Hiliamaetaniha or if other settlements have these houses, too. I did not notice houses of this type in any of the other villages during my visit. But I did no research at other places, my visit always were restricted to short walkthroughs.

Traditional buildings:

Traditional Standard House - TSH
72 71.3%
Traditional House build on short pillar TH-SP
25 24.7%
Traditional Standard House build on short pillar - TSH-SP
4 4%

fig. 61: traditional house types: “shiae028”: Traditional Standard House; “shiae 099”: Traditional Standard House build on short pillars; “shiae 115”: Traditional House build on short pillars

6.1.1.1 Traditional Standard House

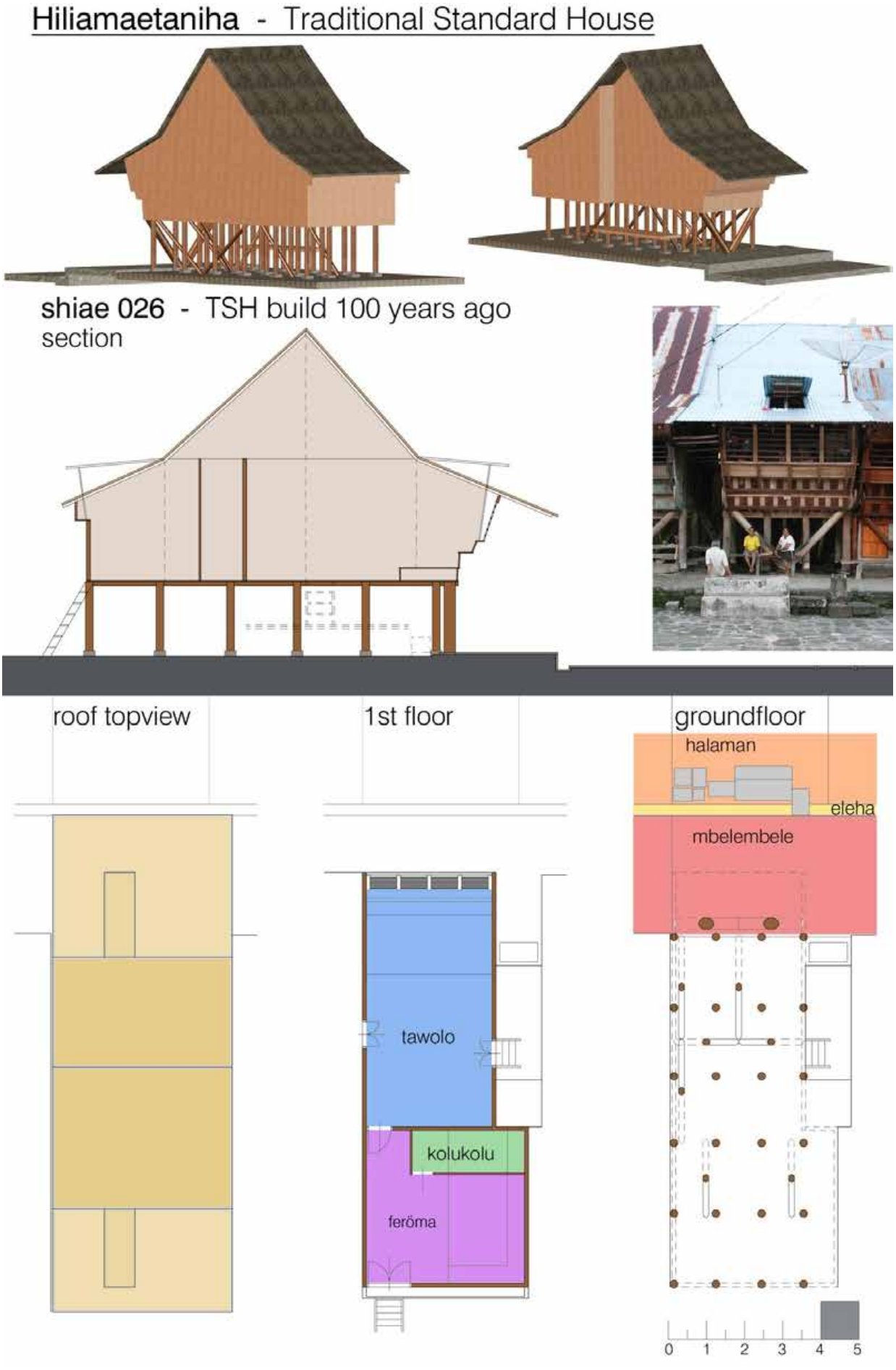


fig. 62: Traditional Standard House "shiae 026"

„... A unique and elaborate architecture developed there. It is rare to find elsewhere in the world the combination of functional and artistic architectural features accompanied by such an excellent use of space. The Nias house is resolutely ´modern´ in its three-dimensional structures. The empirical perception of static principles has led to an architecture unknown elsewhere in traditional dwellings. The master of carpentry has enabled the use of gigantic jardwood beams for building, demonstrating great artistic sensibility. ..."[65]

fig. 63: Sketch of a South-Nias village from the 27.01.1904

The worldwide unique architecture in form of the traditional house in South-Nias has not changed since the first records. The drawings and photographs of the first explorers in Nias show the same ensemble within the villages as we still find today. The traditional house has not changed in the last century. The architecture from over hundred years ago was well engineered, that the houses are still up to date. One of the outcomes of our questionnaire was that nearly all the inhabitants of Hiliamaetaniha and Sondregeasi are on one hand proud to live in a TSH or on the other hand would like to live in a TSH.
The possibility to build a Traditional Standard House in South-Nias had and still have a very important validity of the owner of the house.
"The integration in the community is proved by the capability to build a traditional house in the village domain. The wealth and the caste play an important role in the determination of the site and the dimension of the house."[66]

fig. 64: Image of Hiliamaetaniha

6.1.1.1.1 The mythological aspect of the Traditional Standard House as a reason for its layout?

"The corresponding research topic comprises the concept of elevation of religious buildings, in context with mythological aspects and social conventions.
Elevation – "high" and "low" – is a subject which to a large extent determines many aspects of social behaviour and hierarchies in a majority of cultures worldwide (Lehner 1998), particularly in South and Southeast Asia. Mythological aspects, such as those represented by the symbol of Mount Meru, with its vertically organized spheres of the demonic underworld, the heavenly upper world, and the earthly word in the middle between them[14], influenced the layout of religious and residential buildings. "[67]

In South-Nias no buildings with an exclusively sacral function can be found. In the records of the first explorers conducting research on Nias there are no hints of any sacral buildings either. But the idea of a tripartite division of sacral buildings in south-east Asia is applicable to the residential building. The tripartite division is clearly visible in the elevation of the house.

[65] *Alain VIARO: Nias Island traditional houses: p. 173-174*

[66] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 31*

[67] *Erich LEHNER: Towards a Documentation Project on Javanese Candis; Technische Universität Wien; Austria; Institut of Comparative Research in Architecture; p. 25*

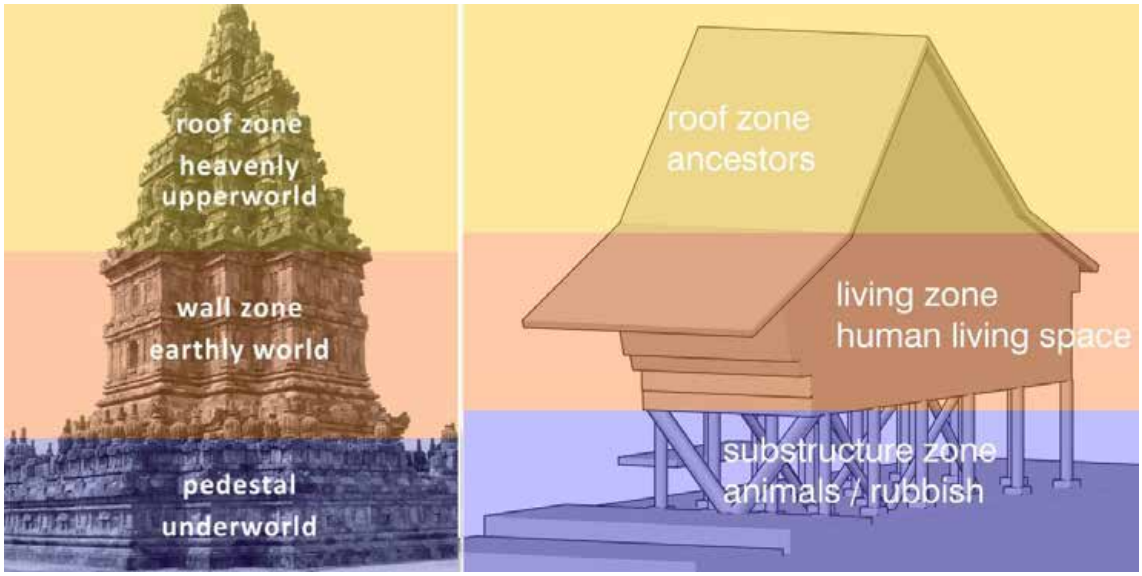


fig. 65: Tripartite of the traditional buildings

The substructure (lowest level) represents the underworld[68], the living area (middle level) represents the earthly world and the roof zone (upper level) represents heavenly upper world.
The area of the substructure was used to raise animals, and thus, the comparison with the underworld (or the lower level) is appropriate. The middle level is used by the residents as living space. The high dimensioned roof zone on top of the living area is domain of the people´s ancestors. A lot of residents wrote the date of birth and death of the deceased on the roof beams. That is why the roof zone is comparable to the upper world.

fig. 66: Wall of the Tawolo of the house "shiae 026"

6.1.1.1.2 The layout of the Traditional Standard House

The houses are built next to each other without any gap. This design is called in Europe a coupled building form. The line of houses starts at the entrance of the village and ends with the staircase to the gardens at the end of the village. If there is a gap between the houses, it is because the house collapsed and the owner did not have the money to rebuild it. The coupled building form is very important to ensure earthquake resistance.
The facade of the house line is divided into blocks of two houses. Between these blocks there is the entrance located. Thus, the pattern is: two houses – entrance – two houses – entrance -...
There is one entrance for two adjoining buildings. That implies that the dwelling is built with the dwelling of one neighbour together as a house block. The entrance of the dwelling is shared with the other neighbour.

The usual average width of a block is about 10.00 meters.
"The width of the house is based on the capacity to found a household, whereas the capacity to attain the social rank and status in the community is demonstrated by the length of the house. In other words, the basic area of the house is based on the social power to found and to establish the household in the community as the public world."[69]
The biggest building in the village is the king's house, the *Omo Sebua.*

[68] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 248*

[69] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 247*

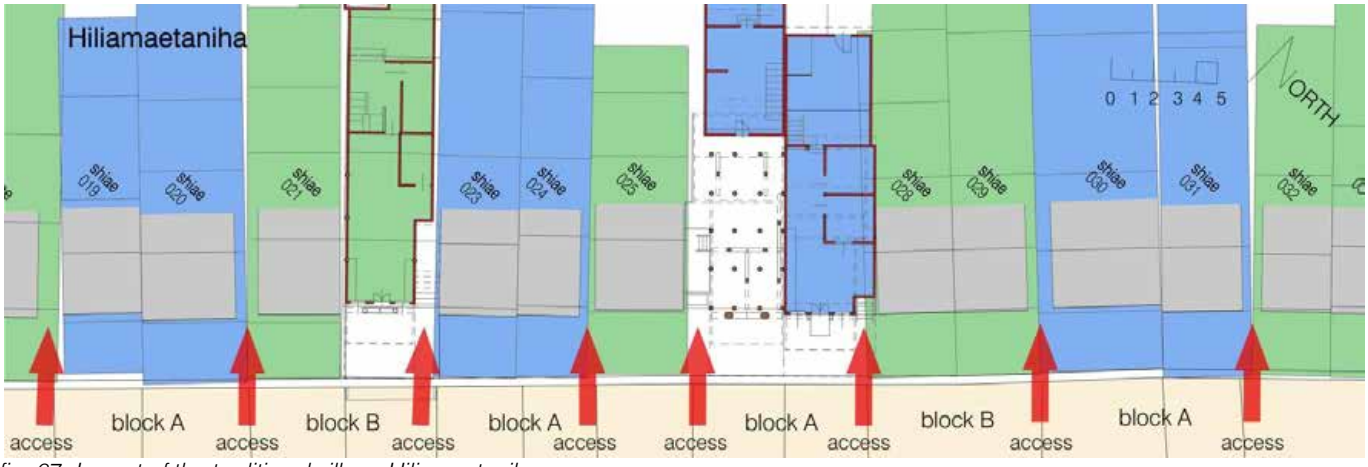


fig. 67: Layout of the traditional village Hiliamaetaniha

In Hilimaetaniha, the dimensions are 6.00 meters by 15.00 meters. Nearly all TSH have an aspect ratio of 1:2.5. The average height of the TSH is about 9.00 meters over ground. The *Omo Sebua* is certainly higher and has a height of 12.00 meters. The unusual height of a traditional building is explainable with the extra height added by the substructure and the very steep roof design, which both have functional backgrounds.

6.1.1.1.3 Way of construction of the TSH

The TSH is a timber frame structure, where all elements (also the non-load-bearing elements) are made exclusively of wood. Joints at the meeting point of structural parts contain no metal (no iron nails or screws). All joints are of the type “mortise and tenon" so that the whole house can be assembled easily - the ends of elements ending in tenons can be put through mortise holes and secured if necessary. The connections are flexible enough to not break under the forces occurring during an earthquake.[70]


fig. 68: carpenter in operation on the Omo Sebua “shiae 095”; wooden conection

To build a TSH, craftsmanship of the highest level is necessary. TSHs are masterworks of carpentry and joinery.
I have an education as a journeyman in joinery and it was unbelievable to see a handcraft like that.
The owner of the house “shiae 124” told us in the interview from the 31th of July 2012, that he is a carpenter of the old school, so he learned his skills from the botton up. In a TSH every junction is differently formed, and a good carpenter can define the position of each element just by looking at the type and shape of a junction.
The problem nowadays is that traditional carpentry is in decline. With the advent of the new construction system using concrete and bricks and for other reasons which will be explained later, traditional construction work is no longer in demand.
In North-Nias, the second area of our fieldwork, (in the settlement of Tumöri) there is not even one carpenter left who is able to build a traditional North-Nias House.[71] If people do not start to work against this process, the traditional houses in Nias will disappear in the next decades. Pastor Hämmerle and the Museum Pusaka Nias started to rescue the craftsmanship and offer workshops for the locals to learn how to build their traditional houses. After the earthquake 2005, the Museum Pusaka Nias was involved in the rebuilding of the damaged houses. They tried to repair or rebuild most of the traditional buildings. Without help from Pater Hämmerle significantly less traditional houses would have been repaired. Another effect of the repairing or rebuilding was the reactivation of the traditional handcraft and with that the hope for its continued existence.

[70] *Petra GRUBER, Ulrike HERBIG; Settlement and housing on Nias island adaptation and development; p. 4*

[71] *Inverview with the Kepala Desa of Tumöri from the 16th of August 2012*

6.1.1.1.4 Material of the TSH

The material that was used in the past to build the TSH was local material from the island itself. Due to the fact that the island was densely covered by rainforest, this material is wood. Thus, it was rather convenient to build the whole house structure from timber.

In the rainforest of Nias, there is a tree very well suited for construction work. The *Manawa Danö* (Ind.: Kayu Laban, lat.: Vitex pubescens)[72] is a very slow growing tree and because of this it is also very hard. So its trunks are perfectly qualifyed for use as piles of the substructure.

The wood is also very long-lasting, which is the reason why all the traditional houses still exist. During our interviews a lot of residents of a TSH told us that their houses are about 100 years old. Whether or not this information is correct, at least the owner of "shiae 091" could tell us the year of construction of his house, which was 1934. So the houses are at least 80 years old but still in very good condition.

With the export of timber the complete clearing of the very important building material started. The occupants of Nias neglected to reforest the stock of the *Manawa Danö* tree. That is the reason why construction wood is not available on Nias anymore. If they would like to build a traditional dwelling, they would have to import the wood, which is mostly too expensive for the people.

For the structure and planking, other trees are used which still are part of the forest in Nias.

The wood from the *Awöni* tree is very practical for planks and boards.

Another very hard wood is the *Berua* and is used also for the structure of the house.

For cheaper houses the *La´ore* tree is used. It has inferior quality, but is not expensive. A very rare tree is the *Si Mandraölö* which is also a very good construction wood.

fig. 69: different types of construction wood

Erklärung der Holzarten, deren Namen hier folgen, ob hartes oder weiches Holz, für was es verwendet wird, ob der Baum Fruchtbaum oder nicht, sonstige Verwendung oder besondere Eigenschaften desselben, hauptsächlicher Standort: (Brief Sundermann an Brenner)[4]

Afoa (Cinnamomum porrectum Bl./Lauraceae, Litsea Sp.): Gutes Bauholz mit starkem Geruche.
Awöni: Gutes Holz besonders für Bretter.
Berua (Celebica L./Clusiaceae): Sehr hartes gutes Bauholz.
Bidaja: Ist keine Holzsorte sondern der Name verschiedener Götzen für einen Häuptling bei einem großen Feste, von verschiedenem Holze.
Boli (Dolichandroe Spathaceae KS/Bignoniaceae): Schlechtes, weiches Holz mit großen Fruchtschoten, wenig gebraucht, höchstens verwendet man irgend ein Stück in einem Hause, damit der Blitz nicht einschlage. Blätter als Arznei gegen Frambosia.
Diho: Hartes Holz, giebt eine gute Holzkohle.
Esöni: Schlechtes Holz, nur als Götze *(golu)* verwandt bei einem Häuptlingsfeste und beim *fahö dödö* (der Nachhochzeit im Hause der Braut).
Fosi: Von mittelmäßiger Güte, zur Noth als Bauholz resp. Bretter verwandt und als Götzen.
La'ore: Von mittlerer Güte, bei geringeren Gebäuden verwandt.
Ma'ae: Ein Fruchtbaum im Walde, die saueren Früchte, die am Stamm (unten) tragen, werden gegessen.
Mahara: Ein fabelhafter Baum […] kommt vor in dem Gesange bei einem Todten (cf. meine Chrestomathie [Sundermann 1892a]).
Manawa danö (Vitex Micrantha/Verbenaceae): Hartes aber meist krummes Holz, ausschließlich für die Ständer und Stützen bei guten Häusern verwandt.
Si Mandraölö (Sysygium Gaerth/Myrtaceae): Gutes Bauholz, aber selten.
Oholu: (Ficus sp./Moraceae): Lieferte bisher den Bast für die Bastkleider, neben *Tawi*, sonst nicht verwandt.
Olalu: Weiches Holz, nur zu dem Reibfeuerzeug *(fuzu)* verwandt, da es sich leicht entzündet.
Tamo: Holz nicht verwandt wird auch […] -blätter dienen als Teller um davon zu essen […] hie und da zu Flechtwerk.
Tuho: Marabaw in malaiisch, mit das beste Bauholz, findet sich aber nicht überall auf Nias.

[73]

Another wood that is used to build a traditional house is palm tree. Palm wood does not have properties like the *Manawa Danö* and is only used for subordinate structures and panels. The palmtree performs well under bending strain, but is not very durable. Nowadays timber is more and more in use, because it is still available from the forest. The biggest problem of palm wood is the shorter lifetime and the smaller load-bearing capacity. The *Manawa Danö* wood is much better for vertical load, which is very important in case of the substructure. But for the roof and other secondary structures the palm tree wood is acceptable.

The house is a pile-dwelling, but the posts of the substructure are not linked with the surface of the earth. They are standing on a pedestal of stones[74] which are squared with a dimension of about 0.50 m. The reason for that unusual structure, which does not have a real connection with the ground, is the omnipresent danger of earthquakes.

[72] *Museum Pusaka Nias*

[73] *Reinhold MITTERSAKSCHMÖLLER (Hg.); Joachim Freiherr von BRENNER-FELSACHER: Eine Reise nach Nias – Die Indonesienexpedition 1887; Böhlau Verlag Wien-Köln-Weimar 1998; p. 191, 192*

[74] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 246*

fig. 70: different types of roof covering

The last traditional material used, are leaves of the sago palm tree. The leaves are bound to elements, which are used to cover the roof. A detailed explanation about the roof and the covering will be provided later.
With the modern influences of the last decades more and more modern materials are added to the traditional materials. All materials used in the past were available on the island. The new materials are all imported products.
One material, which is frequently used, is corrugated iron sheets. These sheets are used to cover the roof and sometimes also to cover the walls.
A very interesting topic is that concrete still is not used for construction of the TSH.

6.1.1.1.5 Construction of the TSH

As mentioned, the unusual construction of the houses is a consequence of the frequent earthquakes in Nias. The houses are a perfect example of earthquake resistant engineering.
The earthquake on the 28th of March 2005 affected the island of Nias badly. 80% of the modern public buildings collapsed. Only the traditional houses survived nearly without any damage.[75]

"Nearly all traditional houses were left standing and remain habitable. Some suffered damage to their roofs and walls, but they appear to be structurally sound"[76]
There are several reasons why these buildings can withstand an earthquake that well. One is the coupled building development. The houses are built together.
Because of that building system, they are able to support each other and keep together in one direction.
Another unusual structure is the substructure. The house are built on poles. The poles are not only built in vertical position, there are diagonal poles as well. The diagonal poles can withstand the horizontal forces. In front of the facade there are also two diagonal poles.[77]

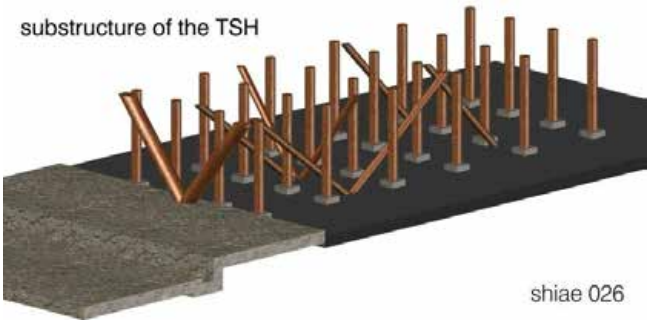


fig. 71: substructure of the TSH "shiae 026"

[75] *Petra GRUBER, Ulrike HERBIG; Settlements and housing on Nias Island, Adaptation and Development; p. 1*

[76] *Alain VIARO; Nias reconstruction in the respect of the tradition; p. 1; 09.07.2007. (CNN world, April 1, 2005, testimony in the village of tumöri near gunung sitoli)*

[77] *Petra GRUBER, Ulrike HERBIG; Settlements and housing on Nias Island, Adaptation and Development; p. 6*

The foundation of the poles is also atypical. They are standing on natural stones and are not linked. The free standing poles have the advantage that the whole house can move as an effect of the earthquake.[78] In Tumöri a house moved or better jumped more than 1.00 meter. The house did not have any damage except for standing in a new position.

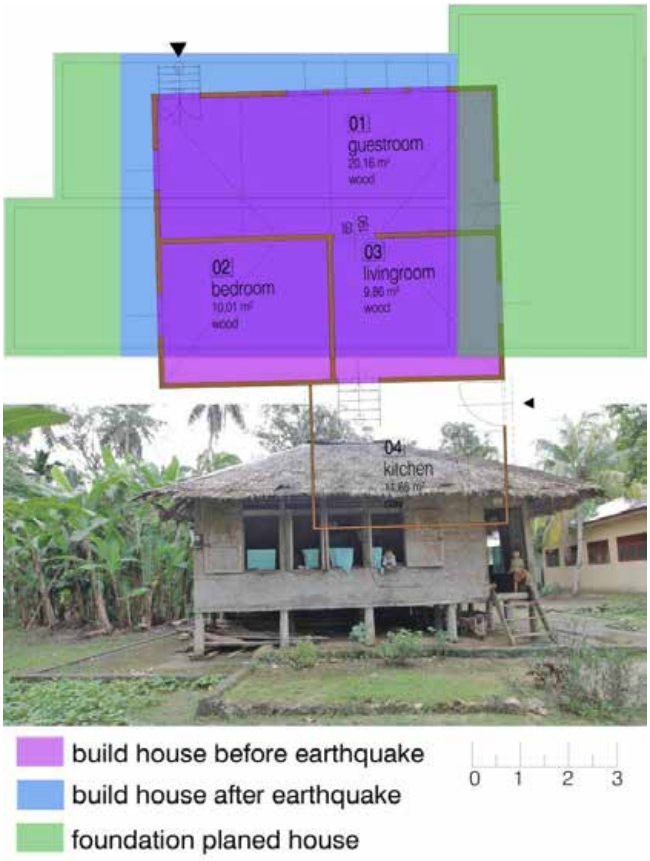


fig. 72: consequence of the earthquake 2005 at the house "ntumo 561"

If the earthquake is too strong, the structure has a predetermined breaking point. The poles collapse and the complete house falls from the poles onto the earth. The advantage is that the house is still habitable, and also, as people will be staying in the upper part, they will not be buried beneath the structure. One special example is a house in Tumöri, where the house collapsed only on one side, so the house was still in a good condition, but askew. The solution for that situation was very easy. 50 people from the village lifted the whole house, then they removed the wooden poles and they placed the house on stones as a new foundation.

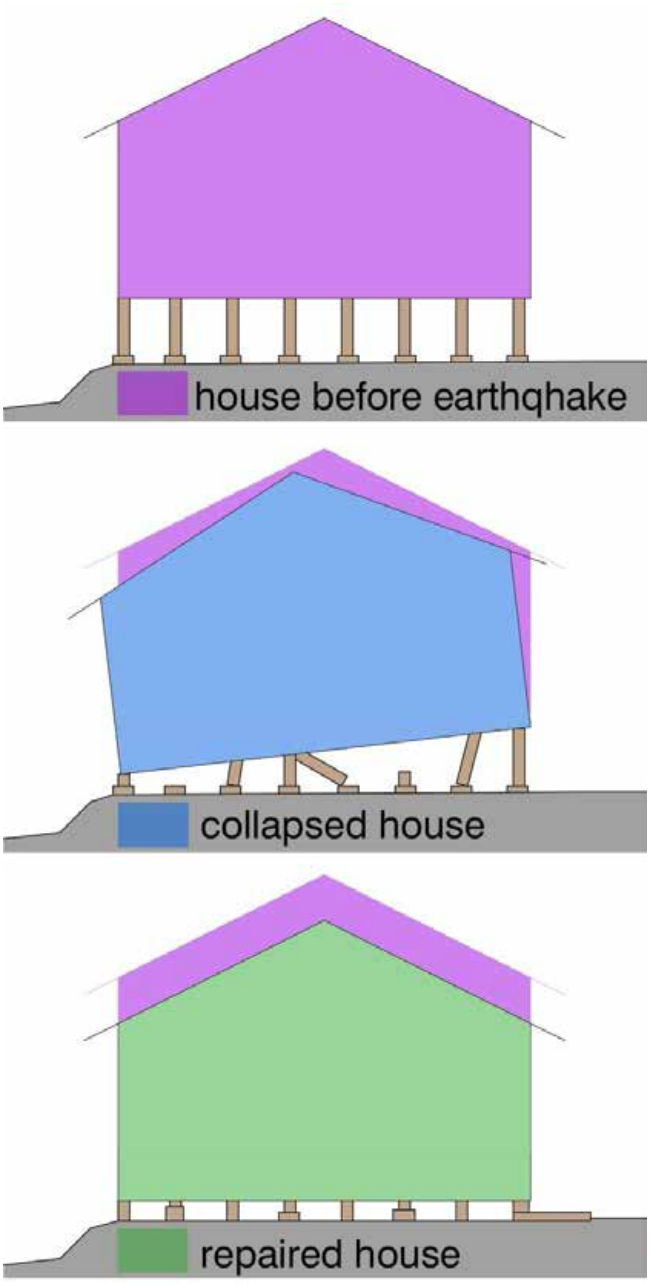


fig. 73: consequence of the earthquake 2005 at the house "ntumo 572"

6.1.1.1.5.1 Substructure

As mentioned in the introduction, the TSH is tripartite. The lowest part is the substructure.
The poles are installed in two different positions. The vertical poles are positioned in a grid with a distance of approximately 1.50 meters apart and have a height between 1.50 and 1.90 meters. The average diameter is about 0.25 m. In the bigger houses, like the *Omo Sebua* in Hiliamaetaniha, the height is 2.80 meter and the diameter is up to 0.70 m.

[78] *Petra GRUBER, Ulrike HERBIG; Settlements and housing on Nias Island, Adaptation and Development; p. 6*

fig. 74: Substructure of two traditional houses in Bawögosali

The other poles are built diagonally with an angle of about 45°. The pillars are fitted in pairs of two mirrored poles in two directions, parallel perpendicular to the facade. The reason for the diagonal poles is the absorption of the horizontal forces from an earthquake. The dimension of the diagonal poles are nearly the same like the vertical poles.

fig. 75: Substructure of the Omo Sebua in Bawomataluo

In front of the substructure there are two bigger diagonal poles, which are larger dimensioned and are also an important visual feature in the elevation of the facade.
"The front row of support beams are always the oblique driwa which run across the width of the house. The driwa do not cross, as they do in North Nias and sometimes in Central Nias, but meet to form a V."[79]

All the poles are seated on stones, which are used as the foundation. The stones are called *Batu*.[80] As mentioned the stones and poles are not connected, so that the house can move in the case an earthquake occurs.
The area of the substructure underneath the house was at the beginning used for the animals. Pigs and chicken were kept there. With the extension behind the house a new access directly to the extension right through the substructure emerged. With the height of 1.50 meters it is not possible to go upright through the substructure and the residents dug a walkway to the entrance below.

fig. 76: Access to the extension – Modification of the traditional standard house

Nowadays the owners started to expand the substructure in order to build new rooms. These modifications will be explained later on.

[79] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 90*

[80] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 90*

6.1.1.1.5.2 Middle area – Living area

On top of the substructure a wooden platform is constructed, which is the level for the residents to live on. On the sides to the neighbours there are walls made of wooden planks. Because of the coupled buildings there are no windows in the lateral walls. The only openings are the entrance door and a connecting door opposite the entrance. With that connection between the houses and the entrance it is still possible to go from one end of the village to the other through the houses. That walkway was in the past very important as an escape route.[81] If any warring clans attacked the village it was possible for the women and children to escape.

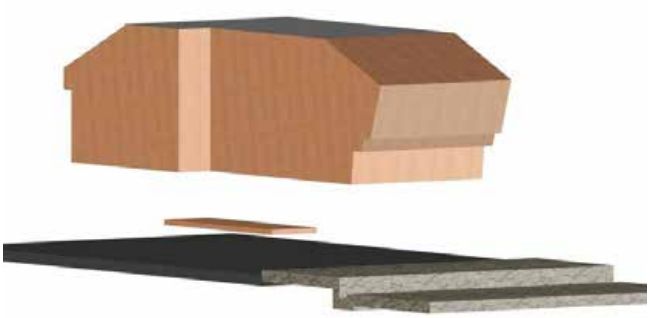


fig. 77: Living Area of the TSH "shiae 026"

Entrance

The entrance into the house is through the lateral walls into the front room or the guestroom, the *Tawolo*.

In former times the possibility to defend the house against other clans was very important. The living platform could only be reached through a moveable ladder leaning to the house. Without the ladder it was as good as impossible to enter the house.[82] Nowadays the entrance changed and it is easier to enter the house.

To get to the entrance between two houses easily, a wooden platform has been built. The platform is halfway up towards the living level and has a width of about 1.00 to 1.20 meters. To get access to the platform there is a step in form of a stone in front of the platform. To be able to ascend from the covered platform into the house a wooden ladder has been installed. The ladder is removable in case of danger to hamper the aggressor to come into the house.

Like the whole house, the entrance door is made of wood. It is a double door with a clearance width of about 0.70 meters and a height of around 1.40 meters. The door opens into the *Tawolo*.

The walls of the TSH

The front wall facing the village is a very interesting wall. As visible on the picture the wall is a wooden construction and horizontally segmented. Every segment has a different function. The wall leans also outwards and is cantilevered, which is designed as a structural cover for the *Mbelembele*. The huge diagonal poles in front of the facade are also linked with one of the segments.

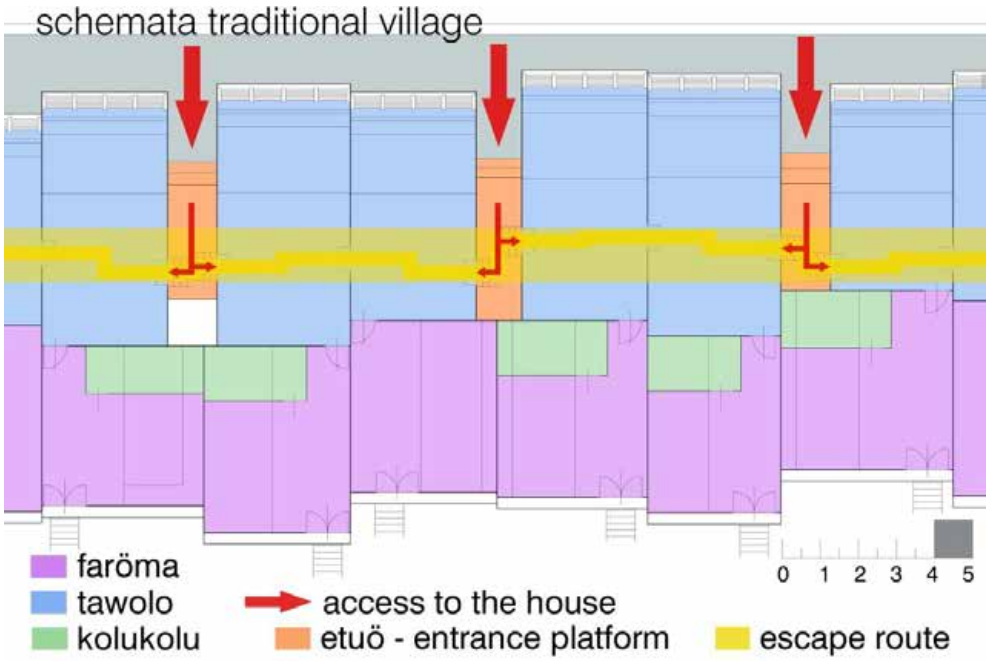


fig. 78: Access and route guidance at the TSH

[81] *Petra GRUBER, Ulrike HERBIG; Settlements and housing on Nias Island, Adaptation and Development; p.6*

[82] *Alain VIARO; Nias reconstruction in the respect of the tradition; p. 177*

All the horizontal segments had and still have different functions and uses, which will be explained later when discussing the function of the rooms.

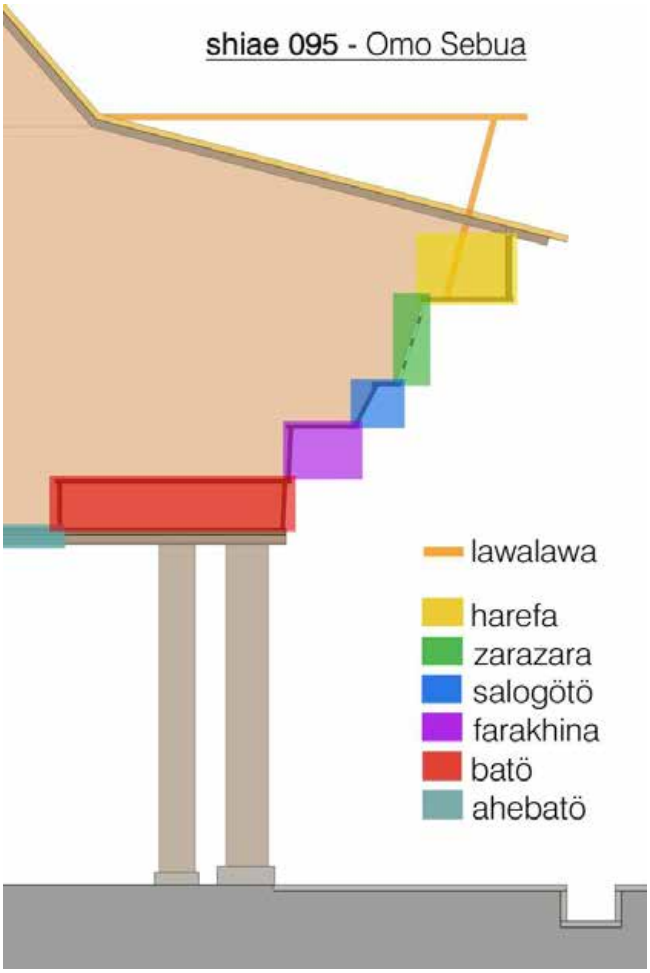


fig. 79: Front facade of the Omo Sebua "shiae 095"

The back wall of the house is also a wooden wall. The difference to the front wall is that the wall is vertical and without any windows. The only opening is a door which is similar to the entrance door and leads to the external kitchen. The wall is up to an average height of 1.50 meters vertical. On top of the wall the structure is stepped out. The alcove is used as storage and is called *Harefa*, the same name like the highest layer in the front wall.

The existing middle walls are built like the outside walls. The only openings are doors with the same height like the entrance door or the backdoor.

fig. 80: Feröma and Tawolo of the traditional house "shiae 080"

6.1.1.1.5.3 Roof area

The highest level of the tripartite structure is the roof. It is in proportion the largest (highest) part of the house and has a height from 4.50 meters up to 6.50 meters. Thus, with a total-height of about 9.00 meters the roof takes more than 50% of the overall height.

fig. 81: roof area of the traditional house "shiae 026"

With its form the roof is conspicuous, and lends the view of the village a special character. All the roofs are connected like the houses and appear as one big, continuous roof stretching through the whole village.
The roof is double-pitched with a central gable. The two sides of the roof have a steeply pitched middle part, which continues afterwards at a much flatter angle (about 25 degree) until the eaves.

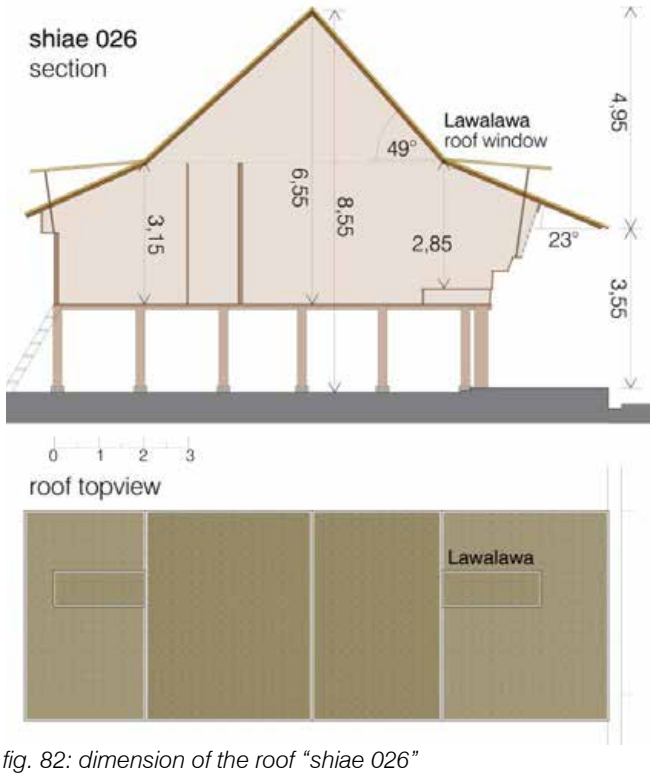


fig. 82: dimension of the roof "shiae 026"

The front parts of the roof starts above the *Batö* (in the inside of the house) and ends above the *Elea* (rain drainage) outside. The eaves are exactly over the rain drain, between the *Mbelembele* and the *Halaman*, so that the rainwater can be led away. Thereby the *Mbelembele* is covered, which is very important as there is frequent and heavy rainfall.
On the back side of the house the roof is identical; the eaves terminate 0.30 meters away from the walls - which makes this flat part of the roof shorter than the frontal one.
The roof-structure in South-Nias is resting on the lateral walls, which is different to traditional houses in North- and Central-Nias, where the roof is resting on two main pillars.[83]
The flat part of the roof has a kind of a roof-top window built in and is called *Zawazawa.* It is not a typical window which features a glass panel, as we would expect from western countries, it is a flap (a part of the roof) which can be lifted up. The lifted part is also covered with the roof material and if closed its shape is not distinguishable from the rest of the roof . To keep the window opened a wooden stick is used. The average size of the window is about 2.20 meters long and 0.80 meters wide. The main function of the window is comparable to a western window. The natural light can enter the rooms, which is very important in the room at the back, the *Faöma*, because it is the only natural lighting. If the window is closed daylight can enter only through small slits and openings of the open attic.
In the front room, the *Tawolo*, the *Zarazara*, a wooden grid, provides a basic-lighting. Not only for light, but also for ventilation the roof-top window is very important.

fig. 83: Drying cloths on the roof of the TSH

The roof-top window at the front has another unusual function, which is in my knowledge worldwide unique. The women use the window as a kind of exit to the roof. While standing or kneeling on the *Harefa*, they spread the wet washed clothes onto the roof to dry them. To have a longer range the women use a wooden stick and thus can reach all parts of the flat piece of the roof.
The steep part of the roof has an angle of about 50 degrees. One reason for building steep roofs were heavy rains. Because of the high roof pitch it is easier for the rainwater to run off. As roofing originally consisted of leafs of the sago palm tree, a high pitch was important as well because: The faster the water could be led away, the less was soaked up by the organic thatch. It was crucial for a longer life expectancy of the thatch material to keep it as dry as possible.
There is a second reason to favour high roofs in a tropic climate: Air heated up inside the house can ascend through the top of the roof, and new, cooler air from the outside is drawn in. Also a kind of inner circulation is established, which helps to keep the inside from overheating. There will be air movement, which the inhabitants feel as light wind breeze, which has a cooling effect.

Construction of the roof

The load-bearing structure of the roof is a wooden framework. “The roof structural system is a light frame building”[84] The braces have a round profile and a diameter up to 0.10 meter. The joints are linked with mortise and tenon or trussed. The self-supporting structure is resting on the wooden walls of the living area.

fig. 84: roof construction of the Omo Sebua “shiae 095”

The roofing material is directly mounted on the wooden load-bearing structure. The original roofing material is made of leafs from the sago

[83] *Settlement and housing on Nias island; adaptation and development; P. Gruber, U. Herbig; page 4*

[84] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 233*

palm tree. This type of roof is called *Bulu Zaku* in Bahasa Niha.
The sago palm tree is historically the most important tree on Nias. The puree made of the pith of the sago palm was the main staple food of the Niha people. They also utilized the wood. After drying, they used it as firewood in the kitchen. The leafs are used to fabricate roofing tiles. Thus, the whole tree was used in the past.
The forest was full of sago trees and the inhabitants paid attention that the tree grew back. Nowadays, the sago palm tree is rare on Nias. With the import of the rice plant[85] the eating behaviour changed and the sago pith became a poor man´s food and thus disappeared from the menu. The economical situation changed as well. With the export of rubber and palmoil, which are the principal incomes of a farmer, the trees for the production of the cashcrops became more important. The villages started to create huge plantations of oil palm trees. Many other trees are threatened by these monocultures; the cultivation of old cultural plants, like the sago tree, is neglected.
The panels to cover the roof are prefabricated elements, which are tied to a wooden stick. They consist of a wooden strip, the leafs of the sago plam and a string. The wooden strip has a length of about 0.90 meters. The leafs are folded in the middle and hung over the strip. The string is used to stitch the leaves together.

At the end one element has a size of about 0.90 by 0.50 meters. These large "shingles" have to dry, before they can be mounted on the roof

fig. 85: roof covering elements

Each sago leaf shingle was tied to the substructure. They need 3 layers to make the roof waterproof. The lifespan of a sagoroof was 3-5 years. As mentioned the leaf of the sago palm was a waste product of food production and was always available. So the changes and repairs of the roofing tiles were no problem. Today it is very expensive to get the roof elements or the leafs to produce the elements. The repair work of a sago roof is also very time-consuming. The owner of a house never changes the whole roof, they just repair a small area of the roof. So it is a never ending work process to maintain the roof.

fig. 86: sago palm leave covering – corrugated iron covering of the TSH

[85] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 44*

With the import of corrugated iron a second option for roofing emerged. The first advantage of the new material compared to the traditionally well-tried sago roof was first of all its price. The corrugated iron is nowadays cheaper than the locally available material. At the same time the average lifespan of a corrugated iron roof is more than 10 years, without much maintenance.
Another reason is its water resistance. The iron is better and safer than the natural roofing. In villages where the water supply is not publicly regulated people started to collect the rainwater. With the corrugated iron it is also more efficient to do that.
The corrugated iron used as roofing material has also disadvantages. The biggest problem is the overheating of the rooms. The iron does not have the natural insulating properties and the air permeability like the sago roofing. With the sun heating the iron the whole room heats up to an intolerable temperature. This prohibits the natural air circulation and heat accumulates everywhere underneath the roof.
In Hiliamaetaniha 115 houses from 142 are already covered with corrugated iron. This is more than 80%. The owners we interviewed, who still have a sago roofing, answered the question what kind of roofing they would prefer with corrugated iron. They all have the plan to change it, because the sago is too expensive and time-consuming.
With that frequent appearance of iron roofing also the view of the village changed. With the different types of corrugated iron and also with the different progress of rusting every roof looks different. In the past all the roofs appeared as one. In Bawogosali the village started a project that every house in the village should have the same corrugated iron roof. The difference to all the other villages, is that the iron is enamelled and has a uniform colour. With this step the appearance of the village is different from the traditional but still consistent. It is in my opinion a step towards the right direction.

fig. 87: default equal roof covering in Bawogosali

As mentioned the overheating of the rooms is the biggest issue coming along with the new roofing. The owners of the houses already started to find solutions for the overheating. In “shaie 099” the inside of the roof is already closed off. The owner used wooden boards to build a ceiling against the heat. The question is, will the ceiling be efficient without an insulation layer in between? Another negative aspect of this solution is the split between the room and the roofing space, which was a big space for the circulation of the air. The owners in Hiliamaeataniha are convinced that the ceiling is a good solution, because the owner of “shiae 080” started also to close the roof with a ceiling. In an interview from the 04.08.2012 the owner of the house “shiae 022” explained that he also planned to build in a ceiling for heat protection. According to this interview the costs for the ceiling are about 10 000 000 IDR, which is equivalent to 660 Euro. In the next time many more houses will build a ceiling in their TSH.

fig. 88: prepared ceiling in “shiae 080” – built ceiling in “shiae 099”

6.1.1.1.6 The archetype of the Traditional Standard House

The nowadays existing TSH has a precursor, which was in use before the colonisation.
The *Omo Hada* had the fireplace in the centre of the house. One of the last examples of the archetype can be found in the village Lahusa. It still has the fire place in the middle of the house.
"The essential component of household is the hearth (Awu). A household in the tradition is always porvided with a proper hearth, though the house has not yet built. The origin of the house is the hearth."[86]

fig. 89: still existing archetype of the TSH in Lahusa (discovered by Ulrike Herbig at the research 2013)

Surly it was very dangerous to have an open fire in the wooden house with a palm leaf roof. If one house started to burn, it was very difficult to contain the fire and save the other houses because of the coupled building form. It happened very often that one house started to burn and at the end burned down the whole village. One example is Hili Sondregeasi (now Hiliamaetaniha) which burned down 1891 completely.
To get the danger under control the colonial administration created a new law to forbid open fire in the house. As a consequence moved the fireplace and as a consequence the kitchen behind the house into the backyard.
With the movement of the fireplace the setup of the house changed.
The first change was the location of the entrance and the access platform between the houses.
With the new fireplace and kitchen behind the house, a new exit arose from the *Feröma* to the backyard to have a direct connection between the house and the kitchen. With the new exit in the back-wall of the *Feröma* the access to the backyard through the entrance platform was not necessary any more. The entrance from the platform to the *Feröma* was also not in use very often. With the time, the inhabitants started to close the access from the platform to the *Feröma* and as a consequence the platform ended after the entrance to the *Tawolo*. With that change the house only had one entrance through the *Tawolo*. The *Tawolo* changed to a walk-through room. Another implication was the expansion from the *Feröma* of the breadth of the access platform.

fig. 90: comparison of the archetype TSH and the TSH

With the new route guidance the setup of the *Feröma* changed and the room rotated of 90°. The *Batö* was positioned at the back wall and build over the whole breadth. After the change, the furniture was positioned on one of the lateral walls and also over the whole length of the room.

fig. 91: Feröma of the Omo Sebua of the village Bawömataluo

[86] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 251*

The expansion of the room with the access platform had the advantage of a larger room and more space in front of the rotated *Batö*.
With all the changes arose a third room in the TSH. Instead of the fireplace in the centre of the house a small room was built. The master room is a separated sleeping room between the *Tawolo* and *Feröma*. In Bahasa Niha it is called *Kolukolu*. The room is located at the same place as the fireplace. The entrance to the *Kolukolu* is through the *Feröma*. In the *Kolukolu* is, like in the *Feröma,* a *Batö* with the same dimensions is built.
The *Kolukolu* is a private sleeping room for the chief of the house and his wife.
The new TSH still exists in all villages and is also a model for the new traditional houses.
The archetype of the TSH is nowadays very rare. During my fieldwork 2012 it was not easy to find an example of the original setup. Only the Chief´s house in Bawömataluo has the primal setup of the TSH. During her research 2013, Ulrike Herbig found one remaining house in Lahusa, where all the debatable aspects were confirmed.

6.1.1.1.7 Room setup of the Traditional Standard House:

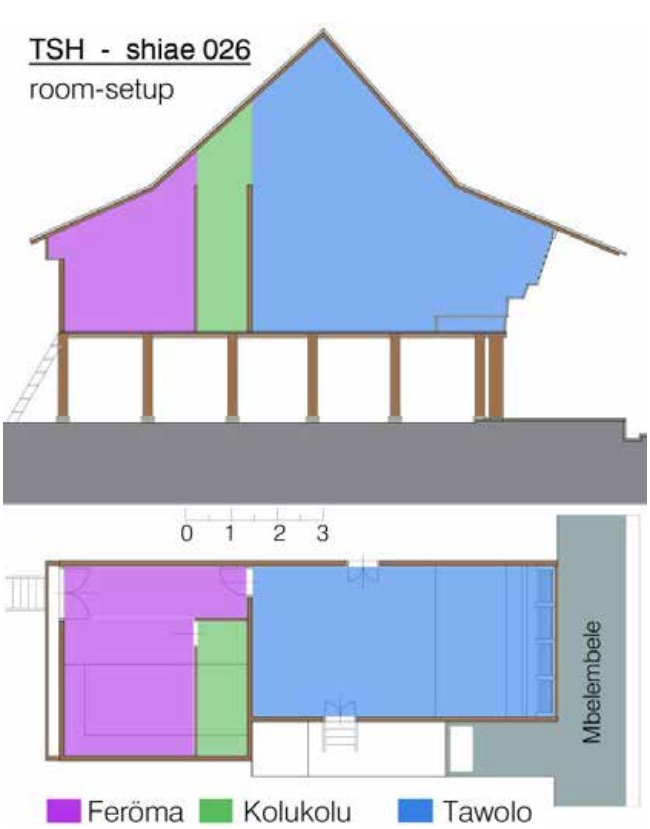


fig. 92: Room-setup of the TSH "shiae 026"

All the Traditional Standard Houses in South Nias have the same concept. The concept consists of two main rooms, the *Tawolo*, the *Feröma* and sometimes one secondary room the *Kolukolu*. The house is spit in a front room (the *Tawolo*), a back room (the *Feröma*) and a small room in the centre of the house (the *Kolukolu*). The two main rooms are multifunctional rooms where all the functions of the daily routine take place.

6.1.1.1.7.1 Tawolo

Tawolo is the name of the main room in Bahasa Niha. The owner of the houses translated the name of the *Tawolo* into guestroom, main room or living room.
The *Tawolo* is the communal room[87] of the house and the centre of the family social life and also the room to receive guests.
The *Tawolo* is located in the frontal half of the house.[88] The room is facing the village and, with the facade, it has a direct connection to the village as well.
The Tawolo I surveyed where rectangular rooms with a proportion of 1:1.45.
The width of the room goes over the whole width of the house from lateral wall to lateral wall. The width of the *Tawolo* is equal to the width of the house and in Hiliamaetaniha it is about 4.10 meters. The tallest width of a house in Hiliamaetaniha is 5.75 meters and can be found in "shiae 095", the *Omo Sebua*.

Roomsize TSH					
			Tawolo		
	village	house number	wide	length	m²
1	shiae	022	3,10	4,60	14,26
2	shiae	026	3,30	5,90	19,47
3	shiae	027	3,20	5,35	17,62
4	shiae	042	4,45	6,20	27,59
5	shiae	043	4,20	6,50	27,30
6	shiae	080	3,25	4,95	16,09
7	shiae	091	4,50	4,80	21,60
8	shiae	094	5,20	7,60	39,52
9	shiae	095	5,75	8,55	49,16
10	shiae	099	4,65	4,55	21,16
11	shiae	111	3,80	5,75	21,85
			4,13	5,89	25,06

list 06: room size of the Tawolo of the TSH

[87] *Alain VIARO; Nias Island traditional houses; p.: 208*

[88] *Petra GRUBER, Ulrike HERBIG; Settlements and housing on Nias Island, Adaptation and Development; p. 6*

The length of the *Tawolo* has a bigger range from 4.60 to 8.55 meters.
The length of the *Tawolo* is related to the bordered houses. The reason therefore is the height of the houses and the roof construction.
The average length of the *Tawolo* is 5.90 meters, but the room itself is smaller because it is split and the levelled area is 2.20 meters shorter.
The average surface area of the *Tawolo,* as a result of the dimension of the room, is 25.00 m^2. In comparison to a western accommodation unit it is the same size like a living room.

The build in furniture – in form of the front-facade

"The expressive character of the front facade is nothing than a representation of active role of the man in the public world. .... Moreover, the expressive facade is also a representation of participation to give the visuality of solidarity and unity."[89]
The front facade which is facing the village is, to my knowledge, a worldwide unique construction. The facade is forward leaning and structured in different horizontal segments. The outside view consists of different layers and functions.
It is structured in five horizontal segments. Each segment has a different layout and function. Each layer has a symbolic and social role.[90]

The segments from the bottom to top are:

1st segment:	*Batö*
2nd segment:	*Farakhina*
3rd segment:	*Salogötö*
4th segment:	*Zarazara*
5th segment:	*Harefa*

Batö:

"At home is indicated by being there on the platform of Batö in the front room."[91]
The *Batö* is the lowest and biggest platform. If the *Batö* is still part of the facade or if it is a separate piece of furniture, is in my opinion a controversial point. On one side the front of the *Batö* is part of the construction of the facade, and on the other side, the form and function is hard to understand from outside. I would say it is a separate element in the room and connected to the facade.

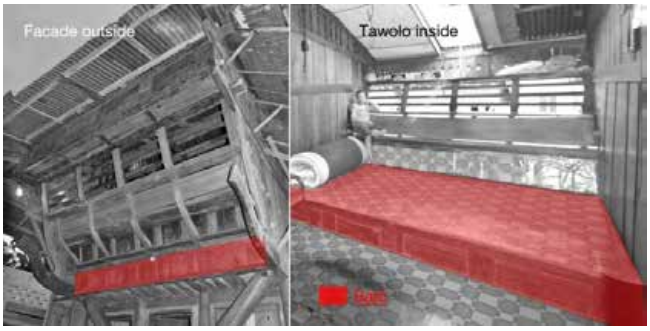


fig. 93: Batö shown at the TSH "shiae 080"

The *Batö* is a built-in platform and is located at the front wall. The height of the platform is normally about 0.35 m - 0.50 m.[92] The depth of the *Batö* depends on the size of a Niha inhabitant and is between 1.60 m to 1.80 m. The width of the *Batö* is equal to the width of the room and has the same dimension as the house.
The *Batö*, like the whole house, is made of wood. The substructure is a framework which is covered with wooden boards. Some of the boards have a width of up to 2.00 meters in one piece.
"The center part of the platform is provided with the widest board of the house. The quality of the board is a sign of the social power of its owner."[93]


fig. 94: wooden bord of the Batö from the Tawolo of the Omo Sebua from Bawämataluo

[89] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 252*

[90] *Alain VIARO; Nias reconstruction in the sespect of the Tradition; p. 2*

[91] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 227*

[92] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 225*

[93] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 225*

The usage of the *Batö* is multifunctional. It is used as a bench for the children of the family and guests. The location in the room where people are allowed to sit depends on the hierarchy situation. The kids are the lowest level of the family members and have to sit on the lowerst step[94]. Of course, other family members are also allowed to sit on the *Batö*.
Another function of the *Batö* is to use it as a bed.[95] Therefore, the residents have made a mat of reed. Who was allowed to sleep in the *Tawolo* in the past and who sleeps nowadays on the *Batö* is explained later (Function of the Tawolo).
During the day the platform is used as a working and playing area. The women do there needlework on the platform and are able to look for their kids who are playing on the platform or on the floor. The most common needlework in South-Nias is sewing and weaving.

fig. 95: weaving woman sitting on the Batö

Farakhina:

The next higher segment or platform is the *Farakhina*. The *Farakhina* looks like a bench which is positioned behind and on top of the *Batö*. It is also used as a bench. "This is a seat which runs along the front of the house."[96] The seating surface is comparable to the *Batö* 0.45 m higher than the lower layer (*Batö*) and has a depth of 0.40 to 0.60 meters.[97] It is comparable to the depth of a normal chair.

Also part of the *Farakhina* is the backrest of the bench.

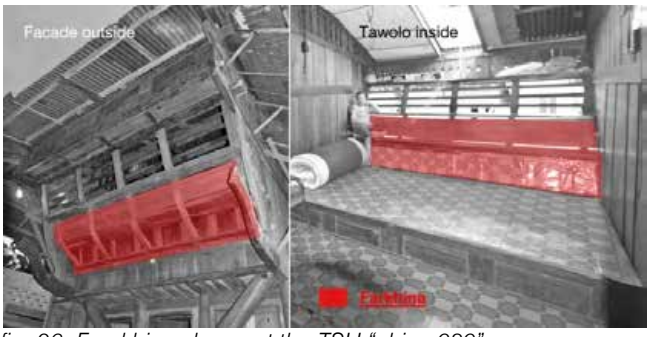


fig. 96: Farakhina shown at the TSH "shiae 080"

The *Farakhina* is a bench, which is usable from the inside and identifiable from the outside. The hierarchy of the family allows only adults to sit on the bench. The sitting location on the bench is also regulated. The right side of the bench is reserved for the owner of the house and his male guests. On the left hand side there sit women, the unmarried men and female guests.[98]
While sitting on the bench, it is possible to look over the village through the lattice window.

Salogötö:

The next higher segment is a narrow horizontal board on top of the backrest of the *Farakhina*. The width of the board is normally about 0.20 meters.

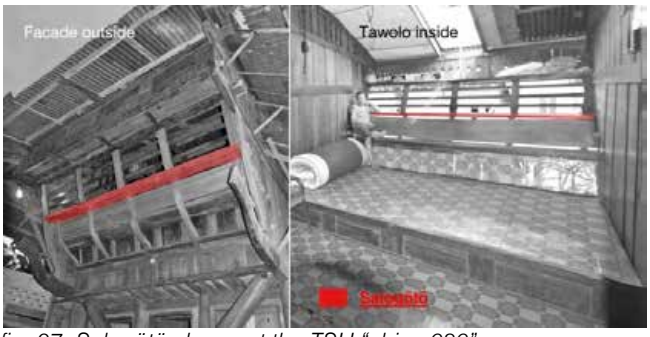


fig. 97: Salogötö shown at the TSH "shiae 080"

Used is the *Salogötö* mainly as an armrest for the sitting persons.[99] The kids use the board also as a sitting board. Therefore, they hang their legs through the lattice window outside of the facade and watch the activities in the village.
In some cases it is also used as a climbing aid to get to the roof top window.

---

[94] *Alain VIARO; Nias reconstruction in the sespect of the Tradition; p. 2*

[95] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 91*

[96] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 91*

[97][97] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 225*

[98] *Alain VIARO; Nias reconstruction in the sespect of the Tradition; p. 2*

[99] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 91*

Zarazara:

The *Zarazara* is the lattice window in the middle of the facade and a worldwide unique type of a window.
From the outside view the window is a real eye catcher and a very striking and defining element of the facade.

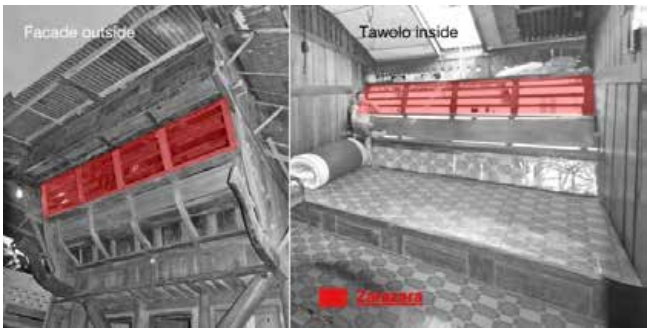


fig. 98: Zarazara shown at the TSH "shiae 080"

The lattice window is constructed with 5 vertical stiles and 3 horizontal laths. The construction had to be very solid as a protection against enemies. The defending function is not necessary anymore, but the solid construction is still in use and the construction is the same as hundreds years ago.
The window is also very important for the climate inside the house. With an opened window without glassing, the circulation of air is unimpeded possible. It is also the only permanent opening to get daylight into the *Tawolo*.
The bench underneath the *Zarazara* makes the window a very important connection between the inside of the house and the village. It is possible to overview nearly the whole village, but from outside is it almost not possible to look into the house.
During our research we lived one week in a TSH. According to the tradition, Julian Breuling and I were sleeping in the *Tawolo.* Sitting on the *Farakhina* and watching the village life was a very exciting experience for me and I set there for hours.
A problem coming along with having an open window and having thin lateral walls to the neighbours, was the noise. During the day it was not disturbing, in contrast to the night, since it was possible to hear every noise from the street and the neighbours.
Another negative aspect of the open window is the lack of privacy.

Harefa

The highest layer of the facade construction is the *Harefa*. It is a storage board on top of the *Zarazara*. In former times the sleeping mats were rolled up and stored there during the day. Nowadays, it is usually empty, only in a few cases it is still used as storage for clothes.
Another very important usage of the *Harefa* is as an access to the roof top window and the roof itself. As mentioned, the roof is used to dry the clothes. The women have to stand on the *Harefa* to get to the roof.
"It is possible to stand upon the harefa to look out of the roof opening (lawalawa)."[100]

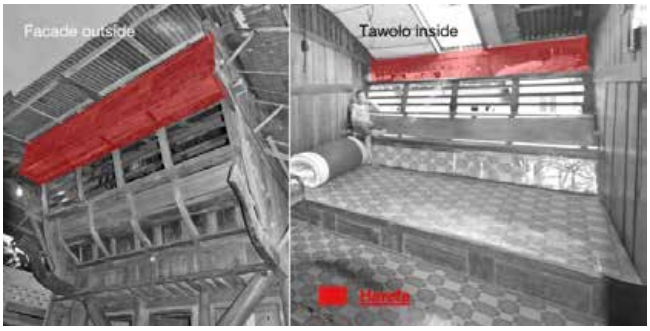


fig. 99: Harefa shown at the TSH "shiae 080"

The *Harefa* is also built with wooden boards. On top of the vertical back panel, a wooden beam is built in. The beam is very important for the roof construction, because the flatter part of the roof lies on this beam.
The depth and the height of the board are between 0.40 and 0.50 meters.

The facade is in many views unique with its different segments and its additional functions. The layout of the wall, the construction, the handicraft to build the facade, the usage of the facade from the inside, the implication of the social hierarchy, and more aspects are worldwide unique and special.

In the past the facade was, with its different functions, the only furniture in the *Tawolo*. The only items, except the walls, are the door openings with the door leaf. The openings to the access platform have nearly the same dimensions. The dimensions are for example: 65/145; 65/140; 70/130; 70/150.
"The height of all doors is same, but the width of the main door is related to the social position of the owner in the village."[101]

[100] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 91*

[101] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 225*

The doors are built as single-leaf and double-leaf doors and are completely made of wood. Also the opening mechanism is made of wood.

"Modern" free positioned furniture

With the modern lifestyle the furniture of the *Tawolo* changed. The traditional furniture still exists and is extended with a few items, which are normal for Europe.

fig. 100: modern furniture in the Tawolo "shiae 026"

With the better income and the import of cheap clothes the inhabitants change clothes more often than in the past. To store all the clothes a few TSH have a cupboard in the *Tawolo*.

fig. 101: business ("shiae 026") – Warung ("shiae 536") in the Tawolo of the TSH

There is also a table with chairs in most of the *Tawolos*. The tables are normally made of wood and used as a desk for the kids, an eating table, and a working desk for the women. All chairs I saw are made of plastic.

Another new category are multimedia devices such as television and radio. All the technical items lie on small wooden sideboards.
Also cooling fans are used in a few TSH, like in "shiae 021", to compensate the overheating as a result of the corrugated iron roof.

Function of the Tawolo:

In the past:

As mentioned the *Tawolo* was the centre of the family social living[102]. During day time, if the family did not work in the garden, they spent the time in the *Tawolo*. Men and women worked there and watched over the children at the same time[103]. At night time the *Tawolo* changed to a defending room against enemies[104]. Therefore the unmarried men sleped in the *Tawolo*[105].
Another very important usage of the room is as a reception for guests[106]. If the owner of the house receives visitors, the *Tawolo* is used as a guestroom where the owner and the guests stay. The function as a guestroom was very important for the inhabitants of the house. The Niha people were and still are a very guest-friendly folk.
As a consequence of this function the *Tawolo* has a representative function.
Nearly all functions are relevant nowadays as well. Obviously the function as a defending room is obsolete nowadays.
With the modification of the substructure the requirement of the *Tawolo* changed. From the modification a second communal room arose. These two rooms share the function of the main-, living-, and guest-room.

Nowadays:

The function of the *Tawolo* is extended nowadays because of the changed lifestyle.

---

[102] *Alain VIARO; Nias Island traditional houses; p. 208*

[103] *Alain VIARO; Nias Island traditional houses; p. 208*

[104] *Alain VIARO; Nias Island traditional houses; p. 177*

[105] *Alain VIARO; Nias Island traditional houses; p. 208*

[106] *Alain VIARO; Nias reconstruction in the sespect of the Tradition; p. 2*

All the functions or room-notation are given from the owner of the TSH in Hiliamaetaniha during our fieldwork.
New functions such as business room, *Warung,* and storage have been added to the traditional functions.

The new term living room has been established because of the new lifestyle and the free time or home time which comes along with it. In most of the houses radios and televisions are installed. They are normally in the *Tawolo* positioned.
Another new term is meeting room. It is similar to the guestroom but used differently. The *Tawolo* is used for family celebrations and also as a location for social organisations. The choir of the church uses the *Tawolo* of the house "shiae 022" to practise for the mass. Also kids meet there to learn about religion and other topics.
The *Kepala Desa* of Hiliamaetaniha ("shiae 088") has his office in the *Tawolo* arranged and the entire meetings take place in this room.

A few owners, additional to the normal use, have their business in that room.
One example is the use as an office like *Kepala Desa*. The women of the houses "shiae 026" have two sewing machines in the *Tawolo* and operate a tailoring.

Hiliamaetaniha - TSH Tawolo									
		Tawolo	Guestroom	Livingroom	Meetingroom	Bedroom	Business	Warung	Storage
shiae	022	1	1	1					1
shiae	026	1	1	1		1	1		
shiae	027	1							1
shaie	042	1		1					1
shaie	043	1		1	1				
shaie	080	1	1			1			
shaie	094	1				1			
shaie	095	1	1	1	1	1			
shaie	099	1		1	1				1
shaie	102	1		1					
shaie	111	1	1		1				1
		11	5	7	4	4	1	0	5

list 07: function of the Tawolo of the TSH

The *Tawolo* is also used as a *Warung*. The owner of the houses "shiae 021", "shiae 123" and "shiae 536" sell goods to the other inhabitants of the village to have a small additional income to their main job.
The goods normally hang on the wall , lie on the table or are stored in a cupboard.
As mentioned the cupboards can be found in many TSH. The normal use is to store cloths there. If the owner has a cupboard in the *Tawolo*, they told us that the room is also used as storage. The storage in Hiliamaetaniha is not used like in western countries; it is only a cupboard full of cloths and other items.
With all the different uses of the room, the *Tawolo* is a multifunctional room and the centre of the house.

6.1.1.1.7.2 Feröma

The second main room of the TSH is the room at the back of the house called *Feröma*. It is the private room where only the members of the family have access.[107]
"Going into the back rooms means to get a privacy and a rest."[108]
The room is located behind the *Tawolo* at the back of the house.

Roomsize TSH					
			Feröma		
	village	house number	wide	length	m²
1	shiae	022	3,90	4,15	16,19
2	shiae	026	4,15	2,85	13,15
3	shiae	027	3,70	3,10	11,42
4	shiae	042			
5	shiae	043	4,20	3,20	13,44
6	shiae	080	3,25	2,60	8,45
7	shiae	091	4,50	3,20	15,80
8	shiae	094	5,20	3,55	18,46
9	shiae	095	5,75	4,95	28,46
10	shiae	099	4,65	3,85	19,10
11	shiae	111	5,20	4,15	21,58
		10	4,45	3,56	16,61

list 08: room size of the Feröma of the TSH

[107] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 91*

[108] *Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989; p. 227*

The room is enlarged over the whole width, like the *Tawolo,* and has an average length of 4.45 meters. The reason for the larger width of the *Feröma* is the additional space needed by the access platform. The length of the *Feröma* is less than at the *Tawolo* and in an average about 3.55 meters. These dimensions imply an aspect ratio of 1:1.125. The area of the *Feröma* is 16.60 m^2 and is 1/3 smaller than the *Tawolo*.
The furniture is similar to the *Tawolo,* but not that elaborated.

The built- in furniture

Batö:

"The first level is the batö which is the sleeping place for the family"[109]
The *Batö* is the largest furniture in the *Feröma*. The location of the Batö changed because of the archetype of the TSH. The Batö and the other segments of the built-in furniture have been moved from the frontal facade to the back wall.
With the changes coming along with the colonial administration, the setup of the *Feröma* had to be changed. The *Batö* rotated to one of the lateral walls. It is still built-in over the whole length of the room and has the same dimension as the *Batö* from the *Tawolo*. Rule of the archetype of the TSH was that the depth of the *Batö* is 1/3 of the length of the room.[110]

fig. 102: Batö in the Feröma of the TSH ("shiae 027"; "shiae 026")

In the past a curtain was installed in front of the *Batö* to have more privacy. In former times the *Sarong* (curtain) was the only possibility to have more privacy[111]. With the *Kolukolu* the family has a separate sleeping room and enough privacy. In a few houses the *Sarong* still is installed to separate sleeping areas on the *Batö*.

Tabolo Nulu:

On top of the *Batö* a chest is superimposed.[112] From the physical appearance, the *Tabolo Nulu* is comparable to the *Farkhina* in the *Tawolo*. It looks like a wooden bench but it is used as a chest. The inhabitants of the house store their cloths and other belongings in the *Tabolo Nulu*.

fig. 103: Tabolo Nulu at the Feröma of the TSH "shiae 021"

The top of the chest is not used as a seating surface it is used as a shelf.
At TSH "shiae 026" the old layout of the *Feröma* is recognizable. The *Tabolo Nulu* continues at the backwall.

Harefa:

The *Harefa* is, in difference to the *Batö* and *Tabolo Nulu,* located on the same position as in the archetype, at the back wall. Used is the *Harefa* also as a shelf to store belongings from the inhabitant.
The dimensions of the *Harefa* are also similar to the *Harefa* from the *Tawolo*. The only difference is the space available for storage. The height of the shelf is about 1.65 meters. The average height of an adult in Nias is nearly the same; about 1.60 meters. Most of the inhabitants are not able to look into the shelf. There are more reasons for the unpractical position of the *Harefa*. In former times the *Batö* and *Tabolo Nulu* were in front of the back wall and in this situation easy reachable. With the rotation of the *Batö, the* exit moved to the back yard, via the back wall, and is underneath the *Harefa*. That is why the *Harefa* has to stay at this height.

[109] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 92*

[110] *Alain VIARO; Nias Island traditional houses; p. 209*

[111] *Alain VIARO; Nias Island traditional houses; p. 209*

[112] *Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture; p. 92*

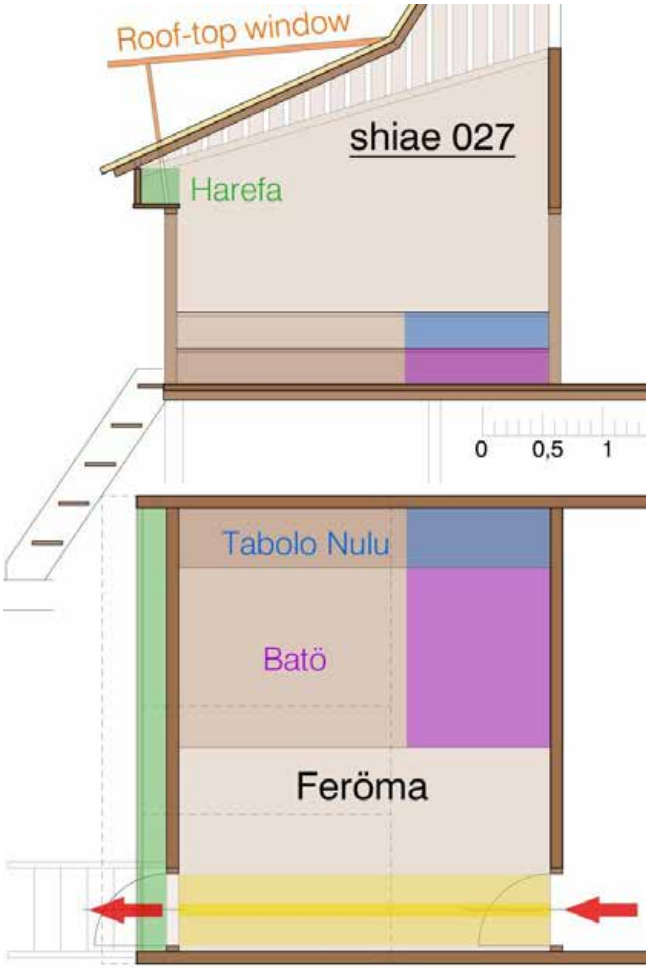


fig. 104: Feröma of the TSH "shiae 027"

Free standing modern furniture does not really exist in the *Feröma*. I did not find such furniture in inside the houses.

Route guidance and doors:

The *Feröma* is a walk-through room. The only access to the *Feröma* is through the *Tawolo* and the only exit is to the backyard, also through the *Feröma*.

The entrance door from the *Tawolo* is located in the middle wall next to one of the lateral walls and build as a single-leaf door with a clearance of about 0.60 to 0.90 meter width and a about 1.40 to 1.60 meters height. It has the same open mechanism as the entrance door of the house. The opening direction is into the *Feröma* and to the lateral wall. The door nowadays is open during the whole day. In the past the door was locked during night times to be secured against enemies.

The exit to the back yard arose with the rotation of the furniture. The only access to the back yard was at the archetype through the continuous access platform next to the house. With the rotated *Batö* the door to the platform was barred and the new door at the back wall arose. The advantage of the movement was the direct access to the fireplace and kitchen behind the house. The door at the back wall is placed opposite the entrance door and is a single or double-leaf door with width of 0.60 to 1.10 meters and height of 1.40 to 1.60 meters.

The access to the back yard or the kitchen is similar to the access to the entrance platform. A removable wooden ladder leant in front of the door. Nowadays is the ladder fix installed and sometimes made of concrete.

Natural lighting and ventilation:

In the *Tawolo* the natural lighting and ventilation is primary given by the *Zarazara* (lattice window). In the *Feröma* the window in the back wall is missing and lighting and ventilation only are provided by the roof top window and the open space of the roof. The room is very dark and the ventilation is bad.

Function

Hiliamaetaniha - TSH Feröma										
		Feröma	Guestroom	Livingroom	Meetingroom	Bedroom	Kitchen	Diningroom	Storage	Prayingroom
shiae	022	1				1			1	
shiae	026	1			1	1				1
shiae	027	1				1		1		
shaie	043	1				1				
shaie	080	1				1				
shaie	094	1								
shaie	095	1				1	1	1	1	
shaie	099	1	1						1	
shaie	102	1								
shaie	111	1		1		1				
		10	1	1	1	7	1	2	3	1

list 09: function of the Feröma of the TSH

As mentioned the *Feröma,* like the *Tawolo, is* a multifunctional room. The main function is the use as a bedroom. The built-in *Batö* is used as a bed. In the past the *Feröma* was a sleeping area for the head of the family with his wife, his daughters, and female guests. The *Feröma* was locked from the inside. Nowadays the traditional sleeping regulation is mostly not in use anymore. The head of the family with his wife sleps in the *Kolukolu* and the rest of the family sleeps in the two other

rooms. With the extension behind the house and the modification of the substructure the sleeping arrangement changed of the whole house.

Another traditional function which is still in use is the function of a storage. The built-in furniture, like the *Harefa*, *Batö,* and *Tawolo Nulu,* are used to store cloths and belongings of the inhabitants.

In rare cases the *Feröma* is still used as a kitchen. The new build *Omo Sebua* ("shiae 095") does not have an extension behind the house and as a consequence no fireplace. The inhabitants of the *Omo Sebua* are using a mobile kerosene stove because open fire is forbidden and dangerouse in the house.
Related to the kitchen, the use as dining room is also one of the first functions of the *Feröma*. 2 of 10 occupants of the TSH use the *Feröma* still as a dining room. At the other TSH the function moved behind the house near the kitchen.
As mentioned, the rooms of the TSH are multifunctional and in a few cases the *Feröma* is also used as a praying room, living room, meeting room or guest room. However, these uses are not the main functions.

6.1.1.1.7.3 Kolukolu

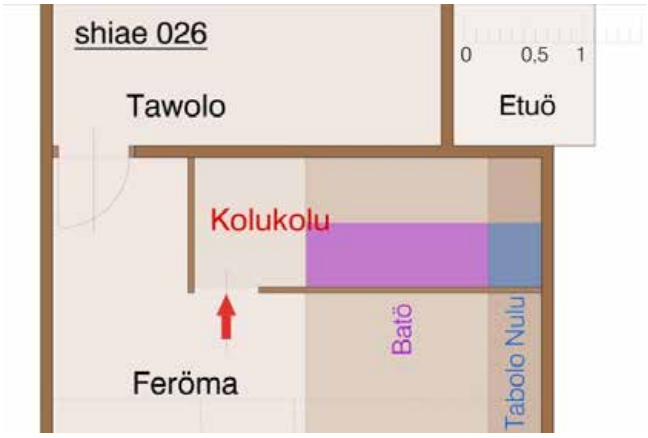


fig. 105: Kolukolu of the TSH "shiae 026"

The third room in the TSH is the *Kolukolu*. Translated it is the Master´s room. In the archetype of the TSH the *Kolukolu* was not part of the layout and arose with the changes caused by the colonial power. The open fireplace was moved behind the house and the accrued room was added to the *Feröma*. In a few cases a new small room was used instead of the separated fireplace.
In the past, the sleeping area was separated with a *Sarong* to have more privacy. This separation was replaced with a wooden wall and a private sleeping room for the head of the family and his wife was estalished.
The master´s room is only for the head of the family. He slept with his wife in the *Kolukolu* and stored all the valuables there.[113]
The width of the *Kolukolu* is related to the need of space for two persons to sleep and is maximum 1.60 meters. The length of the room is relative to the width of the house. The length is equal to the width of the house minus the needed space for the passage to get access to the *Feröma*. Access to the *Kolukolu* is only possible from the *Feröma* and the door is usually built-in the alongside wall.
The wall is like the whole TSH a wooden construction and has a height of 1.80 to 2.20 meters. The room does not have a ceiling and is connected with the *Feröma* .
The *Kolukolu* has the same built-in furniture as the *Feröma*. The *Batö* and *Tabolo Nulu* have the same dimensions and are continued in the *Kolukolu*.

[113] *Alain VIARO; Nias Island traditional houses; p. 177*

6.1.1.1.8 Public – Semi-public – Semi-private – Private

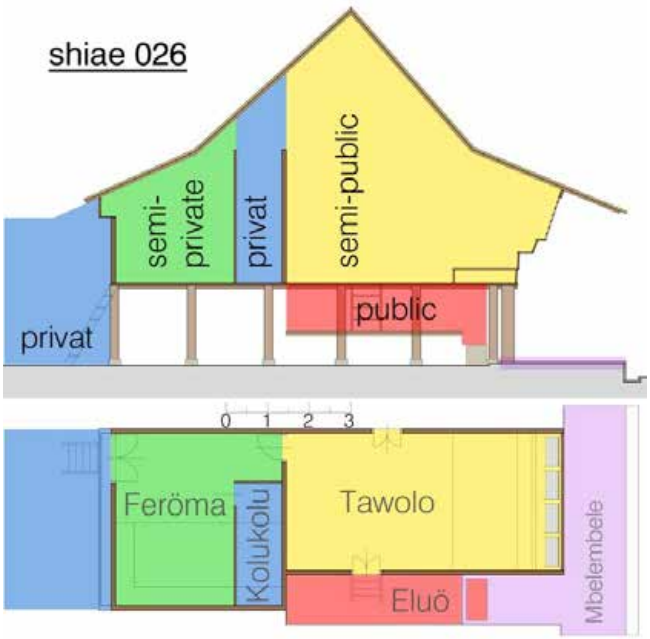


fig. 106: public to private area of the TSH "shiae 026"

The setup of the villages in South-Nias are, as mentioned earlier, classified in different areas from public to private. The house is the private area in this classification of the village.
The house as a separate object is also divided into the same classification.

Public area of the TSH

The public area of the TSH is the platform between the houses. The *Etuö* is an intermediate area between the village and the house. If this zone is part of the village or part of the house is not directly defined, but its affiliation to the house is higher and in my opinion it is part of the house.
The entrance platform is accessible for everybody, but the height difference is a physical barrier. There is also a psychical barrier to enter the *Etuö*. We entered the *Etuö* only after asking for permission.
The border from the village to the house is viewable and noticeable.

Semi-public area of the TSH

The semi-public area is defined by the main room of the TSH, the *Tawolo*. The entrance into the house from the *Etuö* is the only possibility to enter the house. Everyone has to go into the main room. The function as the reception room and guestroom prescribes the classification. All guests were welcomed and feasted in the *Tawolo*. It is also the main room for the inhabitants of the house where the day routine is happening.
With the lattice window in the frontal facade a permanent connection to the village is given. A complete insularity and privacy is not possible. A permanent acoustic and visual connection is given and, in my opinion, deliberated by the inhabitants of the house.
If the inhabitants wants to have more privacy, they have to use the back rooms of the house.

Semi-private area of the TSH

The *Feröma* is the private area of the house for the inhabitants. On closer consideration the private area of the TSH is divided into two zones, the semi-private and private area.
The *Feröma* is the semi-private area of the house. As mentioned, the *Feröma* is the sleeping room for the family and guests. Also the room is used as a dining room and kitchen. Good friends and relatives are allowed to enter the *Feröma*. The other guest, like us during our research, are only allowed in the *Tawolo*.

Private area of the TSH

The *Kolukolu* is located in the centre of the house and is also the heart of the house. It is the master´s room and only reserved for the head of the family. Only the family is allowed to enter the *Kolukolu* and, thus, it is the private area of the TSH. The inhabitants store their valuables there.
It is only accessible through the *Feröma*, the semi-private area.
In most of the houses it was not allowed to observe the *Kolukolu*. A few inhabitants allowed us to have a quick look inside the room.
Another private area is the backyard. Only the family has access to the area behind the house.

6.1.1.2 Traditional House build on short pillar TH-SP

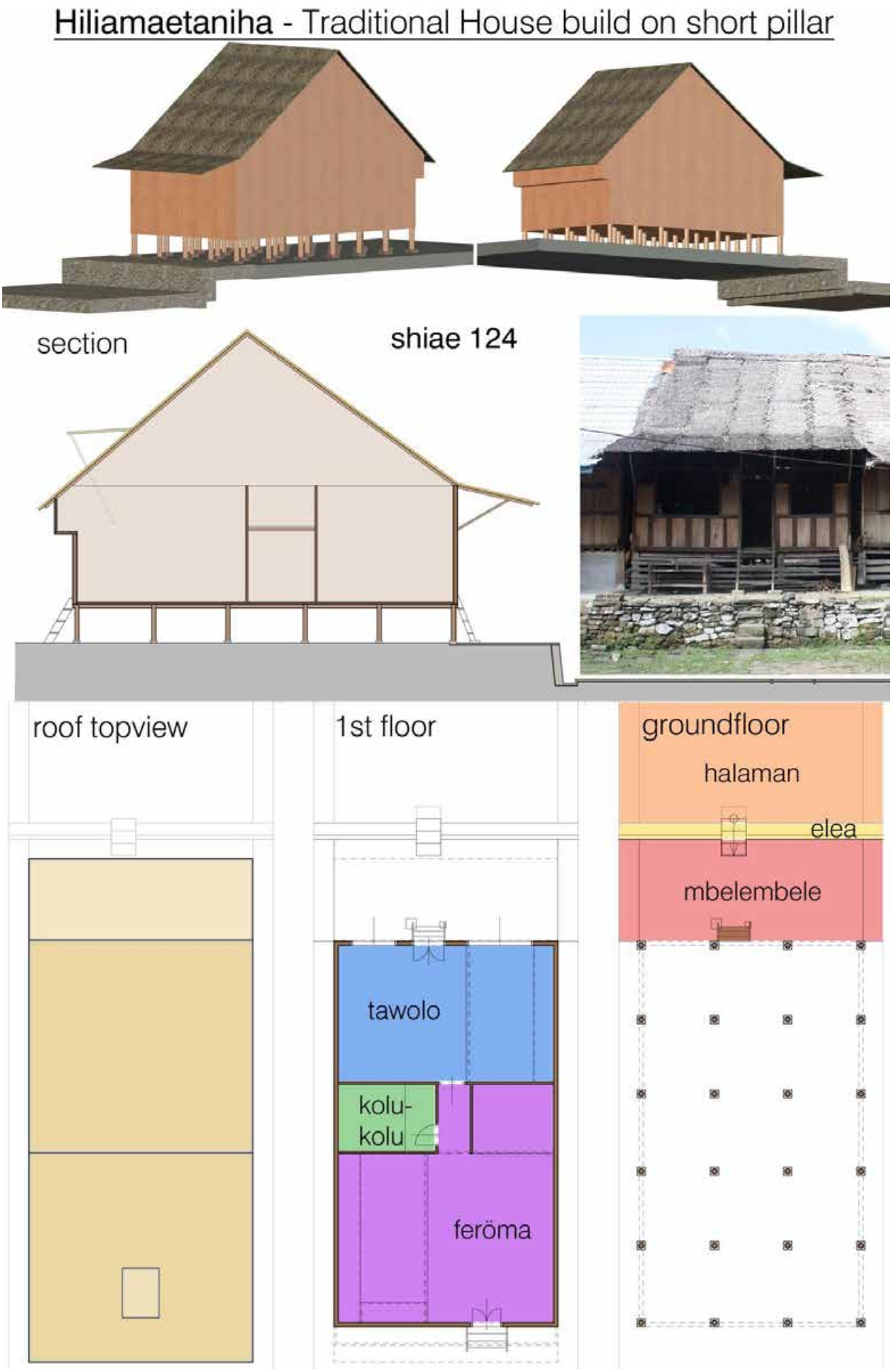


fig. 107: Traditional House build on short pillar "shiae 124"

The Traditional House build on short pillar is the second building type of the traditional houses. This type is an advancement from the Traditional Standard House and is related to it. It is the simplified type of the TSH. The identity of the two traditional house types is in many aspects present and visible.
Colloquially you can also say: The TH-SP is the small neglected brother of the Traditional Standard House.
A very interesting fact is that the TH-SP can be found in all the different area on Nias. We found the same building type during our research 2012 in the South- and North-Nias. A few little changes exist, but the basic type is the same. In Tumöri, our second reseach area, are 7 TH-SP out of 149 houses existing (4.7%).
In South-Nias it is built more often.

Hiliamaetaniha:

Traditional and Extended Village

Buildings	175	100%
TH-SP	29	16.6%

Traditional Village

Buildings	142	100%
TH-SP	25	14.5%
TH	101	100%
TH-SP	25	24.7%

Extended Village

Buildings	33	100%
TH-SP	4	12%

The TH-SP is located:

- at the end of the village
- at the side road
- at the extended village

In the centre of the village are only TSH build.

Nias is famous for its worldwide unique traditional houses. A lot of articles and books are written about these houses. All the researchers and visitors did not note and describe the TH-SP. This type of the traditional houses is not any less interesting than the TSH.

fig. 109: Elevation of the TH-SP ("shiae 124", "shiae 125")

6.1.1.2.1 The incurrence of the TH-SP

The TSH is a very elaborate building and a time- and cost-consuming project.
The construction wood for the structure is, as already mentioned, very rare on the island and has to be imported. Many craftsmen are needed to build the elaborate house. Another reason is the cultural and social tradition. The construction is divided into different building phases and if one of these phases is finished, the building contractor has to celebrate a feast.
Summarizing it is very expensive to build a TSH. A lot of young families do not have the funds to build the elaborate dwelling.
As a consequence, the not so wealthy families started to build simplified houses and developed the Traditional House on short pillars.

fig. 108: position of the TH-SP in Hiliamaetaniha

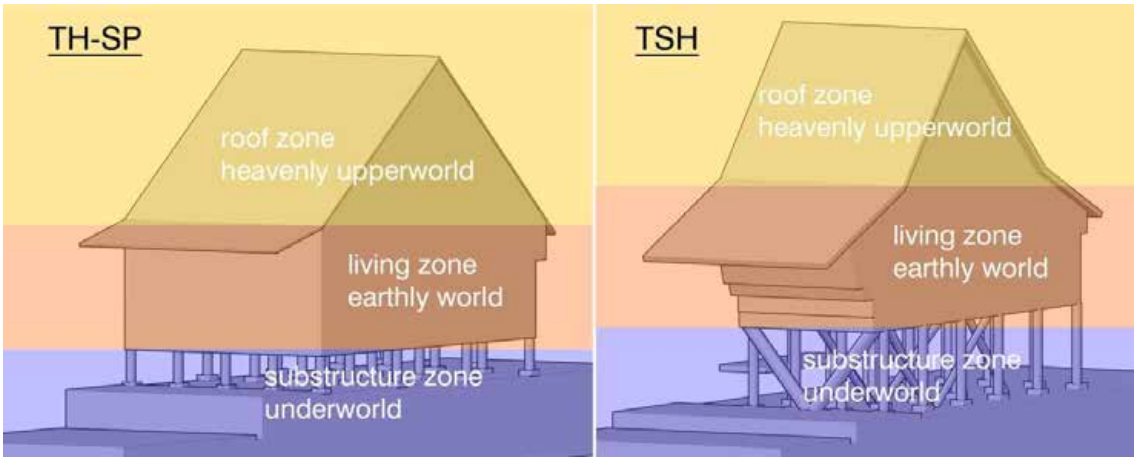


fig. 110: Tripartite of the TH-SP and TSH

The tripartite of the house is from the TSH taken over. The TSH and the TH-SP are segmented into the substructure (underworld), the living area (earthly world) and the roof area (heavenly world).
The differences in consequence of the simplification are also visible in the tripartite.
The vertical pillars of the substructure are lower and the diagonal braces are missing. In the living zone, the frontal facade is vertical and without the elaborate horizontal segmentation. The third part of the house is the roof. It is not built so high.
The inside of the house is not affected. The layout of the rooms is similar to that of the TSH.
Summarizing all these facts is the TH-SP a cheaper and simpler variation of the TSH.

It was not possible to found out when the TH-SP was established. One of the oldest existing houses was built in 1954. It is not clear if houses of this building type were build long before the still existing houses. In my opinion the TH-SP arose in the middle of the 20th century.

village	house number	year	builder
shiae	102	1971	father of owner(58)
shiae	123	58 years ago	father of owner(45)
shiae	124	40 years ago	father with owner(65)

list 10: building date of the TH-SP

6.1.1.2.2 Construction of the TH-SP

All the traditional buildings have the same structure. The concept of the substructure is also comparable to the TSH, but a lot of changes can be found.
The kinds of woods which are used to build the TH-SP are the same. I could not identify if the wood with the best attributes for the needs was used or a cheaper type of wood was used.

6.1.1.2.2.1 Substructure

The substructure of the TH-SP is also a pile-dwelling like the TSH.
The connection between the pillars and the ground is the same. Underneath the wooden pillars are rocks placed to transfer the forces into the ground. The pillars are not connected to the grounding stones. This is very important for the earthquake-resistant of the construction.
The wooden pillars are shorter in comparison to the TSH. The finished floor level of the living platform is 1.00 to 1.10 meters above terrain. The height of the pillars are 0.80 to 0.90 meters.
The biggest difference is the missing diagonal poles. With the lower height of the substructure are the diagonal poles not so important. With the attached building development the houses are clamped and supported sideways.

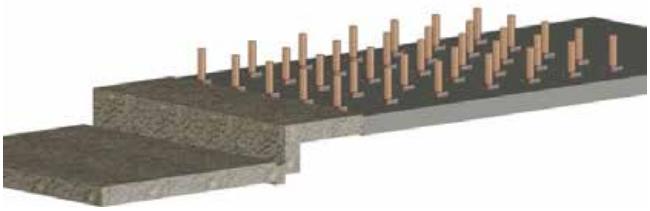


fig. 111: substructure of the TH-SP "shiae 124"

6.1.1.2.2.2 Middle area – Living area

From the setup and arrangement of the rooms, the living area of the traditional houses is nearly the same with small changes. The biggest and from the outside most recognizable change is the front facade of the TH-SP. The facade is completely simplified. The out leaning, elaborate segmented facade from the TSH developed into a vertical normal constructed wall. Instead of the lattice window two normal windows are built in the front facade.

fig. 112: living area of the TH-SP "shiae 124"

Another conspicuous change is the situation of the entrance. The access moved to the front wall. The approach changed from an indirect to a direct frontal approach. The entrance into the house is directly from the *Mbelembele* and not indirect over the entrance platform, the *Etuö*.

6.1.1.2.2.3 Roof area

The imposing roof of the TSH changed also towards a simplified roof construction.

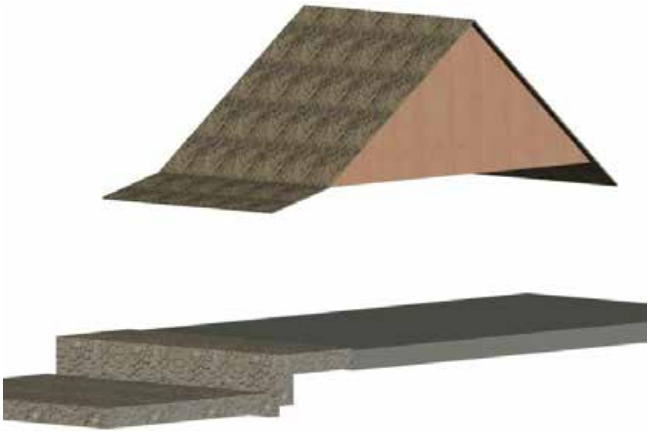


fig. 114: roof area of the TH-SP "shiae 124"

The house is roofed with a gabled roof. The *Mbelembele* in front of the house is covered with a flatter roof. This two roofs together have the same look like the TSH, but are not connected. The consturction of the two roofs is devided.
The joint of the roofs is located ontop of the front wall of the TH-SP. Only a few exceptions like "shiae 060" or "shiae 063" have the same knik between the two parts of the roof in the middle of the *Tawolo*, inside the house.

fig. 113: elevation of the TH-SP

A consequence of the new access into the houses is the changed view of the facade. The segmentation: "two houses – entrance – two houses" got lost and the TH-SP are build next to each other.

The height of the roof is also comparable to the TSH. The pitch of TH-SP's roof is about 10° to 15° smaller, and that´s why the roof seems to be lower.

The roof covering material is exactly the same like at the TSH. There are toppings made of sago palm leaves and corrugated iron.

Hiliamaetaniha:

TH-SP	29	100%
Palm leaf roof		
	9	31%
Corrugated iron roof		
	20	69%

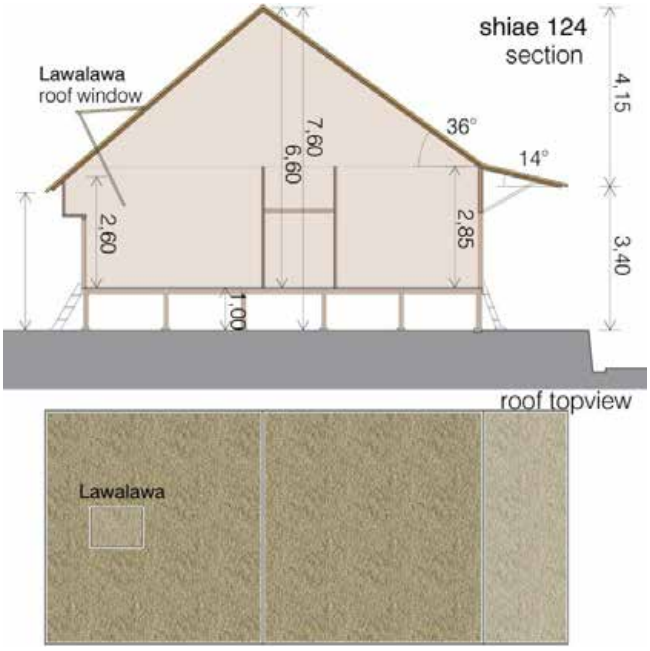


fig. 115: dimension of the roof "shiae 124"

The roof top window in the front room, the *Tawolo*, is not built anymore except in four houses ("shiae 054", "shiae 060", "shiae 063", and "shiae 105"). One of the reasons is the normal windows found in the front wall.
In the back room, the *Feröma* the roof top window is still used and like in the TSH the only possibility of ventilation and lighting.
One function of the roof top window got completely lost; The access to the roof to dry the clothes on top of the roof is in the TH-SP not possible.

6.1.1.2.3 Room setup the Traditional House build on short pillars:

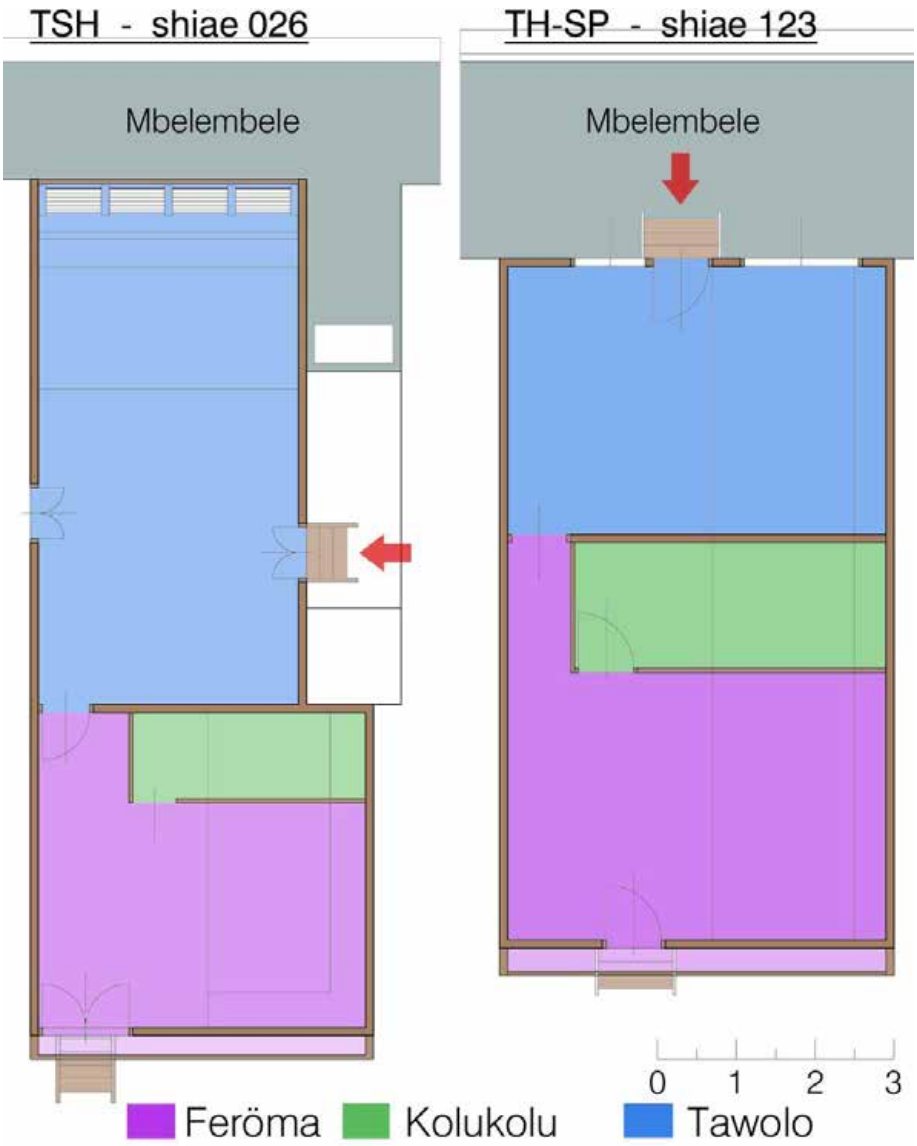


fig. 116: room setup of the TH-SP "shiae 124"

The room setup of the traditional houses is the same in every type.

The traditionally oldest part of the house consists of three rooms.
The communal room (*Tawolo*) is positioned at the front of the house. The private room (*Feröma*) is situated at the back of the house and the master´s room (*Kolukolu*) is located in the middle of the house.

6.1.1.2.3.1 Tawolo

The *Tawolo* is as explained positioned in the same location and goes over the whole width of the house which has an average of 5.30 meters. The houses are in comparison to the TSH about one meter wider. The length of the *Tawolo* is smaller and has an average of 3.60 meters. As a result changed the *Tawolo* from a longitude to a latitude room.
In comparison to the TSH the *Tawolo* has the most changes to report.
Also, from the outside the new access is recognisable. The new frontal access is through a door in the front facade. The entrance door has a clearance height up to 1.80 meters. To reach the entrance door a ladder is positioned infront of the entrance. With the lower height of the living platform the entrance platform (*Etuö*) of the TSH is not necessary.

The new access results in a new route guidance. The primary route through the *Tawolo* goes from the entrance at the front facade to the back wall. In the TSH the main route was not longitudinal, it was across the room.

That rotation is connected with the new entrance. The connection to the neighbours through doors in the lateral wall has disappeared. The houses are not connected anymore.

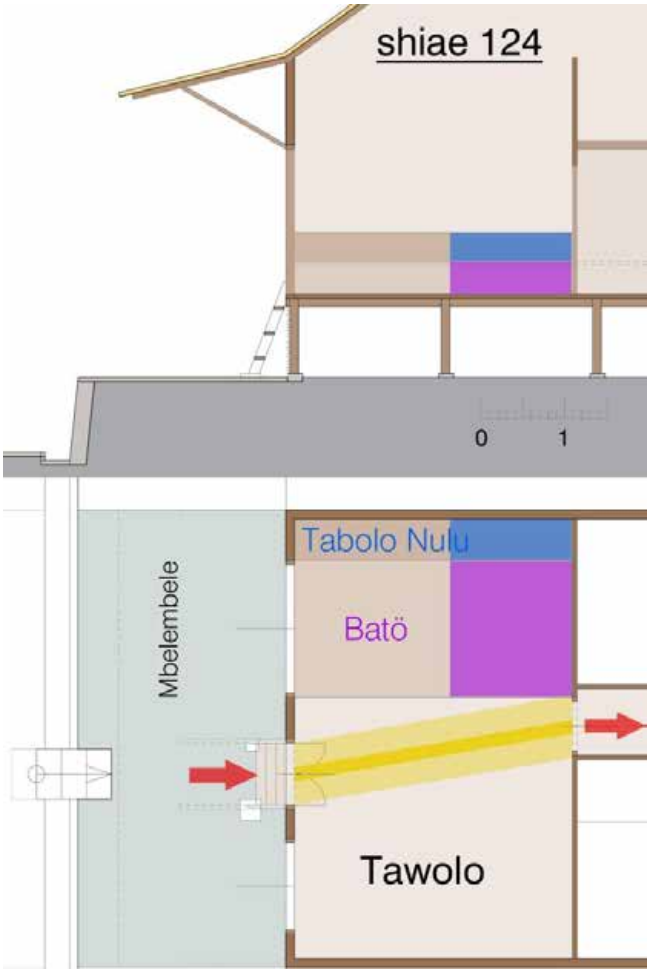


fig. 117: Tawolo of the TH-SP "shiae 124"

As a consequence of all these changes the built in furniture has rotated. The unique furniture from the *Batö* to the *Harefa* is simplified like the whole house and is composed of the *Batö* and the *Tabolo Nulu*. These two elements are positioned on one of the lateral walls. The dimension of the *Batö* and the *Tabolo Nulu* are in the same range as in the TSH. The functions are also the same. The only difference is the *Tabolo Nulu*. In the TSH the *Farkhina* was built on top of the *Batö* and was part of the facade and only used as a bench. In the TH-SP a *Farkhina* is not built in. On top of the *Batö* is a chest, which is used as a bench and as storage like in the *Feröma* of the TSH.

As previously mentioned, this rotation happened a long time ago to the *Feröma* and the TSH. This process also happened in the *Tawolo* of the TH-SP. As a result the *Tawolo* of the TH-SP is more similar to the *Feröma* of the TSH then to the *Tawolo* of the TSH.
The new furniture for example cupboard, table, and chairs are also used in the *Tawolo* of the TH-SP.

Function of the Tawolo

The main function of the Tawolo is still the function as the centre of the family's social life. That is why most of the inhabitant told us that the *Tawolo* has the function of the living room and the guestroom.

Hiliamaetaniha TH-SP - Tawolo						
		Tawolö	Guestroom	Livingroom	Warung	Storage
shaie	102	1		1		
shaie	123	1	1		1	1
shaie	124	1	1	1		
shaie	536	1	1	1	1	
		4	3	3	2	1

list 11: function of the Tawolo of the TH-SP

In two of the TH-SP the owner established a *Warung* in their *Tawolo* to supply the villages with the needed goods.

With the *Tabolo Nulu* and the cupboards is the *Tawolo* also used as storage for clothes and other items.

fig. 118: Warung and living room - "shiae 124"

6.1.1.2.3.2 Feröma

The *Feröma* is the private room of the Traditional House. The room is completely the same in the TSH and the TH-SP.

fig. 119: Feröma of the TH-SP "shiae 536"

If you compare the ground floor plan of the *Feröma* of the house "shiae 027" (TSH) and "shiae 536" (TH-SP), there are no differences.
One small difference is the roof. The roof from the TH-SP has no knik between the gable and the eave like at the TSH.

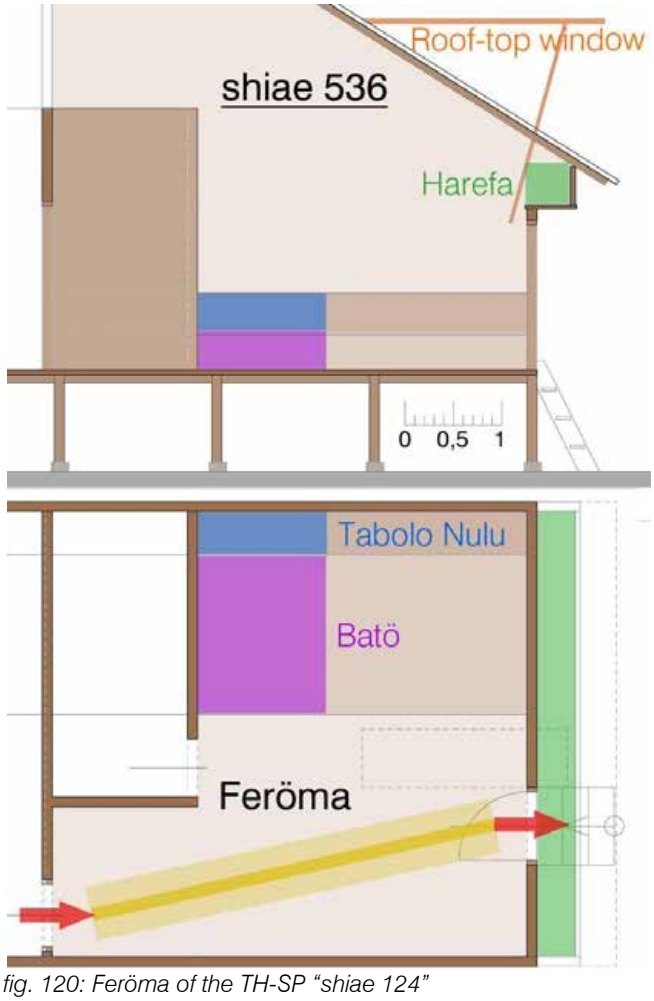


fig. 120: Feröma of the TH-SP "shiae 124"

fig. 121: roof top window of the house "shiae 123"

In both types of the traditional houses the roof-top window is built in, because it is the only possibility to ventilate and lighten the room.

Function of the Feröma

The *Feröma* has the same room function as the *Feröma* of the TSH. The main function is as a sleeping room. Other minor functions are the use as a storage room, dining room and living room.

Hiliamaetaniha TH-SP - Feröma						
		Feröma	Livingroom	Bedroom	Diningroom	Storage
shaie	102	1				
shaie	123	1	1	1		
shaie	124	1		1	1	1
shaie	536	1		1		1
		4	1	3	1	2

list 12: function of the Feröma of the TH-SP

6.1.1.2.3.3 Kolukolu

In the TH-SP is the *Kolukolu* a standard room in the layout of the house. In all the houses we surveyed was the *Kolukolu* part of the ground floor. The position and the dimensions are comparable to the TSH The furniture is also similar.

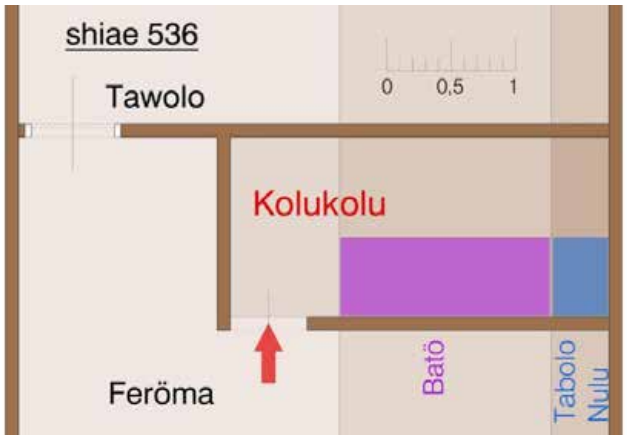


fig. 122: Kolukolu of the TH-SP "shiae 124"

6.1.1.2.4 Public – Semi-public – Semi-private – Private

The classification of the house from the public- to the private area is similar to the TSH. The only change to the TSH is the public area.
As a result of the direct access into the house is the *Etuö*, the entrance platform, not needed anymore and the junction between the village and the house, and with that the private area, got lost.
People enter directly into the *Tawolo*, the semi-public area, through the front. All the other areas are completely similar and have the same explanation as on the TSH.

fig. 123: public to private area of the TH-SP "shiae 124"

6.1.1.3 Traditional Standard House build on short pillar - TSH-SP

The Traditional Standard House build on short pillars is a special type of the traditional houses. It is a mixture of the two main types of the traditional houses, the TSH and the TH-SP.
The TSH-SP is like a modular assembly system combined. The substructure is taken from the TH-SP and the superimposed house is taken from the TSH.

fig. 124: animation of the TSH-SP "shiae 099"

The substructure is identical to the traditional house build on short pillars. It consists of vertical pillars with a height of about 1.00 meter.

fig. 125: substructure of the TSH-SP "shiae 099"

The house on top of the substructure is completely identical to the TSH. It has the elaborate unique front facade, the same roof construction, the *Etuö* as the entrance platform, the same inside room layout and all the other aspects.

fig. 126: living and roof area of the TSH-SP "shiae 099"

In Hiliamaetaniha the TSH-SP is only located on the north side of the side road and is very rare.

Hiliamaetaniha:

Buildings:	142	100%
TSH-SP	4	2.8%
Traditional Houses	110	100%
TSH-SP	4	3.6%

The TSH-Sp is built in blocks like the TSH. At the north facade of the side road of Hiliamaetaniha the houses are organized in blocks.

fig. 127: elevation with the different blocks

The sequence is:

1 block TSH	(shiae 097+shiae 098)
1 block TSH-SP	(shiae 099+shiae 100)
1 modern house	(shaie 101)
1 block TH-SP	(shiae 102+shiae 103)
1 block TSH-SP	(shiae 104+shiae 105)

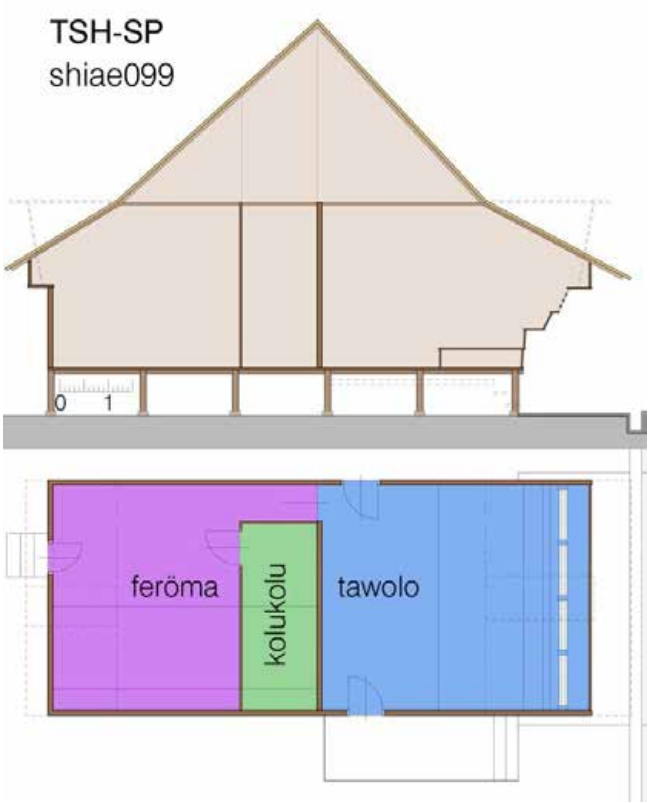


fig. 128: Traditional Standard House build on short pillars "shiae 099"

6.1.1.4 Extension of the traditional house

The reason to build the extension was the new government of the colonial power. They forbade by law open fires inside the houses. The reason for that was the hazard of fire, because of the wooden construction and the palm leave roof. The structure of the villages was also problematic. With the terraced building development a fire in the village would be very dangerous. If one house started to burn down, a consequence is all the houses are affected because the fire jumps from house to house. A lot of villages in the past burned completely down like Hiliamaetaniha in 1891.
To prevent this incident the colonial power passed the law that a open fire in the house is forbidden. As a consequence the fireplace moved behind the house.

Therefore, the palm leave roof was extended, but not fully across the length. Only the area over the fireplace was covered. With time the whole kitchen moved behind the house. So they extended the whole roof and started to close up the lateral boundary to the neighbours and created a new room behind the house.
At the beginning they closed up the roof substructure (wooden poles) with wooden boards. With the launch of bricks the walls were built with the new materials and they started to cast concrete slabs as a proper floor. The access to the new room was mostly through a small staircase or ladder positioned at the back wall of the *Feröma*. Because of the high substructure underneath the TSH a second entrance through the pillars was created and the extension was directly accessible from the *Mbelembele*. To close up the private area behind the house the inhabitants built a wall

fig. 129: Extension of the TSH "shiae 026"

First of all, an uncovered fireplace arose behind the house. The fire was and still is very important for the occupants to prepare their food. Because of the heavy rain the inhabitants started to cover the fireplace to protect the fire and the people.

underneath the back wall of the *Feröma* and separated the substructure and the extension.
The back yard behind the house changed with that conversion to a more useful area with an easy access through the extension.

fig. 130: inside of the extension of the TSH "shiae 026"

So arose the first extension behind the house which was mainly used as a kitchen and a pantry.

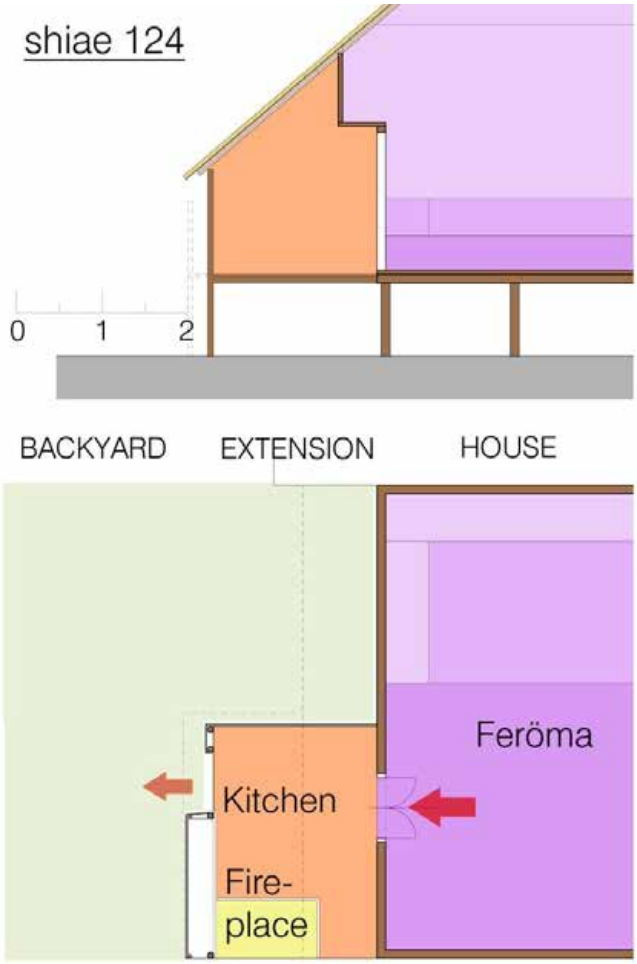


fig. 131: extension and backyard of the house "shiae 124"

With the growing living standard and the conversion to the modern western living the inhabitants needed more space. The solution was to expand the extension for living space up to a room size of 25.00 m². In this case the room is not only used as a kitchen, it changed to a multifunctional room, where nearly all the daily routines can be done.
The inhabitant started to pay more attention towards hygiene and build private toilets and bathrooms on their own properties. Before, the inhabitants went into the forest to use as their toilet. The newly built toilets normally are positioned at the end of the property or at the border to the forest. South-Nias was and still is not developed with a sewage-system, so the excrement was washed into the forest; This is the reason for the location near the forest. Arranged next to the toilets are most of the pig-sties. In that case the excrement was washed into the pig-sty.

In the last 20 to 30 years the people started to search for possibilities to obtain more privacy. That is the reason they built small chambers in the extension. Most of the private sleeping rooms only screened off with a curtain. The size of the room is on average not bigger than the *Batö,* which is a heightened surface made of wood and in this case is it only used as a bed. The breadth of the *Batö* and the room is normally around 2.50 m. The depth of the sleeping room is mostly the same, compound of the *Batö*, which is about 1.80 to 2.00 meters and a small corridor.

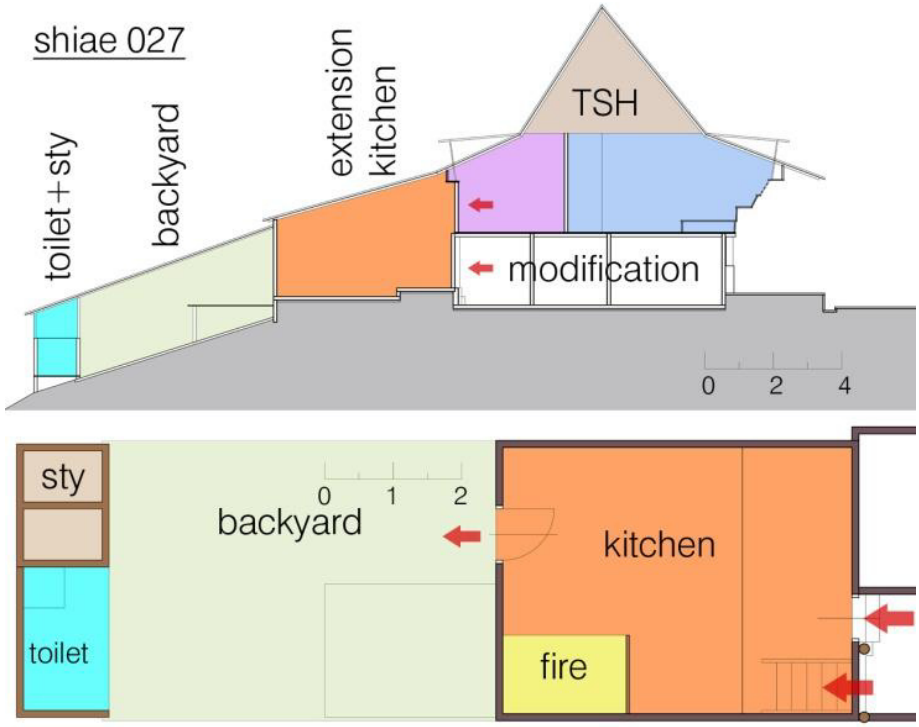


fig. 132: extension and backyard of the house "shiae 027"

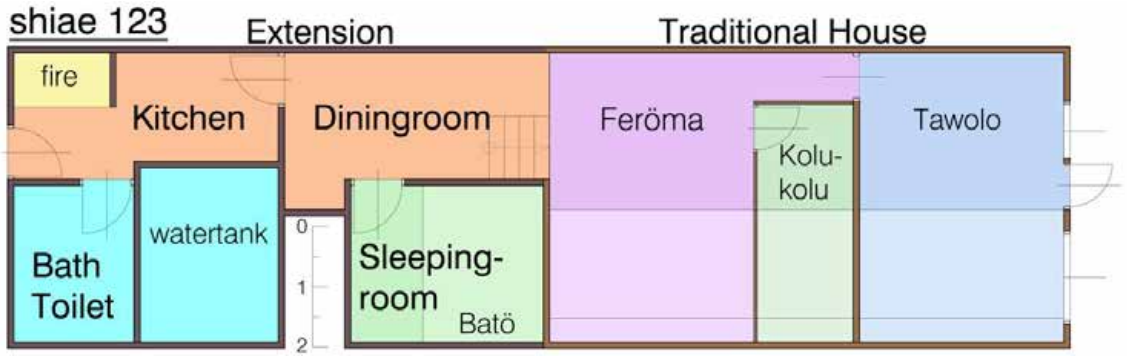


fig. 133: room layout and function of the extension "shiae 123"

6.1.1.4.1 Extension of the extension

A family in South-Nias has in average 3 children but also not unusual up to 5 kids. Traditionally the oldest son takes over the house from the parents. He is also responsible for the parents, who live together with their son in their house until they die.
The daughters normally gets married and moves with her husband to a new village or into the house of the husband. The younger sons have to build their own house and move into it with his wife. The new house is normally situated in the same village or near the village.
Building a new house was in the past a question of time and workmanship. There was enough building ground available and with the agreement of the *Si´Ulu* the approval was given. The only material needed for a traditional house was wood, which was available in the forest. The situation today is completely different. With the partition of the properties and the arrangement of the ownership of the ground it is not easy to find an affordable property to build on. Nearly all available properties are already taken. In the surroundings near to the villages properties are still available, but for the average salary of a farmer or fisherman it is still very expensive. Also, the situation with the building material has changed. The wood which was used for the traditional house is nearly completely consumed and has not been replanted. Because the inhabitants needed the space for palm tree plantations, for the production of rubber and palm oil. Newly building materials like cement and bricks are imported and quite expensive.
The children of many families are not able to afford a new house and to move out. As a consequence many of the houses are still quarters for the family and the families of the children.
As an example: in Hiliamaetaniha is in one house "shine 070" in which 16 people live.

Number of resident - Hiliamaetaniha shiae 070			
1	Farther	65	Hiliamaetaniha
2	Mother	46	Hiliamaetaniha
3	1st Son	32	Hiliamaetaniha
4	1st Daughter in law	19	Hilimanamöle
5	Grandchild	4	Hiliamaetaniha
6	Grandchild	2	Hiliamaetaniha
7	2nd Son	30	Hiliamaetaniha
8	2nd Daughter in law	26	Botohilitanö
9	Grandchild	8	Hiliamaetaniha
10	Grandchild	5	Hiliamaetaniha
11	Grandchild	3	Hiliamaetaniha
12	3rd Son	28	Hiliamaetaniha
13	3rd Daughter in law	24	Hilizihöne
14	Grandchild	8	Hiliamaetaniha
15	Grandchild	5	Hiliamaetaniha
16	Grandchild	2	Hiliamaetaniha

list 13: resident of the house "shiae 070"

To extend the existing house is definitely cheaper than to build a new house.

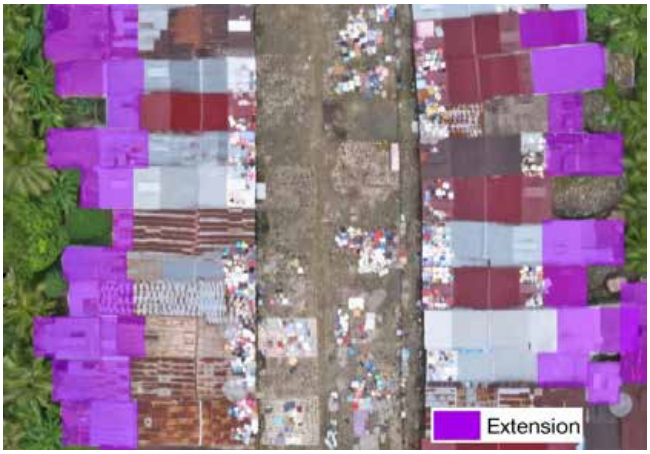


fig. 135: extension shown of the aerial view of Hiliamaetaniha

Nearly every house owner extended their house with a second or additional extension. Because of the setup of the traditional village Hiliamaetaniha the space behind the house is not bounded. The only criterion or barrier to extending behind the house is the topography.

fig. 134: extension of the extension "shiae 099"

But the need of space is not the only reason for the build extensions in the last years. As mentioned the requirement of privacy and the new accrued lifestyle with western influence are several reasons to extend the house.

6.1.1.4.2 Function of the diferent areas of the extension

and the layout of the sleeping rooms are still the same and comparable to the *Kolukolu*. A small room with a built-in *Batö* separated through a wall or a curtain. Houses with bigger extensions have up to 2 separated sleeping rooms and 1 multifunctional room with a sleeping area, like in the house "shiae 043".
The multifunctional rooms in the extensions are comparable to the *Feröma* or the *Tawolo*.

	Roomfunction of the Extension																																	
	Traditional house																Extension													Extension 1st floor			
	Tawolö	Feröma	Kolukolu	Guestroom	Livingroom	Meetingroom	Bedroom	Bedroom	Bedroom	Kitchen	Diningroom	Business	Warung	Storage	Storage	Prayingroom	Kitchen	Kitchen	Diningroom	Bedroom	Bedroom	Bathroom	Toilet	Toilet	Watertank	Storage	Storage	Storage	Stable	Passage	Bedroom	Bedroom	Storage	Passage
shiae 022	1	2		1	1		2							1	2		7	8	7	6		9	9		12	7	11			11	3		3	
shiae 026	1	2	3	1	1	2	1	2	3			1				2	4		4			5	5		5	4							X	
shiae 027	1	2					2				2			1			3		3							3								
shaie 042	1				1									1			5	7	3	2	4	6	6	8	11	3	5	7	12	3				
shaie 043	1	2	3		1	1	2	3									6		7	7					10						4	5	3	3
shaie 080	7	6		7			7	6									5		4							5				4				
shaie 094	1	2					1										7					8	9			7							2	
shaie 095	1	2		1	1	1	1	2		2	2			2																				
shaie 099	1	2	3	2	1	1								1	2		6	8	4	5		7	9		10	5	6			4				
shaie 102	9	10			9												6	8	4	4	5	7	7		7	4	8			4				
shaie 111	4	5		4	5	4	5							4			3		3							3							6	
shaie 123	1	3	2	1	3		3	2					1	1			6		4	5		7	7		7	4								
shaie 124	1	3	2	1	1		2	3	5		3			3			4																	
shaie 536	1	2	3	1	1		2	3					1	2			5		4			6	6		7	4								

list 14:room function of the extension of the traditional houses

6.1.1.4.2.1 Sleeping room

As mentioned ever more people are living in the house and the need of space and privacy is rising. As a consequence more sleeping rooms and sleeping facilities are planned and build. The size

The room with a size from 20.00 m² up to 35.00 m² has a built-in *Batö* like the traditional rooms.
Additional to this function as a sleeping room it is used for nearly all the other functions from a normal daily processes like cooking, eating, working, relaxing and also as storage.

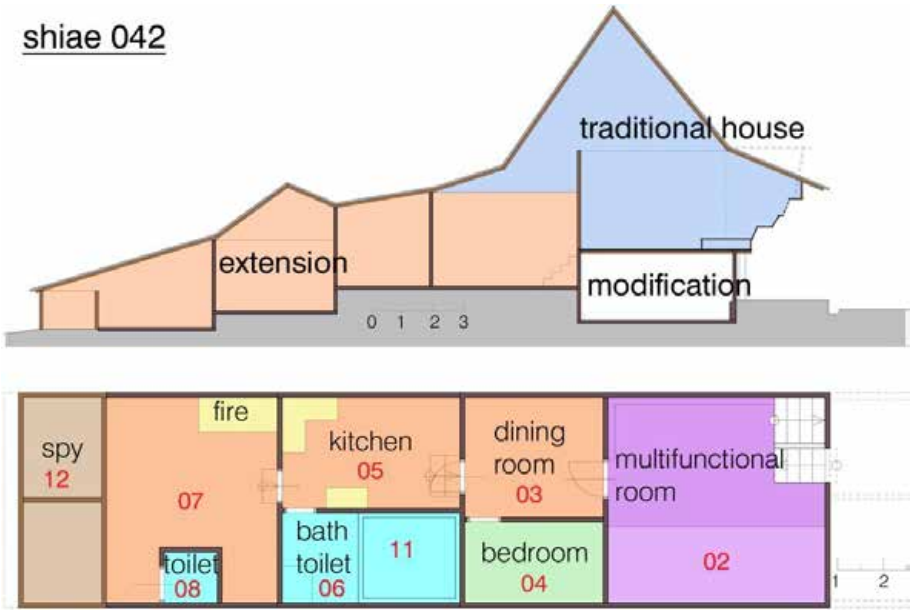


fig. 136: seperate bedroom in the extension

fig. 137: multifunctional room of the extension of the TSH "shiae 042"

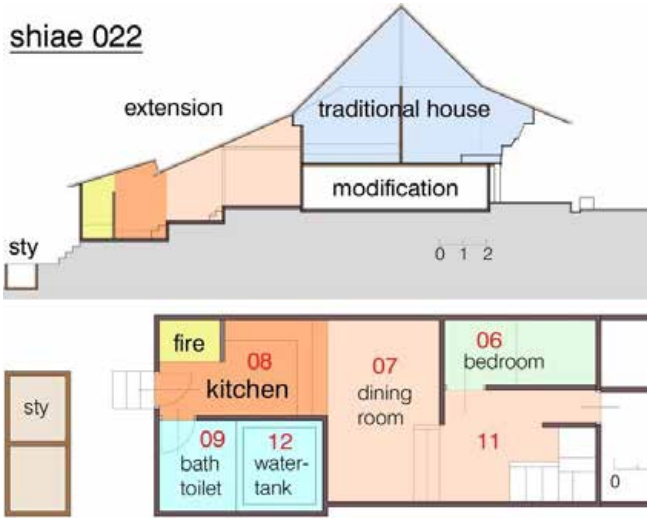


fig. 138: kitchen of the extension of the TSH "shiae 022"

6.1.1.4.2.2 Kitchen

A very important main function of the additional, connected building is the kitchen. At the beginning of the extensions was the kitchen a small fireplace. The new built kitchens are more comfortably equipped, but the centre of the room is still the fireplace. The kitchen is positioned with the fireplace at the farthest end of the extension near the back yard.

If a occupant decided to rebuild the extension or to extend the existing extension, the builder located the kitchen also at the back of the new extension. The reason for the position is surely still the safety aspect because of the open fire. Another reason is the smell and the dirt of the open fire. At the back of the house it is possible for the smoke to escape through the back wall.

fig. 139: open fire place "shiae 022"

The fireplace was firstly positioned on the floor. Nowadays is the fire placed on a table made of concrete. The size of the fireplace is usually up to 1.20 meters deep and 1.40 to 2.00 meters long.

Over the fire is mostly a construction to store firewood, which will dry the wood through the heat at the same time. To have dry fire wood is because of the rain intensity very important in Nias.
With the new technology new cooking systems are used, like portable gas-cookers, which are normally located next to the fire. To simplify the cooking the concrete table of the fire is extended. The bigger table is used for the new cooker and as a working area and for storage. New furniture in the kitchen are small cupboards or shelves. They are made of wood and are used to store the dishes and food, which were lying on the floor previously.
With the new cooker arose in a few extensions a second kitchen. One of the kitchens is still with an open fire and found in the last room of the extension. The new kitchen for the fire free cooker is the room in front of the old kitchen.

fig. 140: two seperate kitchens "shiae 102"

6.1.1.4.2.3 Dining area

In South-Nias, a completely new area in the house setup is the dining room. In the old traditional buildings a separate dining area is not necessary, because the daily routine happened in the two main rooms of the house, the *Tawolo* and *Feröma*. The built-in *Batö* was used for nearly all operations like sleeping, eating, working, relaxing and much more. With the transition to the modern western lifestyle the use of a is dining table more and more common.

fig. 141: dining room of the extension "shiae 099" and "shiae 042"

The area for dining is normally combined with the kitchen and identifiable through the table, which is used for eating, as a worktop, as storage and much more.
The dining room normally is positioned in front of the kitchen and can be a separate room or part of the kitchen.
This development is still progressing, because not every house has a dining area yet.

6.1.1.4.2.4 Bath

In the last decades, the major alteration and reason for the huge extension is the house own water supply and the higher attention of the personal hygiene.
As already mentioned the village Hiliamaetaniha is not connected to the regional water supply and the inhabitants have to carry the water form the water springs in the forest to their houses. To get rid of the problem many house owners started to build a private water tank behind the house to collect the rainwater. Nias has very high rain intensity, so the opportunity to collect rainwater is a cheap and easy solution. The rainwater from the backside of the roof will be carried into a tank.
The fist step of the development was a small water tank, called *Mandi*. The tank is built in to collect and save the water. On the island of Java, the *Mandi* is also a fixed component of the bathroom.

fig. 142: bathroom and toilet "shiae 022"

With time, the inhabitants started to build a bigger and bigger *Mandi* to collect more water. On one point the inhabitant started to build huge separate water tanks. The water tank is normally a sealed up room. In some cases a separate *Mandi* is positioned next to tank and can be filled from the tank. The other possibility is that the tank used as a *Mandi*.

Water supply in Hiliamaetaniha							
village	house number	build-in tank	flexible tank	Sumur Umum	Area of tank		comments from the interview
shiae	021	1					
shiae	022	1			3,60	m²	if tank empty, use Sumur Umum
shiae	026		1		1,15	m²	round watertank made of plastik
shiae	027			1		m²	use Sumur Umum
shiae	042	1			4,30	m²	
shiae	043			1		m²	use Sumur Umum
shiae	080			1		m²	use Sumur Umum
shiae	094	1			2,15	m²	tank lasts for 2 weeks
shiae	095		1			m²	collect rainwater in barrels; plan to build Watertank
shiae	099	1			4,00	m²	tank last for 1 month
shiae	102	1					tank last for 2 weeks
shiae	111			1		m²	use Sumur Umum
shiae	124			1		m²	use Sumur Umum
shiae	536	1			6,15	m²	used for everything
	14	7	2	5			

list 15: water supply of the houses in Hiliamaetaniha

Around 50% of the houses have a built-in water tank in the extension. Most of the other occupants have planed to build one, because a connection to the regional water system is not planned in the foreseeable future A few house owners, who don´t have the money or the possibility to build a tank use plastic drums to collect the rainwater on the *Mbelembele*.

The volume of the tanks goes from 2.00 m³ ("shiae 094") up to 6.15 m³ ("shiae 536"). Depending of the volume, the rain intensity and the season of the year the water in the tank from 2 weeks to the whole time.

If the tank is empty, the inhabitant has to carry the water from the *Sumur Umum* to the house like in the past.

With the house-own water supply the personal hygiene moved from the *Sumur Umum* into the house. With the personal care arose a new area in the extension. The bath is usually a separate room, bordered with a bricked wall or with wooden-board. Another new or unusual installation is the door to lock off the bath.

The bathroom is positioned like the kitchen at the backside of the extension. The reason for the location is on the one hand the runoff, used for the water and the bodily waste from the toilet, which is through a hole in the back-wall into the backyard , and on the other hand the position of the water tank. It is positioned at the end of the roof area to collect as much water as possible.

A variation very commonly used in the layouts is the sharing of the kitchen with the last room before the backyard.

The toilet in most of the houses is included in the bathroom. Only a few houses have the toilet in a separate room or a separate small building in the backyard of the house.

With the newly built extensions, nearly every house has a private bathroom built-in. Only 5 out of 14 houses do not have their own bathroom and have to use the public *Sumur Umum*.

The size of bathrooms varied from 2.20 m² to 6.38 m².

fig. 143: bathroom and watertank "shiae 102"

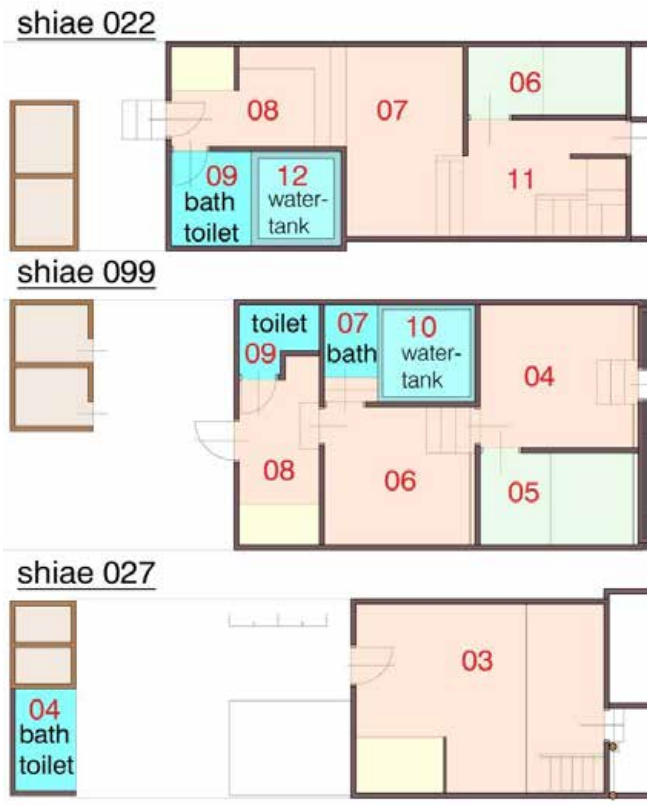


fig. 144:options of the position of the bathroom

The environment of the bathrooms is still very basic. The most important facility of the bathroom is the *Mandi*. It is normaly located next to the water tank.
The toilet is a heightened basement with a hole, a typical squat toilet with no direct flush. Only in one of the houses we visited is a standard built-in western toilet existent. Only in a few bathrooms are built-in washbasins, but without a direct water supply. For us, usual furniture like a shower or a bathtub is not standard and not integrated.

As already mentioned in Nias tiles are a symbol of wealth. In the bathroom the situation is a bit different. If people could afford it, they tiled their bathroom, but not for prestige, the reason is simply the better features of tiles comparing concrete. It is easier to clean the room; tiles are not that slippery than concrete and tiles dry quicker.
In my opinion, the tiling in the bathroom is still a symbol of wealth, because not everyone can afford it.

6.1.1.4.3 Progress of the extension

The nowadays existing extensions arose mostly in different phases.
After the TSH (main house) the next phase was the external fireplace, which was required from the colonial power. With the covering of the fireplace arose the first extension. The fireplace was in a first step extended to a proper kitchen, and in the second step to a multifunctional room.
The building phases in nearly all houses are the same. With the need of more space and as the lifestyle changed the inhabitants started to build larger extensions behind the houses. This happened in different ways.
One possibility was the additional way of construction.

If the resident decided to extend the house, they attached a new room behind the existing extension. The new extension was often a step by step development, where the roof was enlarged first, later the walls closed by wooden boards or tarpaulin.

Hiliamaetaniha - bathroom & toilet																
		inside the house								seperate behind the house						
village	house number	bathroom & toilet			bathroom			toilet		bathroom & toilet				toilet		comments from the interview
shiae	021	1	not verified			m²			m²			m²			m²	
shiae	022	1	3,22	m²		m²			m²			m²			m²	sitting toilet
shiae	026	1	2,20	m²		m²			m²			m²			m²	
shiae	027			m²		m²			m²	1	2,63	m²			m²	seperate - behind the house
shiae	042	1	3,22	m²		m²	1	1,26	m²			m²			m²	new build bath with toilet
shiae	043			m²		m²			m²			m²			m²	no bathroom
shiae	080			m²		m²			m²			m²	1	1,50	m²	
shiae	094			m²	1	2,41	m²	1	0,65	m²			m²			m²	
shiae	095			m²		m²			m²			m²			m²	*Omo Sebua*
shiae	099			m²	1	2,20	m²	1	1,99	m²			m²			m²	
shiae	102	1	not verified			m²			m²			m²			m²	
shiae	111			m²		m²			m²			m²			m²	no bathroom
shiae	124			m²		m²			m²			m²			m²	no bathroom
shiae	536	1	4,20	m²		m²			m²			m²			m²	
	21	6			2			3		1			1			

list 16: size and position of the bathroom

With the change of the function into an indoor room function the inhabitants closed the room with proper walls and a foundation. After those construction steps the new extension was finished. Sometimes they started with the next extension directly after the finishing. This development is still in progress. The only reason to stop is due to the topographical situation.

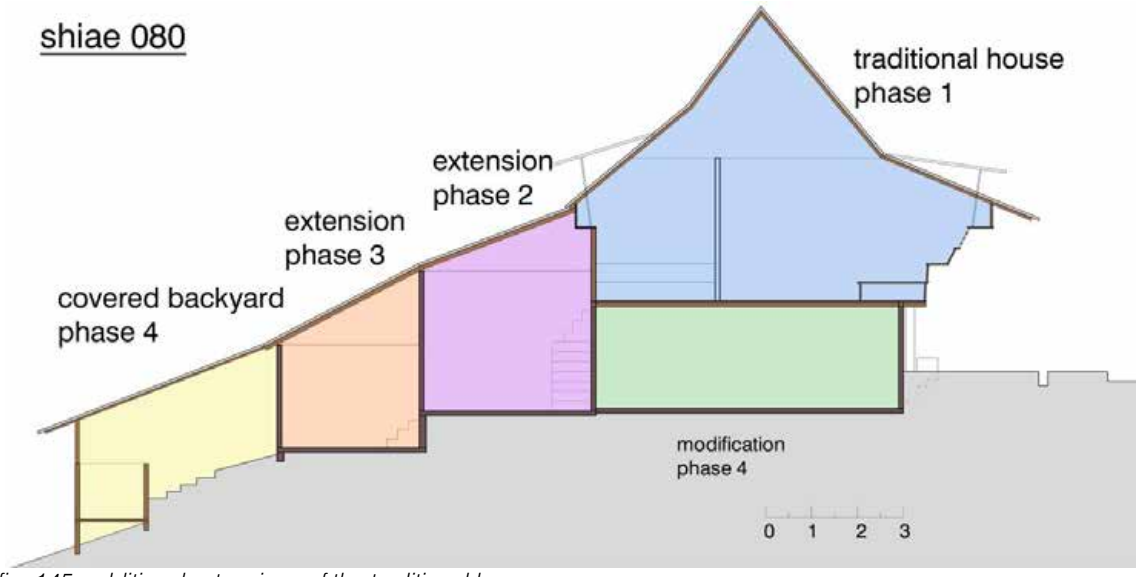


fig. 145: additional extensions of the traditional houses

The other option is to rebuild the whole extension. The existing extension was broken down and a newly designed extension was build. A reason to rebuild the whole extension is the bad quality or an impractical room arrangement. Advantage of this option is the possibility to design a complete new room arrangement, which conforms to the new requirements. This way is surly very expansive and not practiced so often as the additional option.

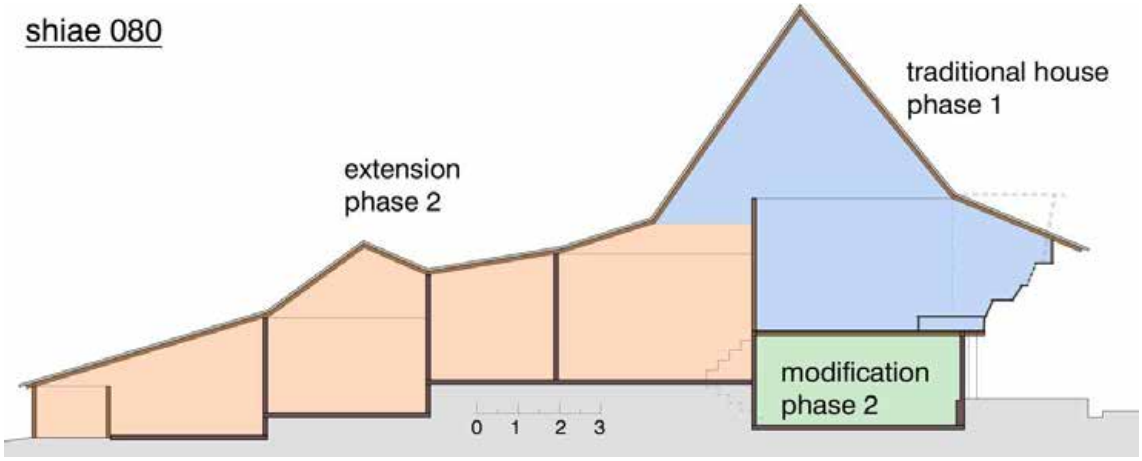


fig. 146: new build larger extension of the traditional house

Another possibility to gain more space is to build a first floor of the extension. The first floor is connected to the *Feröma*. Located are normally sleeping rooms in this area.

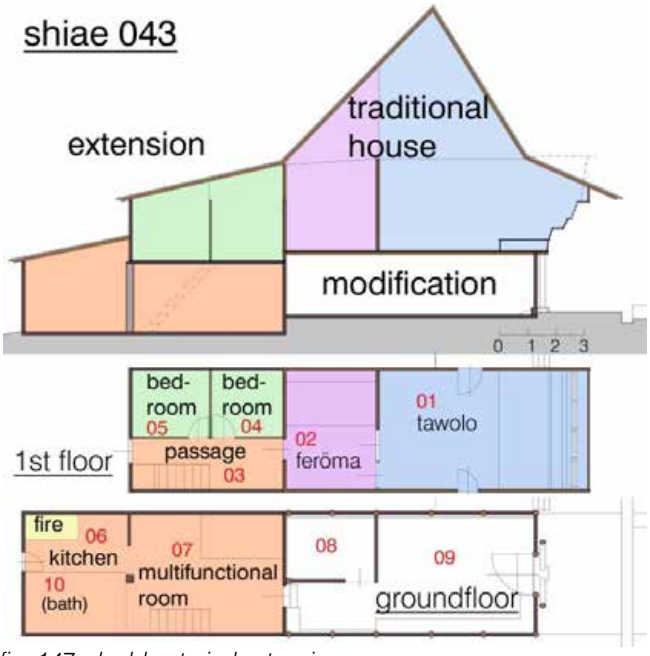


fig. 147: double-storied extension

If there is space still available behind the house and it is able to be built on, the progress of the house will go on.

With the newly built bricked walls the roof also had to be rebuilt. Instead of the natural wooden poles saw tooth beams were used to build the substructure of the roof.

With the change of the roofing material from the traditional part of the house, the roof covering of the extension changed as well. Nearly all the extensions were viewable from the aerial images, the sago palm leave roofing changed to the corrugated iron sheets.

A huge advantage of the new roofing material is the effectiveness in the collection of the rainwater. Channeling the water into the tank is much easier with the corrugated iron.
In all extensions, the underside of the roof construction is not covered. A result is the better air circulation and the smoke of the fire can escape quicker and easier.

In a few cases planks are laid over the crossbeams to attain a separate platform, which is used as storage or as a sleeping place.

6.1.1.4.4 Construction of the extension

Roof

The progress of the roof is simelar to the progress of the roof of the TSH. As mentioned the history of the extension started with the lengthening of the existing roof to cover the fire place. As in colonial times the fireplace had to be moved outside the house (by orders of the colonial administration), the kitchen was situated outside the house, at the back. The place was covered, usually in a way, that it was connected to the main building. The sago palm leave covering rested on a substructure made of wooden poles.

fig. 149: platform on top of the extension used as a storage "shiae 026" and as a sleeping place "shiae 080"

fig. 148: roof covering material of the extensions

The platform is not enlarged to cover over the whole room; it covers just a small area, which is accessible from the staircase down from the extension.

The lighting of the extension is comparable to the lighting of the *Feröma*. Because of the attached building development it is not possible to have windows in the side walls. The front, facing the substructure of the TH is also very dark. The only possibility to put windows is by the wall to the back yard. This opportunity is used very rarely, because of the usage of the rooftop window, which is built in nearly every extension. One of the advantages of the rooftop window is the central, bright light and also as an outlet for the smoke of the open fire.
Often the stables are located behind the extension at the back yard, which are mostly covered with the traditional roof covering, the sago palm leave roofing.

fig. 150: roof top window of the extension "shiae 123"

Wall

In the extensions built first, the fireplaces were completely open. With time the people started to close up the area to secure and define their property. The inhabitants closed up the area between the poles from the roof construction with wooden boards and tarpaulin. With the availability of bricks and cement the residents started to build proper walls with the new material. Till now the material hasn´t changed.
The thickness of the wall is defined through the thickness of the bricks, which is normally about 0.10 m.
The top ending of the wall is horizontal. The resulting triangle to the roof is not closed up.
The intermediate zone between the wall and the roof is boarded-up with wooden boards. The construction of the roof rests on the edge of the wall. The height of the bricked wall is on average 2.20 meters.
Openings in the walls are just for built-in doors. Windows are as mentioned only possible in the back wall, but are not often built-in. Not one of the surveyed houses in Hiliamaetaniha has a window to the back yard. Only the newly built house "shiae 530" has small windows.
Many of the surfaces of the walls are not plastered and they have the natural brick look. The rooms with the fire place have the walls blackened with soot. Also the area, where the fire place was located before, has still black walls.

fig. 151: plastered and painted wall "shiae 042" and bricked wall "shiae 111"

In the last years affluent families started to plaster and paint the walls. But till now are only a few extensions like "shiae 042" which are plastered and painted. The color of the paint is usually very bright and intensive like in the house "shiae 042" or "shiae 022".

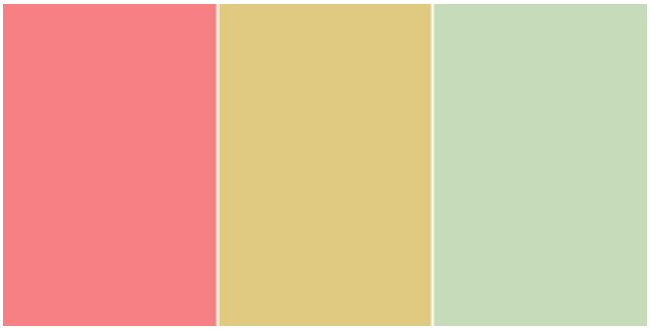


fig. 152: colours of the walls "shiae 022"-"shiae 042"-"shiae 094"

Floor

The ground behind the TSH was natural ground. With the heavy rain in Nias the clay ground often changed to mud and it was not useable anymore. To get the mud under control the residents started to build wooden platforms, so that the rainwater can run off below it. The higher and level position of the platform has also the advantage that it is more secure against animals. With the import of

cement and the possibility to pour concrete slabs many inhabitant started to rebuild the floor.
The slabs made of concrete are also necessary as the foundation for the walls. It was not possible to make a drilling to measure and control the thickness of the slap, but I would say the slabs are undersized and do not correspond to the European norm.
The floor construction does not have an adequate constancy as we are used to building. The concrete slab is normally the only layer without any sealing or insulation. I assume that the concrete slabs are painted, but because of the dirt and the bad lighting inside the extensions it was not clearly visible.
In the last few years the people started to design the inside of the house to make it look nicely. At the same time as plastering and painting the residents started to tile the floor. The first areas to be tiled were the bathrooms. 5 out of 21 bathrooms were already tiled. The tiling in this area has not just the function to show the wealth of the family, it is more due to hygienic reasons, the water forced mold on the floor. Another reason is the hazard of slipping on the concrete slabs when wet.
The other rooms are normally not tiled, because of the value of the rooms. The rooms of the extensions are not that important as the traditional rooms.
Only very wealth families started to tile other rooms of the extension. The only area that is not tiled is the kitchen.
The tiles like the painted walls are very bright and intensive in colour and have a symmetric and geometric motive.

fig. 153: tiled floor “shiae 042” and plain floor “shiae 111”

Earthquake security

Hiliamaetaniha was like all the other villages badly affected by the earthquake. The consequence was a lot of damage to the houses. As previously mentioned the traditionally built houses are very resistant against earthquakes. Most of the damage happened to the extensions. 4 of 16 house owners told us that the extension of the traditional house had suffered damage. The results of the vibrations were cracks in the wall.
After the earthquake the people started to rebuild the completely damaged extensions. As a consequence of the earthquake the inhabitants started to think about the new possibilities to build earthquake secure housing.
The NGO´s showed how to build earthquake secure housing with a primary structure in the form of a framework made of concrete. The areas inside the frames are filled with bricks.

fig. 154: concrete frame “shiae 043”

6.1.1.5 Modification of the traditional house

The TSH building is on a substructure made of wooden pillars. The height of the substructure is on average between 1.50 to 1.70 meters. In the last decades the occupants started to develop the substructure. The vertical and leaning pillar underneath the house where broken off. Because of the height of the substructure is it not possible to have a proper room height underneath. The solution is to dig out the soil, till the inhabitants have a proper room height.
To close up the room the spaces between the bordered pillars were closed up with bricks.

The position of the stable matched also with the tripartite of the house, where the substructure is reserved for the underworld.
The substructure was also used as storage. All the construction material to build and repair the house was stored underneath the house to protect it from the rain. Typical material was the roof covering element to repair the roof, wooden planks, rocks,
A newer variation of the storage is a large box in front of the substructure. The wooden boxes are positioned on the *Mbelembele.* The height of the boxes depends on the substructure of the house

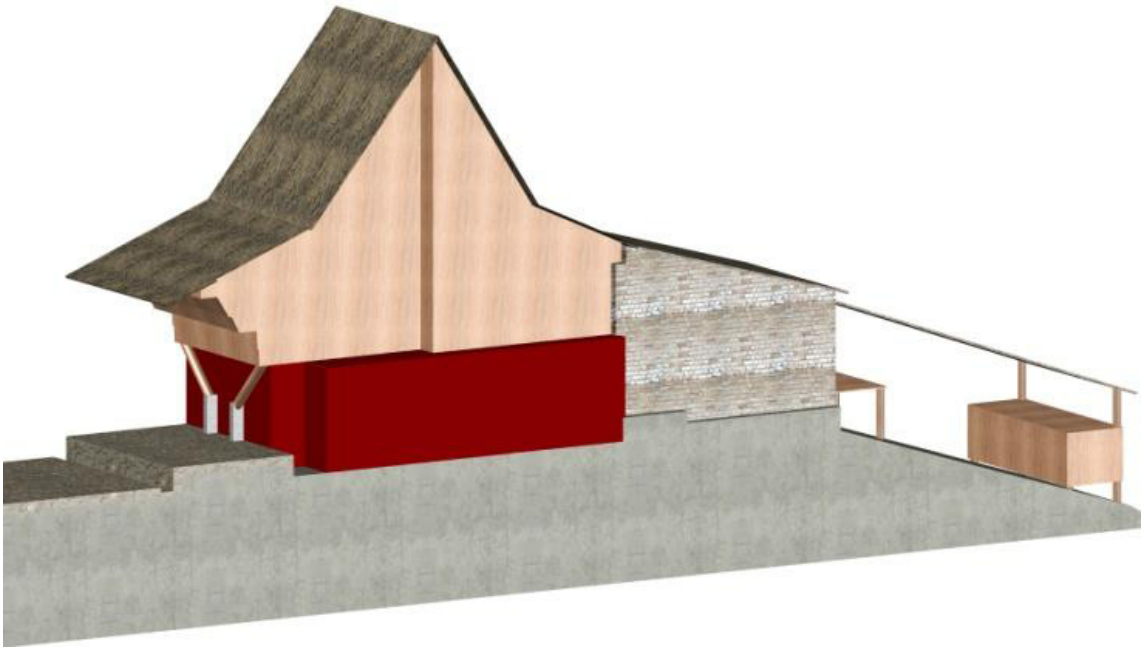


fig. 155: modification of the TSH "shiae 027"

In the past, the space underneath the house was also used.
First of all, the area was completely open and mainly used for the animals like pigs and chickens. With time the inhabitant started to close up the substructure with wooden planks, so that a proper stable arose for the pigs.

and is equal. The boxes were used to store the food of the family.

fig. 156: storage boxes in front of the substructure; without any changes of the substructure – in Hiliamaetaniha

Nowadays, there is not a single wooden box left in Hiliamaetaniha. In my opinion, the reason for that is the appearance of the traditional village. The residents of Hiliamaetaniha are very proud of their village and the boxes in front of the houses do not fit with the look of the village and that´s why they had to break them down.

fig. 157: TSH "shiae 091"without the modification of the substructure

With the enlarged extension behind the house arose an additional access through the substructure. With the low height of the substructure it was now possible to go upstanding to the extension. To simplify the way to the extension the occupants started to deepen the way. These ways of access to the extension through the substructure are still present.

fig. 159: elevation of TSH with build modifications of the substructure

fig. 158: modification and extension of the TSH "shiae 022"

The reasons to modify the substructure are in a few cases comparable to the reasons to build the extensions. The main reason is the need of space. The win of the space is enormous from the extension of the TSH, but because of the topography it is limited. This space which is gained is mainly used as kitchen, bathroom, and toilet and water tank. With the need of more privacy, small sleeping cells are also built-in the extensions. Problems of this solution are the smoke of the open fireplace, the result of mosquitoes from the water tank, the smell from the toilet and kitchen and the noise from the cohabitants.

The modification of the substructure with the possibility to integrate private sleeping rooms was a better solution. In all the modifications one or two sleeping rooms are built-in.

The modification is not only used as a private area. In all the modification we surveyed a communal room was planned and build in the front. The room has approximately the same function as the *Tawolo* in the TSH without the function of being place for sleeping.

Another very important reason is the climate of the modification. As mentioned the temperature rose in the TSH with the change to the corrugated iron roofing. In the modification the climate is very cool and pleasant; this is why the daily routine moved from the TSH down to the modification and extension.

6.1.1.5.1 Statistic

The change from the substructure to the modification is the preferred way to develop space and upgrade the living conditions. From 72 existing traditional houses already 56 houses have enlarged with a modification, this is 78%. But the process is still on going. All the residents we asked want to modify their substructure. The problem for the majority of the residents is the building cost. Some of them are not able to afford it and have to save money. One example is the owner of the house “shiae 026”, who told us that he is busy saving money to build his modification.
Another example is the *Si´Ulu* of Hiliamaetaniha, who built the new *Omo Sebua* in the last decade and told us in the interview from the 03rd of August 2012, that he also wants to change the substructure to an enlarged basement. The cost for the building project is an estimated 50 million IDR. But the cost is not only for the modification, it is also for a planned guestroom in the huge roof area, a bathroom for the guests and tourists with a water tank for an autonomous water supply.
It will be interesting to pursue the idea to build a second floor in the roof area.

6.1.1.5.2 Function

The modification is in difference to the TSH not a multifunctional area; it has different room with different functions. In all of the 7 modified houses surveyed, only two different functions were visible. The major and more striking function is the communal room or living area.

6.1.1.5.2.1 Guestroom

The living area of the modification normally claimed more than 75% of the whole floor area which is in average 20,50 m² from a total effective area of 26,50 m².
The living room is located in the front of the modification, bordering the *Mbelembele.* Behind the guestroom is in a few modifications a floor on one of the lateral walls located. Reason is the access to the expansion.
Another option is an L-shaped guestroom. The communal room is the whole area of the modification, except a separated sleeping room in on of the back corners.
Used is the guestroom comparable to the one level higher positioned *Tawolo*.

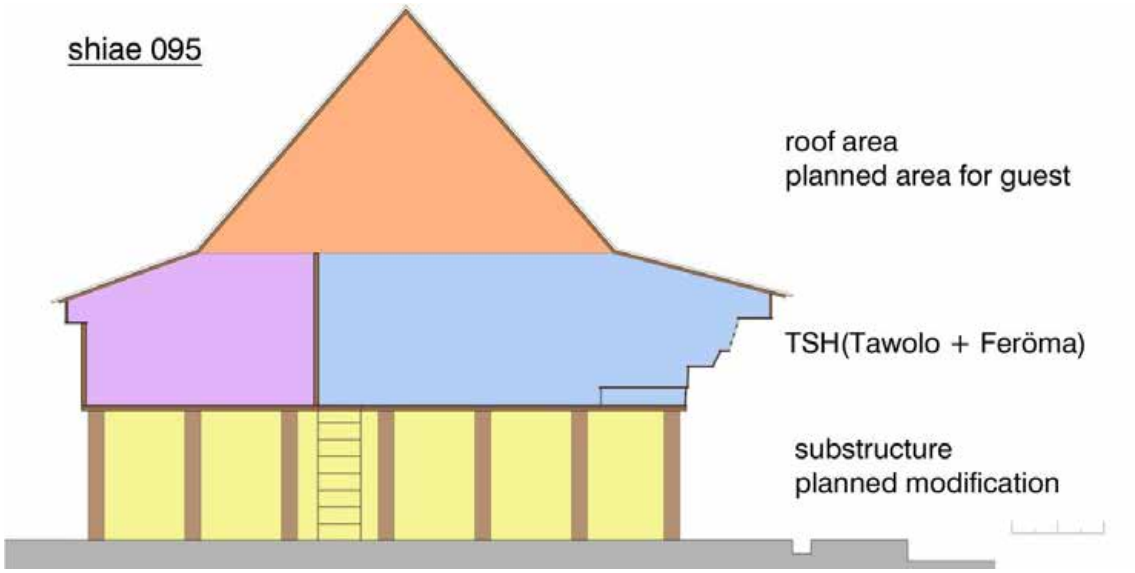


fig. 160: planned extension of the Omo Sebua “shiae 095”

It is also an attenuated variation of a multifunctional room. The build in-furniture of the living room in the modification has a lot of similarities with the furniture of the *Tawolo*.
The guestroom use is comparable to the *Tawolo*. The Tawolo is one floor over the guestroom. It is also a simplified variation of a multifunctional room. The built-in-furniture of the living room in the modification has a lot of similarities with the furniture of the *Tawolo*.

Modification of the TH										
		Guestroom	Bedroom	Bedroom	Diningroom	Livingroom	Storage	Passage	Passage	Garage
shiae	022	4	5							
shiae	027	5	7	8		5				
shaie	042	10	9							
shaie	043	9	8							
shaie	080	1	3				1	2		
shaie	094	3	4	6	5	3	5	3		3
shaie	102	1	2	3						
shaie	111	1	1	2	2	1		1	2	
	8	8	8	4	2	3	2	3	1	1

list 17: function of the modification of the TSH

From point of functionality it is still a piece of multifunctional furniture on which people sit, sleep, relax, eat, store, and much more. The function as a bed was only removed because of the separate sleeping rooms. The bench is still used for an after-lunch nap.
The bench is made of concrete, an in a few cases it is tiled. The bench is not positioned similarly, as the *Batö* and the *Farakhina* are, at the front side of the room. The reason for this is the new entrance. The bench is rotated an on the lateral wall positioned. In a few cases it is built as a corner bench and in this case it has a better connection to the outside.

The only connection between the village and the houses is the frontal facade. In the *Tawolo* the visual contact is through the *Zarazara*, the wooden grid on top of the *Farakhina*, the bench on top of the *Batö*. The connection from the guestroom to the village is possible through the window. As a result of the window and the position of the modification is the link between the public of the village and the private of the house closer then between the *Tawolo* and *Mbelembele*.
In every traditional main room a *Batö* is built-in. The *Batö* in the modification is in a different variation built in. In every surveyed modification a bench is present. The bench is more similar to the *Farakhina*, the bench, which is positioned on top of the *Batö*.

fig. 162: guestroom with the bench in the modification "shiae 080", "shiae 021"

The function of the room is also similar to the *Tawolo*. Most of the time it is the residence for the whole daily routine.
One of the functions is as a dining room. Therefore, a wooden table usually stands in the room. This new furniture is only existing in the extension and/or the modification. The connection between the kitchen and the modification is easier and more comfortable because it is on the same height.
The newly arisen guestroom is also a reception area for visitors. We were occasionally welcomed in the guestroom of the modification and not in the *Tawolo*.
In a few cases the modification was also used as a *Warung*. One example is the house "shiae 021", where the occupants sold a variety of products like cigarettes, cold drinks, instant noodles and also

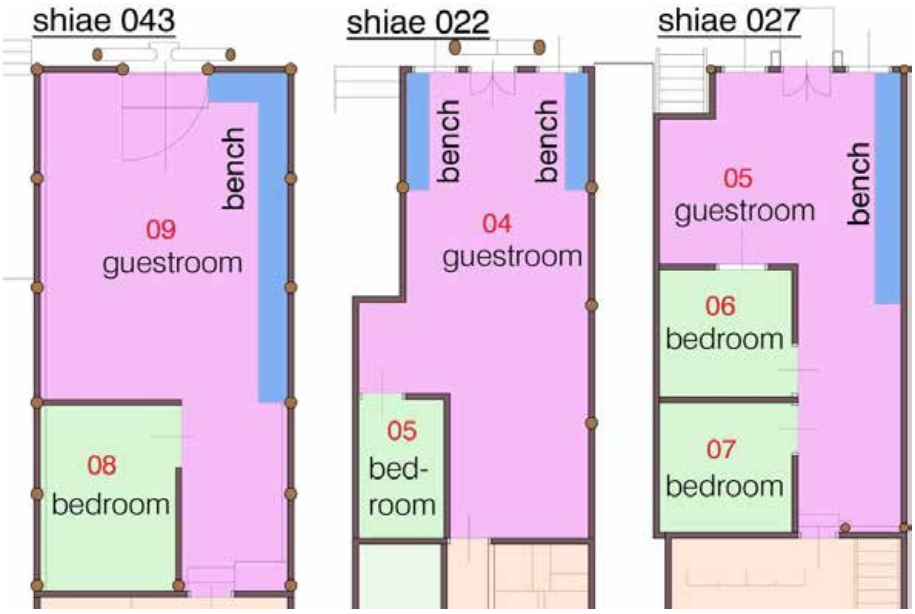


fig. 161: layout of the modification and position of the bench

medication. The daughter of the owner worked as a nurse and helps the village with her knowledge.

As mentioned motorbikes are the most widespread transportation in Nias and a very important commodity. Many people push their motorbike to the house and park it in the modification. So the modification is also a kind of a garage.
With the cool climate the modification is perfectly qualified for the typical midday-sleep. Many residents lie on the built-in bench and relax there. I must be honest, I also did some midday-sleeping in the modification of the house "shiae 021".
As a new communication center of the house it is also used for many more activities like watching television, working, meeting other people and all the other activities.

In nearly all the sleeping rooms the bed is in the form of a traditionally built-in *Batö*. Wooden doors or curtains are used to close off the rooms. The door is mostly the only opening to the sleeping room and that is why it is very dark inside. 2 out of 7 bedrooms have a window to the living room to let light into the room. The window can be closed with shutters to create privacy.

fig. 164: bedroom in the modification "shiae 021", "shiae 022"

6.1.1.5.2.2 Bedroom

As mentioned in every modification a room for sleeping is built-in. Comparable it the sleeping room with the *Kolukolu* of the traditional house. The master´s bedroom is located behind the *Tawolo* and is the only private area. The size of the sleeping rooms is also nearly the same. The room consists mainly of a bed and a small method of accessing it. The average size of the sleeping room is only 4.15 m².

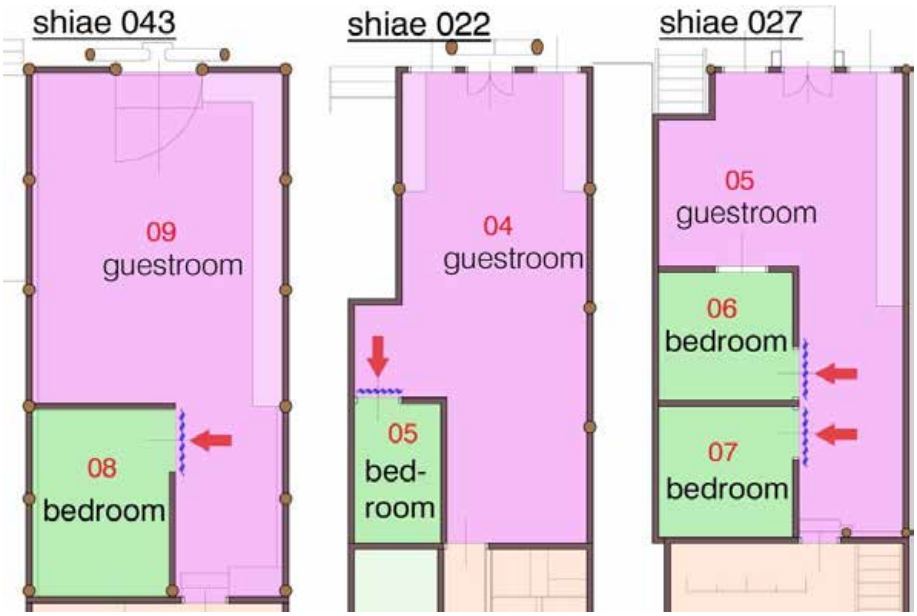


fig. 163: location and access to the bedroom of the modification

6.1.1.5.3 Changes in the organisation of the house after the modification

Entrance

With the modification the access to the house changed. In the traditional house the access was through a heightened entry passage between two houses. The two neighboring houses use the passage together. From this entry passage the access to the T*awolo* is through a small ladder. The entrance is through the sidewall of the house and not the front, which is very important for the room arrangement, as already explained.
With the position of the modification directly next to the *Mbelembele* it was logical that a new entry situation arose. The entry into the modification, in every modification, is through the middle of the front facade, flanked by two windows.
The new access to the modification is the new main entrance to the house. The reason for the change is the movement from the daily routine from the *Tawolo* to the guestroom of the modification. The whole daily life can happen at

the ground-level; in the modification and extension. In a few cases, like “shiae 022”, the upper level (the original traditional house) is not in use anymore. All the activities happen downstairs. One of the remaining functions for the *Tawolo* and *Feröma* is as a spare room for visitors or for storage. In a few cases the grandparent still lives in the traditional part of the house.
We had also the possibility to live upstairs for 10 days to get the feeling of life in a TSH. That was a great experience.

the house. With the modification it was possible to sit inside the modification on the same level as the *Mbelembele*. The inhabitant can sit in the cool living area and as a consequence moved the function of relaxing into the modification. The semi-private area (Mbelembele) is with the communication area of the modification connected and linked.
We could observe that the resident of the houses sat inside the communal room of the modification on the built-in bench next to the window and

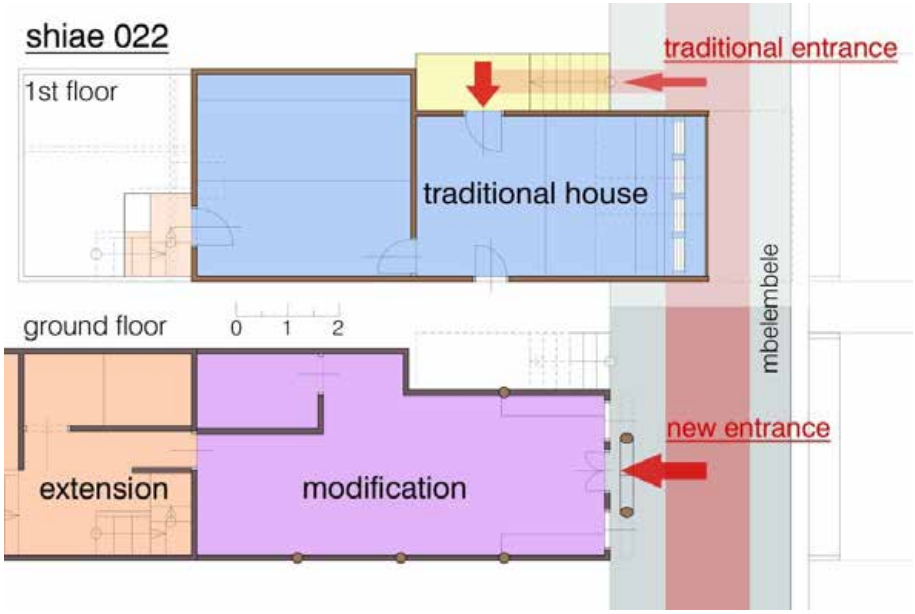


fig. 165: traditional – new access to the TSH

Impact of the modification of the village

observed the activities outside in the village. If neighbors or friends passed-by the windows a conversation through the window was started.

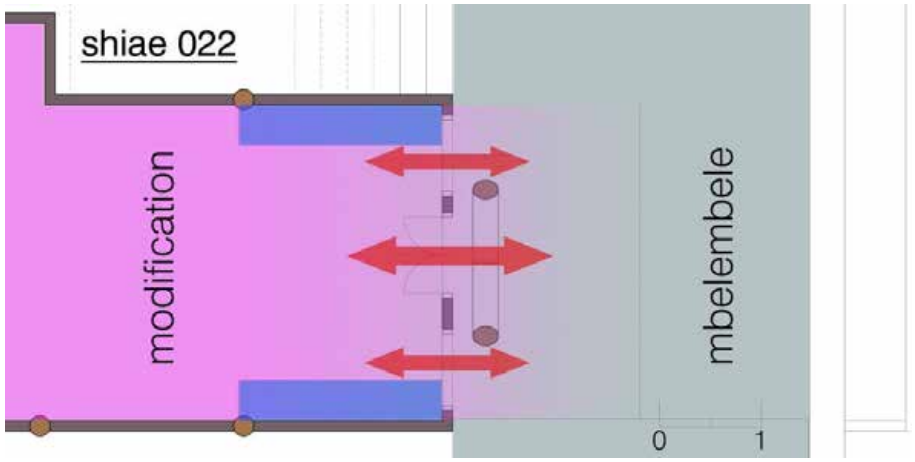


fig. 166: connection between the Mbelembele and the modification

The modification has also had an impact of the function of the village, more detailed the *Mbelembele*. The *Mbelembele* is the semi-private area and is a communication and relaxing area and a meeting point for the inhabitants in front of

In the past the people sat outside on the *Mbelembele*, where it was easier to meet each other and have a conversation. So the communication between the inhabitants of the village decreased and the people moved back into their house.

6.1.1.5.4 Construction

As already mentioned, the height of the substructure of the TSH is between 1.50 and 1.70 meters. To use the space underneath the house it is necessary to lower the subsoil. To bare the house after the removal of the soil concrete walls are built underneath the bordering pillars. It is used as a boundary to the soil and as a foundation for the pillars.

fig. 167: construction of the modification "shiae 043"

Above the boundary walls the wooden pillars are still existing. The pillars are positioned in a distance of about 2.00 meters. This gap between the pillars is closed up which bricks.
The walls, in difference to the extension are plastered and also painted. If the plaster work is not finished, the reason is the loss of money. The resident have to save money to finish the building work.
Having a clean and pleasant modification is very important for the owner. It has the same rank as the TSH and has as mentioned the same usage. In the past, when only the TSH and the extension existed, there was a very large difference in the value of the two areas. The TSH was very clean, light and the centre of the family's life, where the extension was just the needed space for the necessary activities. The modification is a new centre for the family and is similar furnished. The difference is the material. The owner used not the traditional material wood, they use the modern material brick, to show their modernity.
The down stepped floor is made of concrete. The slab is also the foundation for the bordering walls. If affordable the floors surface is tiled. Otherwise the concrete is varnished with a dark paint. In nearly all the interviews the owner told us about his plans to tile the modification, if they could afford it.
A very important and precarious part of the construction of the modification is the ceiling, which is the floor of the TSH. The wooden platform was bearing on wooden pillar, which were positioned in a grid of about 2.00 m. To get an unsupported large room with the size of the TSH the middle standing poles were broken of. To compensate for the reduction of the load-bearing capacity, the owner put additional wooden beams under the existing slab. In a few cases concrete beams are built-in to support the wooden ceiling construction.

All these additional components are not calculated, but in nearly all the modifications the beams sufficiently are well sized. In a few houses like "shiae 102" the construction was not enough and the occupant had to put a pillar in the middle of the room.

fig. 168: pillar to secure the construction "shiae 102"

As mentioned is in every modification a sleeping room was built-in. The room is located in one of the back corners. The two missing walls are non-load bearing walls made of brick. The edge of these two walls in the middle of the room can be build as a bearing concrete column.
The modification has also had an impact of frontal positioned *Mbelembele*. With the lower surface of the modification it is possible for the rainwater to make the modification float. To get the danger of the rainwater under control it is very important to have a sloped surface away from the house. In nearly all the villages as well as in Hiliamaetaniha the *Mbelembele* already was sloped to the Elea.
To bridge over the high difference between the *Mbelembele* and the modifications are steps or ramps build in.

6.1.2 Modern Houses in the traditional village

The second type of houses in the traditional village is the modern house. All houses in Hiliamaetaniha can be categorized in traditional or modern houses. Compared to the traditional houses, the modern houses are of a newer type and have a few attributes similar to the TH. The modern houses are completely separate buildings. The main difference is the constructive form of the house.
The MH is not a pile dwelling made of wood, it is a house made of concrete and bricks and is built on the ground.

fig. 169: comparison traditional and modern house in Hiliamaetaniha

6.1.2.1 Reason for the Modern Houses

Why the modern house was developed and built had a lot of different reasons. One of the main reasons is the building material. In one regard a newer building material was available. The most important material is cement and bricks. With the imported cement a new way of construction was possible. No one could tell us if the bricks are produced on Nias or imported. On the other hand the traditionally used material wood is not so easily available. As mentioned, the wood needed for the substructure is very rare on the island and has to be imported as well. In view of all the aspects the wood needed for the construction of the structure is very expensive.
Another problem is the unique construction of the traditional houses. Nowadays, the craftsmen who are able to build a traditional house are rare and they are becoming scarce. In Tumöri, the northern area of our research, the *Kepala Desa* (mayor of the village) told us that not a single craftsman of the village is able to build a traditional house.
With the scarce availability of the craftsmen it is not easy to find one and if you find one the costs are very high. The modern house can be built without any help from a specialist. This aspect makes it simpler and cheaper to build a house.
Another very important aspect for the builder is the building cost. The most important premise for the building owner is the money. As explained it is normally cheaper to build a modern house then a traditional house. Most of the owners we interviewed told us that they had to save money for years to build the complete house or they built the house in phases.

Examples:

Shiae 058:

The property “shiae 058” was in the past a garden. After the family bought the land they had to live in a temporary house for two years to save money for the planned house. The temporary dwelling was made of bamboo. The family saved till 2004 enough money to build their new house. The money sufficed for a house with a surface of 34.65 m^2. 8 years later the owner is still saving money to extend the house to build a proper kitchen and a toilet behind the house. They are also planning to change the roofing from palm leaves to corrugated iron.

Shiae 070:

In 1985, the family built the main house with a surface of 48.00 m^2. With a growing family and a need for more space, after 10 years it was possible to extend the house. 16 people are living in the new house with a building surface area of 93.40 m^2.

Resident of the house shiae 070			
1	Farther	65	Hiliamaetaniha
2	Mother	46	Hiliamaetaniha
3	1st Son	32	Hiliamaetaniha
4	1st Daughter in law	19	Hilimanamöle
5	Grandchild	4	Hiliamaetaniha
6	Grandchild	2	Hiliamaetaniha
7	2nd Son	30	Hiliamaetaniha
8	2nd Daughter in law	26	Botohilitanö
9	Grandchild	8	Hiliamaetaniha
10	Grandchild	5	Hiliamaetaniha
11	Grandchild	3	Hiliamaetaniha
12	3rd Son	28	Hiliamaetaniha
13	3rd Daughter in law	24	Hilizihöne
14	Grandchild	8	Hiliamaetaniha
15	Grandchild	5	Hiliamaetaniha
16	Grandchild	2	Hiliamaetaniha

list 18: resident of the house "shiae 070"

Shiae 516:

The house "shiae 516" is built in the extended village of Hiliamaetaniha. The family of the house started to build their house in 1992. The money was at first only sufficient for the kitchen. The family (5 persons) lived in the 16.10 m² large room for 9 years. In 2001 the family started to build the main house in front of the kitchen. After a building time of 8 years the house was finished in 2009. The long building time was just because of the need of money.

cost of the modern houses			
	mainhouse	extention	total
shaie 058	35.000.000 IRD		35.000.000 IRD
shaie 070	30.000.000 IRD	15.000.000 IRD	45.000.000 IRD
shaie 516			20.000.000 IRD

income of the family	
shaie 058	150.000 IRD
shaie 070	850.000 IRD
shaie 516	800.000 IRD

list 19: cost of the modern houses and the income of the family

6.1.2.2 The modern house in Hiliamaetaniha

With the need of more privacy and more space the inhabitants started to build new houses. To acquire more building sites the people started to extend the village and turn farmland into building properties. After this development arose a separate district on the way up to Hiliamaetaniha. This process started in the 1980´s.

fig. 170: comparison extended village of Hiliamaetaniha 1986-2012

Nowadays, more than half of the way from Sondregeasi to Hiliamaetaniha is developed.

Hiliamaetaniha:

Complete town:
174 buildings 100%

Traditional district:
142 buildings 81.5%

Extended district
31 buildings 18.5%

Extended district:

31 buildings	100%
4 traditional buildings	13%
27 modern buildings	87%

As mentioned, in the traditional district of the village the modern houses are mostly positioned at the end of the village. Another common location is the side road of Hiliamaetaniha. Only a few modern houses are located between the traditional houses on the main road.

Traditional district:

142	buildings	100%
101	traditional buildings	71%
38	modern houses	27%
3	empty properties	2%

The modern houses are also built next to each other without a gap. In the traditional district, the modern houses are fitted between the traditional houses.

6.1.2.3 Arrangment of the Modern Houses

The modern houses can be arranged into different types.
The most noticeable classification is in single- and double-storied houses. In Hiliamaetaniha only 5 out of 69 are double-storied houses (7%). This non-typical type is only present in the traditional part of the village. A possible reason could be the

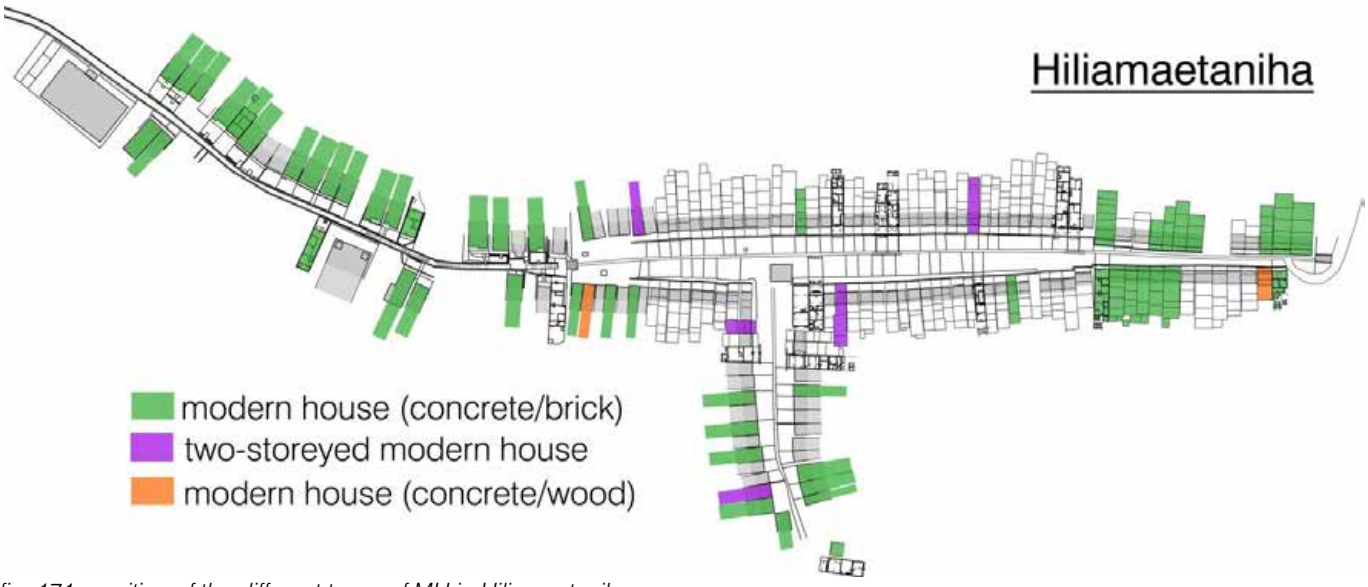


fig. 171: position of the different types of MH in Hiliamaetaniha

height of the traditional houses. The double-storied houses are normally built next to a traditional house. To preserve the view of the village the new houses are also build as high as the traditional houses.

The construction of the double-storied houses is divided. The ground floor is built with concrete and bricks and the first floor is built with a wooden construction.

fig. 172: modern house between two TSH in the traditional part of Hiliamaetaniha

Another possibility of classification is based on the building material the owner used to build their house.
The most common combination of materials is concrete and bricks. In Hiliamaetaniha 62 of the 69 houses are built with concrete and bricks (90%). Another combination of building materials is concrete and wood. In Hiliamaetaniha only 2 houses are built with these materials. This type of the modern house is more present in the North of Nias. In Tumöri 36 out of 149 houses are built with concrete and wood (24%).

The last possibility I found in South-Nias is a construction built with wood. This type of houses is normally only a temporary dwelling for the inhabitant and can also be built with bamboo or in a combination of these two materials. This construction type is in Hiliamaetaniha not present. One such dwelling exists in Sondregeasi and will be explained later.

fig. 173: building material and the combinations to build a MH

6.1.2.4 Construction of the Modern Houses

Substructure-Foundation

The substructure of the traditional houses is a pole construction and not connected with the ground. All the modern houses are built on the ground and are connected to it. The houses are built on a foundation slab. A foundation and floor construction like in Europe is not usual in Nias. The whole floor construction consists of a concrete slap. The only preparatory operation is to level the ground. After pouring and polishing the concrete the slab is finished. The flooring of the rooms is normally made of the naked concrete slab. In the last years the occupants started to tile the floor. The tiling is too expensive for most of the families. Only two MH we surveyed had tiles on the floor.

Construction of the dwelling

The structure of the house depends of the used building material.
The most common structure is a build with concrete and bricks. The main structure is a skeleton frame structure made of reinforced concrete. The reason is the high earthquake frequency. The know-how to build this structure is, in my opinion, missing and that´s why most of the damage after an earthquake is to the modern houses. The quality of the reinforced concrete construction is still not very high.

The open fields between the frameworks are filled with bricks. If the occupants still have money available, they start to plaster the walls of the rooms. After the plasterwork is finished they paint the wall. The paint is normally a very bright color.

	wall				floor	
	brick	plaster	paint	colour	concrete	tile
shaie 058	1				1	
shaie 070		1	1	green	1	
shaie 506		1	1	yellow		1
shaie 509	1				1	
shaie 516	1				1	
shaie 530		1	1	white		1
	3	3	3		4	2

list 20: wall and floors of the MH

fig. 174: construction of the MH “shiae 516”, “shiae 506”

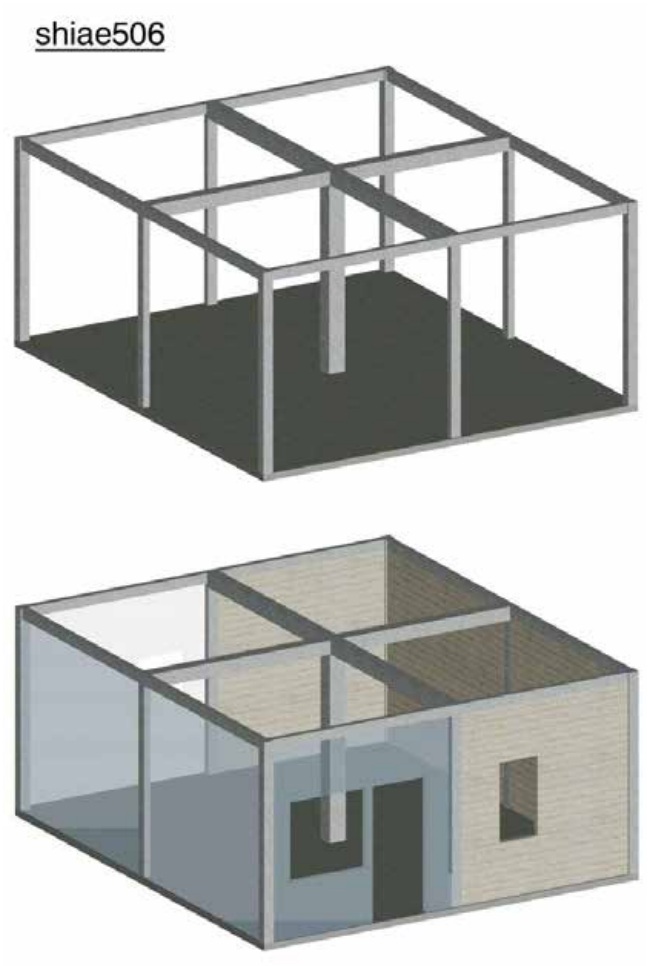


fig. 175: construction with concrete frame of the MH "shiae 506"

Adjustment to the terrain

The traditional villages are built on the ridge of a hill, as a consequence is the terrain not level. The MH is built on the ground and has to be adjusted to the terrain.
The houses are if necessary stepped down. One example is the house "shiae 070". The house is built on four steps and the total height different of the steps is 3.00 meters.

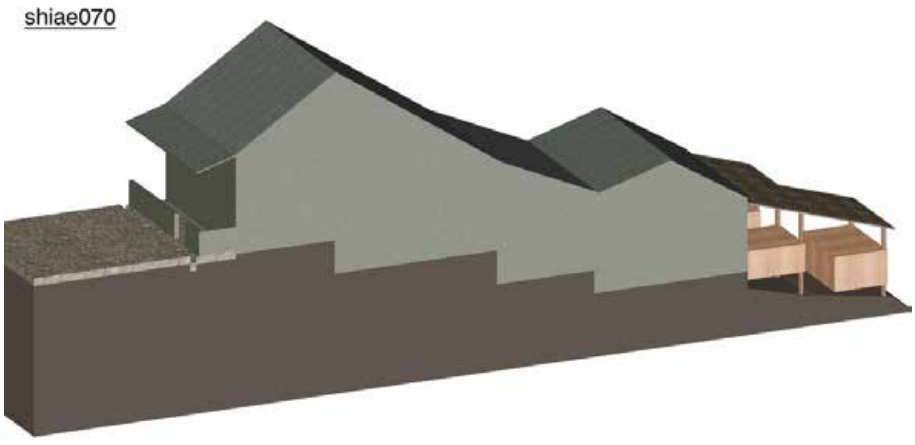


fig. 176: adjustment of the tarrain at the MH "shiae 070"

Roof construction

The roof construction is related to the traditional roof construction but simplified. It is a double-pitched roof with a central gable parallel to the front facade. The construction is a wooden framework which rests on the load-bearing walls.
The height of the roof construction is between 1.50 and 3.00 meters. The roof of the TSH is 4.50 to 6.50 meters high. This is less than half of the height of the roof of the TSH.
The total height of the houses is nearly comparable. Without the pole-substructure and with the lower roof, the average height of the house is 5.30 meters (from 4.20 to 5.90 meters).
The covering of the *Mbelembele* is taken over from the traditional house.

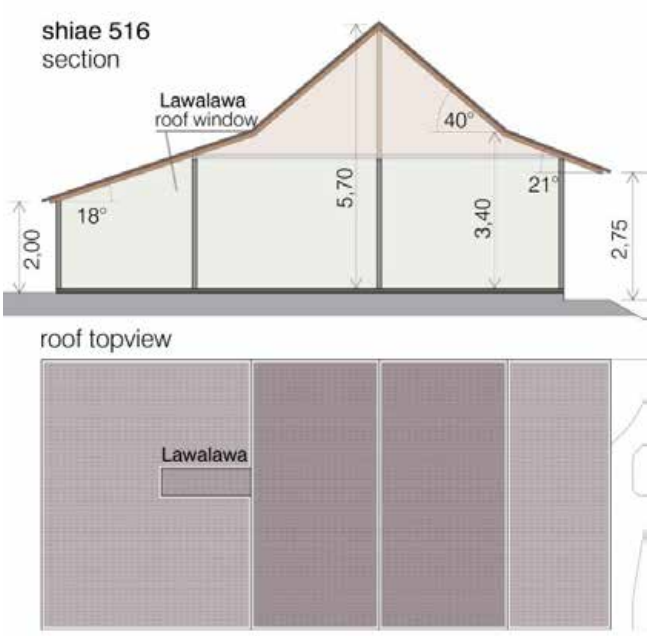


fig. 177: roof dimension of the MH "shiae 516"

Most of the roofs are covered with corrugated iron. Only 13 from the 65 modern houses have a sago palm leaf roof (20%). The reason for the traditional roof covering is the lack of money after the occupants have built the houses. The family is able to produce the palm leave tiles by themselves and do not have to spend money for the roof covering. The expensive aspect of the traditional roof covering is the maintenance of the roof tiles. Most of the 13 houses are busy saving money to change the roof to a corrugated iron roof. With that change the inhabitant does not have to maintain

the sago palm leave covering.
In the house “shiae 530” a ceiling is present. All the other houses I surveyed have an open roof construction. The reason for this is the ventilation and the light, like in the traditional houses.
Similar to the TH-SP the modern house has the roof-top window only on the backside of the roof. In the front facade the door and the windows are fitted. Through the openings is it possible to bring fresh air and light into the houses.

fig. 178: building phases of the MH

6.1.2.5 Composition of the house

The modern house is similar composed as the traditional house. The traditional house consists of a traditional part of the house, the extension and sometimes of the modified substructure.
The modification of the substructure is not possible in the modern house, because they are built on the ground and it does not have a substructure made of poles.

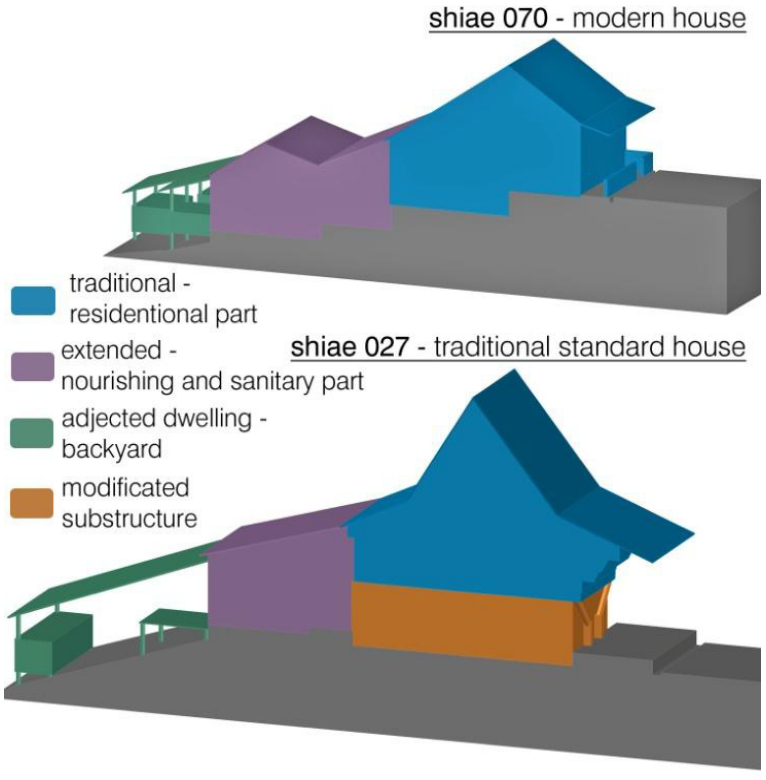


fig. 179: segmentation of the MH and the TSH

The arrangement of a main part and extended part of the house is taken over.
The two segments of the MH have also the same function as the TH.
Because of the same construction type the two segments of the MH are not so clear recognizable.
The different building phases of the traditional house are clear visible. Firstly the traditional house was build. In a second step, the occupants built the extension. In the last 10 years the inhabitants of the Traditional Standard House started to modify the substructure. The progress of the traditional house is with the temporal progress of the development given.
The MH is the youngest dwelling type in Hiliamaetaniha and arose in the last decades. That’s why different possibilities of the development of the modern houses exist.

Every modern house has his past.
Three examples are already explained at the beginning of the chapter (“shiae 058”, “shiae 070”, and “shiae 516”)
The modern house is divided into three main parts:

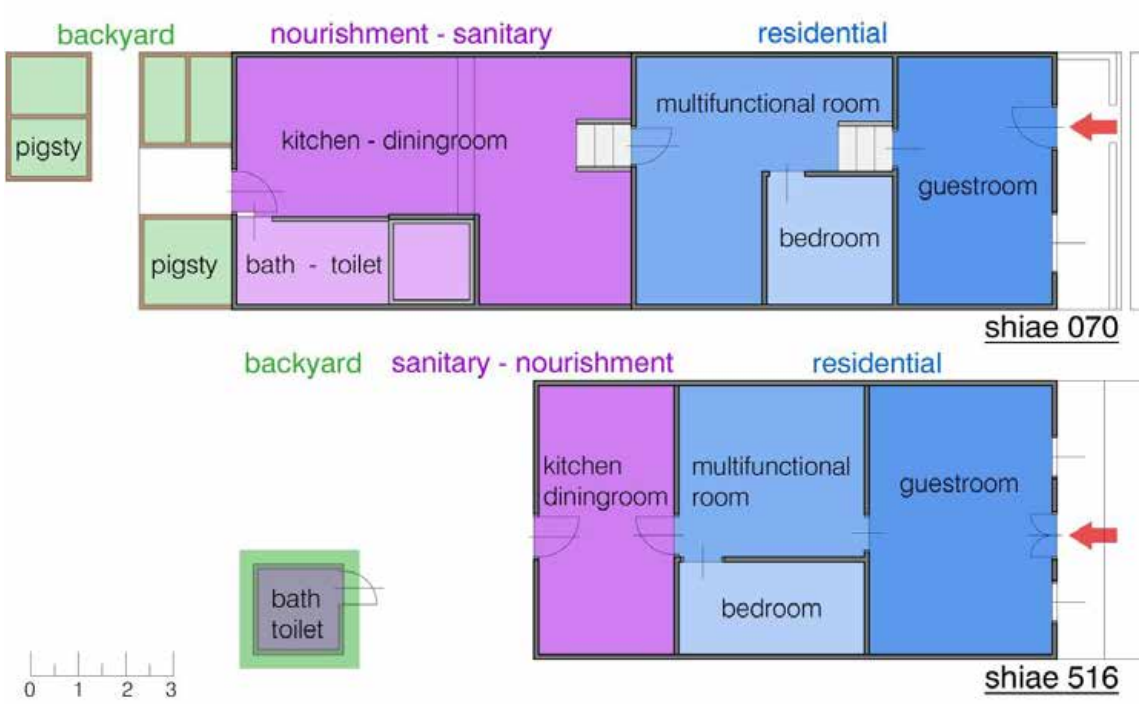


fig. 180: segmentation of the MH

6.1.2.5.1 Residential part of the MH

The residential part is comparable with the traditional part of the TH like the TH-SP. It has a similar room setup and is usually composed of three rooms. The main room, facing the village is the guestroom and similar to the *Tawolo*. The second room is located at the back of the house and is similar to the Feröma. It is also a multifunctional room. The last room of the residential part of the MH is the bedroom or *Kolukolu*. The daily routine takes place in the residential part of the house.

6.1.2.5.2 Nourishing and sanitary part of the MH

The back area of the house is similar to the extension of the TH. Rooms like kitchen, dining room or bathroom and toilet are located in this area. It is clearly separated from the residential area and accessible normally through a door.
Traditionally, the nourishing and sanitary part of the house does not have the same status as the residential part. It is not so important. The main focus of the builder is to build the residential part of the house. The nourishment area behind the house is often built later comparable the extension of the TH. The kitchen of the houses is often located in a temporary shelter behind the house until the occupants can afford a proper kitchen.

6.1.2.5.3 Adjacted buildings at the backyard

In most of the properties stables for animals are positioned behind the houses. Pigs have culturally a very important status and nearly every family has their own pigs. Small sheds in which the toilet is built in, are also located next to the stables.

6.1.2.6 Residential part of the MH

6.1.2.6.1 Approach to the MH

The access into the house is derivate and comparable with the access into the TH-SP. The only difference is the missing difference of the height. The access to the house from the village is through an entrance in the front facade. After entering the house, you are standing in the middle of the guestroom. There is no transitional zone between the out- and inside. In many of the houses these entrances are the only possibility to enter the house.

6.1.2.6.2 Guestroom

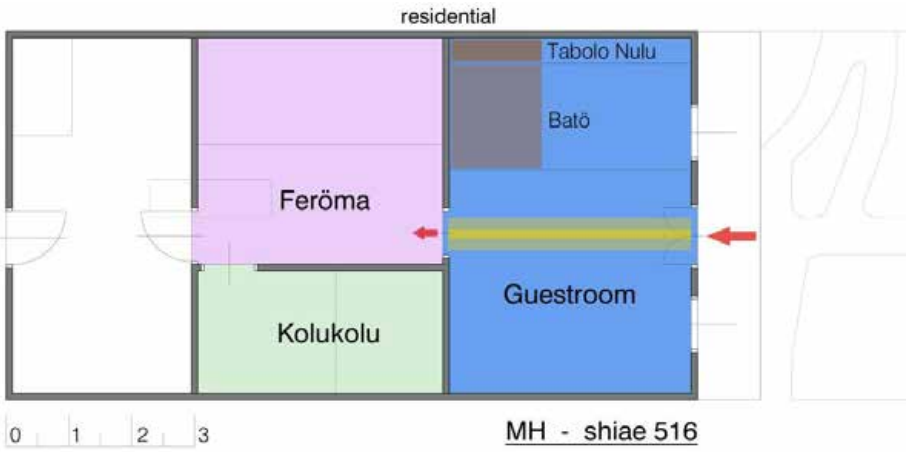


fig. 181: guestroom of the MH "shiae 516"

The guestroom is comparable with the *Tawolo* of the traditional house or the guestroom of the modification of the substructure. The guestroom is the centre of the daily life.
The room is also called communal room or living room. Nearly all of the daily routine happens there.

The layout of the guestroom is similar to the *Tawolo* of the TH-SP.
A lot of facts like the approach, furniture and route guidance are equal to the *Tawolo*. Another similarity is the positioning of the room. The guestroom is street facing. The width of the room is equal to the width of the house. With the entry-door and windows, the room is connected with the *Mbelembele*. The width of the guestroom and the house is in average 5.25 meters. With time the width of the house developed from 3.10 meters (TSH "shiae 022") up to 5.60 meters (MH "shiae 516").
The length of the room is in average 3.00 meters and is smaller then the guestroom of the TH-SP. In summary, the surface of the guestroom is smaller than the *Tawolo* of the TH.

roomsize: tawolo - guestroom			
	THS	TH-SP	MH
length	5,90 m	3,60 m	3,00 m
breadth	4,15 m	5,30 m	5,25 m
area	25,05 m²	19,10 m²	15,40 m²

list 21: room size of the guestroom of the MH

The development of the guestroom started with the *Tawolo* of the Traditional Standard House. This *Tawolo* is a longitudinal room with a lateral access. The first changes are visible at the common room of the TH. The access to the house moved to the front facade, and the room changed from a longitudinal to a lateral orientated room. The first build modern houses have the same layout. The latest and last step in the development was the fusion from the *Tawolo* or guestroom and the *Feröma* or multifunctional room.
The occupants started to open the wall to the *Feröma* with a bigger opening. With the next step the wall between the *Tawolo* and *Feröma* was missing and the two rooms combined into one room. The newly created room has an L-shaped ground plan.
As a result consists the residential area of two remaining rooms.
The residential area is the guestroom with a recessed room, the bedroom.

fig. 182: guestroom of the MH "shiae 516", "shiae 506"

Furniture

Batö

The *Batö* is part of the layout of every traditional house. Nowadays, the traditional element is still a very important part of the modern house. In 4 out of 5 modern houses a *Batö* is built-in in the common room. The only guestroom without a Batö was in the newest building. After the earthquake 2005, the occupant of the house "shiae 506" had to rebuild his house. He used the new ground plan and did not build a *Batö* in the guestroom. The missing street view from the Batö can be a reason why the resident does not build one.
The existing *Batös* have an average height of 0.45 meters and a depth of 1.75 meters and this dimension is nearly the same as the *Batö* in the TH.
Another traditional item is the *Tabolo Nulu*, the chest on top of the *Batö*. This traditional installed furniture was located in the *Feröma.* In the TH-SP it was also used in the guestroom or *Tawolo*. Presently the *Tabolo Nulu* is only build in two of the five surveyed houses.
Other moveable furniture like plastic chairs, tables or cupboard is also used.

Function of the guestroom

	guestroom					
	Guestroom	Livingroom	Bedroom	Diningroom	Warung	Storage
shaie 058	1		1		1	
shaie 070	1	1	1			
shaie 506	1	1	1			1
shaie 509	1	1				
shaie 516	1	1	1	1		1
shaie 530	1	1				
	6	5	4	1	1	2

list 22: function of the guestroom of the MH

As already explained, the guestroom is the social centre of the house where the daily routine happens. It is the living room for the family and the reception room for visitors.
With the build in *Batö* the Guestroom is still used as a bedroom.

6.1.2.6.3 Feröma – multifunctional room

The second room of the residential area of the MH is the *Feröma*. It is located behind the guestroom. In the Traditional House it was the private area for the resident at the back of the house.
The position of the *Feröma* is still located at the back of the residential area, with the difference that the extension is nowadays directly connected.
The *Feröma* rotated from a lateral to a longitudinal room. The reason for the rotation is the bedroom for the family next to the *Feröma.* It is getting larger and larger.

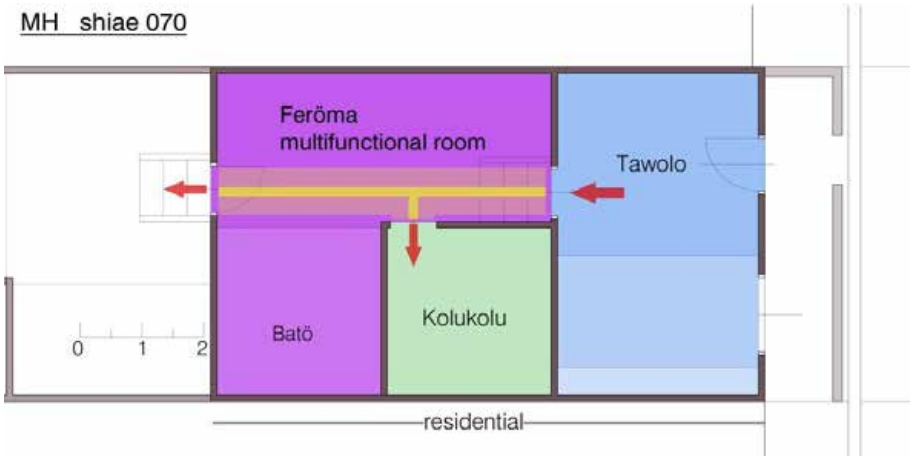


fig. 184: Feröma-multifunctional room "shiae 070"

The width of the Feröma at the TH is equal to the width of the house. At the MH is the width of the house divided into the *Feröma* and the bedroom. As a result is the size of the *Feröma* 20% smaller and in average 13.15 m².
The room is a walk-through room and the connection between the residential area and the nourishment and sanitary area. The access to the bedroom is also through the *Feröma.*

fig. 183: Feröma of the MH "shiae 516"

The development of the *Feröma* started with the archetype of the TSH long time ago. The *Feröma* was a dead-end longitudinal room at the back of the house. The first change happened at the TSH. The room became a walk-through room and rotated from a longitudinal to a lateral room. Reason was the movement of the kitchen from inside the house behind it. As a consequence, a separate private sleeping room arose in the *Feröma*. The *Kolukolu* was between the *Tawolo* and *Feröma* located.
As time went by, the bedroom started to grow and the *Kolukolu* arose to a fix component of the room layout of the TH-SP. At the MH grow the size of the bedroom to a proper room. It is next to the *Feröma* at the back of the residential area located. With other words, the width of the house is divided into the *Feröma* and the bedroom.
The next important step of development is the merging of the *Feröma* with the *Tawolo*. The first step was, to open the wall between the two rooms. With the next step disappeared the wall completely and the separation of the two rooms was not viewable anymore. With the new arose L-shaped room vanished the *F*eröma. As a result the residential area consists of two rooms, the guestroom and the bedroom.

Comparison with the modification of the TSH

If you compare the modification of the substructure of the TSH and the residential area of the MH, you will find the same room setup. The ground floor is composed of an L-shaped guestroom with a square bedroom in one of the back corners.

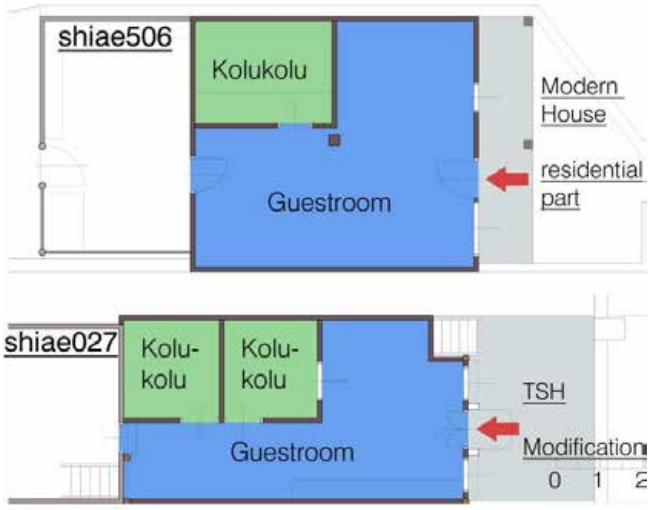


fig. 185: comparison of the MH "shiae 506" and the modification of the TSH "shiae 027"

Furniture

The *Batö* was the most important furniture in the *Feröma*. Nearly all the activities happened on the *Batö*. As a result of the changed function of the *Feröma*, is the *Batö* not necessary anymore and as a consequence not build. In only 2 out of 5 houses we surveyed is a *Batö* build in.
The MH with the new room layout does not have a *Batö* anymore. It is possible that the *Batö* in the semi-public area will get completely lost.
In the traditional house is on top of the *Batö* the *Tabolo Nulu* placed. The same trend from the *Batö* happened to the chest. It nearly disappeared and only on Tabolo Nulu is left ("shiae509").
At the backroom is the rooftop window, like in the TH, builds in. It still is the only possibility to get fresh air and light into the room. In the front part of the house is the room top windows not build in. Reason that for are the existing windows and door in the front facade. The window takes the function of the ventilation and lighting from the rooftop window over. The windows are just openings in the wall without any glassing. Only in one of the 27 modern houses in the extended village are the windows glassed. The rest of the residents can close the window with shutters. During my visit in Hiliamaetaniha, I did not recognize a closed window. I thing the inhabitant close them only if they are more then a day away from home.

fig. 186: window in the front facade "shiae 516" and roof top window in the Feröma "shiae 516"

The flexible furniture is completely the same as the furniture of the TH, the extension and modification. Existing are tables, chairs, cupboards and sideboards. With the cancelled *Batö* is the flexible furniture more important and in nearly all houses available.

The function of the multifunctional room

The *Feröma* is a room with many functions. It was used in the past mainly as a bedroom. Nowadays the room does not have a main function. The room is used as meeting room, dining room, bedroom, storage and also as a passage.
Compare to the TH is the Feröma not so important and not that often in use. That can be a reason why the *Feröma* and *Tawolo* are connected and a new larger room arose.
With the connection of the two rooms are functions like guestroom and living room also functions of the *Feröma*.

	multifunctional room								
	Guestroom	Meetingroom	Livingroom	Bedroom	Bedroom	Diningroom	Diningroom	Storage	Passage
shaie 058		2				2			
shaie 070					3			3	
shaie 506	(1)		(1)	(1)				(1)	
shaie 509	(1)		(1)				3		
shaie 516				2					
shaie 530									2
	2	1	2	2	1	1	1	2	1

list 23: function of the multifunctional room of the MH

6.1.2.6.4 Kolukolu – bedroom

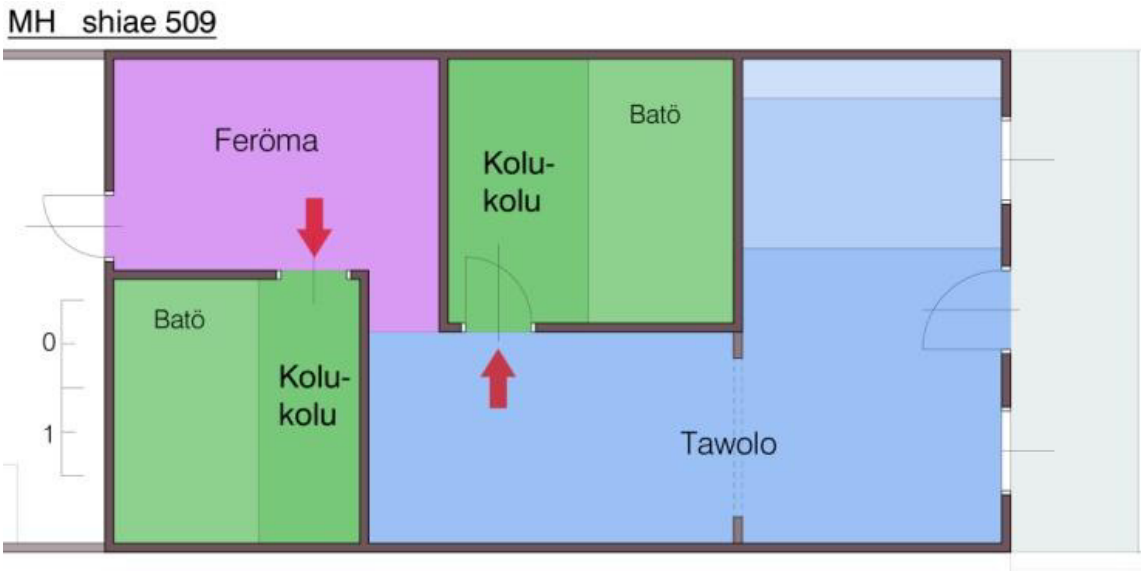


fig. 187: bedroom of the MH "shiae 509"

The *Kolukolu* developed to a proper room in the layout of the residential part of the modern house. The room is located behind the guestroom, at the back of the residential part and next to the *Feröma*. The size of the bedroom is in average 8.00 m² and has a length of 3.15 meters and a width of 2.55 meters.
The average size of the *Kolukolu* in the traditional house is 4.95 m². The *Kolukolu* grew 38% from the TH to the MH.
With the new properties and the independency from the *Feröma* is the position of the bedroom more flexible.
Access to the bedroom is through the *Feröma*, or later through the guestroom given. The door is the only opening in the bedroom. There is not a single window build in. It is a very dark room. The ventilation is through the door and the roof space ensured.
A fixed feature of the bedroom is the *Batö*, which is used as a bed and a shelf. The position of the *Batö* changed. At the TH was the Batö parallel to the house axis positioned. In 4 of 5 modern houses is the *Batö* rotated and normal to the length axis positioned.

Function of the bedroom

The *Kolukolu* has as a consequence of the larger size a new function. Nearly all the bedrooms are also used as storage.

	Bedroom			
	Bedroom	Bedroom	Storage	Storage
shaie 058	3		3	
shaie 070	2			
shaie 506	2			
shaie 509	2	4		
shaie 516	3		3	
shaie 530	3	4	3	4
	6	2	3	1

list 24: function of the bedroom of the MH

Development of the bedroom.

At the archetype of the TSH is no separate bedroom build in. It consists of two main rooms, the *Tawolo* and the *Feröma*. The first separated sleeping area arose at the TSH. It was firstly separated with a curtain. This sleeping area was reserved for the chief of the family and his wife. As time went by the resident build proper wooden walls to separate the bedroom. This room is called *Kolukolu*.
In the TH-SP was the Kolukolu a fix component of the layout of the ground floor. At the MH developed the sleeping are to a proper bedroom. Nowadays, some of the residents build a second bedroom in the residential part. The modern houses "shiae 509" and "shiae 530" have two bedrooms.

fig. 188: development of the residential part of the houses

6.1.2.7. Nourishment and sanitary sector of the modern house

The nourishment and sanitary sector is adjoining to the residential part of the modern house. It is at the back of the residential part of the house located.
The separation of the two parts is visible and discernible. The main sector is the residential area. It is more important for the resident then the nourishment and sanitary area. It is the centre of the house. In this area happens the daily life, the resident receive visitors in the guestroom, and it is the centre of the communication. This area is always in tidied up and very clean
The nourishment and sanitary sector of the house is not so important and necessary. All the activities from the nourishment and sanitary area located can be outsourced. It is possible to cook behind the house in the backyard, and the resident can use the public *Sumur Umum* instead of the private bathroom. If you compare this area to the residential, is it normally not so clean. Things are lying around; it is a bit smelly and sometimes wet. Another reason for the bad climate is the open fire, which is located in the nourishment and sanitary area.

Comparable is the nourishment and sanitary sector of the modern house with the extension of the traditional house.

Many aspects are comparable or the same:

- the position
- the function
- the construction
- the room setup

6.1.2.7.1 Development of the nourishment and sanitary sector

The development of this sector can be divided in two variants:

Variant 1:

This variation is comparable to the extension of the TH. The nourishment and sanitary part of the house was built after the residential part. Between the building phases is a time interval up to 10 years (“shiae 070”). Reason for the huge interval is in most of the cases the missing money. If the money was available, the resident started to build the nourishment and sanitary area behind the existing house.

fig. 189: comparison of the nourishment and sanitary area of the MH to the extension of the TH

Variation 2:

The nourishment and sanitary area of the younger modern houses is it from the beginning part of the building plans. The inhabitant constructed the whole house in one step.
In a few cases was the whole project too expensive and the resident finished the residential part firstly. As the money was available, they finished the completely house.
This variation is common and mostly used in the extended village of Hiliamaetaniha.

6.1.2.7.2 Construction of the nourishment and sanitary sector:

The construction of the back area of the MH is equal to the construction of the front area. The bricked walls are erected on top of the concrete slap. The roof is a wooden construction with a palm leave or corrugated iron covering.
The walls are in nearly all the nourishment and sanitary areas not plastered and painted.
The framework made of concrete, which is very important for the earthquake resistance, is missing in most of the nourishment and sanitary sectors. This part of the house had, as a result, most of the damages after the earthquake 2005.
In a few houses ("shiae 506") is the nourishment and sanitary sector a temporary construction of wooden pillars, wooden boards and bricks. This temporary part of the house will be replaced if the owner has the needed money to build a proper nourishment and sanitary area.

fig. 190: temporary construction of the kitchen "shiae 506"

6.1.2.7.3 Function of the nourishment and sanitary sector

The main function of this area has not changed. It is still the preparing of the food or in other words the kitchen. The open fire place is at the back wall, in one of the corners located. The fire place is a heightened platform made of concrete with an average dimension of 0.90 by 1.70 meters. Nearly all inhabitants of the MH are busy cooking on the open fire. In a few houses are already kerosene cooker installed, but the main cooker is the open fire place.

Next to the kitchen is the dining room located. The new arose area is normally combined with the kitchen. The dining area is discernible through the dining table. The dining table is a wooden table with wooden benches in front of it.
Another function of this area is the use as storage. In a cupboard or an open shelf is the cookware and dishes stored.

fig. 191: kitchen and dining room "shiae 516"

	nourishment and sanitary sector								backyard			
	Kitchen	Diningroom	Bedroom	Bathroom	Toilet	Watertank	Storage	Storage	Toilet	Bathroom	Stables	Storage
shaie 058	4						4		5	5	6	X
shaie 070	4	4		5	5	6	4				X	X
shaie 506	3	3					3		4			
shaie 509	5	3	4				5		6	6	7	
shaie 516	4	4					4		5			
shaie 530	5	5	7	6	6	9	5	7				
6	6	5	2	2	2	2	6	1	4	3	3	2

list 25: function of the nourishment and saniary area of the MH

The second main function of the nourishment and sanitary area is the bathroom and toilet. In only two of 6 surveyed houses is a bathroom and a water tank build in. The reason therefore is the easier access to the *Sumur Umum.* The extended village has his own *Sumur Umum*, which is very close to the village located. All the inhabitants of the houses in the extended village are using the *Sumur Umum*.
Only one house has a proper bathroom inside the house. The resident of the house "shiae 530" is the pastor of the church. He lives in a very good equipped house, which belongs to the church. The bathrooms is equal furnished like the bathrooms of the extensions of the TH. The room is tiled and plastered. The water tank is in the bathroom located.

water supply							
village	house number	build-in tank	flexible tank	Sumur Umum	Area of tank		comments from the interview
shiae	058		1	1		m²	small drum -last only for 2 days
shiae	070	1			3,25	m²	watertank empty - use Sumur Umum
shiae	506			1		m²	use Sumur Umum
shiae	509		1	1		m²	drum, last for 1 day
shiae	516	1		1		m²	tank for toilet; rest Sumur Umum
shiae	530	1		1	2,50	m²	Sumur Umum for drinking-water
	7	3	2	5			

list 26: water supply of the MH

If the inhabitant wants to have a private toilet on their property, they mostly build a separate small dwelling in the backyard of the house.

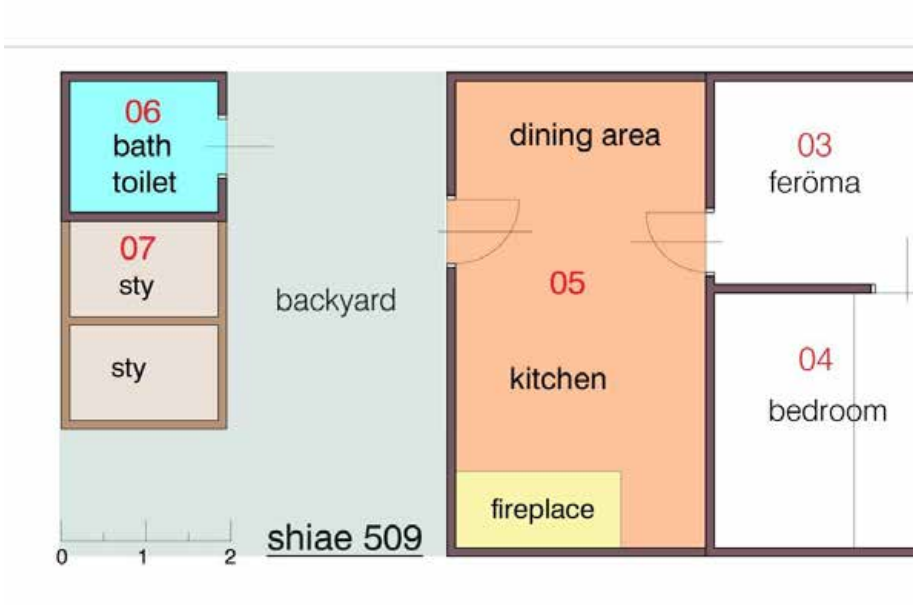


fig. 192: bathroom and toilet seperated in the backyard "shiae 509"

In all younger modern houses is not a single bedroom planed and build in. The reason is that enough bedrooms are available in the residential sector.

6.1.2.8 Backyard of the Modern House

The terrain of the backyard behind the modern house is not sloped down at the extended village. That is why the area behind the house is easier to develop. The function of the backyard has not changed. There are two functions. One function is the bath and toilet. Therefore is a small separate dwelling build. The bathroom and toilet is made of brick. Because of the smell is it with a distance to the main house positioned.
In that small dwelling is a water tank built in.
The size of the bath is normally smaller then the existing water tanks from the extension of the TH. The second buildings at the backyards are the sty´s for the pigs.

fig. 193: toilet in the backyard "shiae 516"

7 The Modern House in the village Sondregeasi

The village of Sondregeasi was founded more than 30 years ago. The detailed date is not clear, but the oldest houses we surveyed, were build 30 years ago ("ssond 005" and "ssond 041").
The village is located at the flat area next to the coastal road and next to the way to Hiliamaetaniha. As mentioned is Sondregeasi a related village to Hiliamaetaniha and has a similar layout. With the topographical situation is the space to grow for the primal village limited. That is why Sondregeasi is extended next to the coastal road. Another possibility to extend the primal village is next to the pathway up to Hiliamaetaniha. As a result of the topographical situation is it difficult and dangerous to build there.
After the earthquake and Tsunami 2005 arose a new complex next to Sondregeasi. The complex was founded by the BRR organisation to help the homeless people after the natural disaster. The access to the complex is through the coastal read. It is part ways connected with the centre of Sondregeasi.

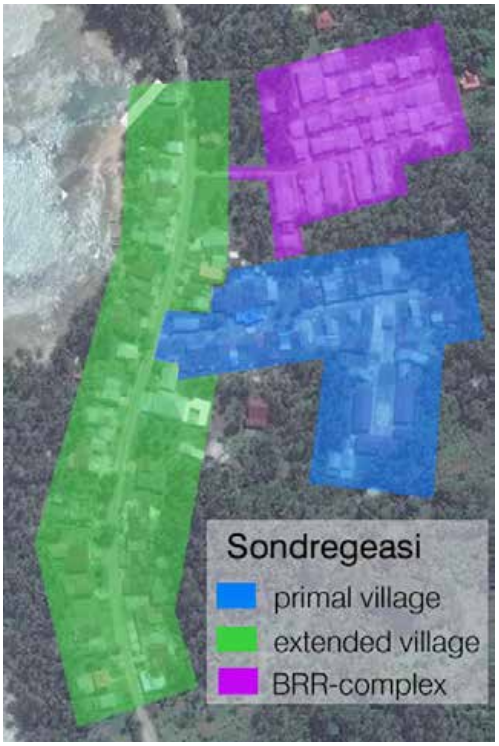


fig. 194: arrangement of Sondregeasi

Sondregeasi was founded at the same time as the extension of Hiliamaetaniha on the way down to Sondregeasi was built.
That is why the layout of the village and the development of the houses are similar.

The occupants of Sondregeasi built also only modern houses. In the whole village is not a single traditional house existing.

7.1 Numbers of houses in Sondregeasi

Primal village
51 dwellings

Extension on the way to Hiliamaetaniha
3 dwellings

Extended village next to the costal road
56 dwellings

BRR complex
60 dwellings

Total dwellings in Sondregeasi
170 dwellings

Our field of research was the primal village of Sondregeasi. We surveyed 11 of the 51 houses, which are 21.5%.

7.2 Classification of the houses in Sondregeasi

7.2.1 Numbers of floors

One of the obvious classifications is the number of floor. Most of the houses are only one-storied houses, but comparable to Hiliamaetaniha are a few houses double-storied houses.

One-storied houses
51 houses ~94.5%

Double-storied houses
3 houses ~5.5%

Because of the small number of double-storied houses, we did not survey one of them.
("ssond 024", "ssond 038", "ssond 039")

fig. 195: example of double-storied houses

The house “ssond 001” is at the time one-storied, but the second floor is prepared to build. The house is occupied by the *Kepala Desa* of Sondregeasi.

7.2.2 Construction and building material

Another important classification is the way of construction and the used building material.

Dwellings made of concrete and bricks

The most common building material for the modern houses is concrete and bricks. The construction is a framework made of real forced concrete with fillings made of bricks.
49 buildings are built in this construction type.

Fig. 196: example of a house builds with concrete and bricks

Dwelling made of concrete/bricks and wood

This construction type consists of a plinth made of concrete and bricks with a height of about 0.80 meters. On top of the plinth is a wooden construction erected. It is a wooden framework with a planking of wooden boards.
This construction type is in South-Nias rare. In Hiliamaetaniha are only 2 houses, and in Sondregeasi is only one house build in this construction form.

Fig. 197: dwelling made of concrete/brick and wood

The dwelling “ssond 023” which is built with concrete and wood is in my opinion not a conventional dwelling, it looks like a barn. If people lived or still lives in this dwelling was for us not obvious.

As mentioned is this type of construction in North-Nias more often in use then in South-Nias.

Dwelling made of wood

This type of dwelling is the simplest and cheapest way to build a house. It consists of a wooden framework planked with wooden boards. Surly is it built with the same material as the traditional house, but it does not have any equality. It has more the character of a shack then a proper house.

Fig. 198: dwelling made of wood

In Sondregeasi is only one dwelling existing. On the way up to Hiliamaetaniha is the wooden dwelling “ssond 525” located.

Double-storied houses

The double-storied houses are divided into the two floors, which are built with different type of construction and building material. The ground floor is in all the houses build with concrete and bricks. The second floor is a wooden construction.
As mentioned, are 3 houses in Sondregeasi built.

Statistic

Concrete – brick houses
49 houses 91%
Concrete/brick – wood house
1 house 2 %
Wooden house
1 house 2 %
Double-storied house
3 houses 5 %

7.2.3 Roof

Another characteristic topic for the houses is the roof. The houses can be classified in two different themes.

Roofing material

The two available roofing materials are similar to the roof covering material, which are used in Hiliamaetaniha.
Most of the houses are covered with corrugated iron. The reason, and difference to the traditional village of Hiliamaetaniha, is that the houses are covered straightaway with corrugated iron and firstly not with sago palm leaves. That is why houses with sago palm leave covering are very rare in the modern village Sondregeasi.

Corrugate iron
51 houses 94.5%

Sago palm leave
3 houses 5.5%

The occupants started to use coated corrugated iron. The advantage is the anti-rust protection. Because of the prevailing climate on Nias, is the antirust protection a very important fact. As a result are already 22 of the 51 houses covered with coated iron.

Fig. 199: coated and normal corrugated iron covering

Roof form

A completely new step of development at the modern house is the rotation of the roof.
The gable of the traditional roof form is parallel to the street or the house front and square to the house axis.

Fig. 200: traditional and rotated roof form

The gable of the new roof form is parallel to the house axis and square to the front of the house and the street. It is about 90° rotated.

Traditional roof form
47 houses 87%

Rotated roof form
7 houses 13%

The houses with rotated roofs are nowadays rare, but, in my opinion, is the rotated roof form the future and will get more and more.
Reason for the rotation will be explained later.

7.2.4 House type

As a result of the earthquake and the Tsunami 2005 accrued a new classification. Next to the self build houses, arose a second type of houses in the village.
A lot of NGO´s build houses for homeless people on the whole island of Nias. In Sondregeasi are also houses located, which were build by an NGO organisation.
LPAM (Lembaga Pencerahan dan Advokasi Masyarakat)[114] and BRR (Badan Rehabilitasi dan

[114] *Mia MECHLER; Das fremde Haus – Die Rolle der Architektur in der Planung und Realisierung einiger Wohnbauprojekte der nationalen und internationalen Hilfsorganisationen auf Nias; Technische Universität Wien 2010; p. 32*

Rekonstruksi)[115] are the NGO´s who build houses in Sondregeasi.

Self build modern house
49 houses 91 %

LPAM
4 houses 7.5 %

The LPAM houses are still existing (“ssond 012”, “ssond 014”, “ssond 052”). The occupant of the LPAM house “ssond 043” renovated 2011 the house.

BRR
1 house 1.5 %

BRR had the strategies to buy a huge property to build a whole complex for the homeless people. BRR bought the property next to Sondregeasi and build the BRR complex with 60 identical houses. In the primal village of Sondregeasi is one house (“ssond 048”) build by BRR.

[115] *Mia MECHLER; Das fremde Haus – Die Rolle der Architektur in der Planung und Realisierung einiger Wohnbauprojekte der nationalen und internationalen Hilfsorganisationen auf Nias; Technische Universität Wien 2010; p. 23*

7.3 Allocation into the different areas of the Modern Houses in Sondregeasi

The layout and development of the Modern House in Sondregeasi is similar to the development of the Modern Houses in Hiliamaetaniha.
The dimension of the buildings is given through the dimension of the property. The properties are limited in the width and open in the length. The dimension of the houses is equal; limited in the width and open in the length. As a result is the building a longitudinal building.
The width of the properties has a range from 5.30 to 11.00 meters and has an average of 7.40 meters.

All surveyed houses in Sondregeasi have the same arrangement and can be divided into two main areas of the house:

The frontal part of the house, which is the residential area of the house;

The back of the house, which is the nourishment and sanitary area of the house.

This arrangement is equal to the MH in Hiliamaetaniha. The separation of these two areas is clearly defined.

7.3.1 Residential part of the Modern House in Sondregeasi

The residential area of the modern houses is the front part of the house. It is the centre of the daily routine of the occupants and also the area to receive guests.
One difference to the MH in Hiliamaetaniha is the width of the residential area. In Hiliamaetaniha is the width of the house equal to the width of the property. In Sondregeasi is it mostly different. In 8 out of 10 surveyed houses is the building smaller then the property. The accrued gap is in average 1.00 meter width.

Fig. 202: access to the nourishment and sanitary are between the houses

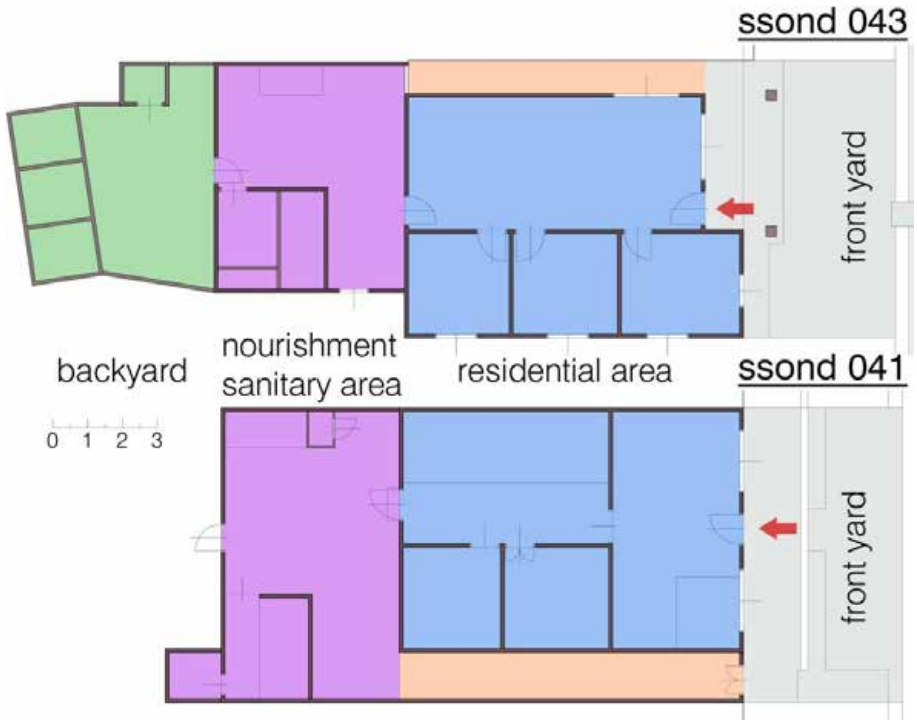


Fig. 201: residential area – nourishment sanitary area – backyard of the modern houses

This gap between the houses is usually used as a direct access to the nourishment and sanitary area at the back of the house. The corridor between the houses has a width between 0.60 (“ssond 005”) and 1.80 (“ssond 047”) meters.
The entrance to the corridor from the *Mbelembele* can be open or closed up with a door.
The corridor is in most of the cases used as storage and sometimes as a garage for the motor bike.

7.3.1.1 Steps of the development of the residential area of the modern house in Sondregeasi

The development of the residential area of the modern house in Sondregeasi is similar to the modern houses in Hiliamaetaniha. It is divided into different steps.

7.3.1.1.1 Basic layout of the residential area

If you compare the basic layout of the residential area with the Traditional House build on short pillars, you will find a lot of equality, as already mentioned at the MH of Hiliamaetaniha.
The houses with this layout are mostly the oldest buildings in Sondregeasi:

"ssond 005": built 1982
"ssond 033": built 1998
"ssond 041": built 1982

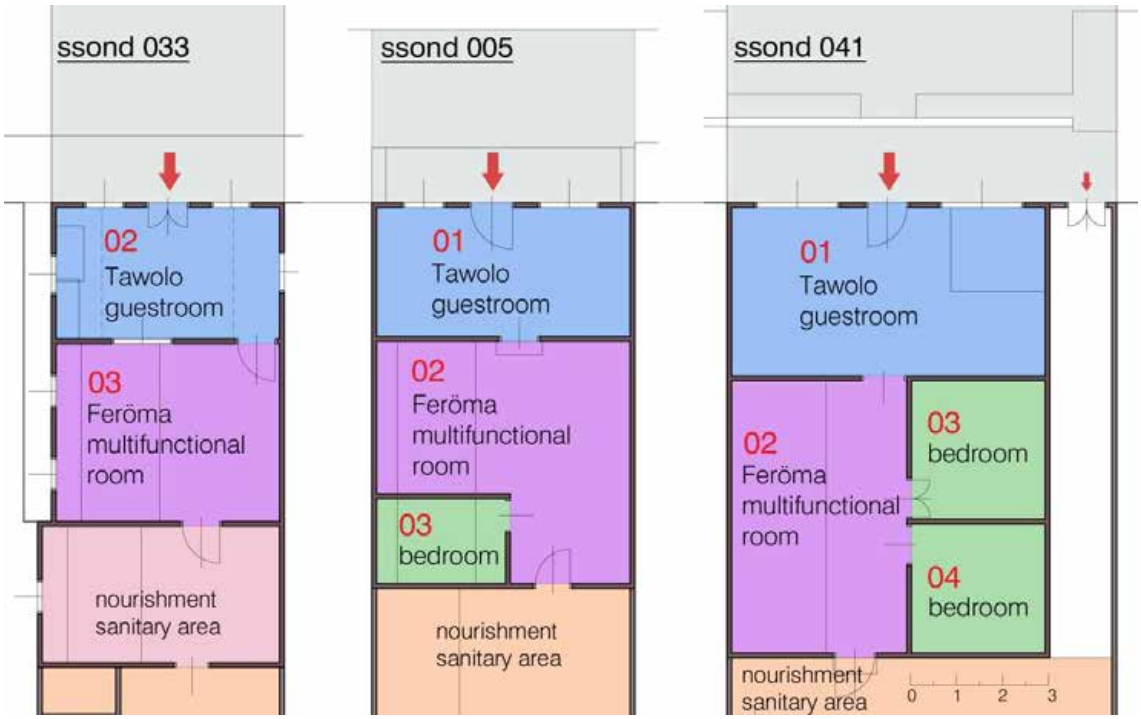


fig. 203: ground floor of houses of the first development step

7.3.1.1.1.1 Rooms and areas of the ground floor

Tawolo - guestroom

The first room in the house is the *Tawolo* or guestroom. The entrance into the house is in all houses in the middle of the front wall positioned. The entrance door is on both sides flanked by windows. Between the *Mbelembele* and the *Tawolo* is no high difference as usual at the traditional house.
The *Tawolo* is a lateral room with a width, which is equal to the width of the house. The average size of the room is about 18.00 m^2

Feröma – multifunctional room

Behind the *Tawolo* is similar to the TH the *Feröma* or multifunctional room located. The *Feröma* has his separate development:
The room was similar to the *Tawolo* a lateral room over the whole width of the house ("ssond 005"). With the time started the inhabitant to separate a small sleeping room one of the back corner. The new form of the *Feröma* is an L-shaped room ("ssond 033").

With the need of more sleeping rooms divided the inhabitant the *Feröma* into two areas. On one side are bedrooms located and on the other side is the *Feröma* located. The *Feröma* rotated from a lateral to a longitudinal room.
The *Feröma* is in average larger then the *Tawolo* and has an average size of 24.50 m^2.

Bedroom

The bedroom in the residential area is a very small room with an average size of 7.30 m^2. The bedroom arose because of the needed privacy of

the family members. As a consequence is a second bedroom in the residential area built in.
The access into the small dark room is through the *Feröma*. The bedrooms do not have a window or other openings. The only possibility to get light into the room is through the open roof area.

7.3.1.1.1.2 Function and interior of the rooms

		tawolo	guestroom	living room	meeting room	kolukolu	bedroom	bedroom	bedroom	storage	storage	garage	room for feast	practice room
ssond	005	2	2		2		2	3		3	2	3		
ssond	033	1	1	2			2	3		1		2	3	
ssond	041		1	2	1	1	1	2	3			2		4
	3	2	3	2	2	1	3	3	1	2	1	3	1	1

list 27: room function of the residential area

Tawolo – guestroom

The *Tawolo* is the centre of the daily routine of the family. The main function is the use as a common room for the whole family. The inhabitants call it meeting room or guestroom. It is also the representative room to receive relatives or guests. The *Tawolo* is also used as a semi-public room. One of the folklore groups uses the *Tawolo* of the house "ssond 041" as a practice room. If it is necessary is the room used as a sleeping room for relatives or guests.

fig. 204: Tawolo "ssond 041"

Like nearly every rooms is it also used as storage and also as a garage for the motor bike.
In the *Tawolo* of the traditional house is a *Batö* build in. The Batö in the modern house is normally not build in.
A completely new furniture is in the house "ssond 041" build in. The *Farathö* is a kind of a *Batö* which is shorter and is not build over the whole length of the room. It is also a wooden platform with a height of 0.45 meters.

Feröma – multifunctional room

The *Feröma* is a multifunctional room. It is used as a sleeping room for the family and guests. It is also used as a living room. With the time moved parts of the daily routine to the multifunctional room. In this room is more privacy given. Surly is it also used as storage.
In the *Feröma* does the Batö still exist. It is positioned on one of the lateral walls. With the transformation of the *Feröma* grew also the length of the *Batö* from 3.80 to 5.90 meters. Another traditional element, the *Tabolo Nulu* is also in 2 of 3 *Feröma* build in. It is still used as storage.

fig. 205: Feröma "ssond 041"

Summarising started the centre of communication and life to move from the *Tawolo* to the *Feröma*.

7.3.1.1.2 Merging of the Tawolo and Feröma

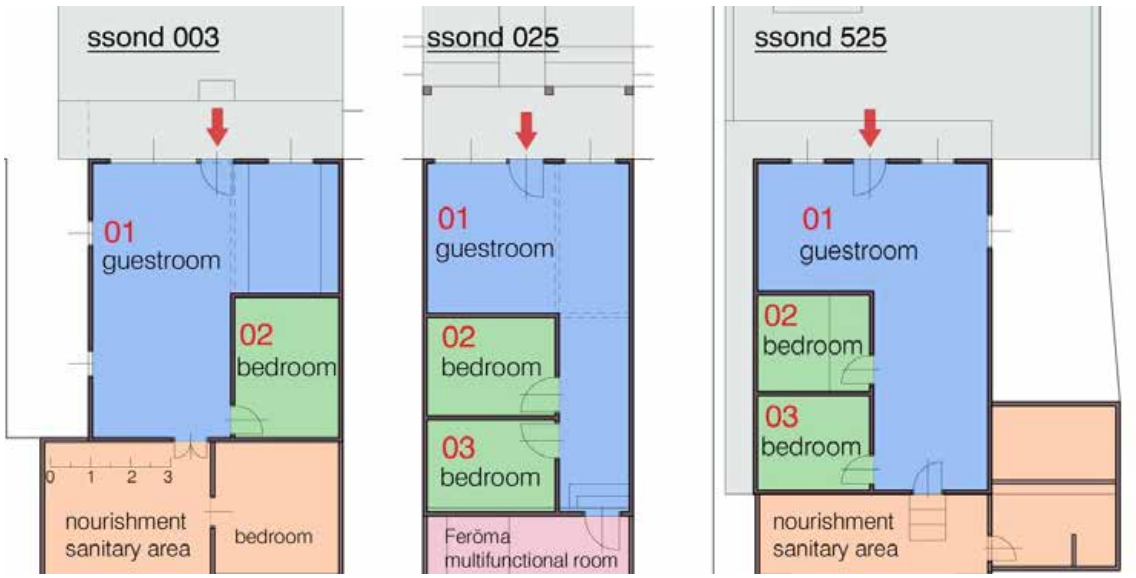


fig. 206: ground floor of houses of the second development step

The next step of the development of the residential area is the fusion of the two main rooms. This step happened also at the MH in Hiliamaetaniha.
Instead of the two rooms *Tawolo* and *Feröma* is one L-shaped room in place. The L-shaped room is a consequence of the separation of the bedrooms in one of the back corners.
These houses are the second generation of houses in Sondregeasi and are also build later.

"ssond 003": built 1995
"ssond 025": built 1999
"ssond 525": built 1987

7.3.1.1.2.1 Rooms and areas of the ground floor

Guestroom

The new accrued main room has an L-shaped form. The front part of the room goes over the whole width of the house. The back part of the room is half of the width of the house, because it has to share the width of the house with the bedroom. The guestroom is the new centre of the daily routine or the living room. It is still the representative room to receive guests.
With the merging of the two rooms is the size of the room larger and in average 30.90 meters.

Bedroom

As a result of the requirement of more privacy are normally two bedrooms built in. The rooms are still nearly square and small with an average size of 7.50 m². The access to the rooms is now from the guestroom. The bedroom is still a very dark room and is only used at night time for sleeping.

7.3.1.1.2.2 Function and interior of the rooms

		tawolo	guestroom	living room	meeting room	bedroom	bedroom	bedroom	storage	garage	feröma	working room	warung
ssond	003	1	1	1		1	2						
ssond	025		1	4	1	2	3	4			1	1	4
ssond	525		1	1		1	2	3	1	1			
	3	1	3	3	1	3	3	2	1	1	1	1	1

list 28: room function of the residential area

Guestroom

The functions of the guestroom are of the functions of the *Tawolo* and *Feröma* together. Summarizing, the function has not changed. It is still the living room, meeting room, guestroom and praying room for the family. Sometimes is it used as storage, garage or as sleeping room for relatives and guests. The inhabitants of the house

"ssond 025" use the guestroom also as a *Warung* and as a working room.
In only one remaining guestroom is a *Batö* built in. In the oldest of the surveyed houses ("ssond 003") is at the short lateral side a *Batö* build in.
In the other guestrooms is the new available furniture placed. Elements like chairs made of plastic, wooden tables, cupboard and chests are the new furniture of the houses. These elements eliminate step by step the traditional built in furniture.

fig. 209: step back of the front facade


fig. 207: guestroom "ssond 003"

Bedroom

As mentioned is the bedroom a place to sleep and does not have another function. In a few cases is a cupboard in the room located to store the clothes of the inhabitants.
The residents sleep on *Batös* or on proper beds. If the beds are getting more and they replace the *Batö* or not was for me not dectable, because we were normally not allowed to survey and photograph the bedroom.

7.3.1.1.3 Transformation of the guestroom and the front facade

The next step of development comprised two changes of the residential area.
The first change is the transformation of the guestroom. The L-shaped guestroom changed to a rectangular room form. It is longitudinal room. The whole area of the residential part of the modern house is devided into the guestroom on one side of the house and bedrooms on the other side. This rooms are splited with a proper brick wall. With other words, is the residential area devided into a public and a private area. The reason for this step of development is the need of more private rooms. As a consequence arose a second and sometimes a third bedroom fo the member of the family.

The second change of this development step is the setback of a part of the front wall. The front facade can be divided into two sections. One of this part is the front wall of the guestroom and the other part is the front wall of the bedroom. One of this parts of the front wall moved back. In nearly all cases is it the front wall of the guestroom. The setback is in average 1.00 meter (from 0.75 to 1.10 meter).
This step of development was already mentioned at the chapter "the setup of the modern village Sondregeasi." As a result of the setback changed the *Mbelembele* to a terrace in front of the guestroom.

This houses are built in the last years:

"ssond 014": 2005 (LPAM)
"ssond 021": 1992
"ssond 032": 2008
"ssond 043": 2011 (former LPAM)

An inspiring example of this layout of the ground floor is possibly the LPAM house. These houses were built by an NGO organisation after the natural disaster in 2005.

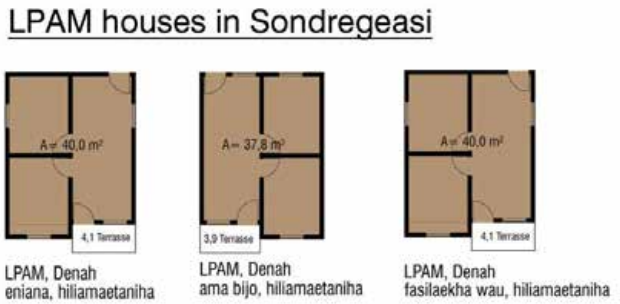


Fig. 210: example of LPAM houses in Sondregeasi

The house "ssond 021" has also this layout of the ground floor and was built before the disaster.

Why this step of the development of the layout of the ground floor happened is not clearly explainable.
It is also possible that a house type from another island was the inspiring example.

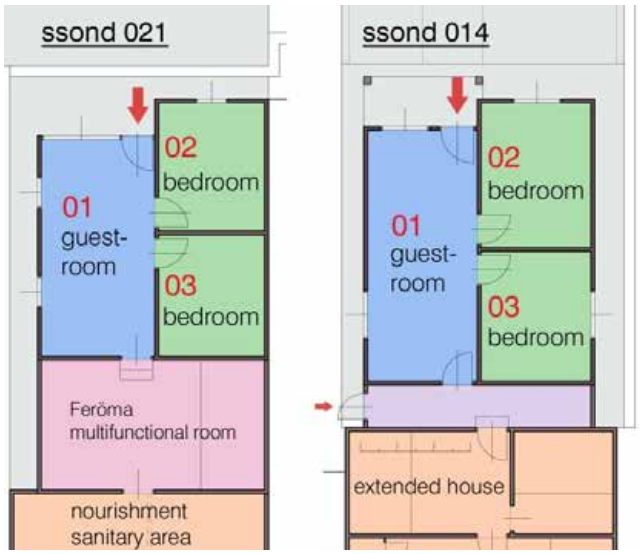
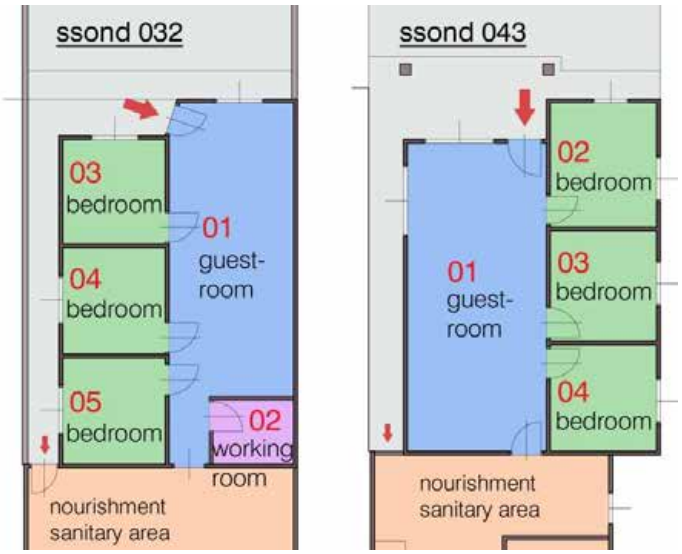


fig. 208: ground floor of houses of the third development step



7.3.1.1.3.1 Rooms and areas of the ground floor

Guestroom

As already explained, changed the L-shaped guestroom into a longitudinal room.
The total width of the house is divided into the guestroom and the bedroom.
As a consequence shrinks the size of the guestroom from 30.90 to 24.50 m².

size of the guestroom								
			length		breadth		area	
1	ssond	014	6,85	m	3	m	20,55	m²
2	ssond	021	5,90	m	3,10	m	18,29	m²
3	ssond	032	8,00	m	3,40	m	27,20	m²
4	ssond	043	8,40	m	3,80	m	31,92	m²
			7,29	m	3,33	m	24,49	m²

list 29: room size of the guestroom

Another result of the new ground floor layout changed the access situation. The entrance door is still at the same position, but with the new wall in the middle of the house moved the entrance door next to the middle wall. The access into the guestroom is not in the middle of the room anymore, it is on one side of the guestroom. As a consequence is the room not splited into two areas divided through the pathway, it is one compact room with the pathway on the side of the new middle wall.
Another alteration happened with the lighting of the guestroom. In the front wall is only one window left, because the second window is positioned in the bedroom. To get enough light and fresh air into the guestroom are windows on the lateral wall built in. The windows are because of the new arose narrow walkway to the nourishment and sanitary area next to the residential area possible. Windows in the lateral wall are in 3of 4 houses existing.

Fig. 211: guestroom "ssond 043"

Bedroom

As a result of the changed ground floor arose another bedroom. All houses of this type have two to three bedrooms in the residential area. The size of the rooms grew to an average size of 9.35 m², which is 1.85 m² larger then before. The frontal bedroom has for the first time a window. The window is at the front wall located. As a result of the change evolved the small sleeping area into a proper room. If it was possible to put windows into

the lateral wall, the residents build them in. The bedrooms behind the first bedroom also have light and fresh air inside the room.

7.3.1.1.3.2 Function and interior of the rooms

Guestroom

The function of the guestroom has not changed after the development step. It is still the living room, guestroom, dining room of the resident and sleeping room for visitors or relatives.
The interior of the guestroom changed completely. The replacement of the traditional furniture is completed finished. In all the houses we visited, there was not a single *Batö* or *Tabolo Nulu* existing. As already mentioned, the new available modern furniture likes chairs, cupboard, chests and, tables are in use.

Fig. 212: guestroom "ssond 043"

A completely new development of the interior is in the house "ssond 032" detectable. In the guestrooms are couches and couch tables present and the furniture is comparable to a European living room.
Another change of the room is the appearance of the room. All guestrooms were plastered and sometimes painted. The older modern houses do not have plaster and paint on the walls. The inhabitants started also to tile the floors. This development happened also in a few houses in Hiliamaetaniha, where modifications of the substructure or *Tawolos* of the Modern houses were tiled. A completely new building project is to close up the roof. The ceiling is also plastered and painted.
The guestroom looks like a (for us Europeans) proper living room.

Fig. 213: living room "ssond 032"

Bedroom

With the advancement of the bedroom to a proper room emerged more functions the room has to accomplish. The main function is still the use as a sleeping room and as storage for the personal belongings. The newly is the use of the rooms to work, play and, study in it.
The rooms are also plastered and the floors are mostly tiled.

7.3.1.1.4 Additional private room behind the guestroom

The development to the additional room at the back of the residential area has two different access points.

7.3.1.1.4.1 New built and planed house with a private room at the back of the residential area

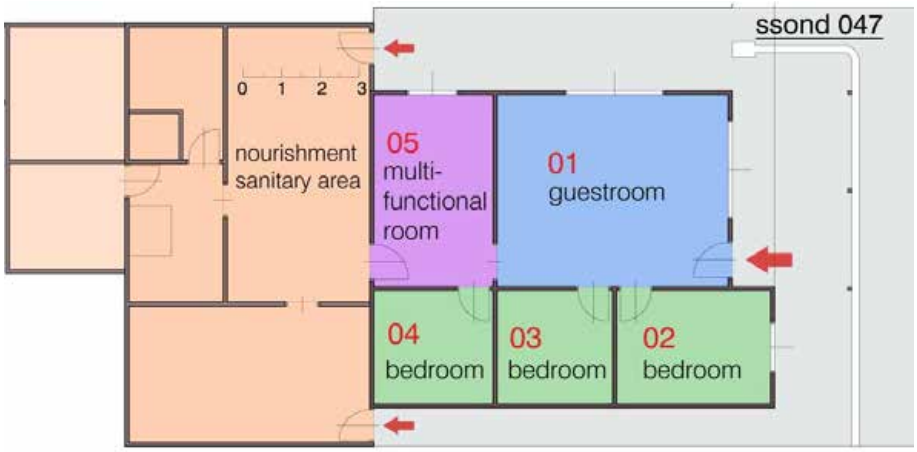


fig. 214: ground floor of houses of the fourth development step

This variety of the ground floor layout is in only one house in Sondregeasi existing. The house “ssond 047” was built 2000.
Behind the guestroom is another room positioned. It looks like; it was build as a private living room to have the possibility to retrieve them into a semi-private area.
Nowadays is the room used as storage and as a spare room to dry clothes.

7.3.1.1.4.2 Incurrence of the private room at the back of the house through the extension of the house.

The occupants of the oldest dwellings started to restored and extend their houses. The inhabitant built in most of the cases a new nourishment and sanitary area behind the house. A reason therefore is the needed space for a larger kitchen with a proper dining area, a new bathroom with a private water supply and if necessary another bedroom.
As a result of the new nourishment and sanitary area moved the kitchen to the new originated area and the remaining room in the residential area and changed to a multifunctional room behind the guestroom.

fig. 215: groundfloor of houses of development step D2

As mentioned consists the modern house of two areas, the residential and the nourishment and sanitary area. The nourishment and sanitary area is at the back of the residential area positioned.

This progress is already realized in three of ten surveyed houses.

“ssond 005”, “ssond 021”, “ssond 025”

The old fireplace is at the house “ssond 005” still viewable. Nowadays is a bed on this position standing.
In all the houses is a *Batö* built in. This room reminds me of the *Feröma* in the traditional house. It is a kind of a comeback. It is a private area at the back of the residential part, has a built in *Batö* and is a multifunctional room.
This room is used as storage and sleeping room for guests.
That kind of development is only possible at the older houses, because all new houses have already a proper nourishment and sanitary area.

fig. 216: multifunctional room “ssond 021”

7.3.2 Nourishment and sanitary area of the Modern House in Sondregeasi

The nourishment and sanitary area is as already mentioned located at the back of the residential area. The separation between these two areas is viewable and noticeable.

7.3.2.1 Development of the nourishment and sanitary area

7.3.2.1.1 Extended area used as a kitchen

The nourishment and sanitary area is an extension or additional building at the back of the residential area. This extension was at the beginning only used as a kitchen and an open fire place was part of the area. The fire place is similar to the traditional house constructed.
In this first step of development, there was not bathroom build in. The reason was the not existing private water supply. The inhabitant used the *Sumur Umum* (public bath and water supply) to collect water and do the personal care.

7.3.2.1.2 Proper nourishment and sanitary area

The nourishment and sanitary area is nowadays equivalent to the residential area. The average size of this area is 44.00 m². This is 45% of the total size of the house.

			residential area		nourishment sanitary area		total	
1	ssond	003	41,51	m²	55,33	m²	96,84	m²
2	ssond	005	47,68	m²	26,8	m²	74,48	m²
3	ssond	014	43,05	m²	50,24	m²	93,29	m²
4	ssond	021	59,67	m²	41,16	m²	100,83	m²
5	ssond	025	62,24	m²	34,05	m²	96,29	m²
6	ssond	032	57,17	m²	34,39	m²	91,56	m²
7	ssond	033	43,80	m²	34,17	m²	77,97	m²
8	ssond	041	64,06	m²	55,90	m²	119,96	m²
9	ssond	043	58,90	m²	34,64	m²	93,54	m²
10	ssond	047	75,29	m²	84,51	m²	159,80	m²
11	ssond	525	45,91	m²	32,76	m²	78,67	m²
			54,48	m²	44,00	m²	98,48	m²

list 30: size of the houses and the two areas

A new and important zone of this area is the sanitary area. With the private water supply on the own property arose a new room. In every nourishment and sanitary area in Sondregeasi, we surveyed, is a bathroom existing.

	water supply					
		water tank (rainwater)	well	Sumur Umum	area of tank	
1	ssond 003		1			m²
2	ssond 005		1		1,68	m²
3	ssond 014	1			1,88	m²
4	ssond 021		1		1,69	m²
5	ssond 025	1			2,93	m²
6	ssond 032	1	1		3,50	m²
7	ssond 033		1		2,28	m²
8	ssond 041			1		m²
9	ssond 043		1		3,50	m²
10	ssond 047		1		1,56	m²
11	ssond 525	1			5,73	m²
		4	7	1		

list 31: water supply of the houses in Sondregeasi

The nourishment and sanitary area is as the name said composed of two main functions. The first area is the kitchen and the second one the already mentioned bathroom.

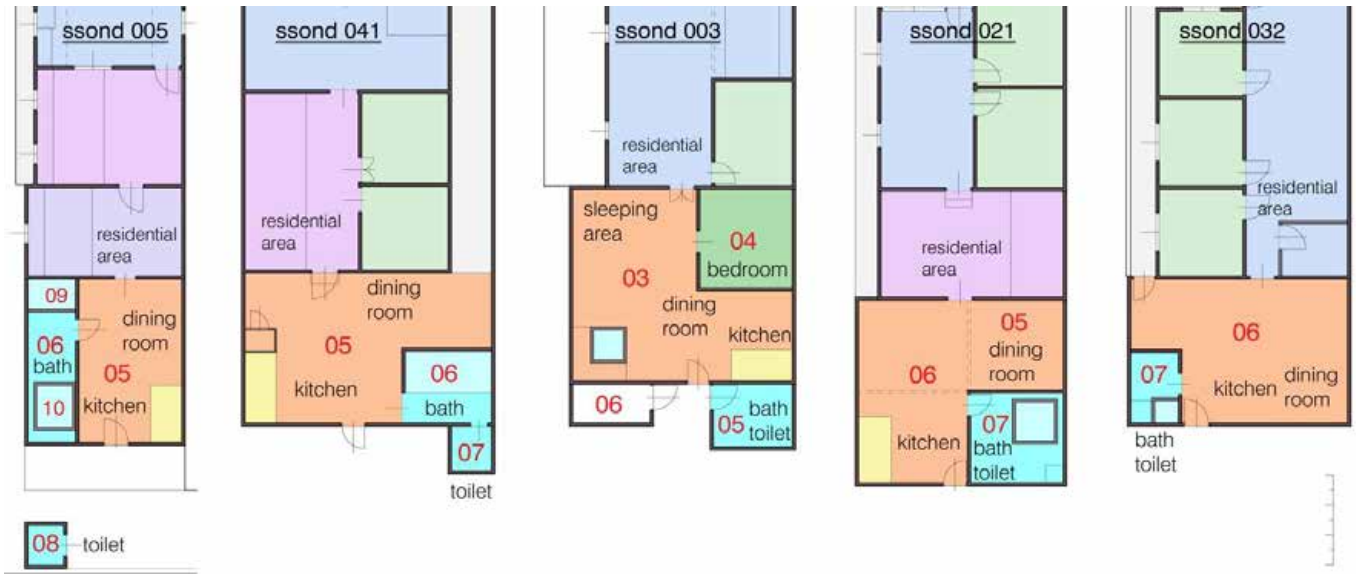


fig. 217: nourishment and sanitary area of the modern houses

7.3.2.2 Construction of the nourishment and sanitary area

This back part of the house is build with concrete and bricks. The first built extensions did not have the real forced concrete frame and is endangered against earthquakes. All nourishment and sanitary areas of the houses, which are built after the earthquake 2005, have the very important concrete frames build in.
The walls are in difference to the residential area mostly not plasters.

fig. 218: nourishment and sanitary area "ssond 025"

Only the last build houses are also at the back plastered and as in the house "ssond 032" viewable on the floor tiled.

fig. 219: nourishment area "ssond 032"

7.3.2.3 Arrangment of the nourishment and sanitary area

As already explained is the nourishment and sanitary area composed of two main functions.

7.3.2.3.1 Nourishment section

This section is the largest area and is located at the back of the house. The nourishment section consists of two main functions, the food preparation and the intake of food.

Food preparation

The open fire is comparable to the traditional house the most common way of cooking. In 9 out of then 10 houses is a traditional open fire place built in. It is still located at the back wall of the house and has the same layout as explained at the extension of the traditional house.
The kerosene cooker is in 50% of the houses part of the kitchen and next to the open fire the second way to cook. If the kerosene cooker will replace the open fire place is not clear. The open fire place is one of the last traditional elements in the extension of the modern house.

fig. 220: open fire place "ssond 005"

Dinning area

The function of the dinning room was in the past located in the *Feröma* and *Tawolo*. As a result of the proper extension moved the function into the extension next to the fire place. The dining room was defined by a wooden table with benches. The next step of the development was the new accrued dinning area at the nourishment area of the modern house.

This separate area is identifiable through the wooden table and the benches. Not in a single survey houses was a chair instead of the bench findable.
A cupboard to store the dishes is sometimes part of the furniture in the dining room.

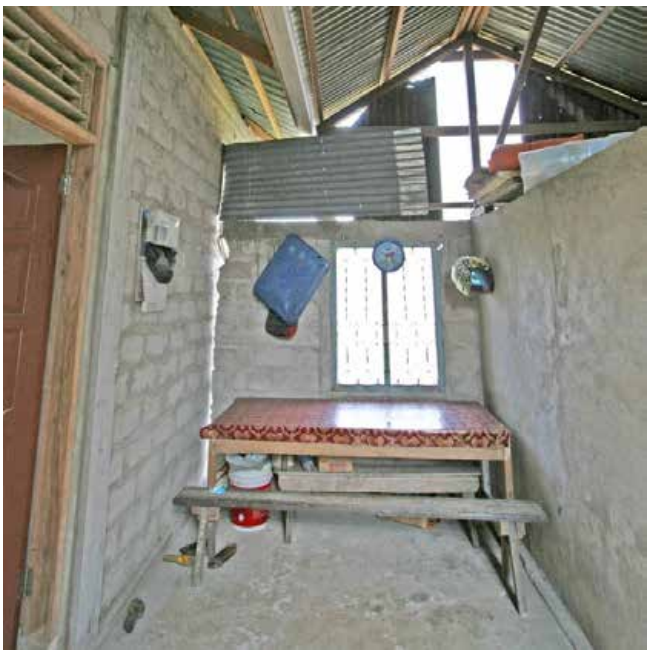


fig. 221: dinning area "ssond 043"

7.3.2.3.2 Sanitary section

The most important item for the sanitary section is the water. As already mentioned has nearly every house his own water supply. The sanitary section is located next to the water tank or the well.

Bathroom

The bathroom is located at the back of the house. It is a poper room with walls made of bricks.
The kitchen and the bath are next to each other located at the back of the house. In a few houses is the bathroom a separate small extended room behind the house.
The bathroom is normally tiled. A reason is the hygiene and to show the wealth of the family. In the bathroom exists a *Mandi*, like in the traditional house.

fig. 222: bathroom "ssond 021"

Toilet

The toilet is in nearly every bathroom integrated. The type of toilet is comparable with the toilet of the traditional house. It is a standing toilet and is normally tiled.
In a few houses, like "ssond 005" and "ssond 043", is the toilet a separate small cabin behind the house. This variation is also at the modern house in Hiliamaetaniha existing.

7.3.2.3.3 Bedroom

If the residential area of the modern house is too small to integrate another bedroom, the resident separated a bedroom in the nourishment and sanitary area. Viewable is it in the house "ssond 003". The size and layout is comparable to the bedrooms of the residential area.

	tawolo	feröma	kitchen	kitchen	dining room	bedroom	bedroom	storage	storage	garage	water	water	bath	bath	toilet	machine room	toilet	fireplace	sty
ssond 003			3		3	3	4	3			3		5		5	6			
ssond 005		4	5		5	4		4	5		10	9	6				8		
ssond 014	4	7	7		7	4	5	7			8		8		8				
ssond 021			5	6	5			5	6		7		7		7				
ssond 025			5	6				5	6		8		7		7				
ssond 032			6		6						7		7		7			X	
ssond 033			5		4	4		4			7		6		6				
ssond 041			5		5			5	8	8	6		6		7				
ssond 043			5		5			5			8		6		7				X
ssond 047			7		6			6	8		9		9	10	9				X
ssond 525			4		4			4			6		5		5				
11	1	2	11	2	10	4	2	10	5	1	11	1	11	1	10	1	1	1	2

list 32: room function of the nourishment and sanitary area of the modern house in Sondregeasi.

7.4 Development of the roof form

fig. 223: development of the roof form

The roof form of the modern house accomplished in the last years also a transition.
The basic roof form of the modern house is similar to the roof form of the traditional house or the modern house in Hiliamaetaniha.
The traditional roof form is a double-pitched roof. The gable is parallel to the street or front facade or with other words normal to the main axis of the house. The roof surface is kinked into a flatter front part and a steep part at the gable.
In 2000 built the owner of the house “ssond 047” firstly a new roof shape on top of his house. The new roof is a hipped roof. The axis of the roof rotated and is identical with the main axis of the house. One reason to build a hipped house is the view of the elevation of the houses. The hipped roof looks like the traditional shape of the roof. This form is also viewable by the house “ssond 032”.

After the earthquake and tsunami 2005 a few houses in Sondregeasi were build from the NGO organisation LPAM. The standardised roof form was a double-pitched roof with the axis parallel to the house main axis.
This roof form changed the layout of the village.
A few inhabitant of Sondregeasi takes the new roof shape over and used it to cover their house.
One example is the house “ssond 043”. It is one of the youngest buildings and built 2011.
The reason of the rotation of the roof is in my opinion, the easier way to build the roof. It is possible to pre-produce the rafter. The roof form is also easier to construct. The small pathway between the houses makes it also possible to build the rotated roof. The eaves cover the pathway and with the eaves gutter is it possible to collect the rain water.
If the new roof form will became the new standard form is not foreseeable, but it´s possible.

8. Closing words

The progess of the architecture in South-Nias will go on. The further development is very important and neccecary for the people.
To obtain the traditional architecture in form of the village and the different types of houses is also very important for the inhabitants, to retain their social lifestyle in the community. This solidarity and cooperation inside the village is a valuable atribute.
To see and live in this unique architecture and community was a unbelivable experience for me.
Hopefully, the inhabitant of the Hiliamaetaniha and Sondregeasi are able to connect the improvement and the preservation of the tradition.
This really encredible architecture has to be obtained!

In eigener Sache:

Ich möchte mich auf diesen Weg herzlich bei meiner Familie, speziell meinen Eltern bedanken, die mir dieses Studium ermöglicht haben!
Weiters gibt es ein paar Personen, ohne die ich dieses Studium nie abgeschlossen hätte – Danke, dass Ihr mich motiviert habt (auch wenn es manchmal mit Sicherheit mühsam was) und nicht aufgegeben habt.
Bezüglich dieser Arbeit muss ich aber meiner Verlobten das größte Dankeschön aussprechen!
Sie hat mir die Zeit, Ruhe und Motivation gegeben diese Arbeit zu Papier zu bringen.

references of the figures						
title of the figure		picture and drawing				overwork
		left	middle	middle	right	
fig. 01	logo ASSIP	www.assip.org				
fig. 02	team (left-right): Bente Wolff, Julian Breuling, Andreas Aahs, Erich Lehner, Ulrike Herbig	Erich Lehner				Andreas Aahs
fig. 03	elevation “shiae 099”	Dwi Eva Ade Lestari				Andreas Aahs
fig. 04	sketch of the groundfloor “shiae 099”	Andreas Aahs				Andreas Aahs
fig. 05	drawing resulting form the sketch	Andreas Aahs				Andreas Aahs
fig. 06	map of the Republic of Indonesia	www.wikimedia.org				Andreas Aahs
fig. 07	map of Nias	http://de.wikipedia.org/w/index.php?title=Datei:Nias_Indonesien.png&filetimestamp=20050115095413&		http://en.wikipedia.org/wiki/File:Nias_Topography.png		Andreas Aahs
fig. 08	map of South-Nias	www.openstreetmap.org				Andreas Aahs
fig. 09	Topography of Hiliamaetaniha and Sondregeasi	www.openstreetmap.org				Andreas Aahs
fig. 10	pictures of the village Hiliamaetaniha	Alain Viaro	Alain Viaro		Andreas Aahs	Andreas Aahs
fig. 11	overview map of Hiliamaetaniha	Andreas Aahs				Andreas Aahs
fig. 12	village of Bawömataluo	Erich Lehner				Andreas Aahs
fig. 13	access to the traditional villages: (left-right) Onohondrö, Bawomataluo, Hiliamaetaniha	Dwi Eva Ade Lestari	Dwi Eva Ade Lestari	Erich Lehner	Andreas Aahs	Andreas Aahs
fig. 14	first extension of Hiliamaetaniha	Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia				Andreas Aahs
fig. 15	overview plan of Sondregeasi	Andreas Aahs				Andreas Aahs
fig. 16	village of Sondregeasi	Dwi Eva Ade Lestari				Andreas Aahs
fig. 17	site plan of Hiliamaetaniha	Andreas Aahs				Andreas Aahs
fig. 18	section of Hiliamaetaniha	Andreas Aahs				Andreas Aahs
fig. 19	village of Hiliamaetaniha	Erich Lehner				Andreas Aahs
fig. 20	section of Hiliamaetaniha – position of the Iri Newali	Andreas Aahs				Andreas Aahs
fig. 21	Iri Newali - left: Hiliamaetaniha, right: Bawögosali	Dwi Eva Ade Lestari			Dwi Eva Ade Lestari	Andreas Aahs
fig. 22	section of Hiliamaetaniha – position of the Halaman	Andreas Aahs				Andreas Aahs
fig. 23	possibilities to dry the clothes – (left-right) Hiliamaetaniha, Hilisimuetana, Hilinawalefau	Andreas Aahs	Erich Lehner		Erich Lehner	Andreas Aahs

title of the figure		picture and drawing				overwork
		left	middle	middle	right	
fig. 24	example of drying things	Erich Lehner	Andreas Aahs		Andreas Aahs	Andreas Aahs
fig. 25	playing kid	Andreas Aahs				Andreas Aahs
fig. 26	wedding in South-Nias: wedding community in Hiliamaetaniha, wedding location in Bawögosali	Dwi Eva Ade Lestari	Dwi Eva Ade Lestari			Andreas Aahs
fig. 27	slaughter of a pig in Hiliamaetaniha	Dwi Eva Ade Lestari				Andreas Aahs
fig. 28	megaliths in Hiliamaetaniha and Bawömataluo	Dwi Eva Ade Lestari	Andreas Aahs	Andreas Aahs	Erich Lehner	Andreas Aahs
fig. 29	section of Hiliamaetaniha – position of the Öli Batu	Andreas Aahs				Andreas Aahs
fig. 30	Mbelembele nowadays and in the past: Bawögosali 2012 – Fondregeossi 1887	Andreas Aahs		Joachim Freiherr von Brenner-Felsach (page 97)		Andreas Aahs
fig. 31	Mbelembele in Hiliamaetaniha	Dwi Eva Ade Lestari				Andreas Aahs
fig. 32	section of Hiliamaetaniha – from Public to Private	Andreas Aahs				Andreas Aahs
fig. 33	Sumur Ummum in Hiliamaetaniha	Erich Lehner	Julian Breuling		Julian Breuling	Andreas Aahs
fig. 34	public central watertank in Bawomataluo (left), water supply with public water taps in Bawogosali (right)	Erich Lehner			Andreas Aahs	Andreas Aahs
fig. 35	Bale in Hiliamaetaniha (left), Bawomataluo (right-up) and Sondregeasi (right-down)	Andreas Aahs		top-right: Andreas Aahs	right-down: Ulrike Herbig	Andreas Aahs
fig. 36	Gorahua Newali in Hiliamaetaniha 1980	Alain Viaro				Andreas Aahs
fig. 37	fig. 36: Omo Sebua in Bawomataluo (left) and Hiliamaetaniha (right)	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 38	Warung in Orahili	Andreas Aahs				Andreas Aahs
fig. 39	Mbelembele in Hiliamaetaniha	Dwi Eva Ade Lestari				Andreas Aahs
fig. 40	site plan of Hiliamaetaniha	Andreas Aahs				Andreas Aahs
fig. 41	overview plan Sondregeasi	Andreas Aahs				Andreas Aahs
fig. 42	foundation of Sondregeasi	top-left: Alain Viaro	top-right: Alain Viaro		down: Andreas Aahs	Andreas Aahs
fig. 43	section Hiliamaetaniha – layout of the village	Andreas Aahs				Andreas Aahs
fig. 44	key of fig. 44	Andreas Aahs				Andreas Aahs
fig. 45	development of the village layout in Sondregeasi	Andreas Aahs				Andreas Aahs
fig. 46	section of Sondregeasi – position of the Iri Newali	Andreas Aahs				Andreas Aahs
fig. 47	partition of the village layout through the Elea	Andreas Aahs				Andreas Aahs
fig. 48	section of Sondregeasi – position of the Halaman	Andreas Aahs				Andreas Aahs
fig. 49	example of Halaman in Sondregeasi	Dwi Eva Ade Lestari			Dwi Eva Ade Lestari	Andreas Aahs

title of the figure		picture and drawing				overwork
		left	middle	middle	right	
fig. 50	usage of the Halaman	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 51	Megaliths in Sondregeasi	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 52	section of Sondregeasi – position of the Mbelembele	Andreas Aahs				Andreas Aahs
fig. 53	examples of different Mbelembeles in Sondregeasi: ssond 041 (left), ssond 006 (middle), ssond 045 (right)	Andreas Aahs	Ulrike Herbig		Andreas Aahs	Andreas Aahs
fig. 54	site plan of Sondregeasi	Andreas Aahs				Andreas Aahs
fig. 55	section of Sondregeasi – from Public to Private	Andreas Aahs				Andreas Aahs
fig. 56	aerial image of Sondregeasi with public houses	www.bing.org				Andreas Aahs
fig. 57	site plan of Sondregeasi	Andreas Aahs				Andreas Aahs
fig. 58	model of Nias houses from the Museum Pusaka Nias	Andreas Aahs	Andreas Aahs		Andreas Aahs	Andreas Aahs
fig. 59	Elevation of Hiliamaetaniha and Sondregeasi	top: Ulrike Herbig			down: Ulrike Herbig	Andreas Aahs
fig. 60	Overview of the traditional village Hiliamaetaniha	Erich Lehner				Andreas Aahs
fig. 61	traditional house types: “shiae028”: Traditional Standard House; “shiae 099”: Traditional Standard House build on short pillars; “shiae 115”: Traditional House build on short pillars	Ulrike Herbig	Ulrike Herbig		Ulrike Herbig	Andreas Aahs
fig. 62	Traditional Standard House “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 63	Sketch of a South-Nias village from the 27.01.1904	Im "Land der Menschen" - Der Missionar und Maler Eduard Fries und die Insel Nias; p. 28				Andreas Aahs
fig. 64	Image of Hiliamaetaniha	Andreas Aahs				Andreas Aahs
fig. 65	Tripartite of the traditional buildings	Erich Lehner; Towards a Decumentation Project on Javanese Candis; fig. 13			Andreas Aahs	Andreas Aahs
fig. 66	Wall of the Tawolo of the house “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 67	Layout of the traditional village Hiliamaetaniha	Andreas Aahs				Andreas Aahs
fig. 68	carpenter in operation on the Omo Sebua “shiae 095”; wooden conection	Julian Breuling			Ferenc Zamolyi	Andreas Aahs
fig. 69	different types of construction wood	Ferenc Zamolyi				Andreas Aahs
fig. 70	different types of roof covering	Ulrike Herbig				Andreas Aahs
fig. 71	substructure of the TSH “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 72	consequence of the earthquake 2005 at the house “ntumo 561”	top: Andreas Aahs			down: Andreas Aahs	Andreas Aahs
fig. 73	consequence of the earthquake 2005 at the house “ntumo 572”	Andreas Aahs				Andreas Aahs
fig. 74	Substructure of two traditional houses in Bawögosali	Andreas Aahs			Andreas Aahs	Andreas Aahs

title of the figure		picture and drawing				overwork
		left	middle	middle	right	
fig. 75	Substructure of the Omo Sebua in Bawomataluo	Andreas Aahs				Andreas Aahs
fig. 76	Access to the extension – Modification of the traditional standard house	Dwi Eva Ade Lestari			Dwi Eva Ade Lestari	Andreas Aahs
fig. 77	Living Area of the TSH “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 78	Access and route guidance at the TSH	Andreas Aahs				Andreas Aahs
fig. 79	Front facade of the Omo Sebua “shiae 095”	Andreas Aahs				Andreas Aahs
fig. 80	Feröma and Tawolo of the traditional house “shiae 080”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 81	fig. 78: roof area of the traditional house “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 82	dimension of the roof “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 83	Drying cloths on the roof of the TSH	Erich Lehner			Erich Lehner	Andreas Aahs
fig. 84	roof construction of the Omo Sebua “shiae 095”	Erich Lehner				Andreas Aahs
fig. 85	roof covering elements	Erich Lehner			Andreas Aahs	Andreas Aahs
fig. 86	sago palm leave covering – corrugated iron covering of the	Ulrike Herbig				Andreas Aahs
fig. 87	default equal roof covering in Bawogosali	Erich Lehner				Andreas Aahs
fig. 88	prepared ceiling in “shiae 080” – built ceiling in “shiae 099”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 89	still existing archetype of the TSH in Lahusa (discovered by Ulrike Herbig at the research 2013)	Ulrike Herbig				Andreas Aahs
fig. 90	comparison of the archetype TSH and the TSH	Alain Viaro: Nias traditional houses; Fig. 9a; p. 200			Andreas Aahs	Andreas Aahs
fig. 91	Feröma of the Omo Sebua of the village Bawömataluo	Erich Lehner				Andreas Aahs
fig. 92	Room-setup of the TSH “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 93	Batö shown at the TSH “shiae 080”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 94	wooden bord of the Batö from the Tawolo of the Omo Sebua from Bawämataluo	Andreas Aahs				Andreas Aahs
fig. 95	weaving woman sitting on the Batö	Alain Viaro (1980)			Alain Viaro (1982)	Andreas Aahs
fig. 96	Farakhina shown at the TSH “shiae 080”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 97	Salogötö shown at the TSH “shiae 080”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 98	Zarazara shown at the TSH “shiae 080”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 99	Harefa shown at the TSH “shiae 080”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 100	modern furniture in the Tawolo “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 101	business (“shiae 026”) – Warung (“shiae 536”) in the Tawolo of the TSH	Andreas Aahs			Andreas Aahs	Andreas Aahs

title of the figure		picture and drawing				overwork
		left	middle	middle	right	
fig. 102	Batö in the Feröma of the TSH (“shiae 027”; “shiae 026”)	Dwi Eva Ade Lestari			Andreas Aahs	Andreas Aahs
fig. 103	Tabolo Nulu at the Feröma of the TSH “shiae 021”	Dwi Eva Ade Lestari				Andreas Aahs
fig. 104	Feröma of the TSH “shiae 027”	Andreas Aahs				Andreas Aahs
fig. 105	Kolukolu of the TSH “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 106	public to private area of the TSH “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 107	Traditional House build on short pillar “shiae 124”	Andreas Aahs				Andreas Aahs
fig. 108	position of the TH-SP in Hiliamaetaniha	Andreas Aahs				Andreas Aahs
fig. 109	Elevation of the TH-SP (“shiae 124”, “shiae 125”)	Ulrike Herbig				Andreas Aahs
fig. 110	Tripartite of the TH-SP and TSH	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 111	substructure of the TH-SP “shiae 124"	Andreas Aahs				Andreas Aahs
fig. 112	living area of the TH-SP “shiae 124”	Andreas Aahs				Andreas Aahs
fig. 113	elevation of the TH-SP	Ulrike Herbig	Ulrike Herbig	Ulrike Herbig	Ulrike Herbig	Andreas Aahs
fig. 114	roof area of the TH-SP “shiae 124”	Andreas Aahs				Andreas Aahs
fig. 115	dimension of the roof “shiae 124”	Andreas Aahs				Andreas Aahs
fig. 116	room setup of the TH-SP “shiae 124”	Andreas Aahs				Andreas Aahs
fig. 117	Tawolo of the TH-SP “shiae 124”	Andreas Aahs				Andreas Aahs
fig. 118	Warung and living room - “shiae 124”	Andreas Aahs				Andreas Aahs
fig. 119	Feröma of the TH-SP “shiae 536”	Andreas Aahs				Andreas Aahs
fig. 120	Feröma of the TH-SP “shiae 124”	Andreas Aahs				Andreas Aahs
fig. 121	roof top window of the house “shiae 123”	Dwi Eva Ade Lestari				Andreas Aahs
fig. 122	Kolukolu of the TH-SP “shiae 124”	Andreas Aahs				Andreas Aahs
fig. 123	public to private area of the TH-SP “shiae 124”	Andreas Aahs				Andreas Aahs
fig. 124	animation of the TSH-SP “shiae 099”	Andreas Aahs				Andreas Aahs
fig. 125	substructure of the TSH-SP “shiae 099”	Andreas Aahs				Andreas Aahs
fig. 126	living and roof area of the TSH-SP “shiae 099”	Andreas Aahs				Andreas Aahs
fig. 127	elevation with the different blocks	Ulrike Herbig	Ulrike Herbig	Ulrike Herbig	Ulrike Herbig	Andreas Aahs
fig. 128	Traditional Standard House build on short pillars “shiae 099”	Andreas Aahs				Andreas Aahs
fig. 129	Extension of the TSH “shiae 026”	Andreas Aahs				Andreas Aahs
fig. 130	inside of the extension of the TSH “shiae 026”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 131	extension of the house “shiae 124”	Andreas Aahs				Andreas Aahs

title of the figure		picture and drawing				overwork
		left	middle	middle	right	
fig. 132	extension and backyard of the house “shiae 027”	Andreas Aahs				Andreas Aahs
fig. 133	room layout and function of the extension “shiae 123”	Andreas Aahs				Andreas Aahs
fig. 134	extension of the extension “shiae 099”	Andreas Aahs				Andreas Aahs
fig. 135	extension shown of the aerial view of Hiliamaetaniha	ASSIP				Andreas Aahs
fig. 136	seperate bedroom in the extension	Andreas Aahs				Andreas Aahs
fig. 137	multifunctional room of the extension of the TSH “shiae 042”	Andreas Aahs				Andreas Aahs
fig. 138	kitchen of the extension of the TSH “shiae 022”	Andreas Aahs				Andreas Aahs
fig. 139	open fire place “shiae 022”	Andreas Aahs				Andreas Aahs
fig. 140	two seperate kitchens “shiae 102”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 141	dining room of the extension ”shiae 099” and “shiae 042”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 142	bathroom and toilet ”shiae 022”	Andreas Aahs				Andreas Aahs
fig. 143	bathroom and watertank ”shiae 102”	Andreas Aahs	Andreas Aahs		Andreas Aahs	Andreas Aahs
fig. 144	options of the position of the bathroom	Andreas Aahs	Andreas Aahs		Andreas Aahs	Andreas Aahs
fig. 145	additional extensions of the traditional houses	Andreas Aahs				Andreas Aahs
fig. 146	new build larger extension of the traditional house	Andreas Aahs				Andreas Aahs
fig. 147	double-storied extension	Andreas Aahs				Andreas Aahs
fig. 148	roof covering material of the extensions	ASSIP				Andreas Aahs
fig. 149	plattform on top of the extension used as a storage “shiae 026” and as a sleeping place “shiae 080”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 150	roof top window of the extension “shiae 123”	Dwi Eva Ade Lestari				Andreas Aahs
fig. 151	plastered and painted wall “shiae 042” and bricked wall “shiae 111”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 152	colours of the walls “shiae 022”-“shiae 042”-“shiae 094”	Andreas Aahs	Dwi Eva Ade Lestari		Andreas Aahs	Andreas Aahs
fig. 153	fig. 150: tiled floor “shiae 042” and plain floor “shiae 111”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 154	concrete frame “shiae 043”	Andreas Aahs				Andreas Aahs
fig. 155	fig. 152: modification of the TSH “shiae 027”	Andreas Aahs				Andreas Aahs
fig. 156	storage boxes in front of the substructure; without any changes of the substructure – in Hiliamaetaniha	Alain Viaro			Alain Viaro	Andreas Aahs
fig. 157	TSH “shiae 091”without the modification of the substructure	Julian Breuling			Julian Breuling	Andreas Aahs
fig. 158	modification and extension of the TSH “shiae 022”	Andreas Aahs				Andreas Aahs
fig. 159	elevation of TSH with build modifications of the substructure	Ulrike Herbig	Ulrike Herbig		Ulrike Herbig	Andreas Aahs

title of the figure		picture and drawing				overwork
		left	middle	middle	right	
fig. 160	planned extension of the Omo Sebua “shiae 095”	Andreas Aahs				Andreas Aahs
fig. 161	layout of the modification and position of the bench	Andreas Aahs				Andreas Aahs
fig. 162	guestroom with the bench in the modification “shiae 080”, “shiae 021”	Andreas Aahs			Dwi Eva Ade Lestari	Andreas Aahs
fig. 163	location and access to the bedrom of the modification	Andreas Aahs				Andreas Aahs
fig. 164	bedroom in the modification “shiae 021”, “shiae 022”	Dwi Eva Ade Lestari			Andreas Aahs	Andreas Aahs
fig. 165	traditional – new access to the TSH	Andreas Aahs				Andreas Aahs
fig. 166	connection between the Mbelembele and the modification	Andreas Aahs				Andreas Aahs
fig. 167	construction of the modification “shiae 043”	Andreas Aahs				Andreas Aahs
fig. 168	pillar to secure the construction “shiae 102”	Dwi Eva Ade Lestari				Andreas Aahs
fig. 169	comparison traditional and modern house in Hiliamaetaniha	Ulrike Herbig	Ulrike Herbig	Ulrike Herbig	Ulrike Herbig	Andreas Aahs
fig. 170	comparison extended village of Hiliamaetaniha 1986-2012	Alain Viaro			Andreas Aahs	Andreas Aahs
fig. 171	position of the different types of MH in Hiliamaetaniha	Andreas Aahs				Andreas Aahs
fig. 172	modern house between two TSH in the traditional part of Hiliamaetaniha	Ulrike Herbig	Ulrike Herbig		Ulrike Herbig	Andreas Aahs
fig. 173	building material and the combinations to build a MH	Ulrike Herbig	Ulrike Herbig	Ulrike Herbig	Ulrike Herbig	Andreas Aahs
fig. 174	construction of the MH “shiae 516”, “shiae 506”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 175	construction with concrete frame of the MH “shiae 506”	Andreas Aahs				Andreas Aahs
fig. 176	adjustment of the tarrain at the MH “shiae 070”	Andreas Aahs				Andreas Aahs
fig. 177	roof dimension of the MH “shiae 516”	Andreas Aahs				Andreas Aahs
fig. 178	building phases of the MH	Andreas Aahs				Andreas Aahs
fig. 179	segmentation of the MH and the TSH	Andreas Aahs				Andreas Aahs
fig. 180	segmentation of the MH	Andreas Aahs				Andreas Aahs
fig. 181	guestroom of the MH “shiae 516”	Andreas Aahs				Andreas Aahs
fig. 182	guestroom of the MH “shiae 516”, “shiae 506”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 183	Feröma of the MH “shiae 516”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 184	Feröma-multifunctional room ”shiae 070”	Andreas Aahs				Andreas Aahs
fig. 185	comparison of the MH ”shiae 506” and the modification of the TSH “shiae 027”	Andreas Aahs				Andreas Aahs
fig. 186	window in the front facade “shiae 516” and roof top window in the Feröma “shiae 516”	Andreas Aahs			Andreas Aahs	Andreas Aahs

title of the figure		picture and drawing				overwork
		left	middle	middle	right	
fig. 187	bedroom of the MH “shiae 509”	Andreas Aahs				Andreas Aahs
fig. 188	development of the residential part of the houses	Andreas Aahs				Andreas Aahs
fig. 189	comparison of the nourishment and sanitary area of the MH to the extension of the TH	Andreas Aahs				Andreas Aahs
fig. 190	temporary construction of the kitchen “shiae 506”	Andreas Aahs				Andreas Aahs
fig. 191	kitchen and dining room “shiae 516”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 192	bathroom and toilet seperated in the backyard “shiae 509”	Andreas Aahs				Andreas Aahs
fig. 193	toilet in the backyard “shiae 516”	Andreas Aahs				Andreas Aahs
fig. 194	arrangement of Sondregeasi	www.bing.org				Andreas Aahs
fig. 195	example of double-storied houses ("ssond 039", "ssond 038")	Ulrike Herbig			Ulrike Herbig	Andreas Aahs
fig. 196	example of a house builds with concrete and bricks ("ssond 041", "ssond 040")	Ulrike Herbig			Ulrike Herbig	Andreas Aahs
fig. 197	dwelling made of concrete/brick and wood ("ssond 023")	Ulrike Herbig				Andreas Aahs
fig. 198	dwelling made of wood ("ssond 525")	Andreas Aahs				Andreas Aahs
fig. 199	coated ("ssond 008") and normal ("ssond 009") corrugated iron covering	Ulrike Herbig			Ulrike Herbig	Andreas Aahs
fig. 200	traditional ("ssond 042") and rotated ("ssond 043") roof form	Ulrike Herbig			Ulrike Herbig	Andreas Aahs
fig. 201	residential area – nourishment sanitary area - backyard of the modern houses	Andreas Aahs				Andreas Aahs
fig. 202	access to the nourishment and sanitary are between the	Ulrike Herbig		Andreas Aahs	Andreas Aahs	Andreas Aahs
fig. 203	ground floor of houses of the first development step	Andreas Aahs				Andreas Aahs
fig. 204	Tawolo “ssond 041”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 205	Feröma “ssond 041”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 206	ground floor of houses of the second development step	Andreas Aahs				Andreas Aahs
fig. 207	guestroom “ssond 003”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 208	ground floor of houses of the third development step	Andreas Aahs				Andreas Aahs
fig. 209	step back of the front facade	Ulrike Herbig			Ulrike Herbig	Andreas Aahs
fig. 210	example of LPAM houses in Sondregeasi	mia mechler: das fremde haus page 91				Andreas Aahs
fig. 211	guestroom “ssond 043”	Dwi Eva Ade Lestari				Andreas Aahs
fig. 212	guestroom “ssond 043”	Dwi Eva Ade Lestari				Andreas Aahs
fig. 213	living room “ssond 032”	Dwi Eva Ade Lestari			Dwi Eva Ade Lestari	Andreas Aahs

title of the figure		picture and drawing				overwork
		left	middle	middle	right	
fig. 214	ground floor of houses of development step D1	Andreas Aahs				Andreas Aahs
fig. 215	groundfloor of houses of development step D2	Andreas Aahs				Andreas Aahs
fig. 216	multifunctional room “ssond 021”	Andreas Aahs			Andreas Aahs	Andreas Aahs
fig. 217	nourishment and sanitary area of the modern houses	Andreas Aahs				Andreas Aahs
fig. 218	nourishment and sanitary area “ssond 025”	Andreas Aahs				Andreas Aahs
fig. 219	nourishment area “ssond 032”	Andreas Aahs				Andreas Aahs
fig. 220	open fire place “ssond 005”	Dwi Eva Ade Lestari				Andreas Aahs
fig. 221	dinning area ”ssond 043”	Andreas Aahs				Andreas Aahs
fig. 222	bathroom ”ssond 021”	Andreas Aahs				Andreas Aahs
fig. 223	development of the roof form	Ulrike Herbig	Ulrike Herbig	Ulrike Herbig	Ulrike Herbig	Andreas Aahs

reference of the lists			
		title	autor
list	01	timeschedule fieldwork 2012	Andreas Aahs
list	02	list of buildings in Hiliamaetaniha	Andreas Aahs
list	03	ancestry of the house owner	Andreas Aahs
list	04	water supply in Sondregeasi	Andreas Aahs
list	05	list of buildings in Sondregeasi	Andreas Aahs
list	06	room size of the Tawolo of the TSH	Andreas Aahs
list	07	function of the Tawolo of the TSH	Andreas Aahs
list	08	room size of the Feröma of the TSH	Andreas Aahs
list	09	function of the Feröma of the TSH	Andreas Aahs
list	10	building date of the TH-SP	Andreas Aahs
list	11	function of the Tawolo of the TH-SP	Andreas Aahs
list	12	function of the Feröma of the TH-SP	Andreas Aahs
list	13	resident of the house “shiae 070”	Andreas Aahs
list	14	room function of the extension of the traditional houses	Andreas Aahs
list	15	water supply of the houses in Hiliamaetaniha	Andreas Aahs
list	16	size and position of the bathroom	Andreas Aahs
list	17	function of the modification of the TSH	Andreas Aahs
list	18	resident of the house “shiae 070”	Andreas Aahs
list	19	cost of the modern houses and the income of the family	Andreas Aahs
list	20	wall and floors of the MH	Andreas Aahs
list	21	room size of the guestroom of the MH	Andreas Aahs
list	22	function of the guestroom of the MH	Andreas Aahs
list	23	function of the multifunctional room of the MH	Andreas Aahs
list	24	list 24: function of the bedroom of the MH	Andreas Aahs
list	25	function of the nourishment and saniary area of the MH	Andreas Aahs
list	26	water supply of the MH	Andreas Aahs
list	27	room function of the residential area	Andreas Aahs
list	28	room function of the residential area	Andreas Aahs
list	29	room size of the guestroom	Andreas Aahs
list	30	size of the houses and the two areas	Andreas Aahs
list	31	water supply of the houses in Sondregeasi	Andreas Aahs
list	32	room function of the nourishment and sanitary area of the modern house in Sondregeasi.	Andreas Aahs

Bibliography

Jerome Allen FELDMANN; The Architecture of Nias, Indonesia with special reference to Bawomataluo village; Columbia University, Ph.D., 1977, Architecture

Petra GRUBER, Ulrike HERBIG; Settlements and housing on Nias Island, Adaptation and Development

Johannes Maria HÄMMERLE; Nias – eine eigene Welt - Sagen, Mythen, Überlieferungen; Herausgeber: Anthropos Institut e.V., Arnold-Janssen-Straße 20, 53754 Sankt Augustin, Germany; Academia Verlag; 1999

Martin HUMBURG, Dominik BONATZ und Claus VELTMANN; Im "Land der Menschen" – Der Missionar und Maler Eduard Fries und die Insel Nias; Verlag für Regionalgeschichte Bielefeld 2003

Mia MECHLER; Das Fremde Haus, Die Rolle der Architektur in der Planung und Realisierung einiger Wohnbauprojekte der nationalen und internationalen Hilfsorganisationen auf Nias; Technische Universität Wien, Architektur, 2010

Reinhold MITTERSAKSCHMÖLLER (Hg.); Joachim Freiherr von BRENNER-FELSACHER: Eine Reise nach Nias – Die Indonesienexpedition 1887; Böhlau Verlag Wien-Köln-Weimar 1998

Pietro SCARDUELLI; Accumulation of heads, distribution of foot; The image of power in Nias; In: Bijdragen tot de Taal-, Land- en Vorkenkunde 146 (1990), no: 4, Leiden, 448-462

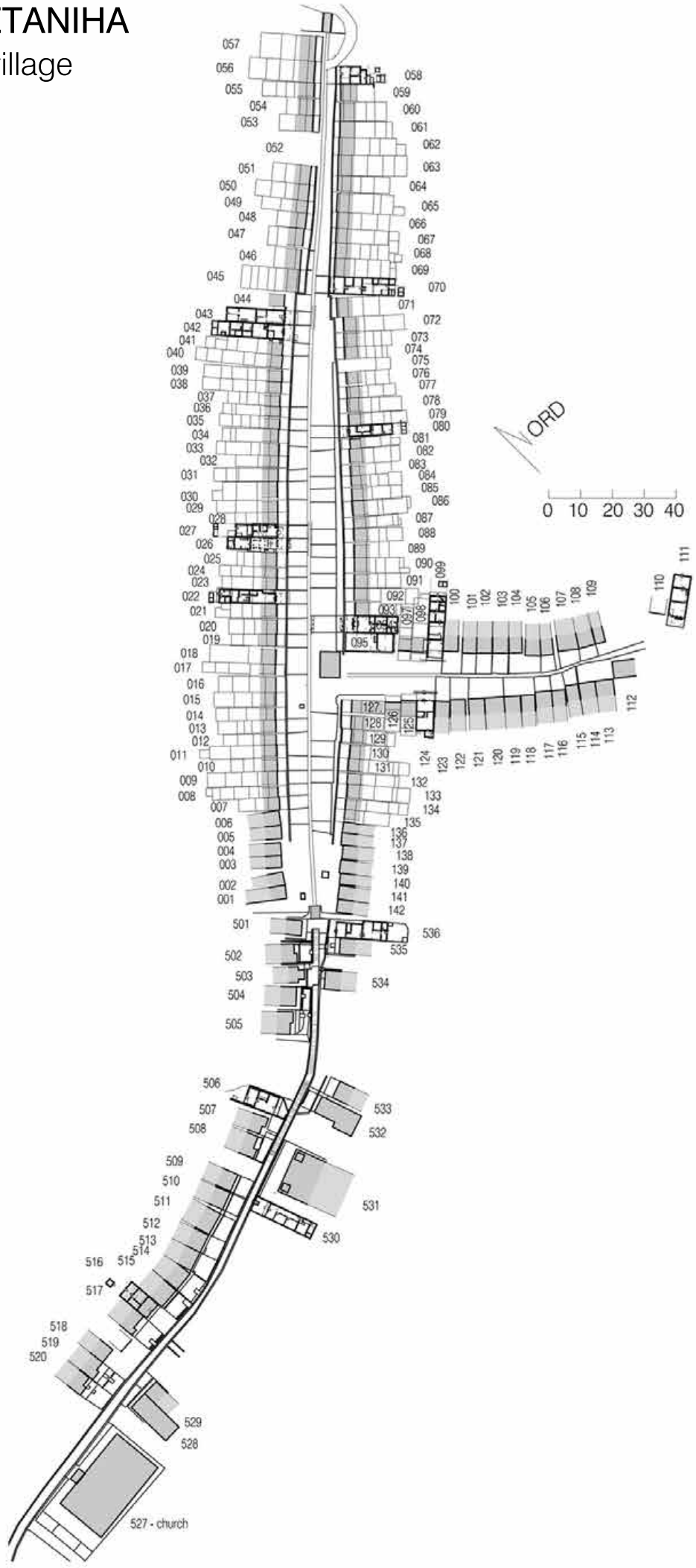
Achmad Bagoes Poerwono WIRYAMARTO; Cosmological – and Spatiotemporal meaning of a traditional dwelling in South-Nias, Indonesia; Von der Fakultät für Architektur der Rheinisch-Westfälischen Technischen Hochschule Aachen; 1989

Alain VIARO; Nias Island traditional houses

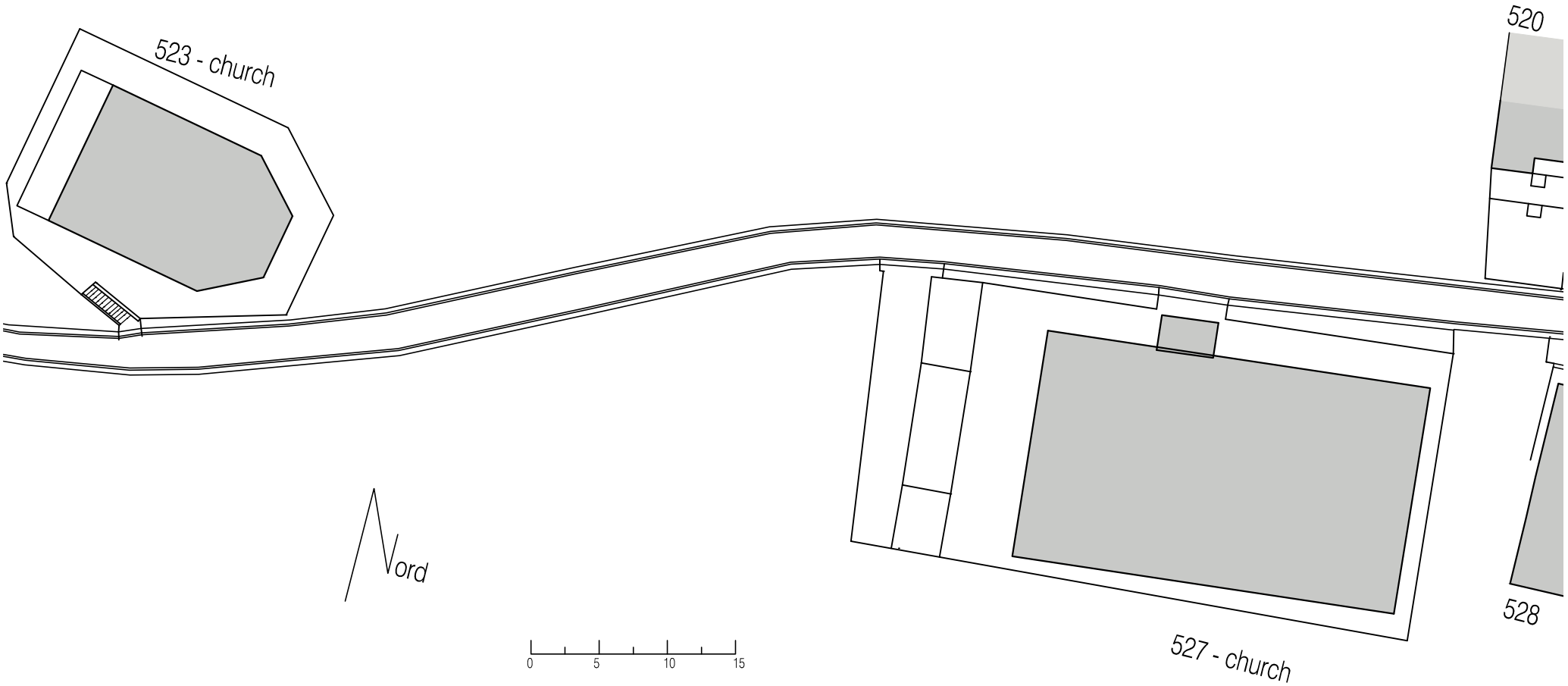
Alain VIARO; NIAS Reconstruction in the respect of the tradition; IUED Geneva; in collaboration with Arlette ZIEGLER

HILIAMAETANIHA

traditional village

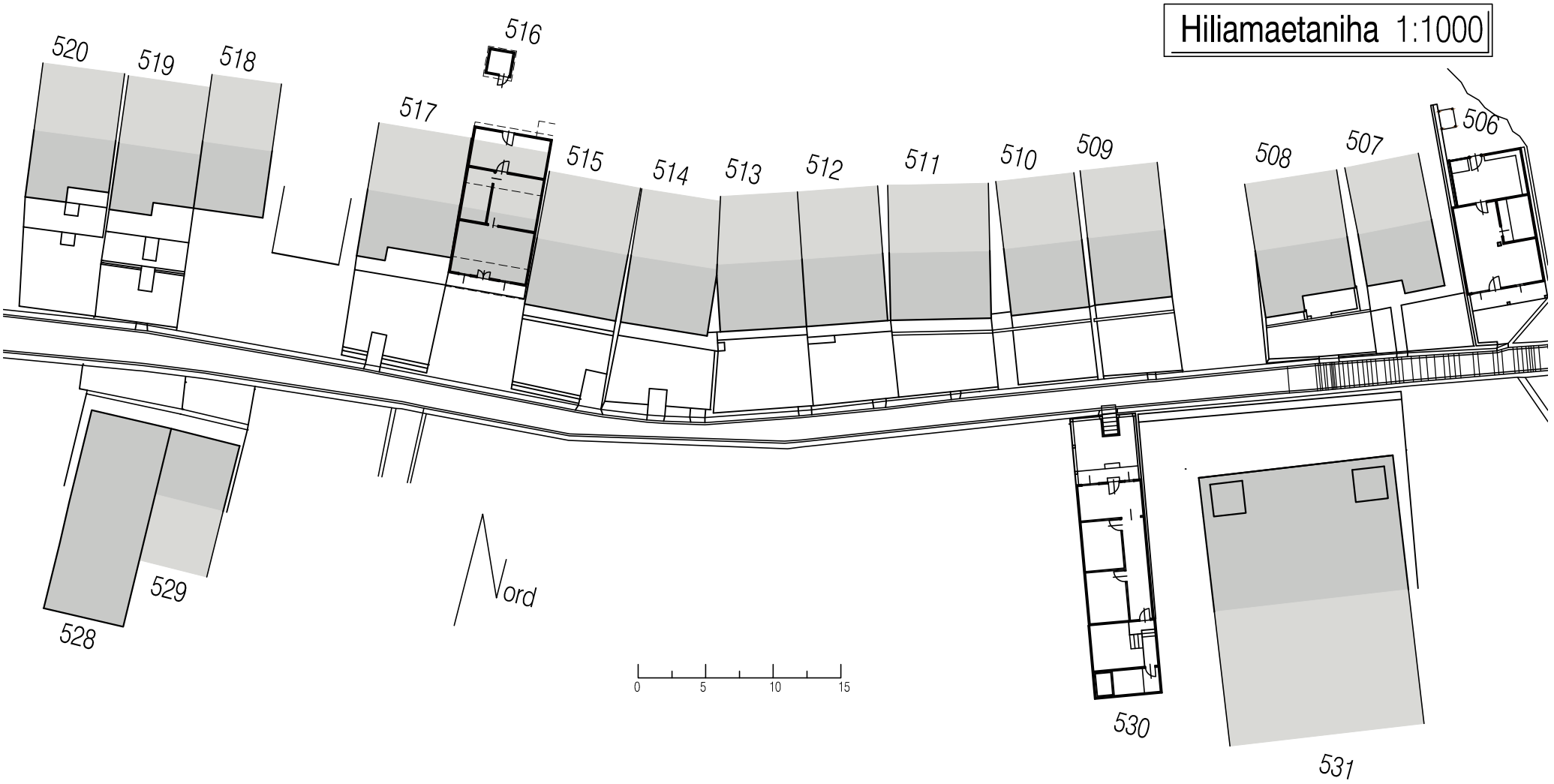


Hiliamaetaniha 1:1000



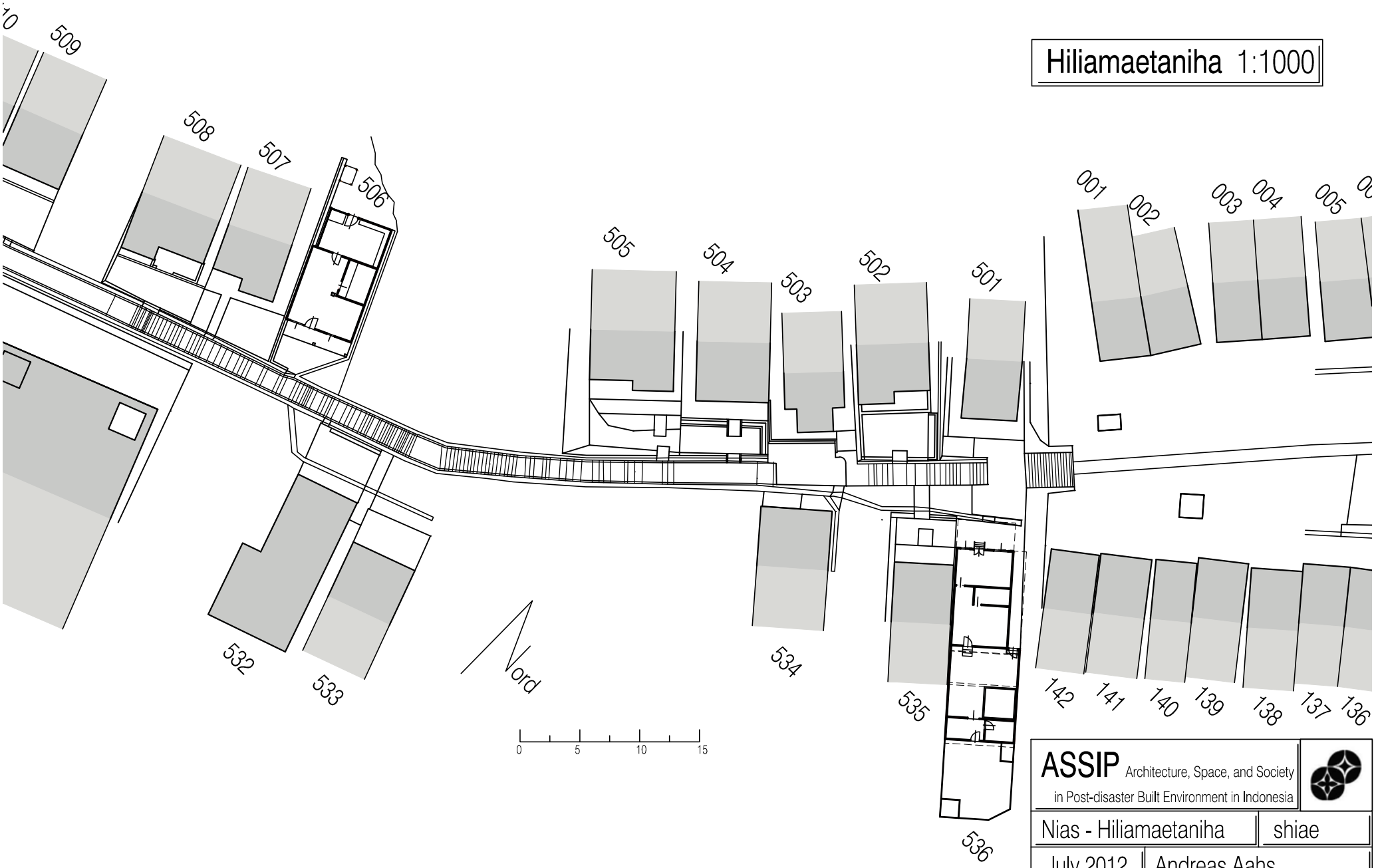
ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

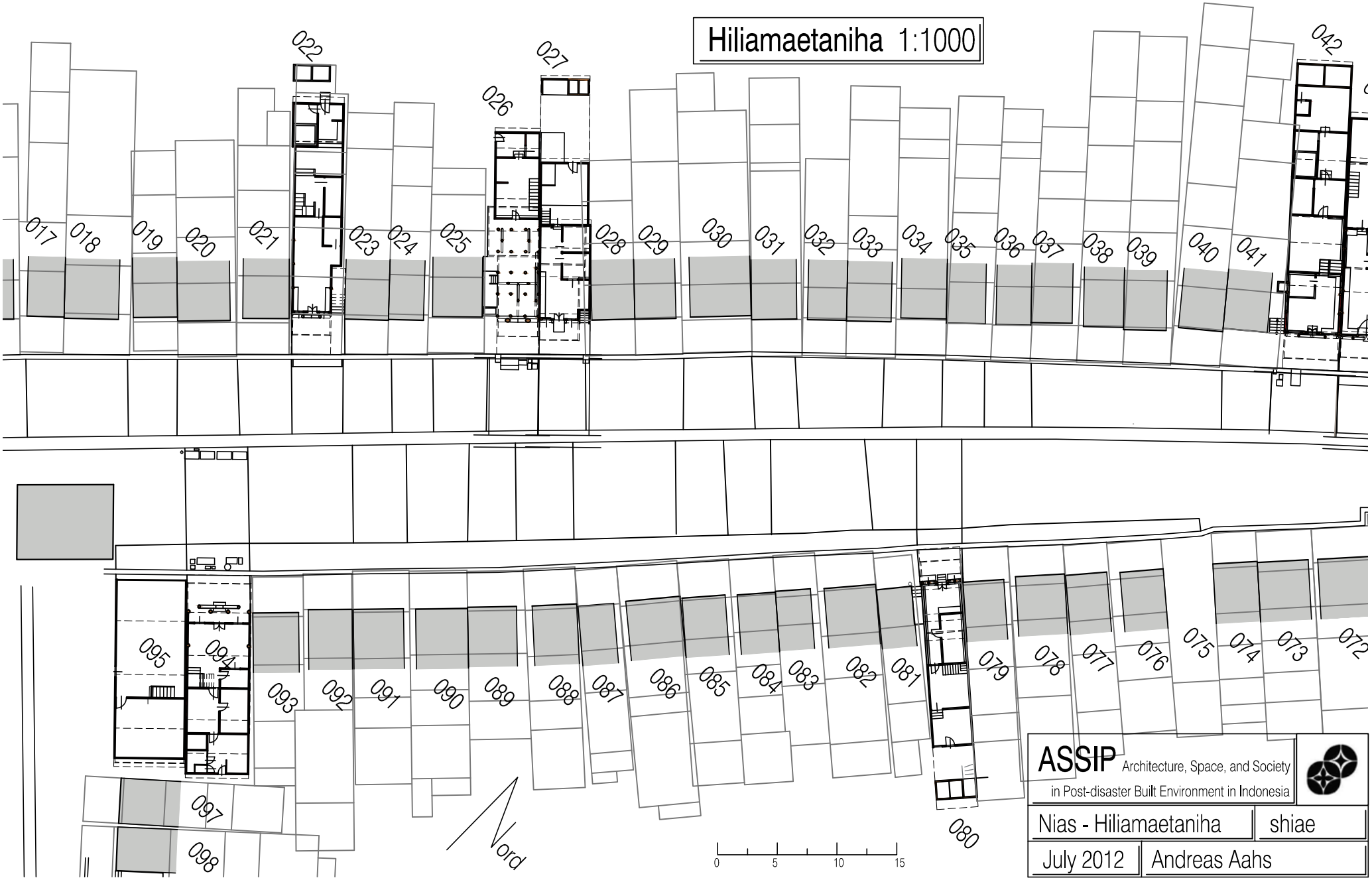


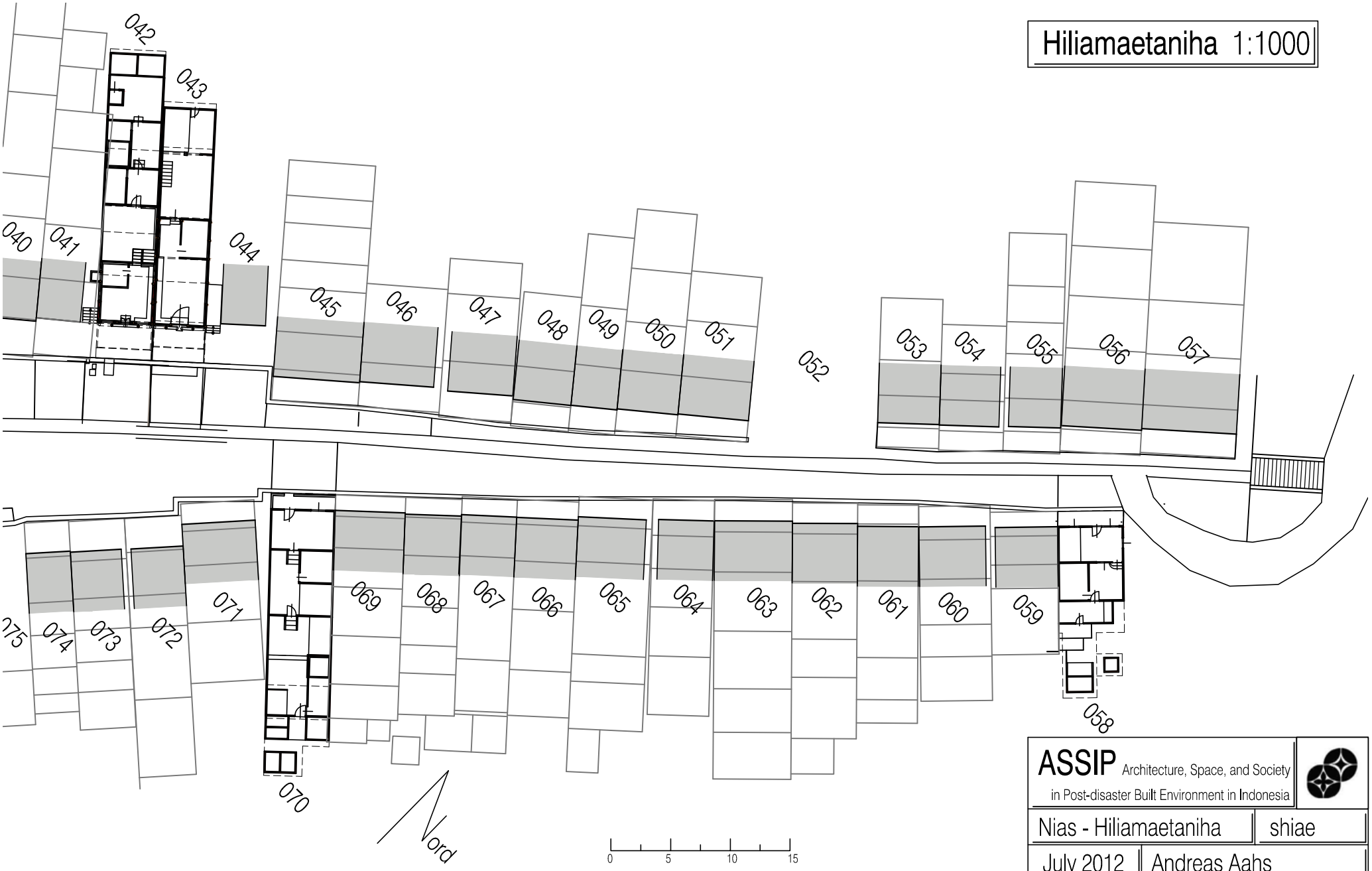
ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs


Hiliamaetaniha 1:1000
509
508
507
506
505
504
503
502
501
001
002
003
004
005
532
533
534
535
536
142
141
140
139
138
137
136
Nord
0
5
10
15
ASSIP Architecture, Space, and Society
in Post-disaster Built Environment in Indonesia
Nias - Hiliamaetaniha
shiae
July 2012
Andreas Aahs


Hiliamaetaniha 1:1000
001
002
003
004
005
006
007
008
009
010
011
012
013
014
015
016
017
018
019
020
021
022
023
024
501
095
094
093
092
091
097
142
141
140
139
138
137
136
135
134
133
132
131
130
129
128
127
126
125
124
Nord
0
5
10
15
ASSIP
Architecture, Space, and Society
in Post-disaster Built Environment in Indonesia
Nias - Hiliamaetaniha
shiae
July 2012
Andreas Aahs

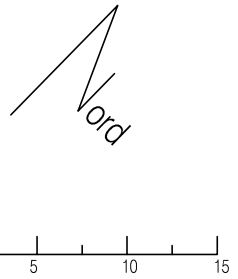

Hiliamaetaniha 1:1000
017
018
019
020
021
022
023
024
025
026
027
028
029
030
031
032
033
034
035
036
037
038
039
040
041
042
072
073
074
075
076
077
078
079
080
081
082
083
084
085
086
087
088
089
090
091
092
093
094
095
097
098
Nord
0
5
10
15
ASSIP
Architecture, Space, and Society
in Post-disaster Built Environment in Indonesia
Nias - Hiliamaetaniha
shiae
July 2012
Andreas Aahs


Hiliamaetaniha 1:1000
042
043
040
041
044
045
046
047
048
049
050
051
052
053
054
055
056
057
071
069
068
067
066
065
064
063
062
061
060
059
058
075
074
073
072
070
Nord
0
5
10
15
ASSIP Architecture, Space, and Society
in Post-disaster Built Environment in Indonesia
Nias - Hiliamaetaniha
shiae
July 2012
Andreas Aahs

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

Hiliamaetaniha 1:1000



ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs


shaie 001


shiae 002


shiae 003


shaie 004


shaie 005


shaie 006


shiae 007


shiae 008


shiae 009


shiae 010


shiae 011


shiae 012


shiae 013


shiae 014

Hiliamaetaniha north-west facade 1

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs


shiae 015


shiae 016


shiae 017


shiae 018


shiae 019


shiae 020


shiae 021


shiae 022


shiae 023


shiae 024


shiae 025


shiae 026


shiae 027


shiae 028


shiae 029

Hiliamaetaniha north-west facade 2

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs


shiae 030


shiae 031


shiae 032


shiae 033


shiae 034


shiae 035


shiae 036


shiae 037


shiae 038


shiae 039


shiae 040


shiae 041


shiae 042


shiae 043


shiae 044

Hiliamaetaniha north-west facade 3

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 045

shiae 046

shiae 047

shiae 048

shiae 049

shiae 050

shiae 051

shiae 052

shiae 053

shiae 054

shiae 055

shiae 056

shiae 057

Hiliamaetaniha north-west facade 4

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 058

shiae 059

shiae 060

shiae 061

shiae 062

shiae 063

shiae 064

shiae 065

shiae 066

shiae 067

shiae 068

shiae 069

shiae 070

Hiliamaetaniha south-east facade 1

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs


shiae 071


shiae 072


shiae 073


shiae 074


shiae 075


shiae 076


shiae 077


shiae 078


shiae 079


shiae 080


shiae 081


shiae 082


shiae 083


shiae 084

Hiliamaetaniha south-east facade 2

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 085

shiae 086

shiae 087

shiae 088

shiae 089

shiae 090

shiae 091

shiae 092

shiae 093

shiae 094

shiae 095

Hiliamaetaniha south-east facade 3

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 095

shiae 097

shiae 098

shiae 099

shiae 100

shiae 101

shiae 102

shiae 103

shiae 104

shiae 105

Hiliamaetaniha north-east facade 1

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 106

shiae 107

shiae 108

shiae 109

shiae 110

shiae 111

Hiliamaetaniha north-east facade 2

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 112

shiae 113

shiae 114

shiae 115

shiae 116

shiae 112

Hiliamaetaniha south-west facade 1

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 117

shiae 118

shiae 119

shiae 120

shiae 121

shiae 122

shiae 123

shiae 124

shiae 125

shiae 126

Hiliamaetaniha south-west facade 2

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 127

shiae 128

shiae 129

shiae 130

shiae 131

shiae 132

shiae 133

shiae 134

shiae 135

shiae 136

shiae 137

shiae 138

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Hiliamaetaniha south-east facade 4

Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 139

shiae 140

shiae 141

shiae 142

Hiliamaetaniha south-east facade 5

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 504

shiae 503

shiae 502

shiae 501

shiae 505

shiae 506

shiae 507

shiae 508

Hiliamaetaniha extension north-west facade 1

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 513

shiae 512

shiae 511

shiae 510

shiae 509

shiae 518

shiae 517

shiae 516

shiae 515

shiae 514

shiae 520

shiae 519

shiae 523 - church

Hiliamaetaniha extension
north-west facade 2

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 536

shiae 535

shiae 534

shiae 533

shiae 532

shiae 531 church

shiae 530

Hiliamaetaniha extension
south-east facade 1

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

shiae 529

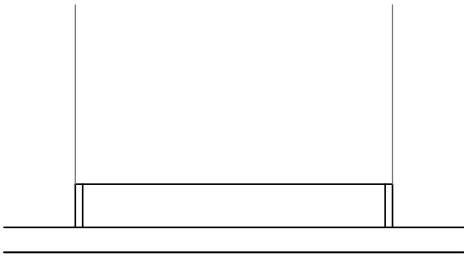
shiae 528

shiae 527 church

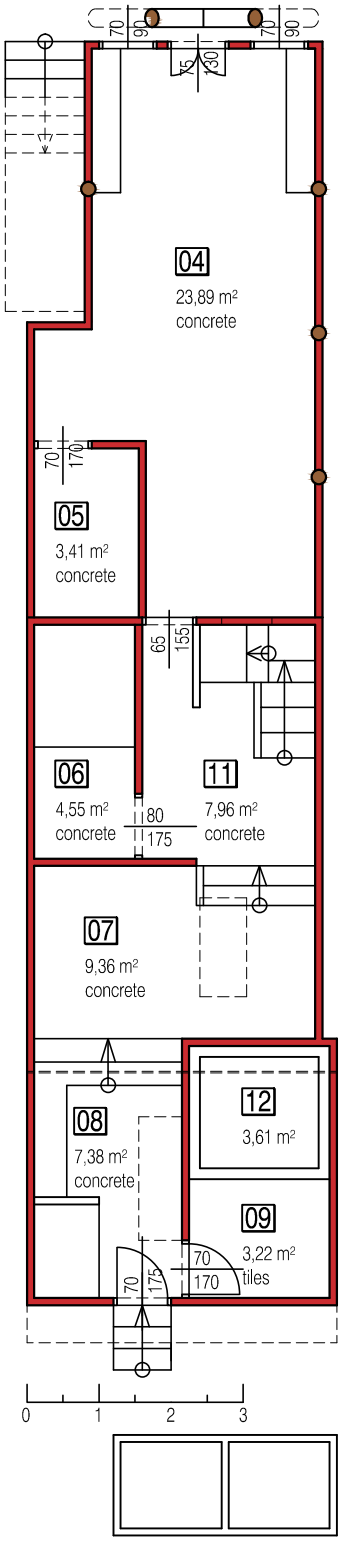
Hiliamaetaniha extension
south-east facade 2

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae
July 2012	Andreas Aahs

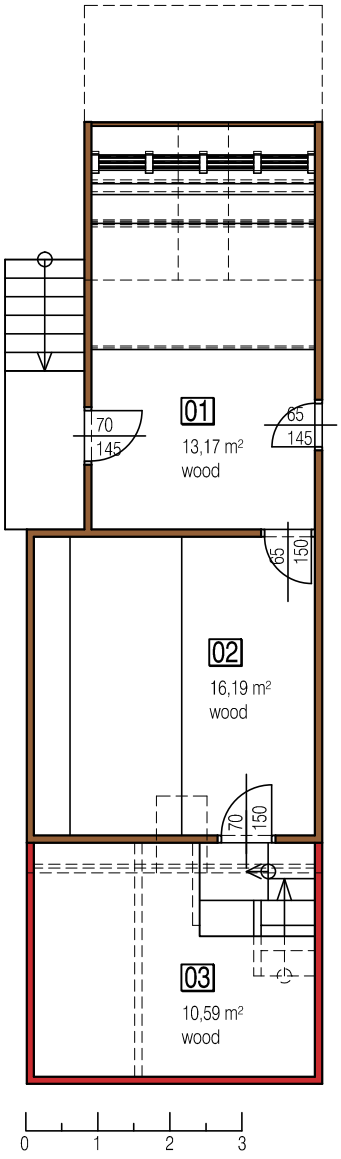
ground floor 1:100



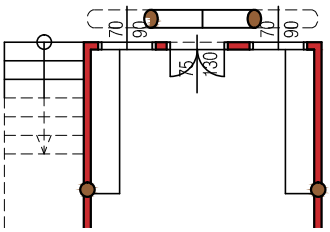
ground floor



first floor



front yard

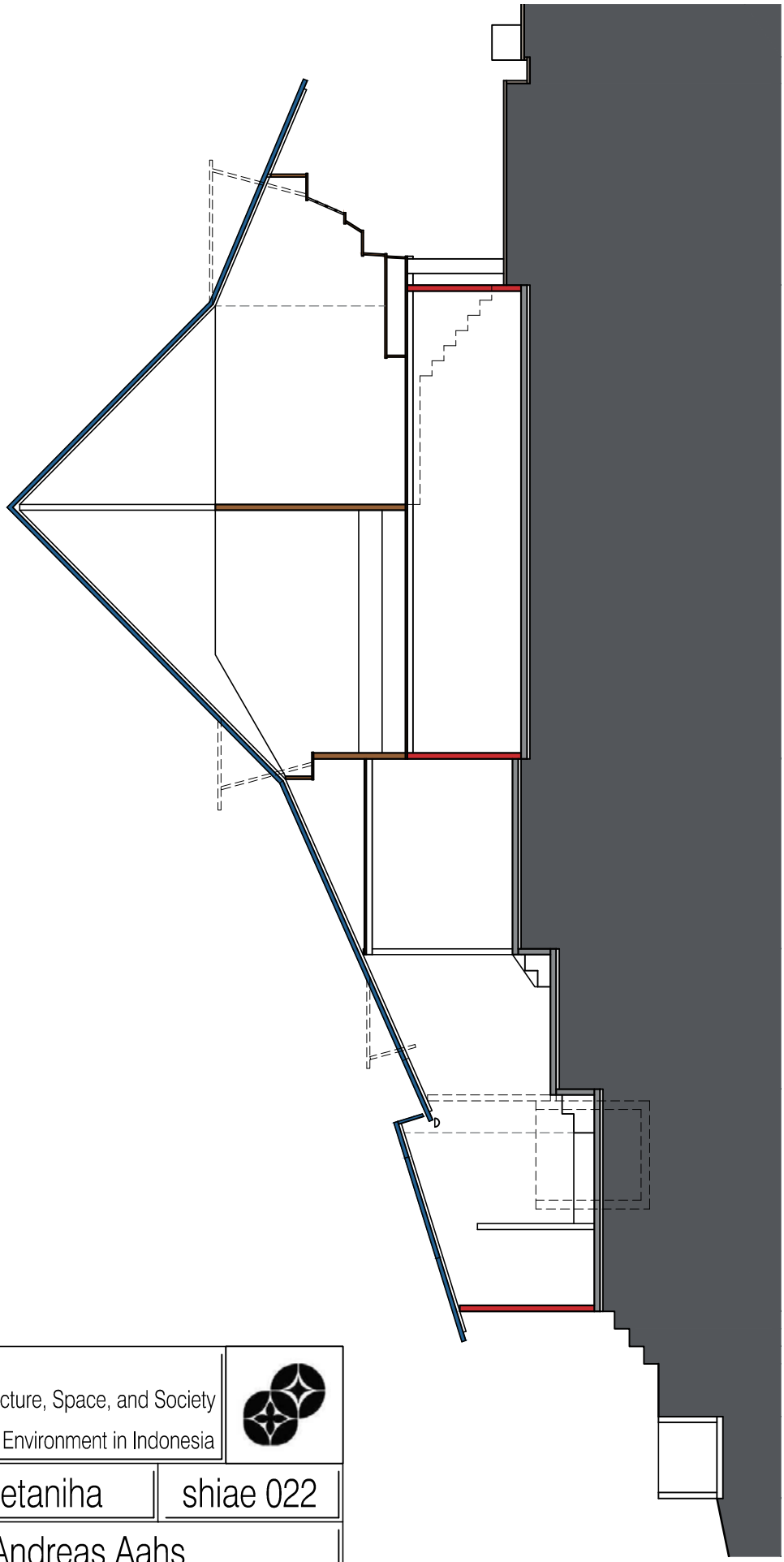


shiae 022

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 022
July 2012	Andreas Aahs

section 1:100

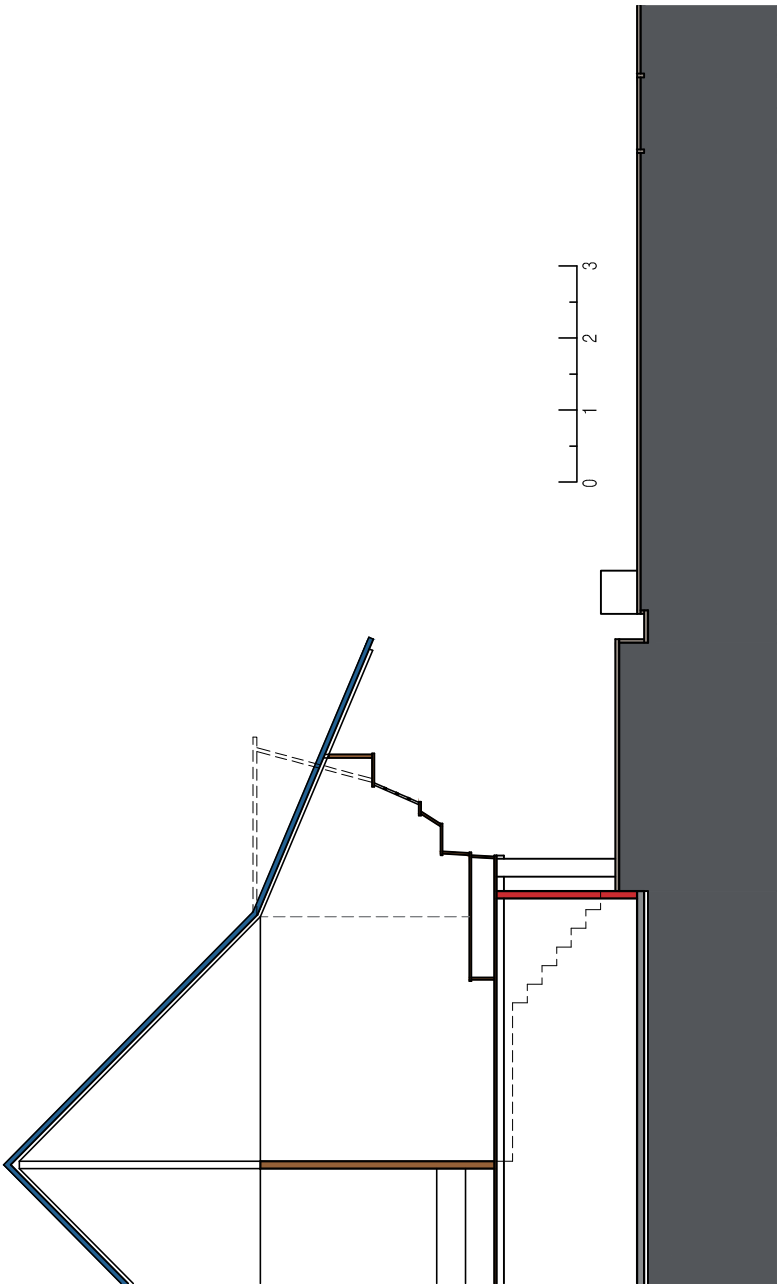


shiae 022

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 022
July 2012	Andreas Aahs

section 1:100

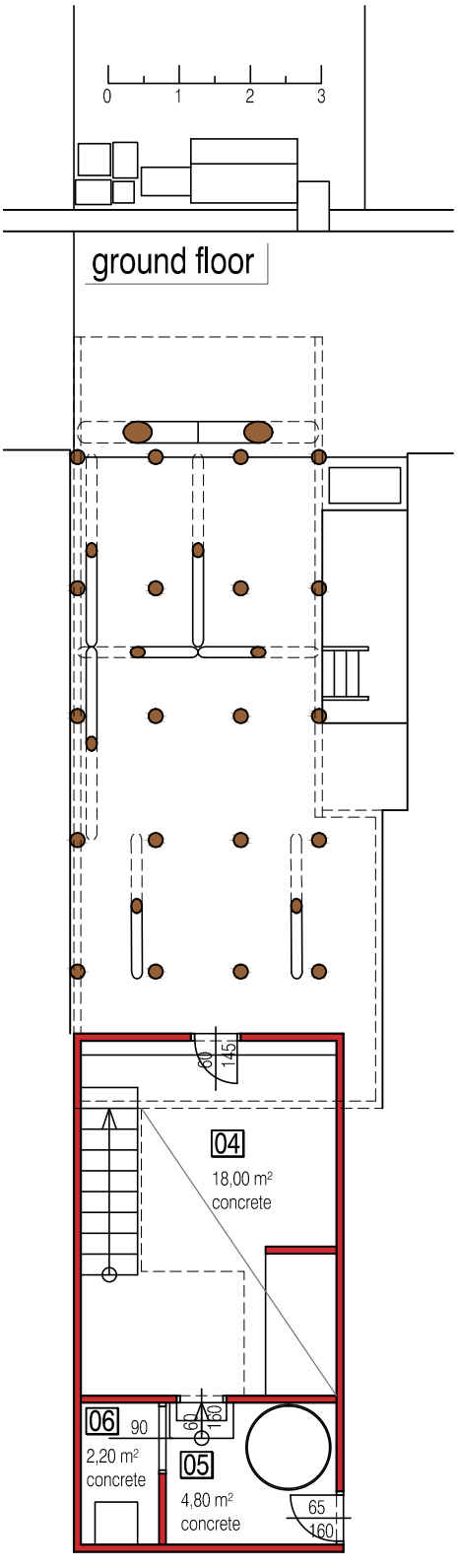


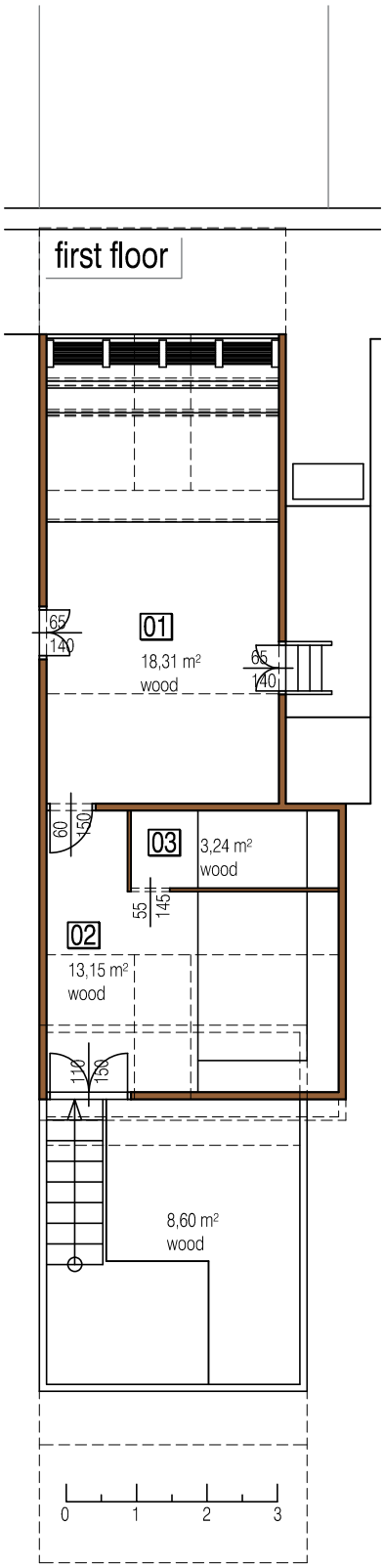

shiae 022

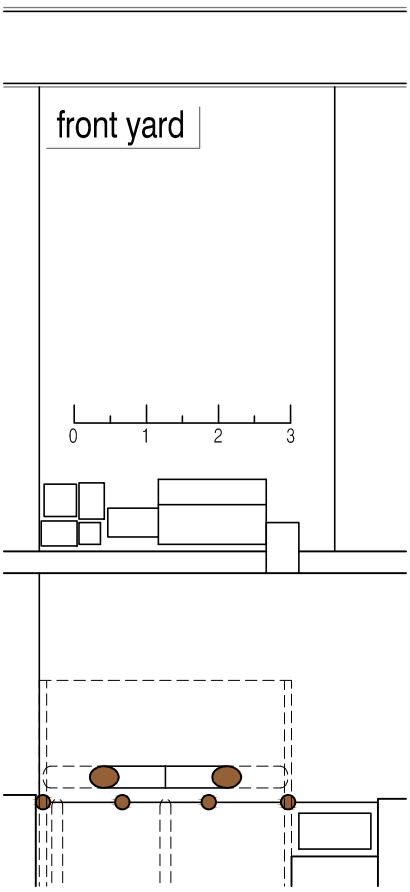
ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

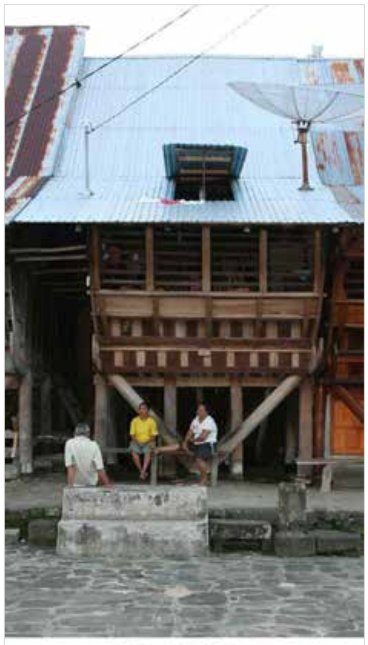
Nias - Hiliamaetaniha	shiae 022
July 2012	Andreas Aahs

ground floor 1:100





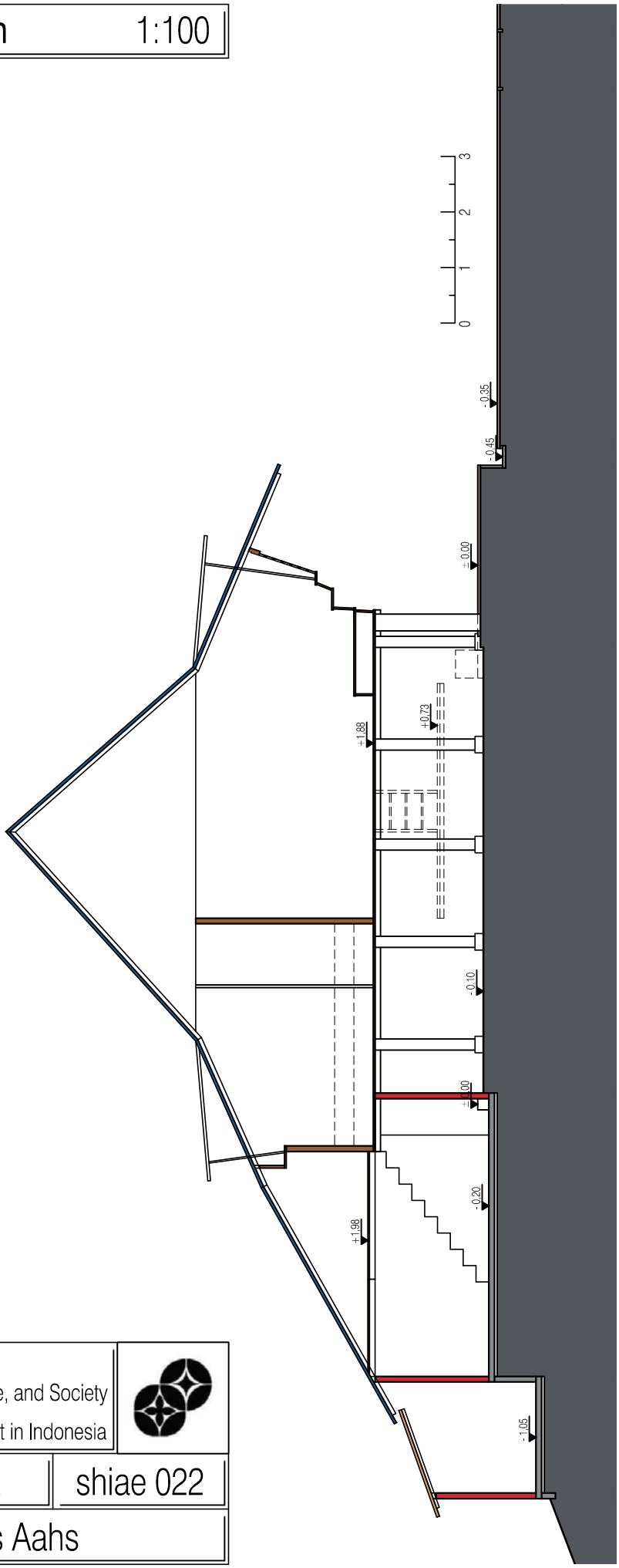


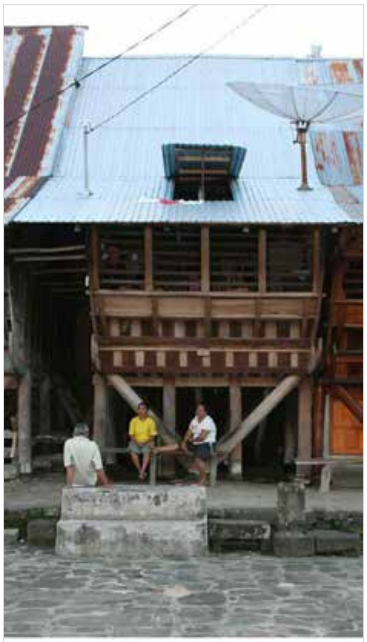


shiae 026

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae 026
July 2012	Andreas Aahs

section 1:100





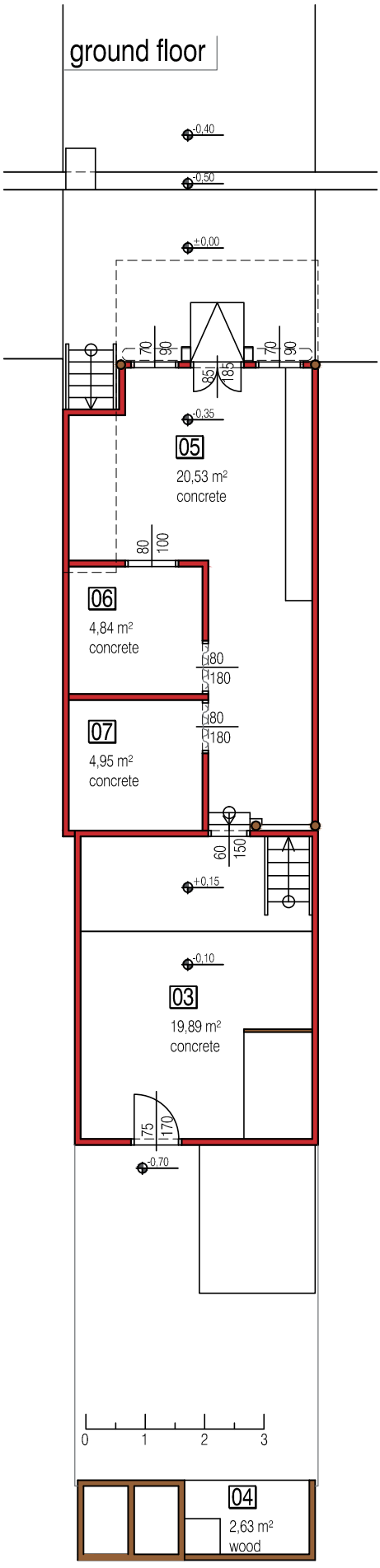
shiae 026

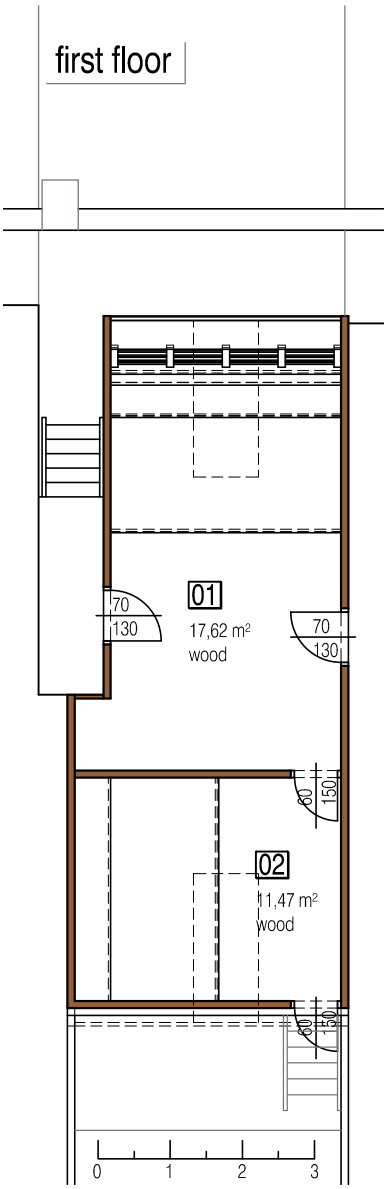
ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

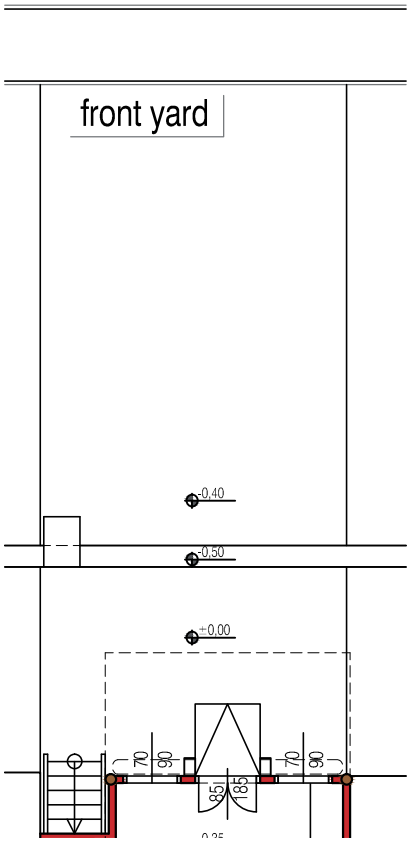
Nias - Hiliamaetaniha | shiae 022

July 2012 | Andreas Aahs

ground floor 1:100





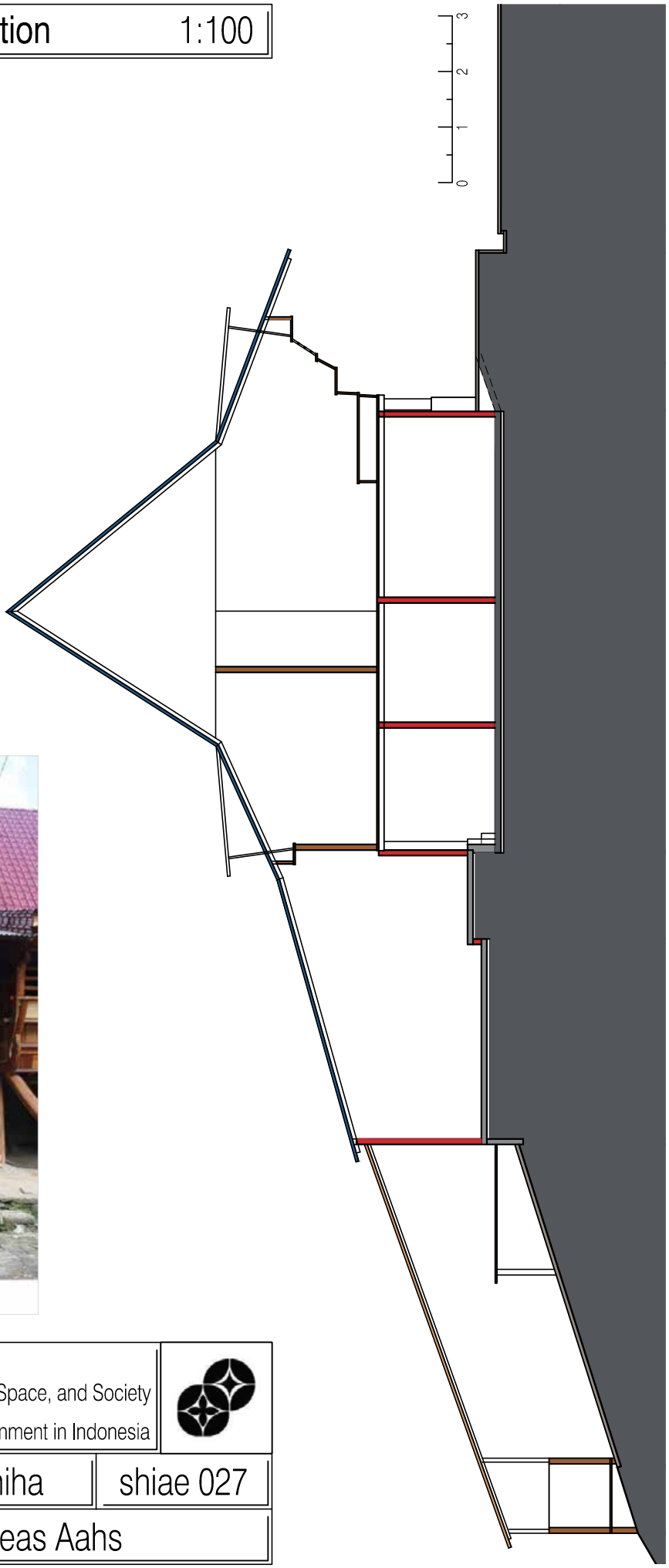


shiae 027

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 027
July 2012	Andreas Aahs

section 1:100

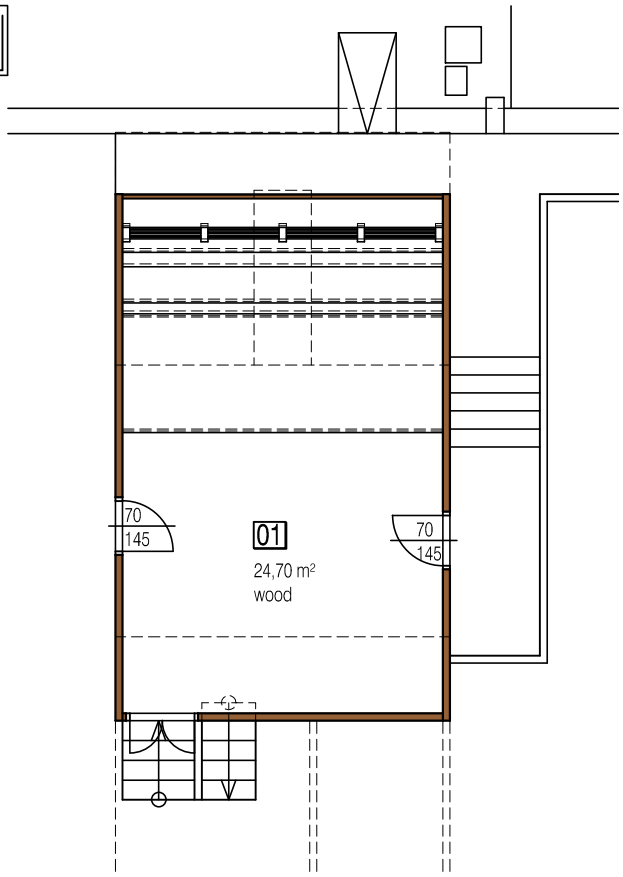


shiae 027

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

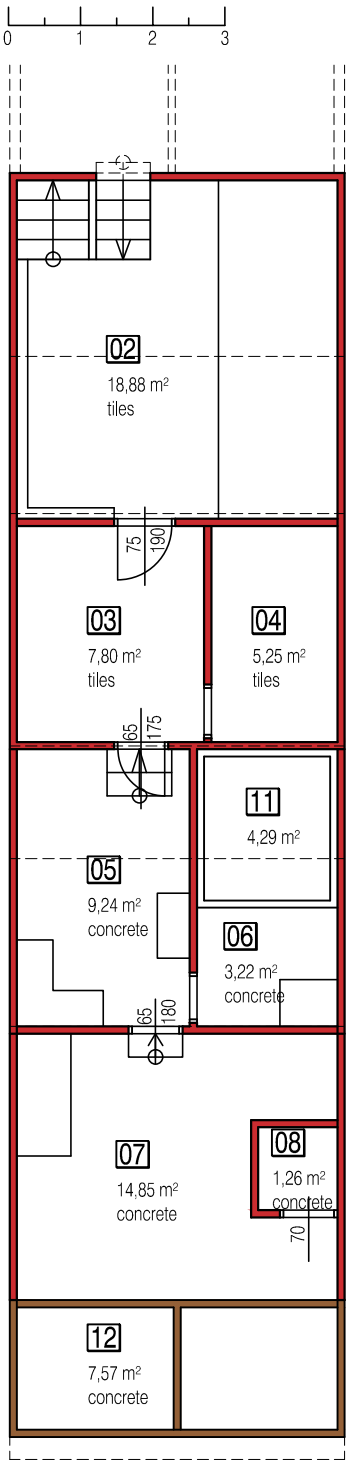
Nias - Hiliamaetaniha	shiae 027
July 2012	Andreas Aahs

ground floor 1:100



first floor

ground floor



shiae 042

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 042
July 2012	Andreas Aahs

shiae 042

ground floor 1:100

front yard

10
16,70 m²
tiles

09
4,40 m²
tiles

60
170

150

0 1 2 3

ground floor

0 1 2 3

02
18,88 m²
tiles

75
190

03
7,80 m²
tiles

04
5,25 m²
tiles

65
175

11
4,29 m²

05
9,24 m²
concrete

06
3,22 m²

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 042
July 2012	Andreas Aahs

section 1:100

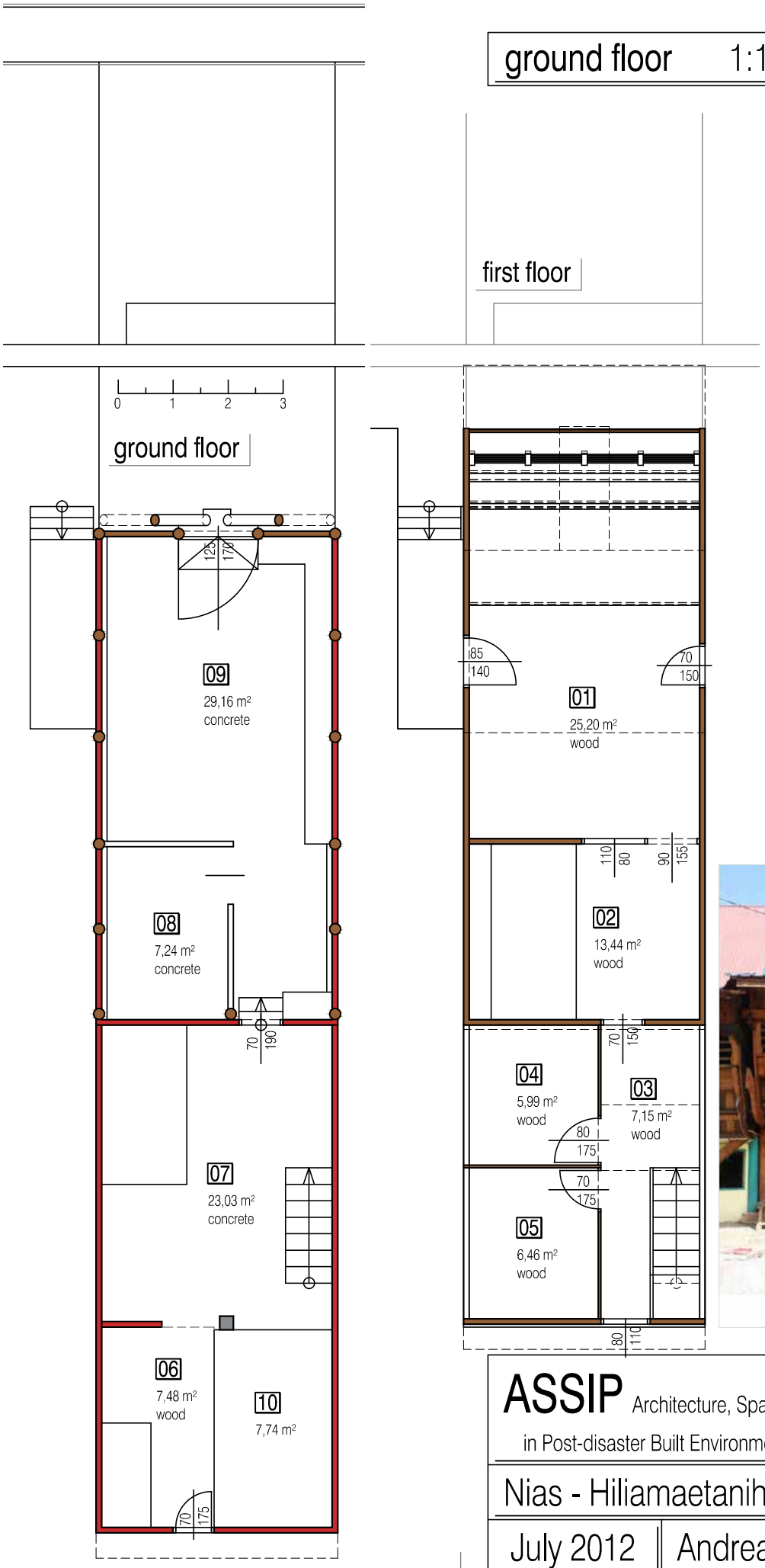
shiae 042

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha | shiae 042

July 2012 | Andreas Aahs

ground floor 1:100



shiae 043

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 043
July 2012	Andreas Aahs

section 1:100

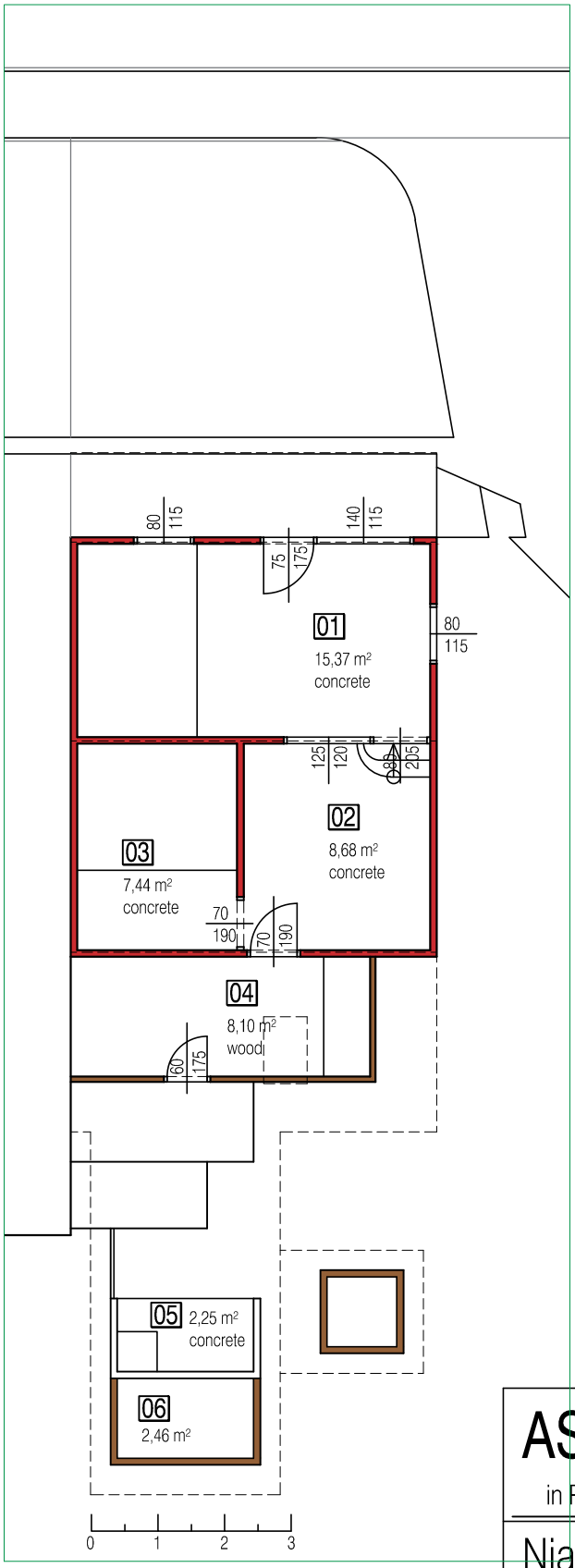
shiae 043

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha | shiae 043

July 2012 | Andreas Aahs

ground floor 1:100

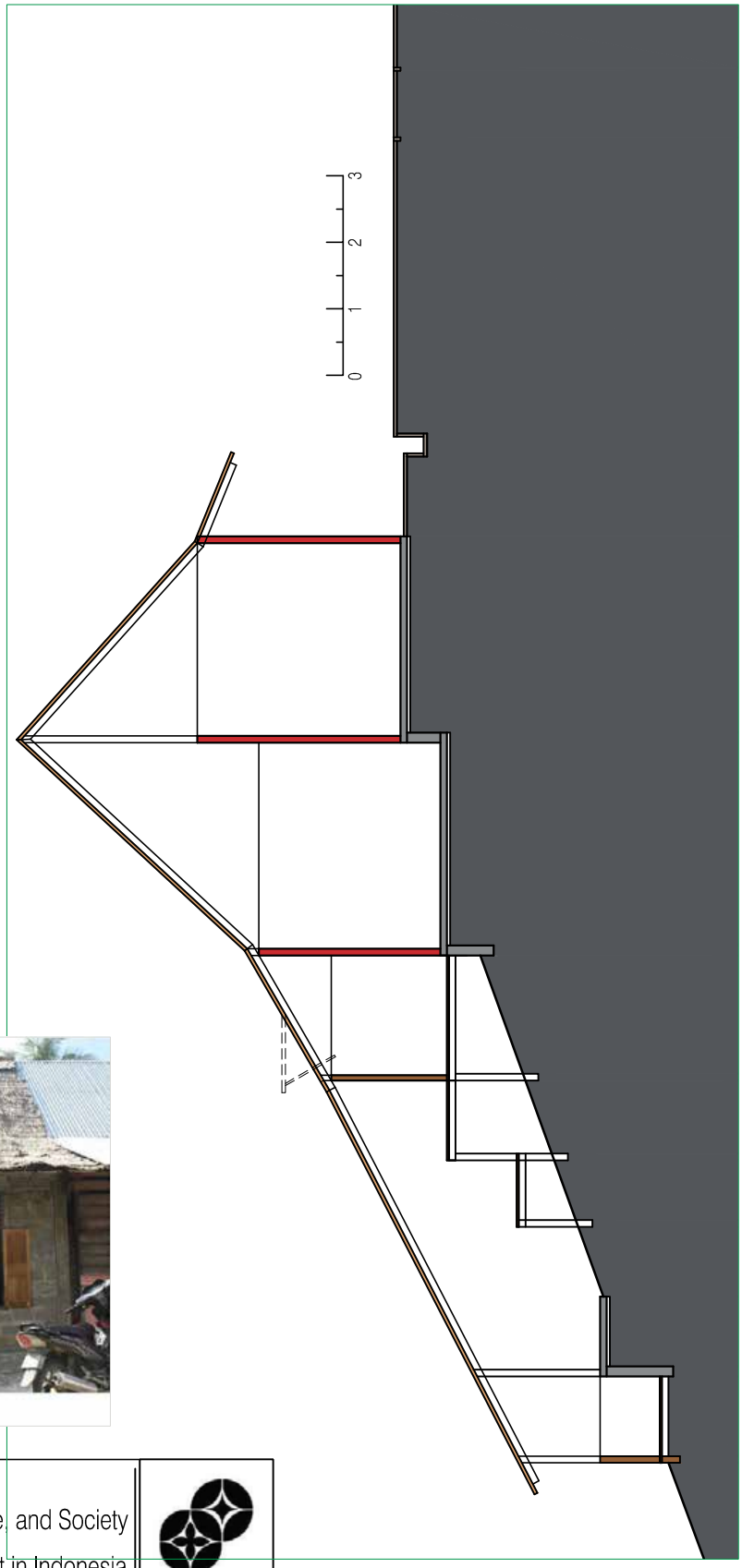


shiae 058

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 058
July 2012	Andreas Aahs

section 1:100

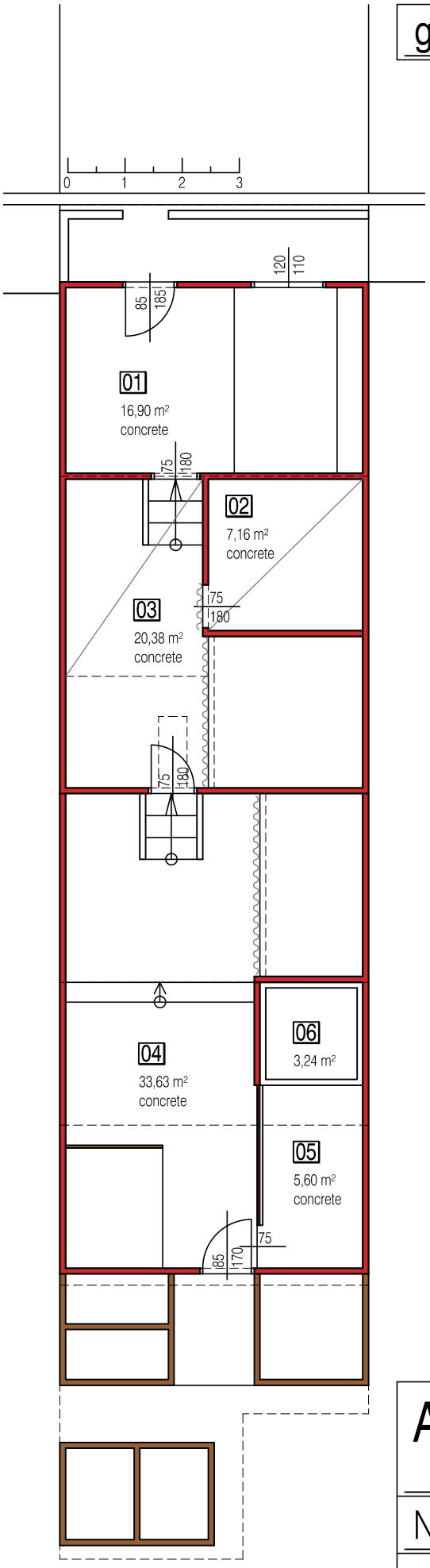


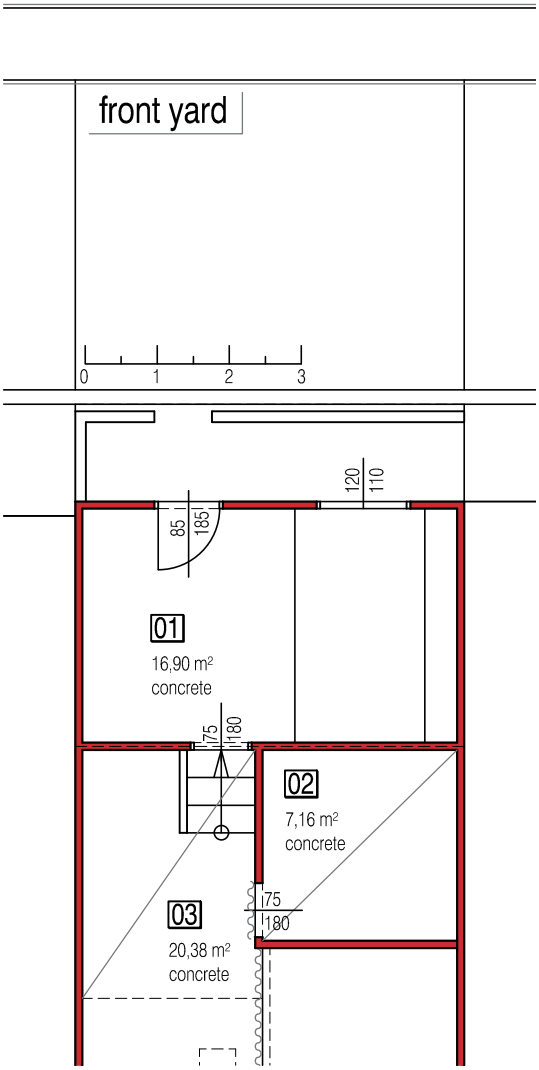
shiae 058

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 058
July 2012	Andreas Aahs

ground floor 1:100



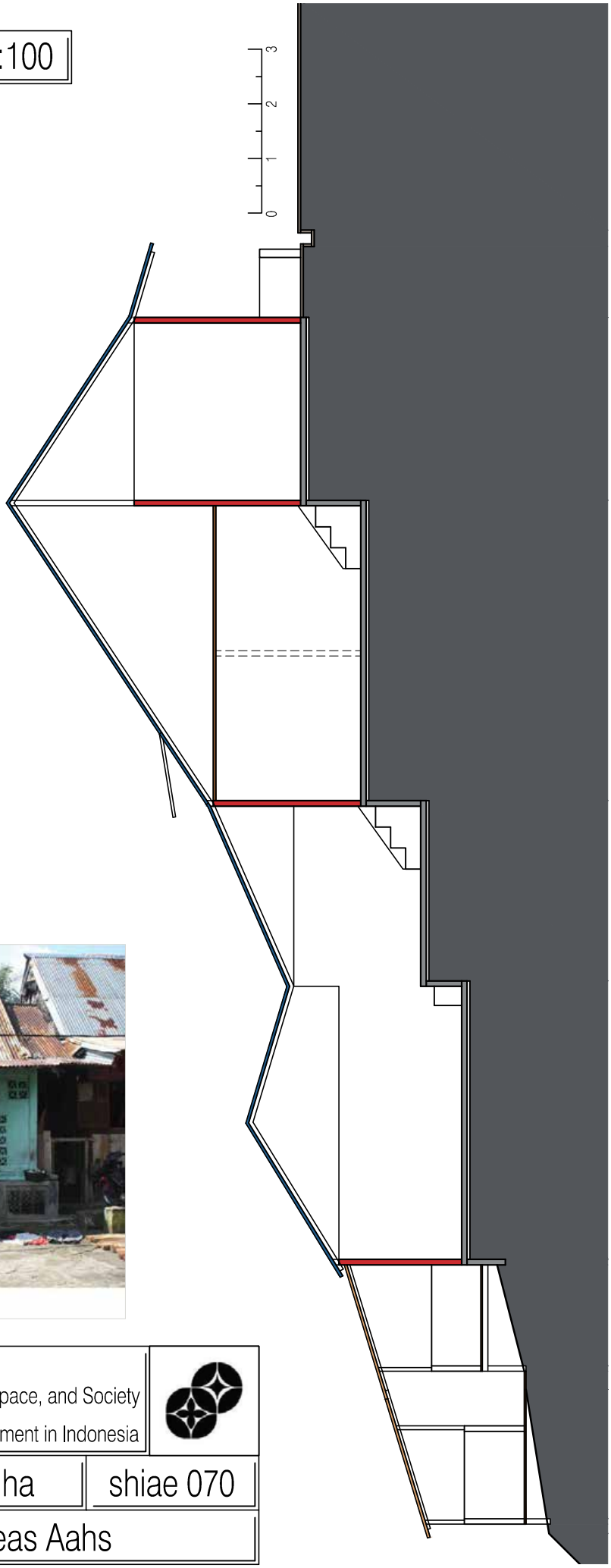


shiae 070

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 070
July 2012	Andreas Aahs

section 1:100



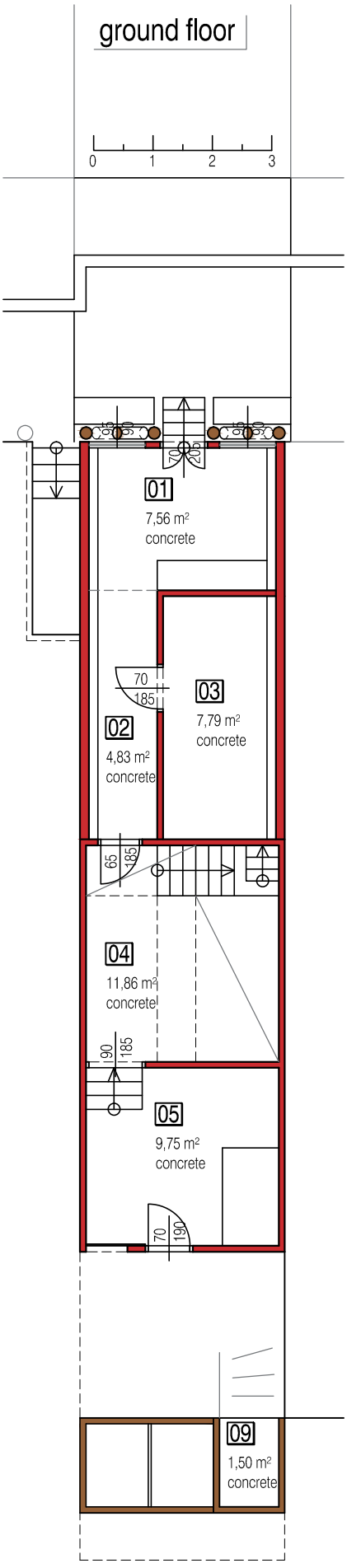
shiae 070

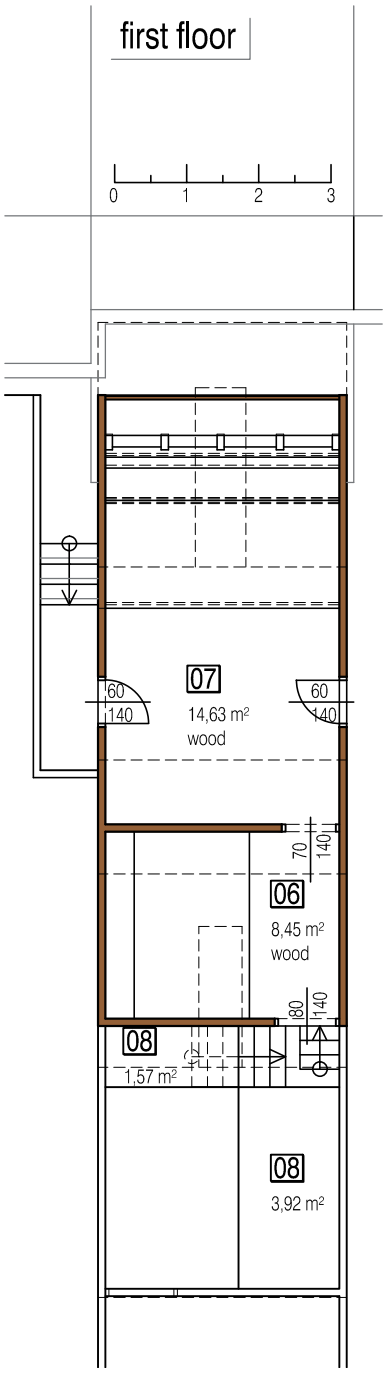
ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

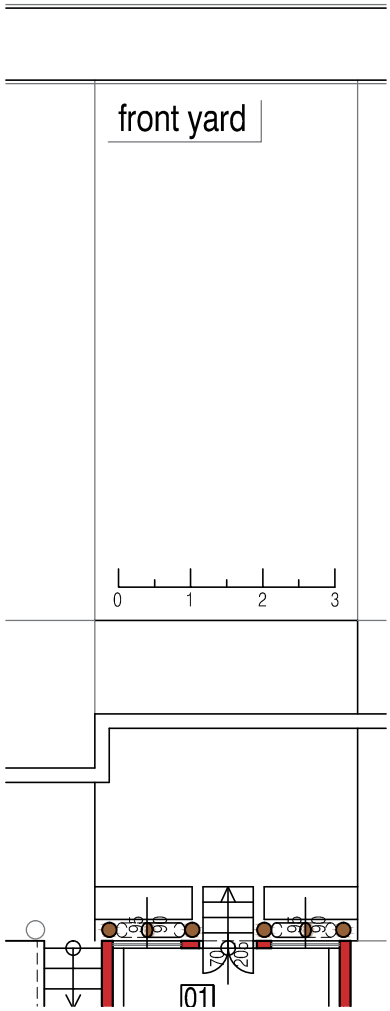
Nias - Hiliamaetaniha | shiae 070

July 2012 | Andreas Aahs

ground floor 1:100



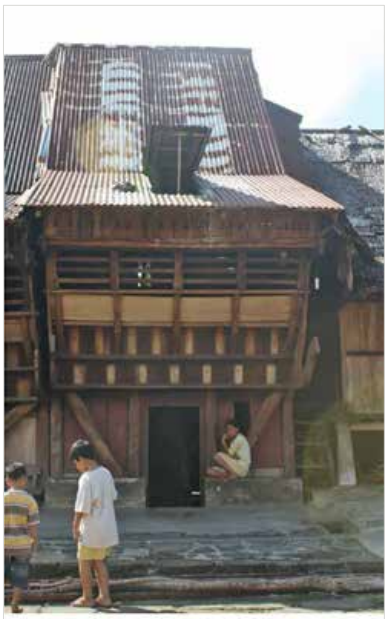




shiae 080

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Hiliamaetaniha	shiae 080
July 2012	Andreas Aahs

section 1:100



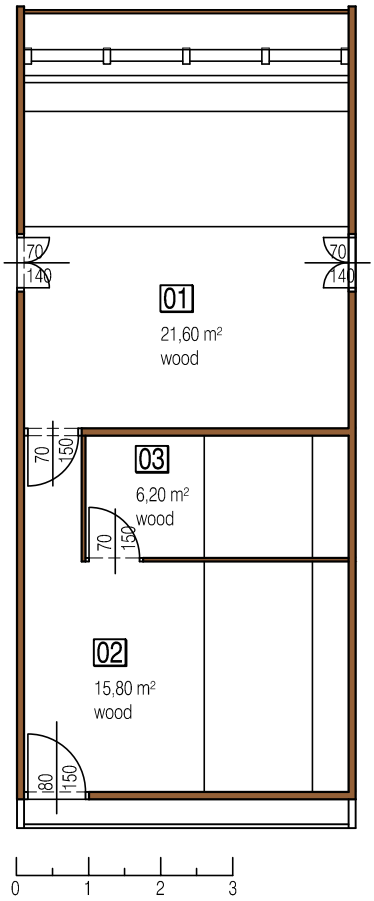
shiae 080

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha | shiae 080

July 2012 | Andreas Aahs

ground floor 1:100



shiae 091

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

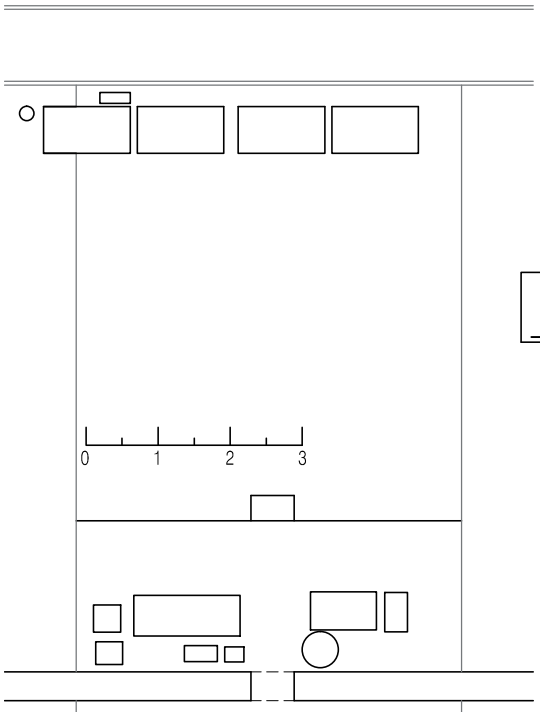
Nias - Hiliamaetaniha	shiae 091
July 2012	Andreas Aahs

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

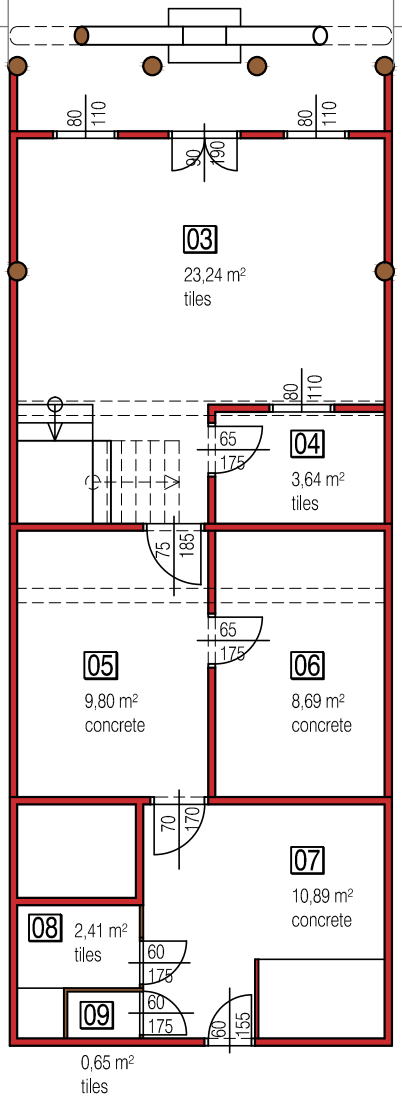
Nias - Hiliamaetaniha	shiae 094
July 2012	Andreas Aahs

ground floor 1:100

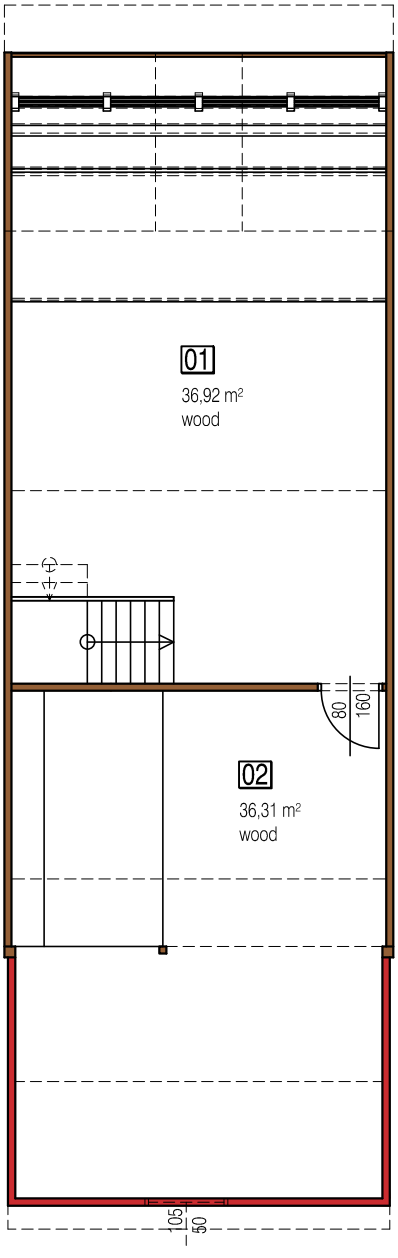
shiae 094



ground floor



first floor

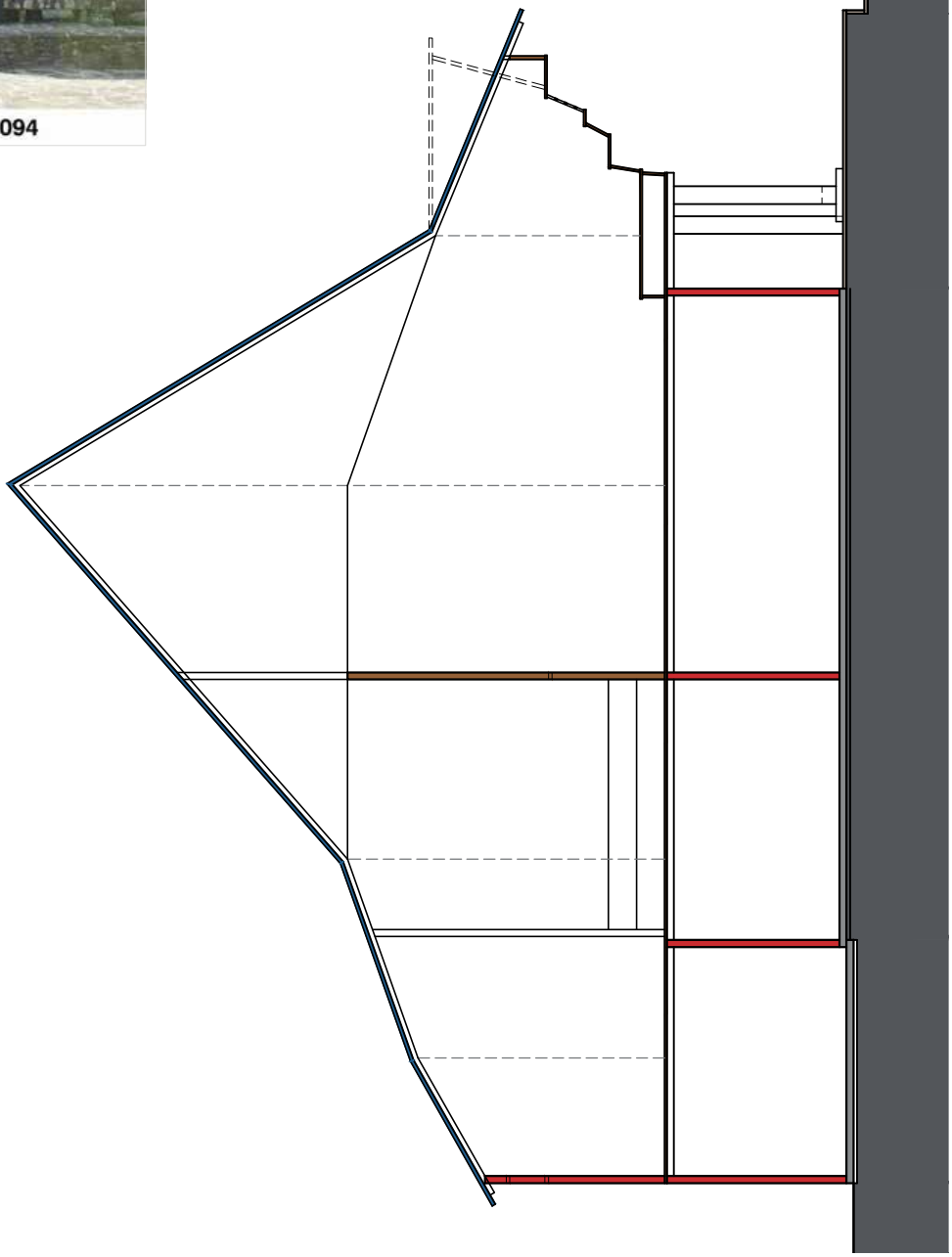


ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 094
July 2012	Andreas Aahs

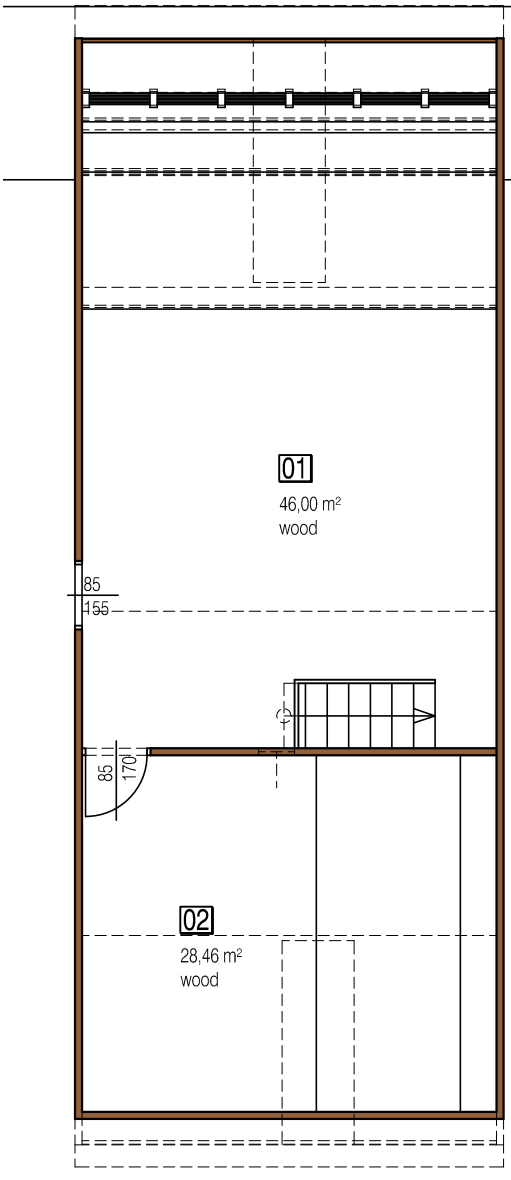
shiae 094

section 1:100



ground floor 1:100

0 1 2 3



shiae 095

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

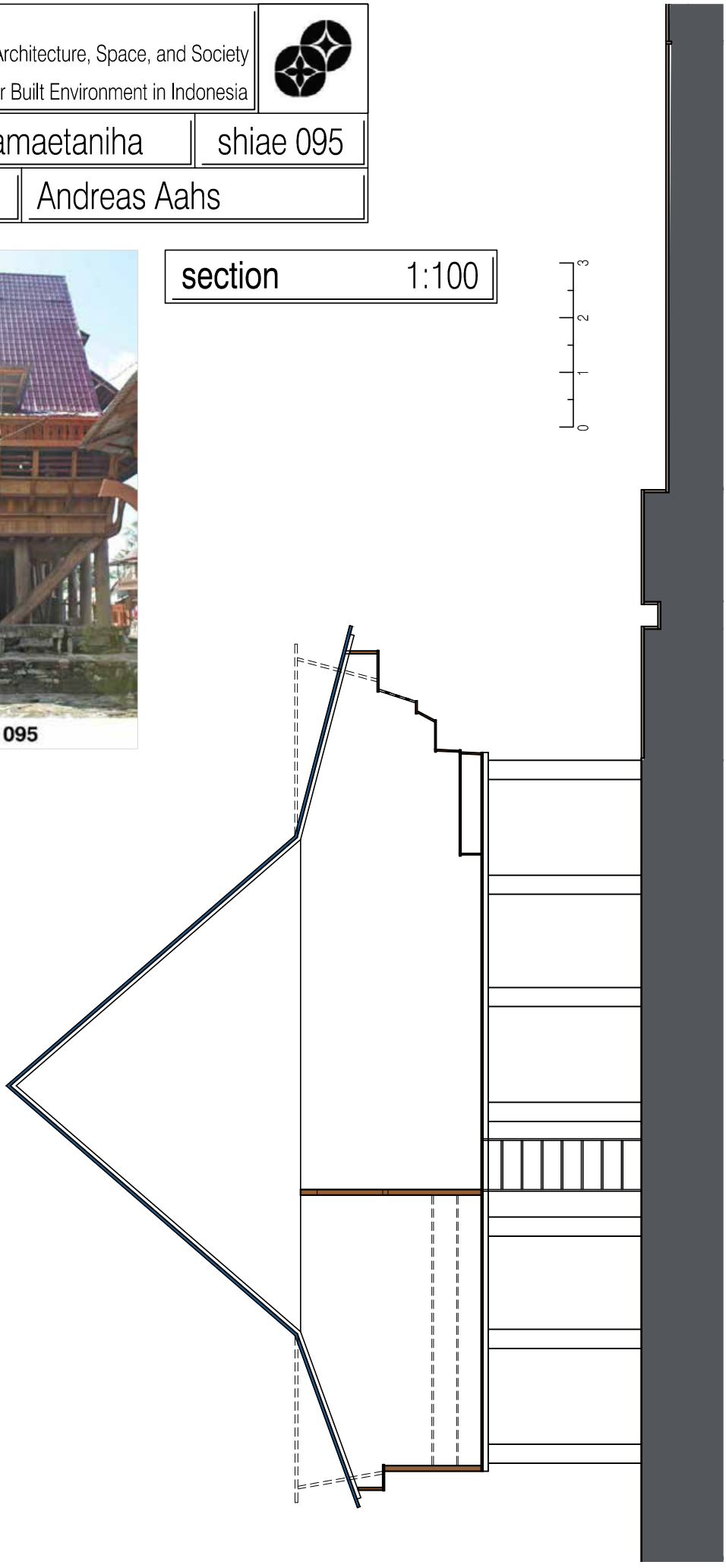
Nias - Hiliamaetaniha	shiae 095
July 2012	Andreas Aahs

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

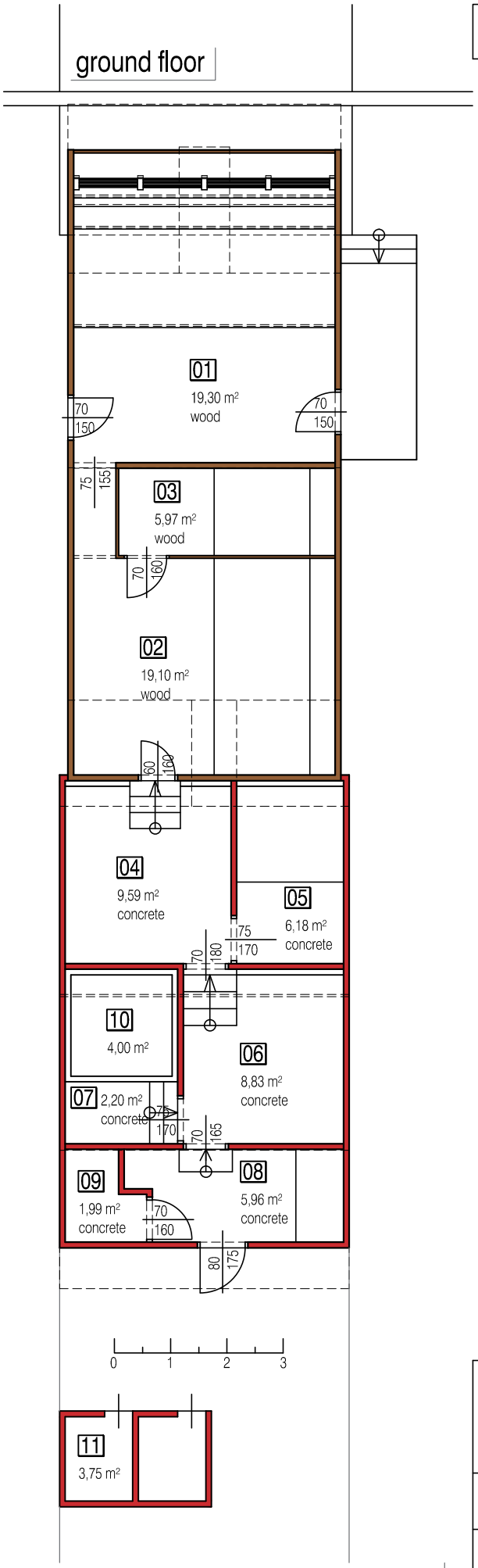
Nias - Hiliamaetaniha	shiae 095
July 2012	Andreas Aahs

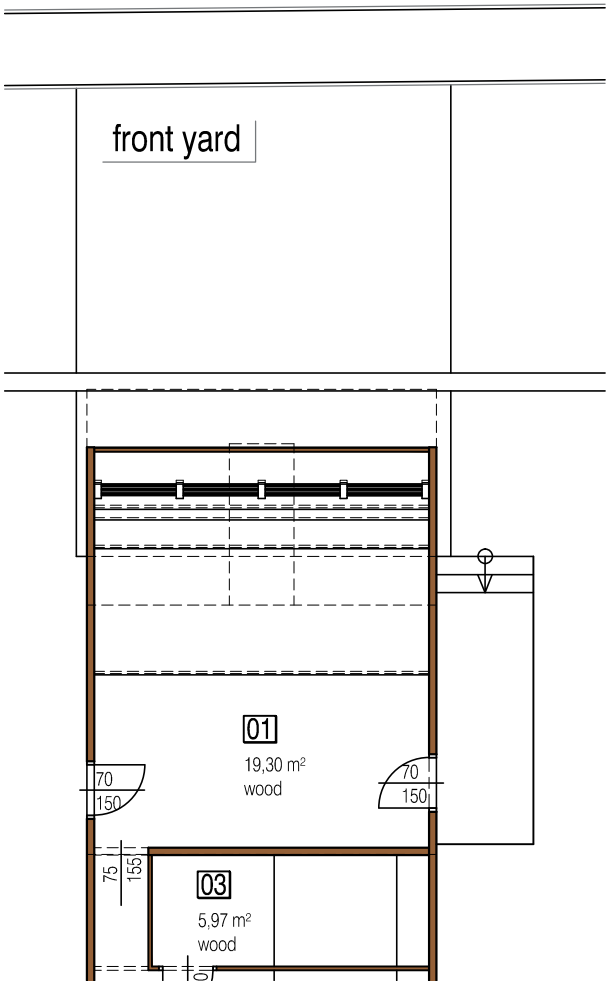
shiae 095

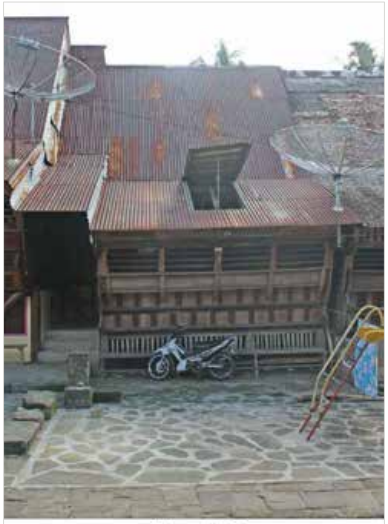
section 1:100



ground floor 1:100







shiae 099

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 099
July 2012	Andreas Aahs

section 1:100

shiae 099

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

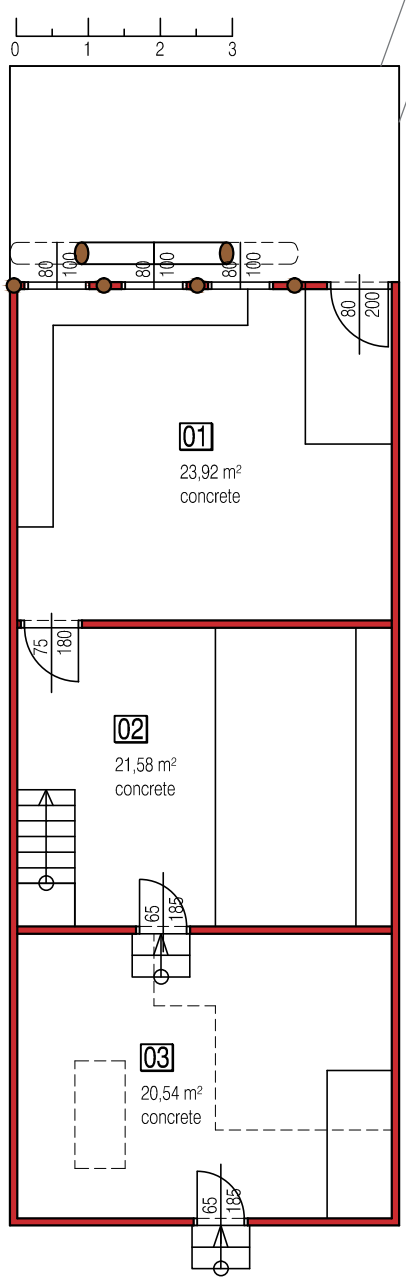
Nias - Hiliamaetaniha | shiae 099

July 2012 | Andreas Aahs

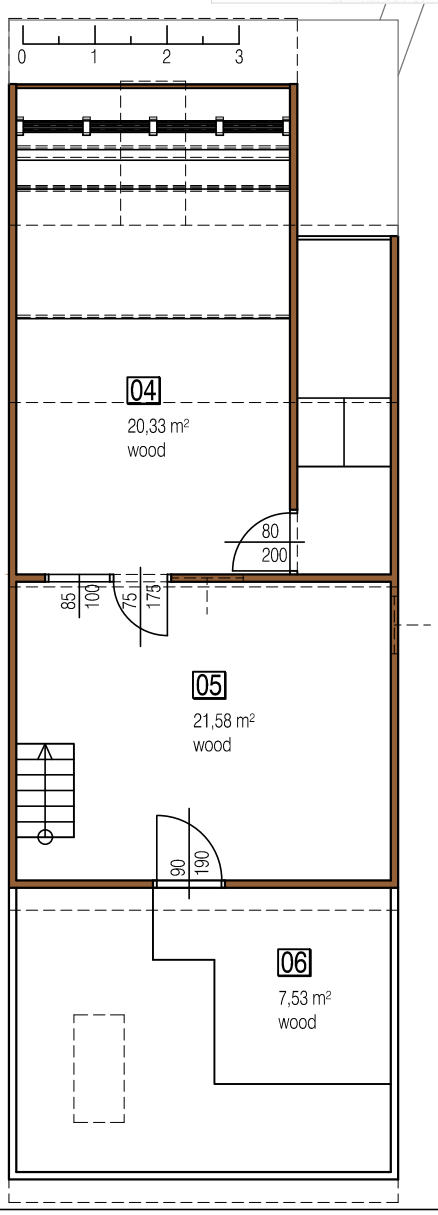
ground floor 1:100

shiae 111

ground floor



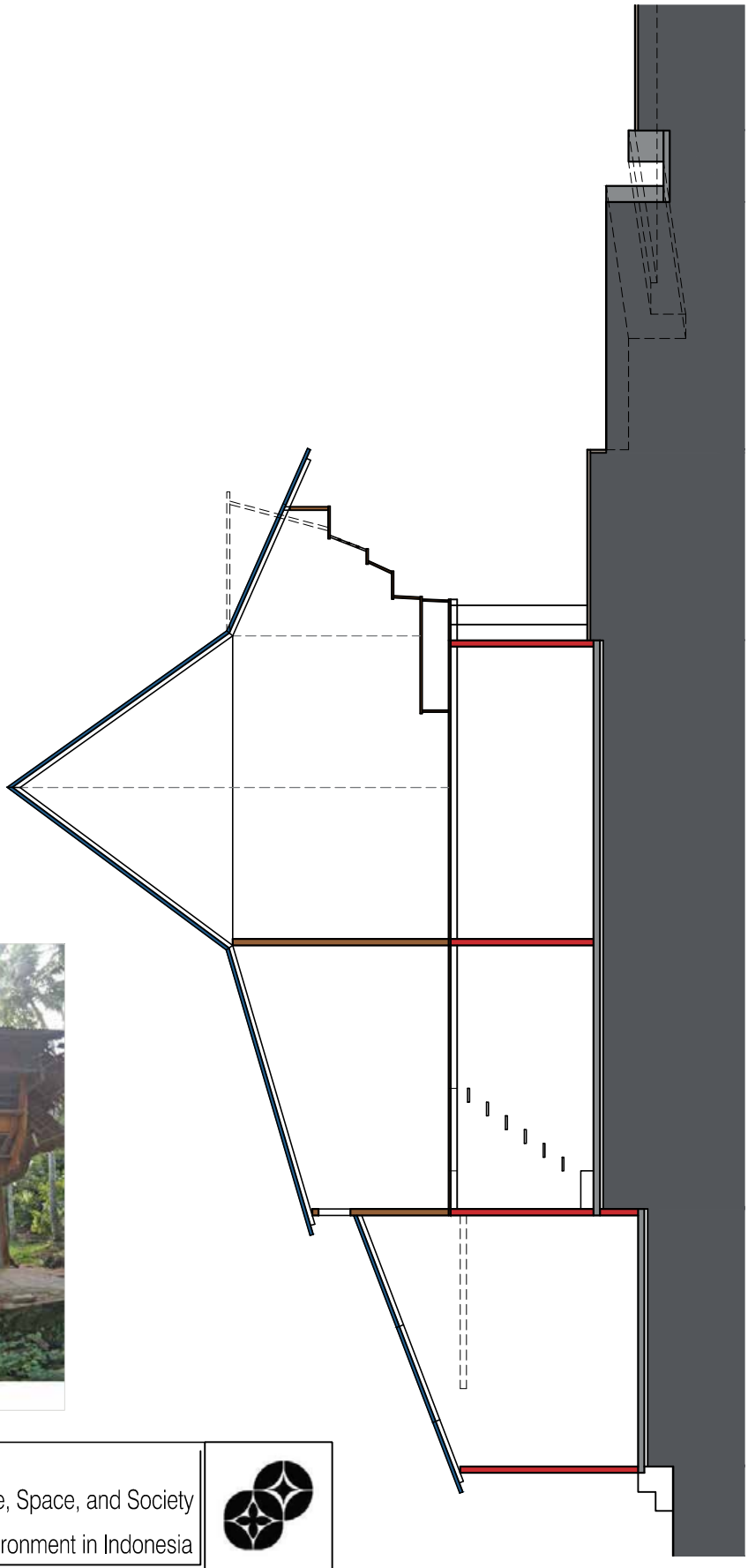
first floor



ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 111
July 2012	Andreas Aahs

section 1:100

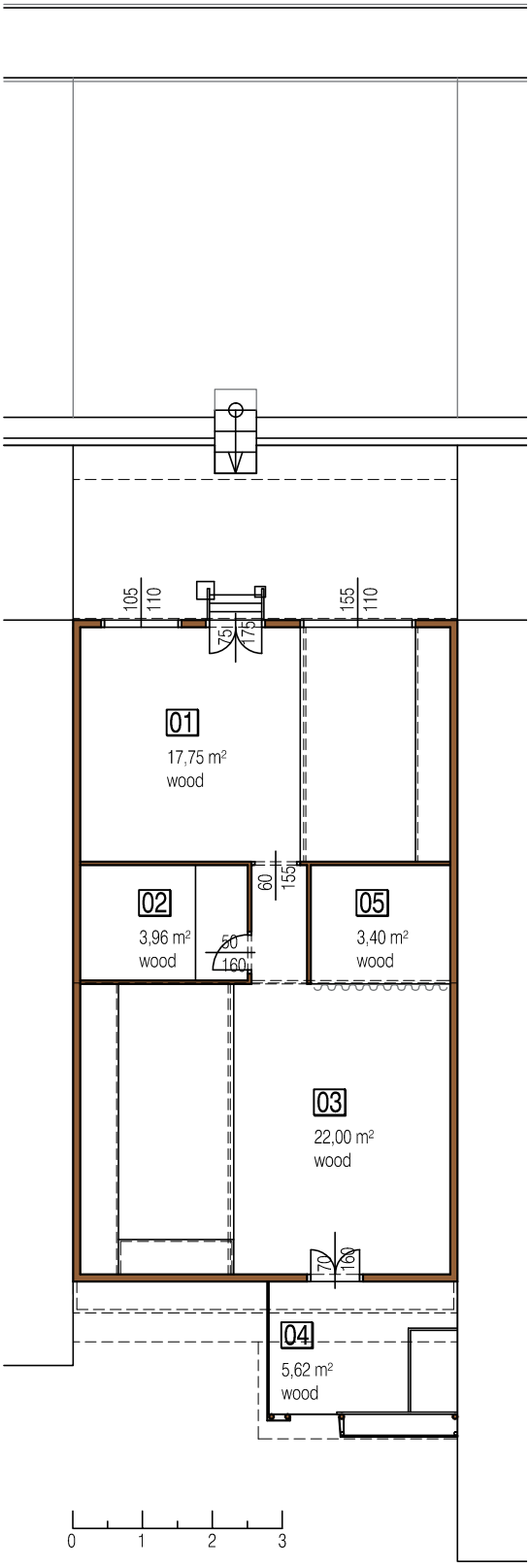


shiae 111

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 111
July 2012	Andreas Aahs

ground floor 1:100

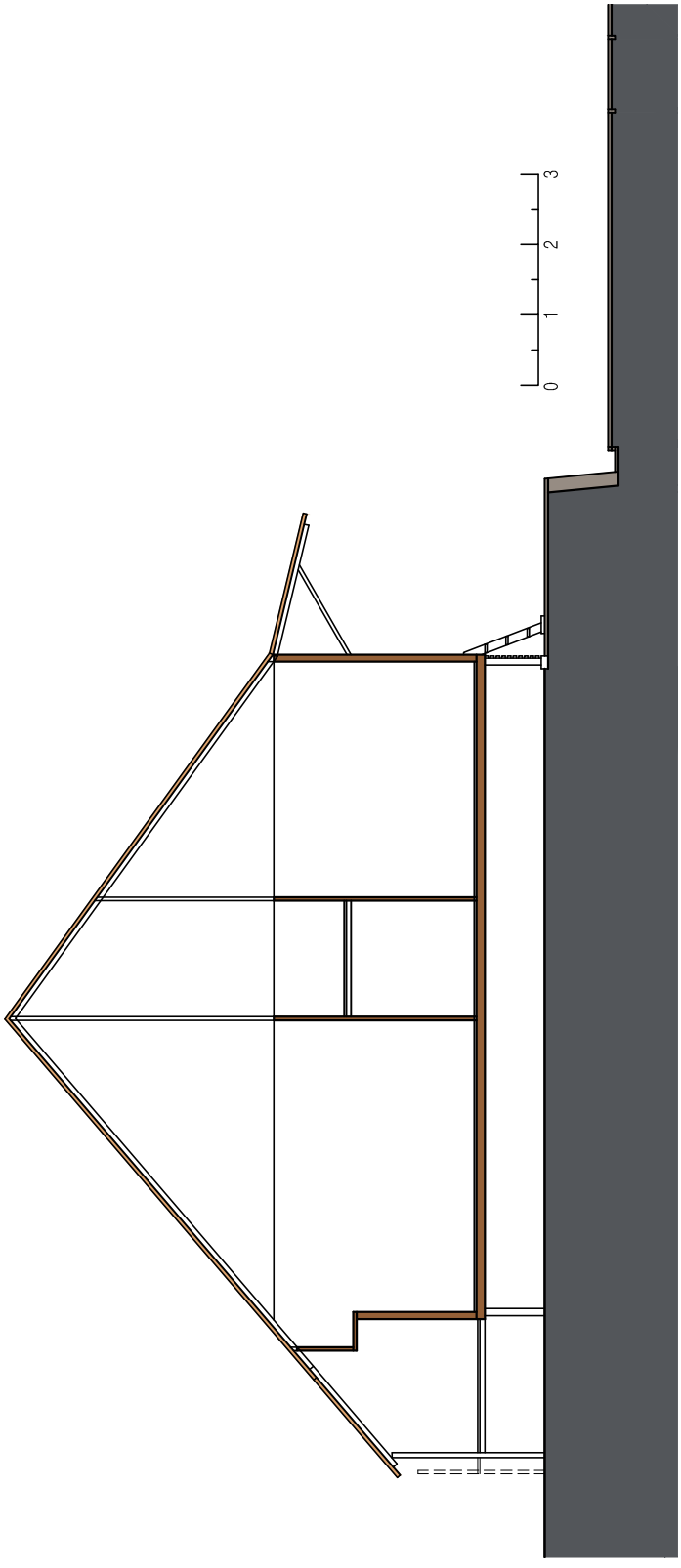


shiae 124

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 124
July 2012	Andreas Aahs

section 1:100

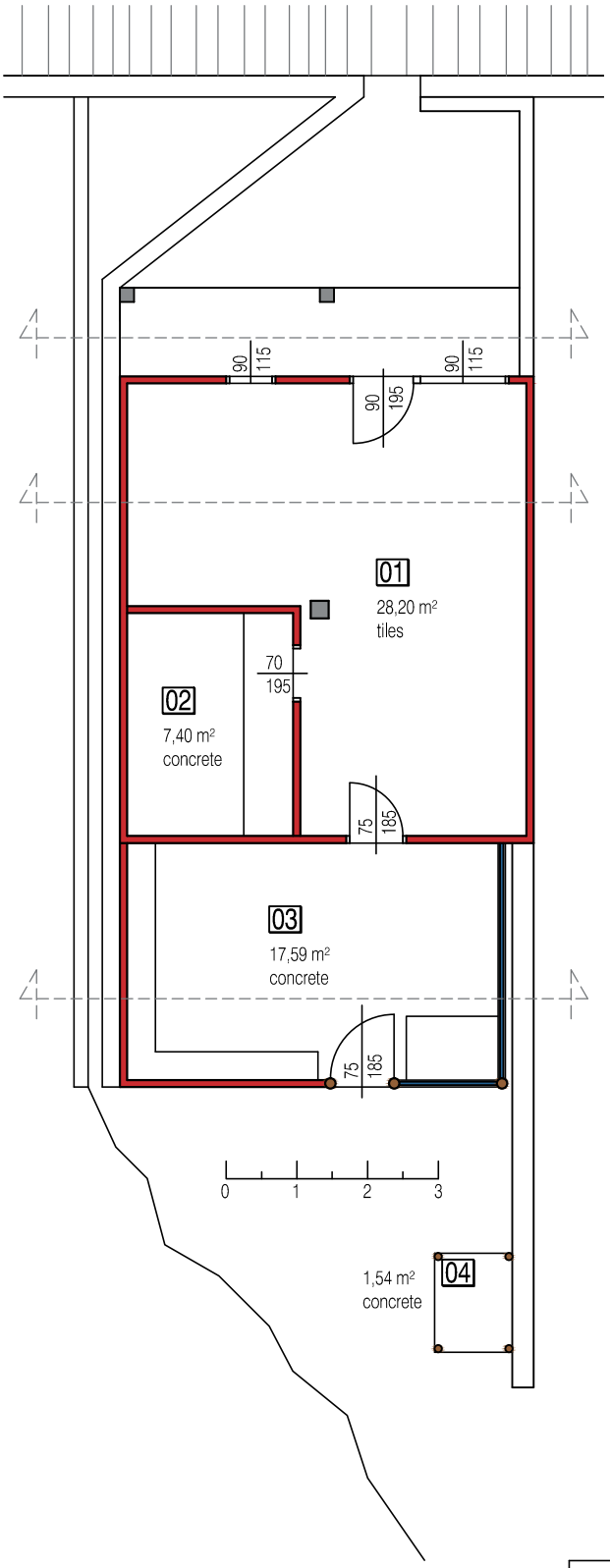


shiae 124

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 124
July 2012	Andreas Aahs

ground floor 1:100

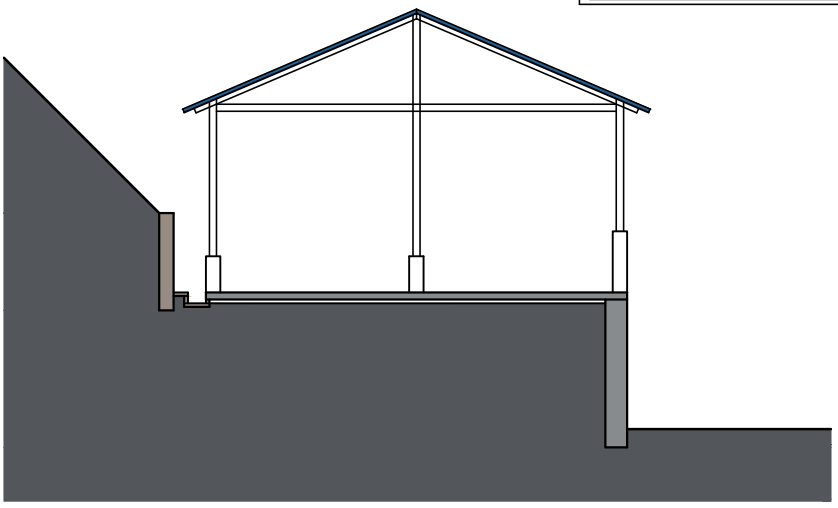


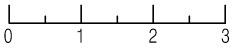
shiae 506

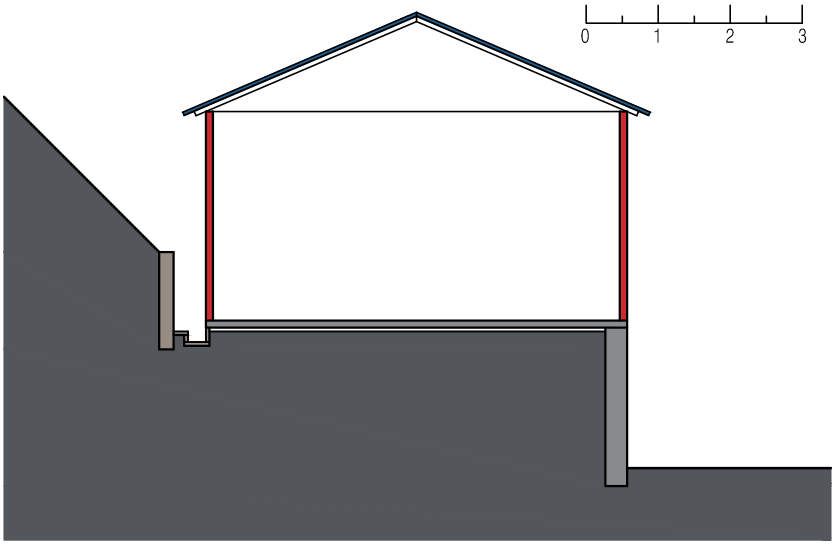
ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

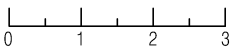
Nias - Hiliamaetaniha	shiae 506
July 2012	Andreas Aahs

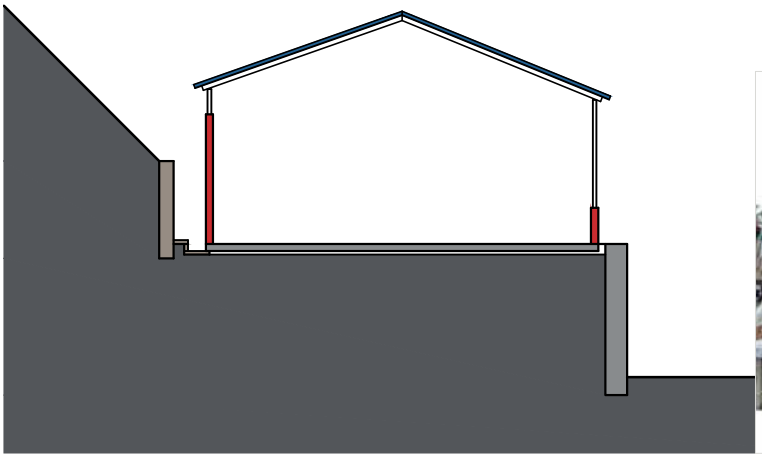
section 1:100









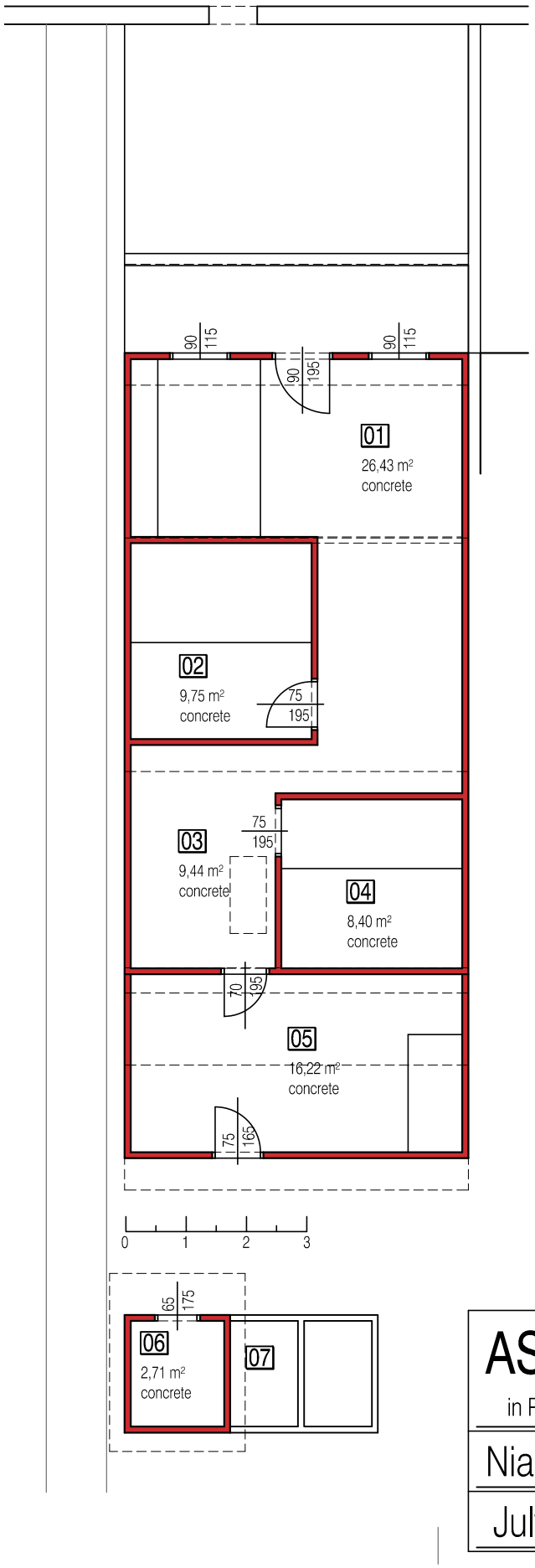


shiae 506

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 506
July 2012	Andreas Aahs

ground floor 1:100

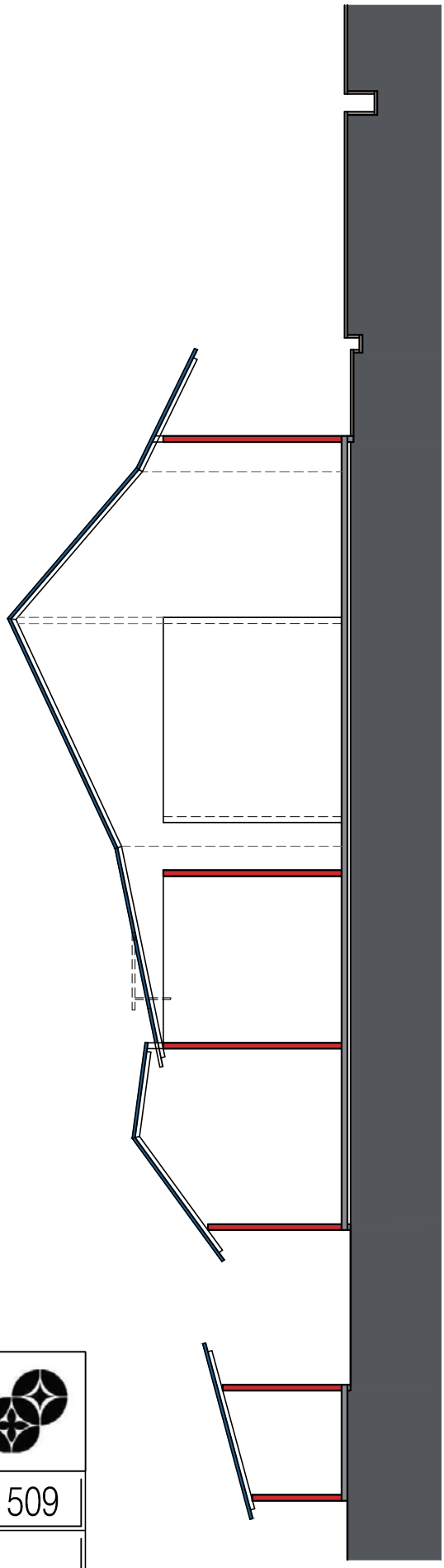


shiae 509

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 509
July 2012	Andreas Aahs

section 1:100



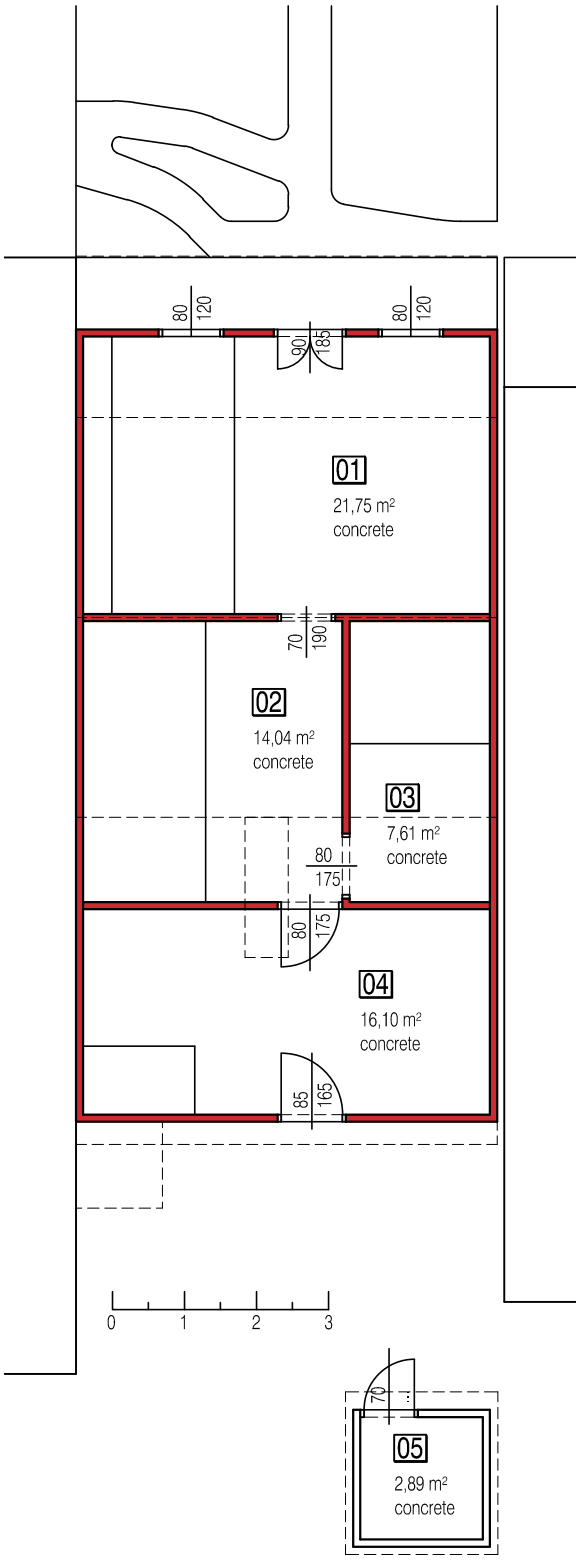
shiae 509

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha | shiae 509

July 2012 | Andreas Aahs

ground floor 1:100

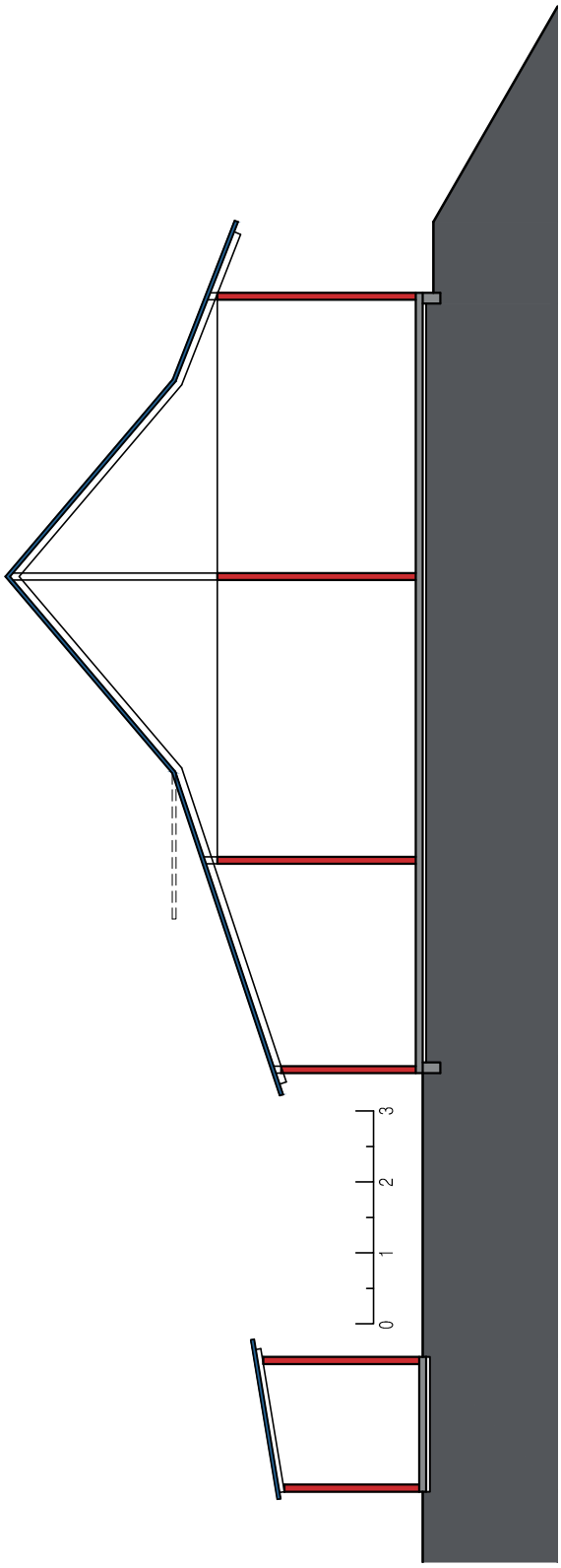


shiae 516

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 516
July 2012	Andreas Aahs

section 1:100

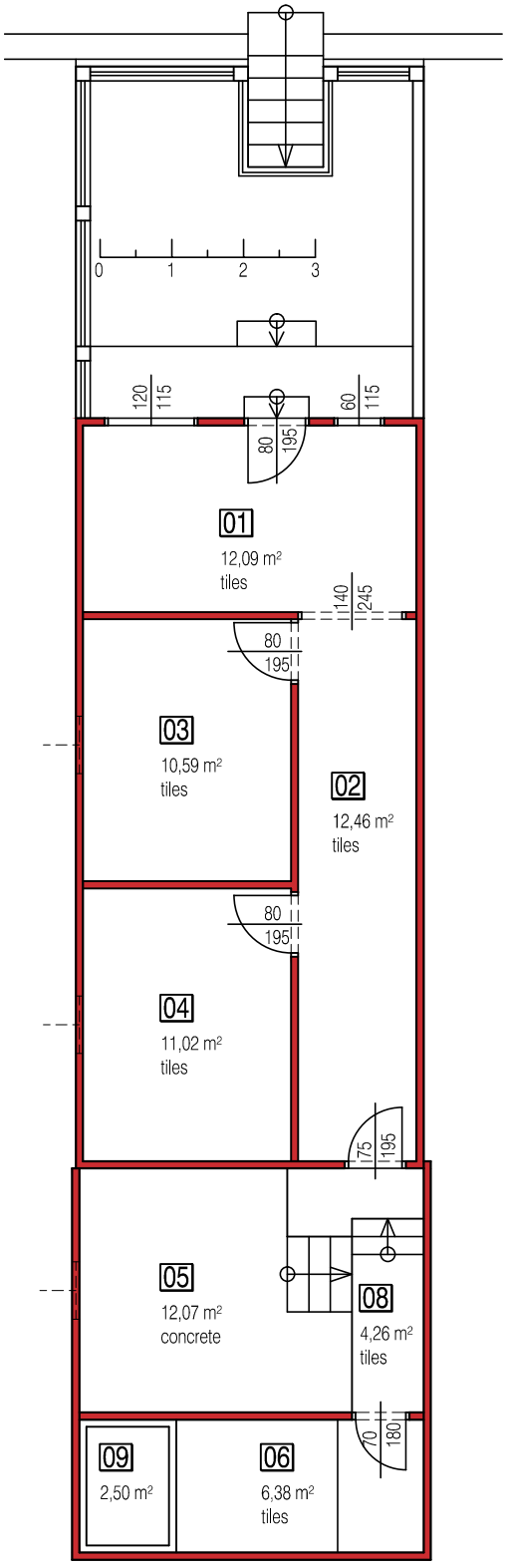


shiae 516

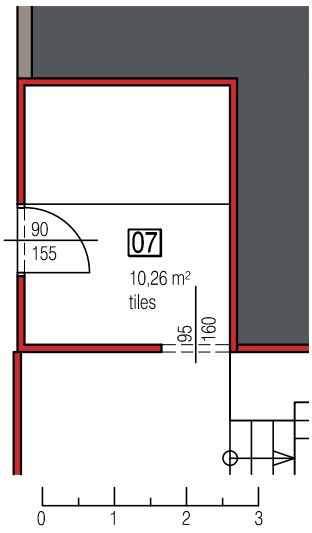
ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 516
July 2012	Andreas Aahs

ground floor 1:100



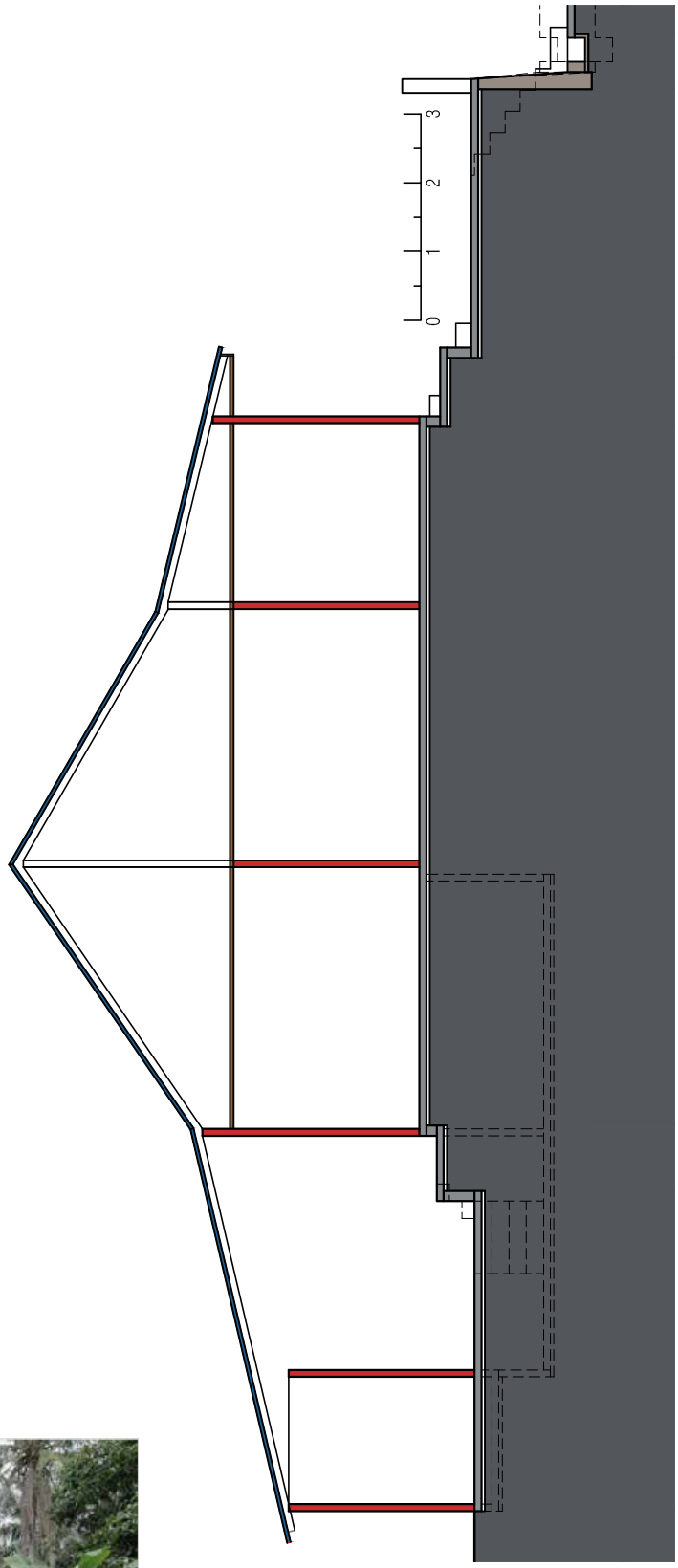
shiae 530



ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 530
July 2012	Andreas Aahs

section 1:100

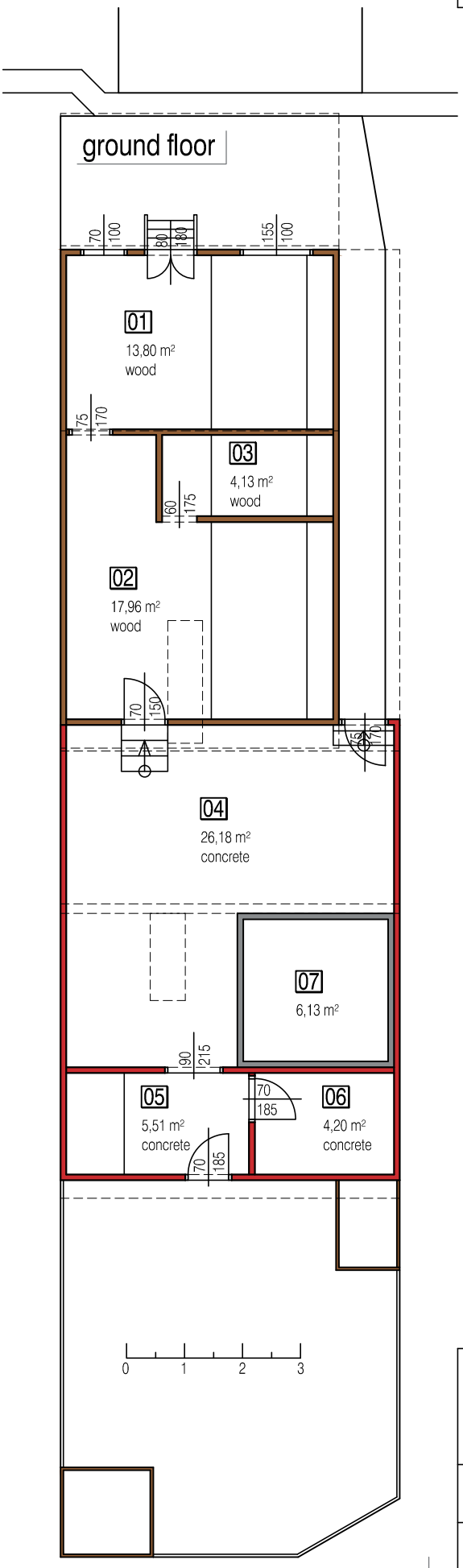


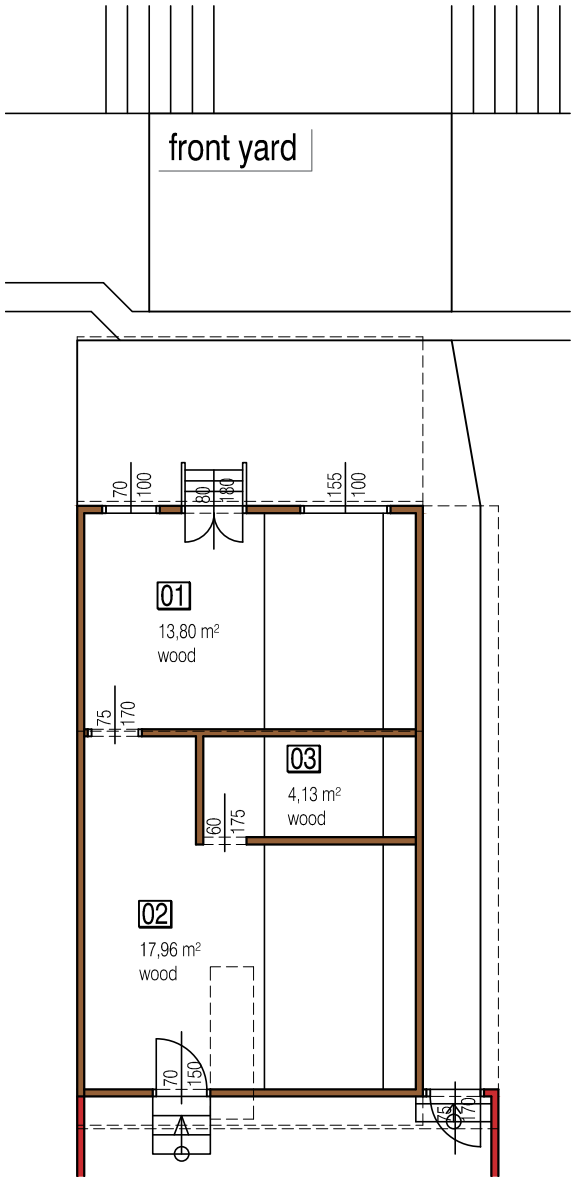
shiae 530

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 530
July 2012	Andreas Aahs

ground floor 1:100



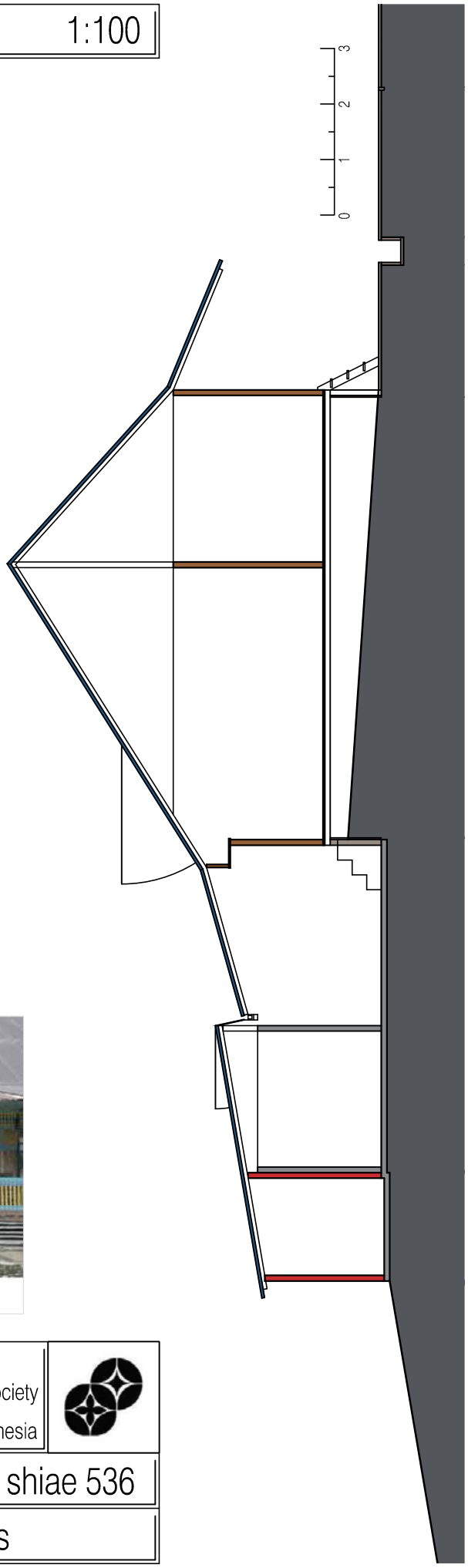


shiae 536

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Hiliamaetaniha	shiae 536
July 2012	Andreas Aahs

section 1:100



shiae 536

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

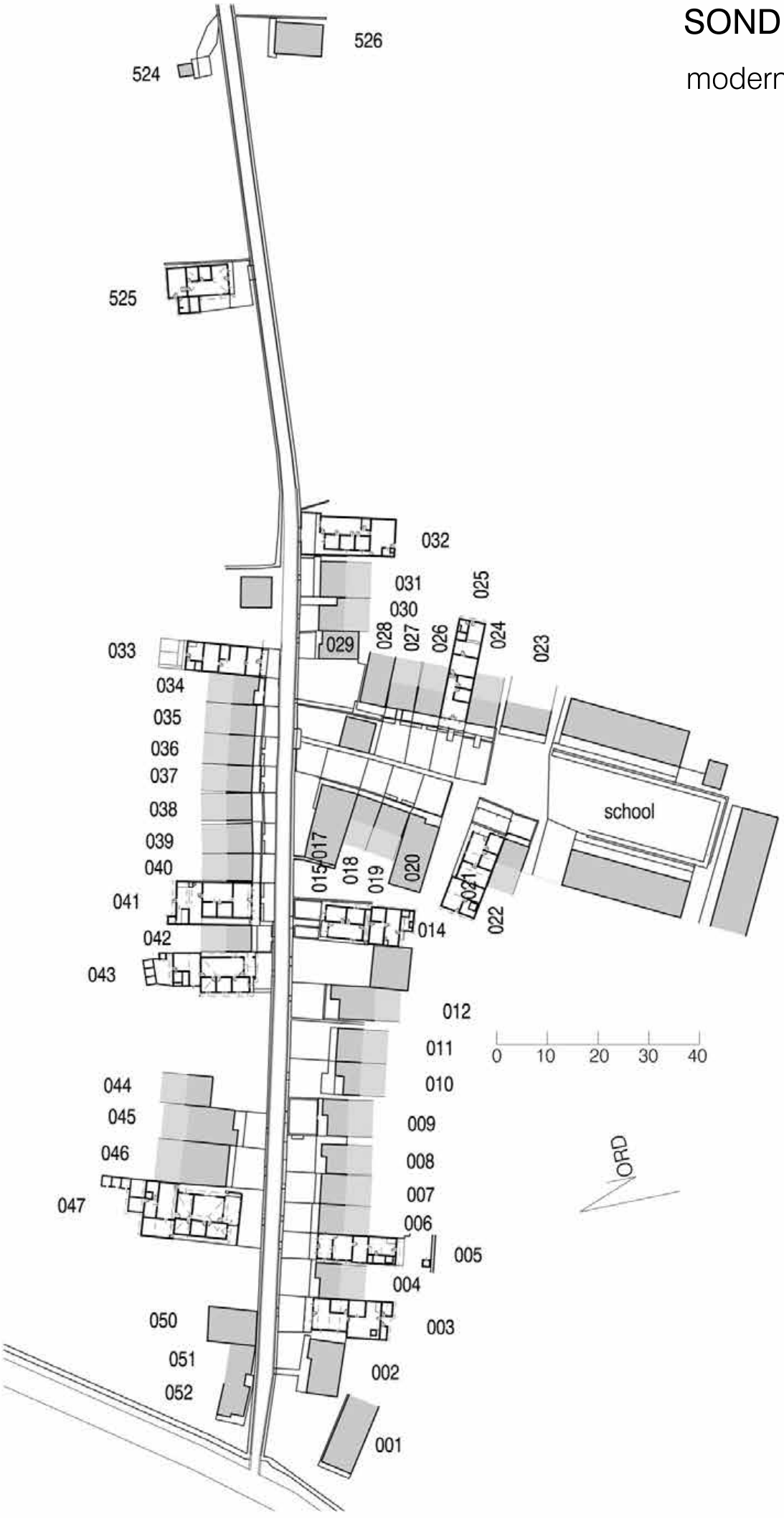
Nias - Hiliamaetaniha	shiae 536
July 2012	Andreas Aahs

		Mainhouse																											Extantion													
		Traditional																Modern																								
		Tawolö	Föröma	Kolukolu	guestroom	living room	meeting room	bedroom	bedroom	bedroom	kitchen	dining room	business	Warung	storage	storage	praying room	guestroom	meeting room	living room	bedroom	bedroom	bedroom	dining room	Warung	storage	storage	passage	kitchen	kitchen	dining room	bedroom	bedroom	bathroom	toilet	toilet	water tank	storage	storage	storage	sty	passage
shiae	022	1	2		1	1		2							1	2													7	8	7	6		9	9		12	7	11			11
shiae	026	1	2	3	1	1	2	1	2	3			1				2												4		4			5	5		5	4				
shiae	027	1	2					2				2			1														3		3							3				
shaie	042	1				1									1														5	7	3	2	4	6	6	8	11	3	5	7	12	3
shaie	043	1	2	3		1	1	2	3																				6		7	7					10					
shaie	058																	1	2		1	3		2	1	3			4									4				
shaie	070																	1		1	1	2	3			3			4		4			5	5		6	4				
shaie	080	7	6		7			7	6																				5		4							5				4
shaie	091																																									
shaie	094	1	2					1																					7					8	9			7				
shaie	095	1	2		1	1	1	1	2		2	2			2																											
shaie	099	1	2	3	2	1	1								1	2													6	8	4	5		7	9		10	5	6			4
shaie	102	9	10			9																							6	8	4	4	5	7	7		7	4	8			4
shaie	111	4	5		4	5	4	5							4														3		3							3				
shaie	123	1	3	2	1	3		3	2					1	1														6		4	5		7	7		7	4				
shaie	124	1	3	2	1	1		2	3	5		3			3														4													
shaie	506																	1		1	1	2				1			3		3								3			
shaie	509																	1		1	2								5		3	4							5			
shaie	516																	1		1	1	2	3	1		1	3		4		4								4			
shaie	530																	1		1	3	3				4	4	2	5		5	7		6	6		9	5	7			
shaie	536	1	2	3	1	1		2	3					1	2														5		4			6	6		7	4				
	21	14	13	6	9	11	5	11	7	2	1	3	1	2	9	2	1	6	1	5	6	5	2	2	1	5	2	1	19	4	16	8	2	10	10	1	10	14	8	1	1	5

		Extantion 1st floor				Modification									backyard			
		bedroom	bedroom	storage	passage	guestroom	bedroom	bedroom	dining room	living room	storage	passage	passage	garage	toilet	bathroom	sty	storage
shiae	022	3		3		4	5										X	
shiae	026			X														
shiae	027					5	7	8		5					4	4	X	X
shaie	042					10	9											
shaie	043	4	5	3	3	9	8											
shaie	058														5	5	6	X
shaie	070																X	X
shaie	080					1	3				1	2			9	9	X	
shaie	091																	
shaie	094			2		3	4	6	5	3	5	3		3				
shaie	095																	
shaie	099																11	
shaie	102					1	2	3										
shaie	111			6		1	1	2	2	1		1	2				X	
shaie	123																	
shaie	124																	
shaie	506														4			
shaie	509														6	6	7	
shaie	516														5			
shaie	530																	
shaie	536																X	
	21	2	1	5	1	8	8	4	2	3	2	3	1	1	6	4	9	3

SONDREGEASI

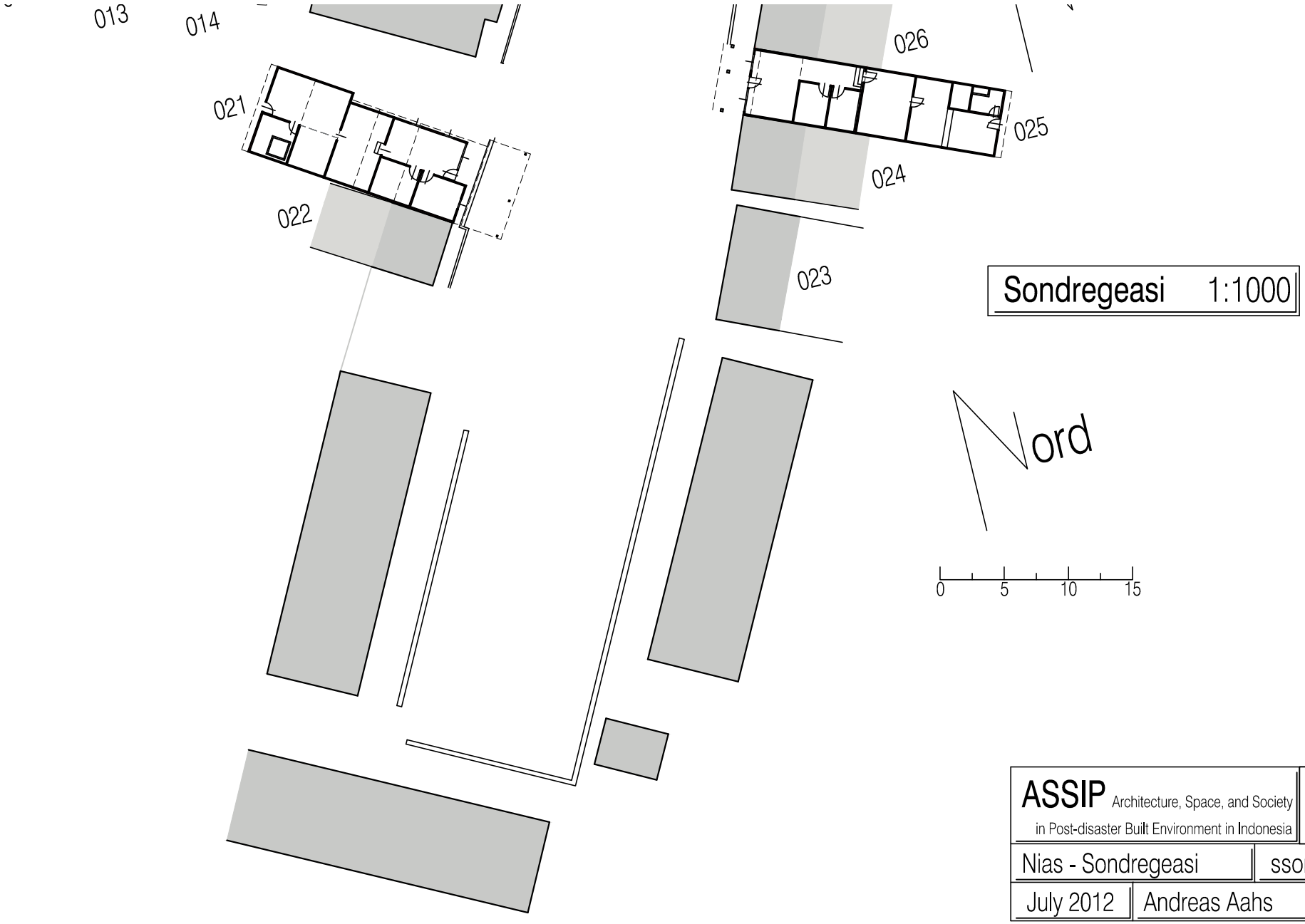
modern village



ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

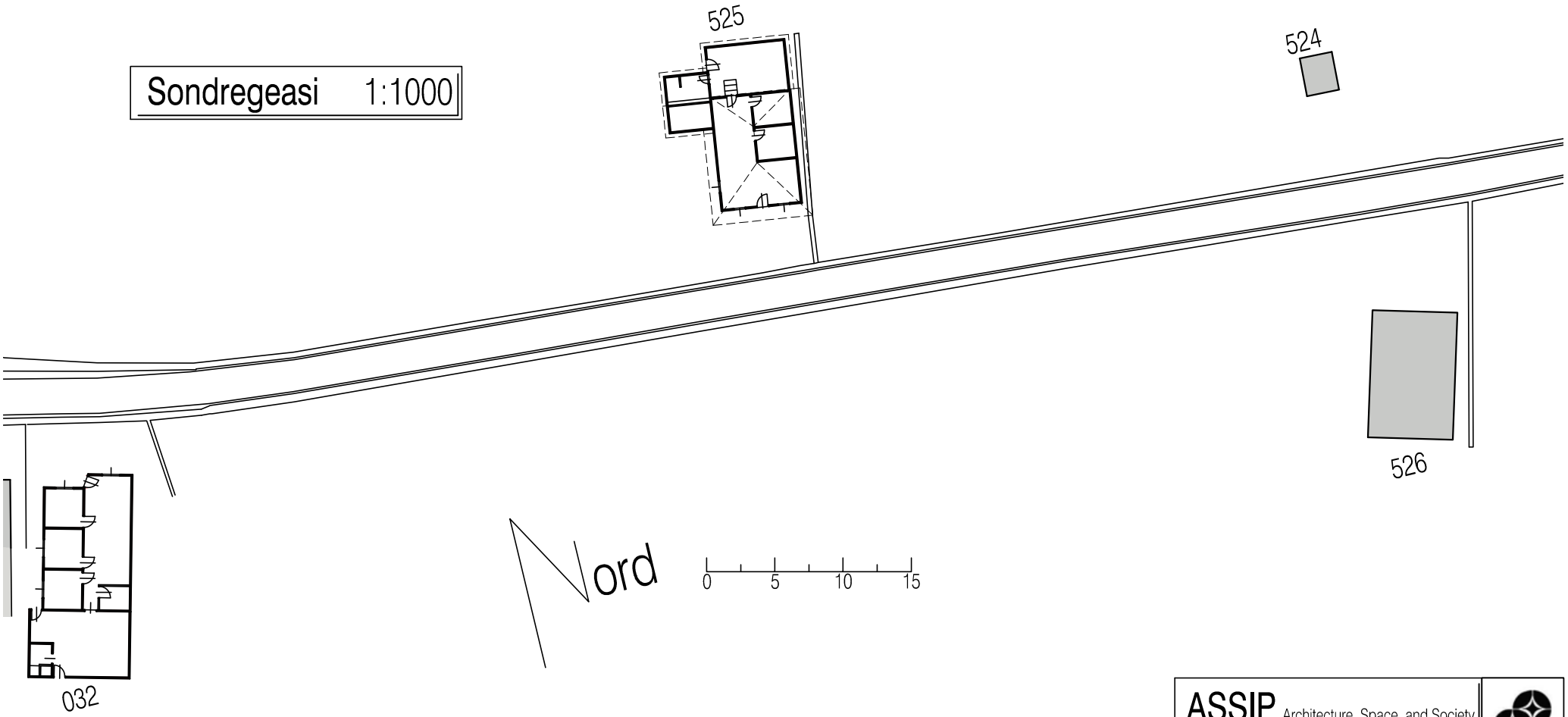
Nias - Sondregeasi	ssond
July 2012	Andreas Aahs


043
041
042
040
039
038
037
036
035
034
033
Sondregeasi 1:1000
015-016-017
018
019
020
012
013
014
021
022
029
030
031
032
028
027
026
025
024
Nord
0 5 10 15
ASSIP Architecture, Space, and Society
in Post-disaster Built Environment in Indonesia
Nias - Sondregeasi
ssond
July 2012
Andreas Aahs



ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond
July 2012	Andreas Aahs



ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond
July 2012	Andreas Aahs

ssond 005

ssond 004

ssond 003

ssond 002

ssond 001

ssond 012

ssond 011

ssond 010

ssond 009

ssond 008

ssond 007

ssond 006

ssond 017

ssond 016

ssond 015

ssond 014

ssond 013

Sondregeasi south facade 1

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Sondregeasi	ssond
July 2012	Andreas Aahs

ssond 028

ssond 032

ssond 031

ssond 030

ssond 029

ssond 526

Sondregeasi south facade 2

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Sondregeasi	ssond
July 2012	Andreas Aahs

ssond 052

ssond 051

ssond 050

ssond 048

ssond 047

ssond 046

ssond 045

ssond 044

ssond 043

ssond 042

ssond 041

ssond 040

ssond 039

Sondregeasi north facade 1

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Sondregeasi	ssond
July 2012	Andreas Aahs

ssond 038

ssond 037

ssond 036

ssond 035

ssond 034

ssond 033

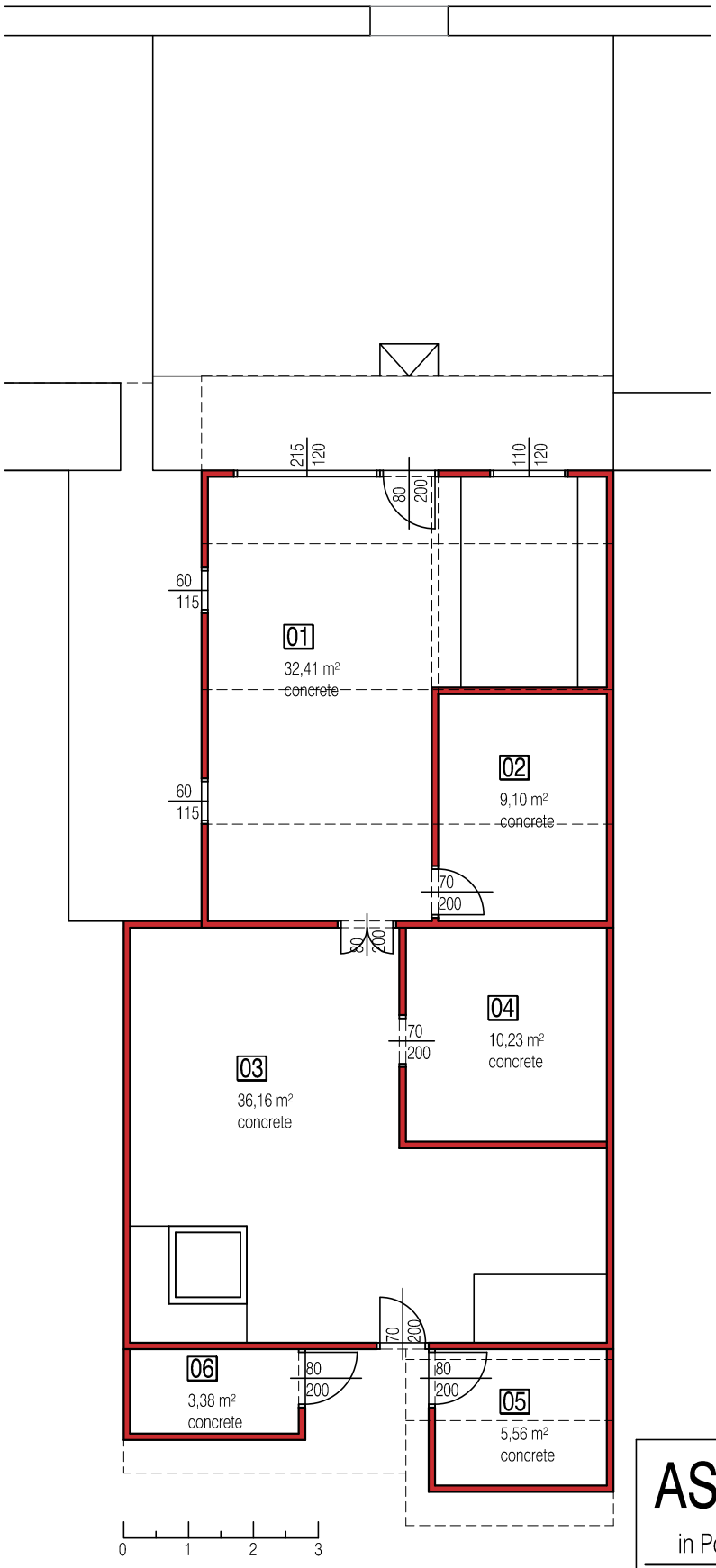
ssond 525

ssond 524

Sondregeasi north facade 2

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia	
Nias - Sondregeasi	ssond
July 2012	Andreas Aahs

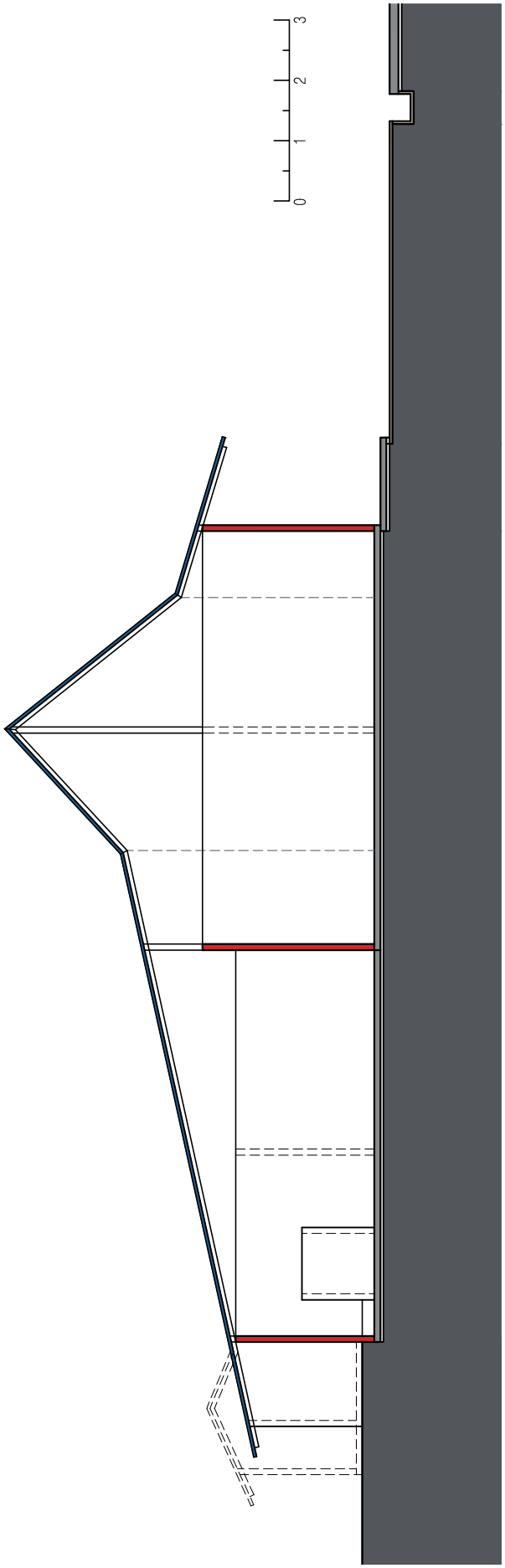
ground-floor 1:100



ssond 003

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 003
July 2012	Andreas Aahs



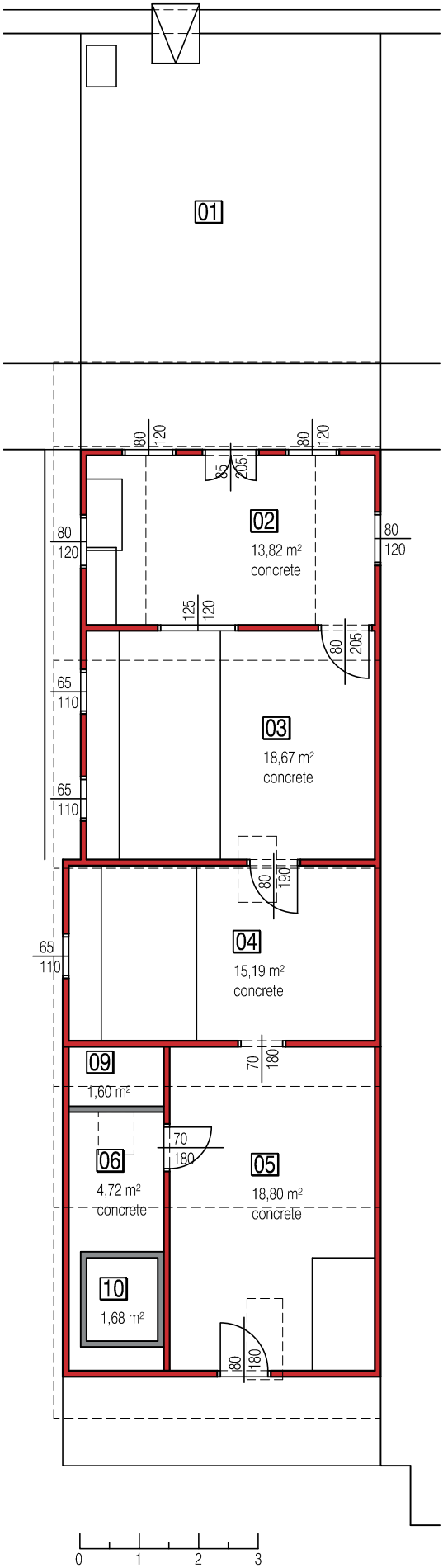
section 1:100

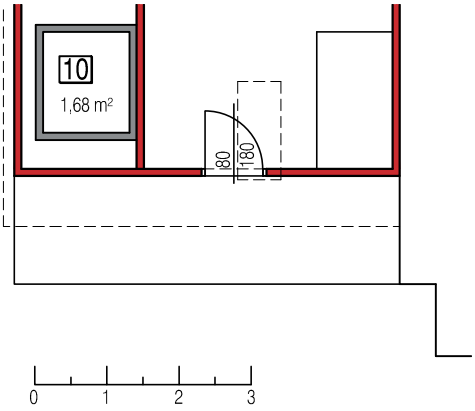
ssond 003

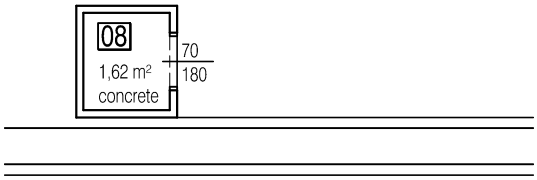
ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 003
July 2012	Andreas Aahs

ground floor 1:100





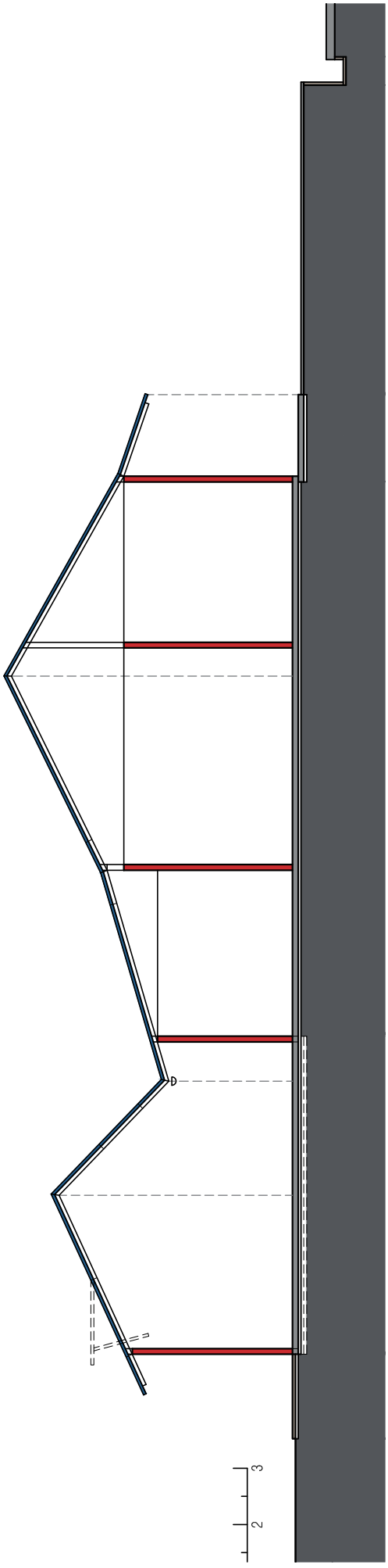


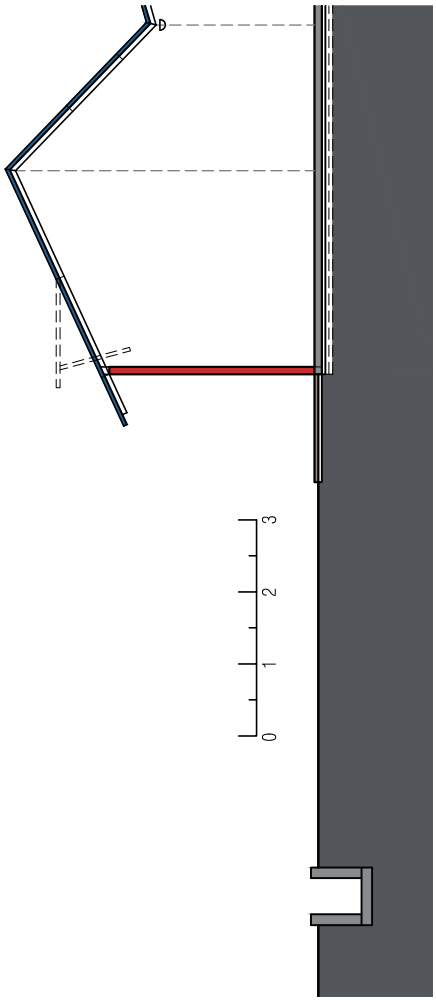
ssond 005

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 005
July 2012	Andreas Aahs

section 1:100



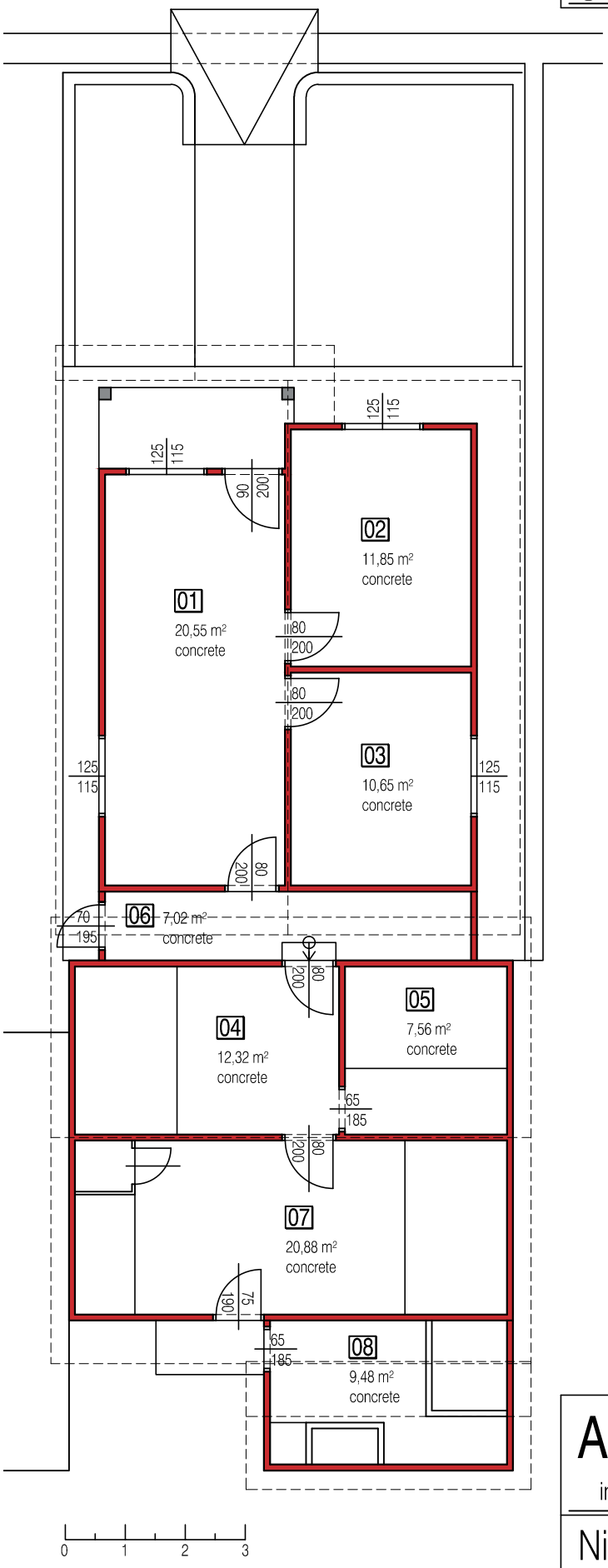


ssond 005

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 005
July 2012	Andreas Aahs

ground floor 1:100

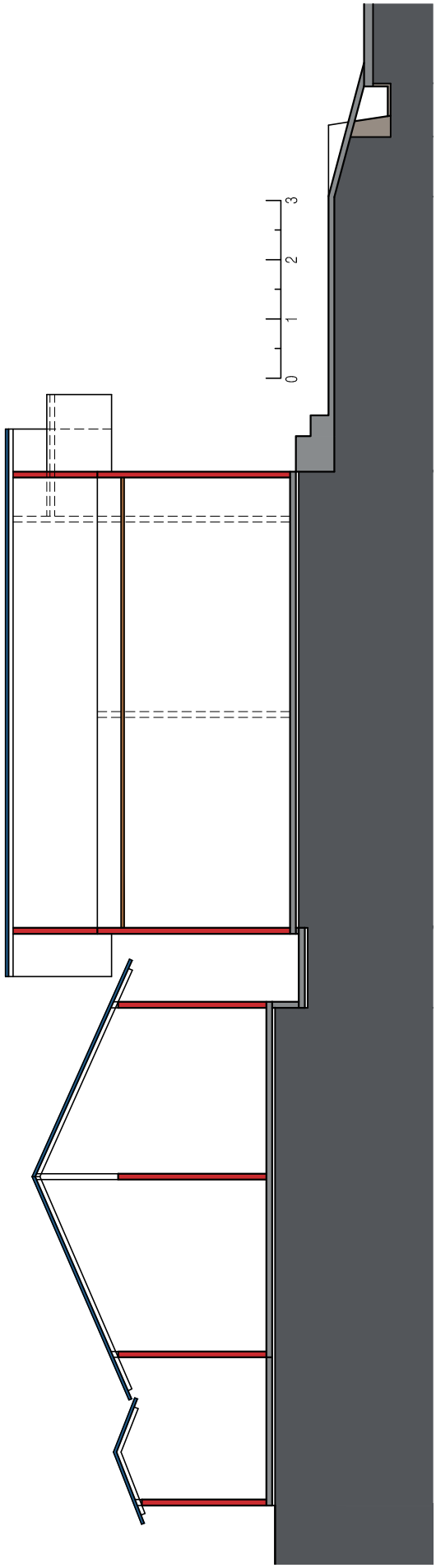


ssond 014

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 014
July 2012	Andreas Aahs

section 1:100

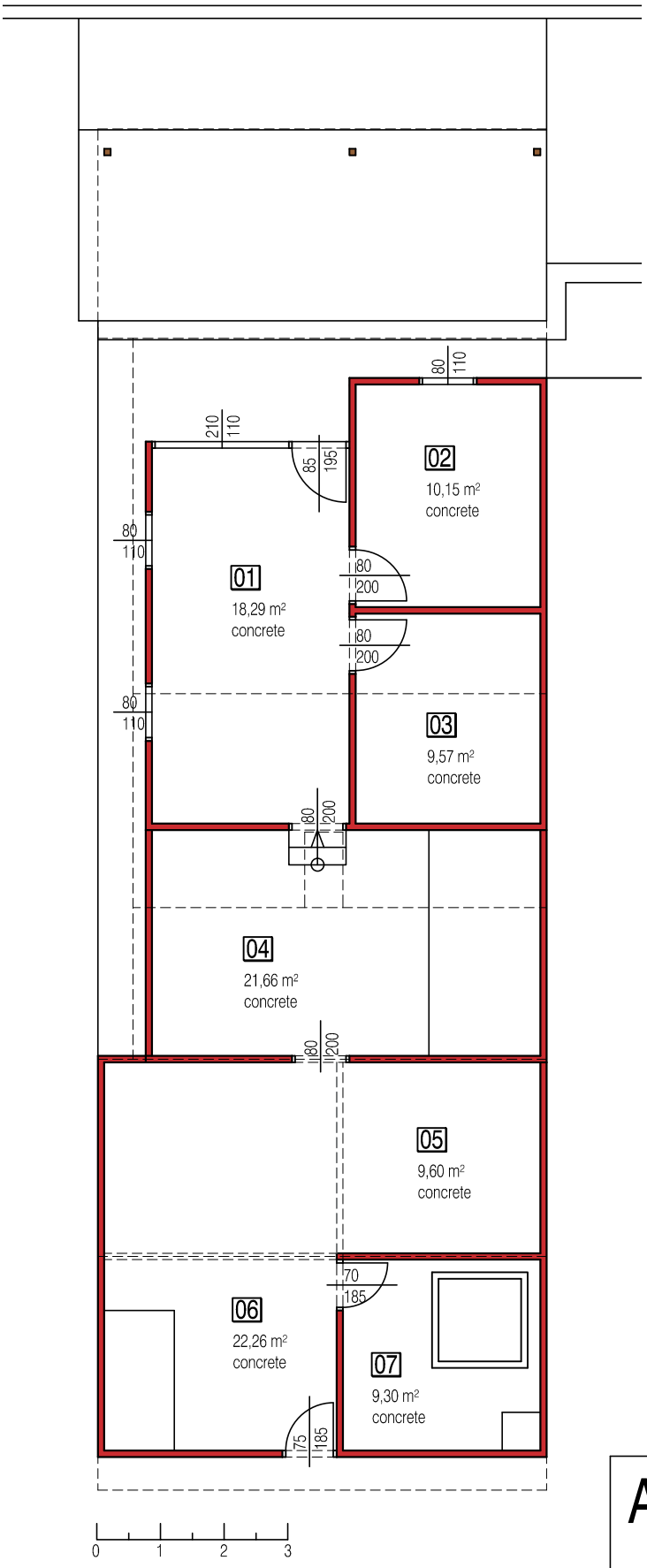


ssond 014

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 014
July 2012	Andreas Aahs

ground floor 1:100

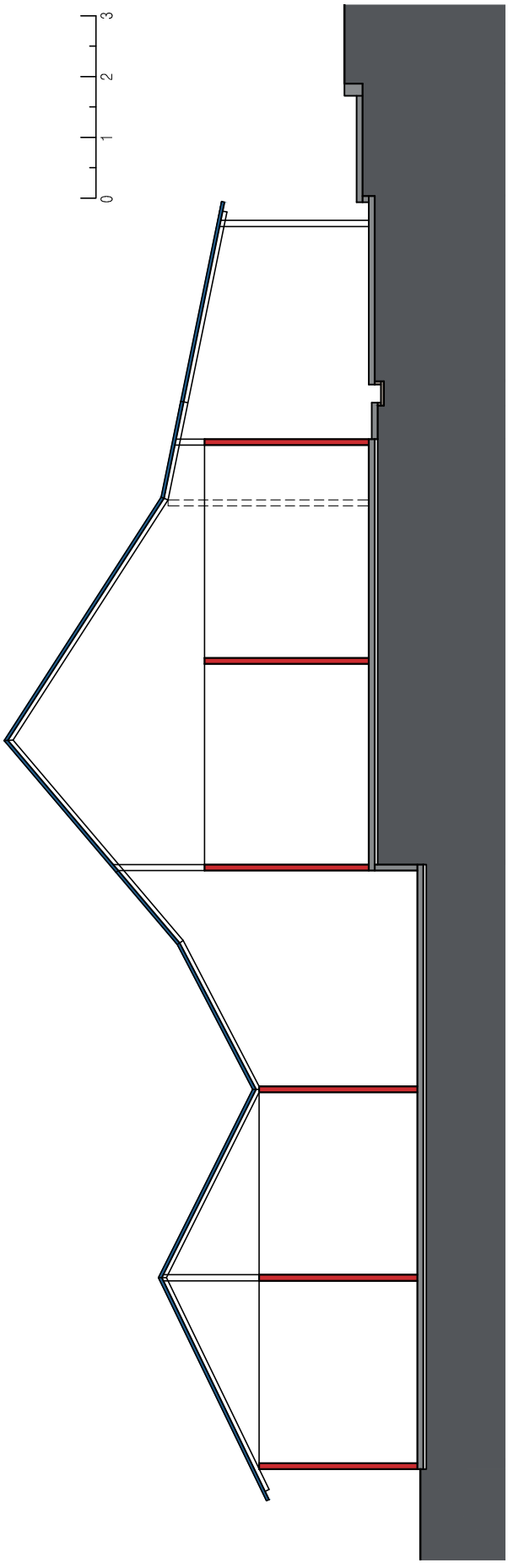


ssond 021

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 021
July 2012	Andreas Aahs

section 1:100

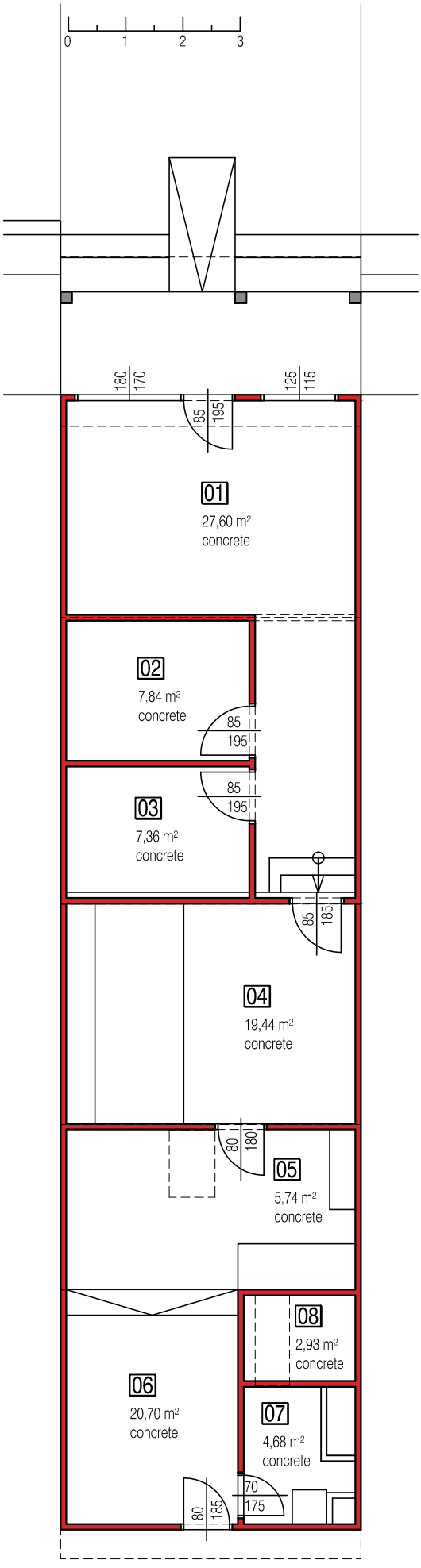


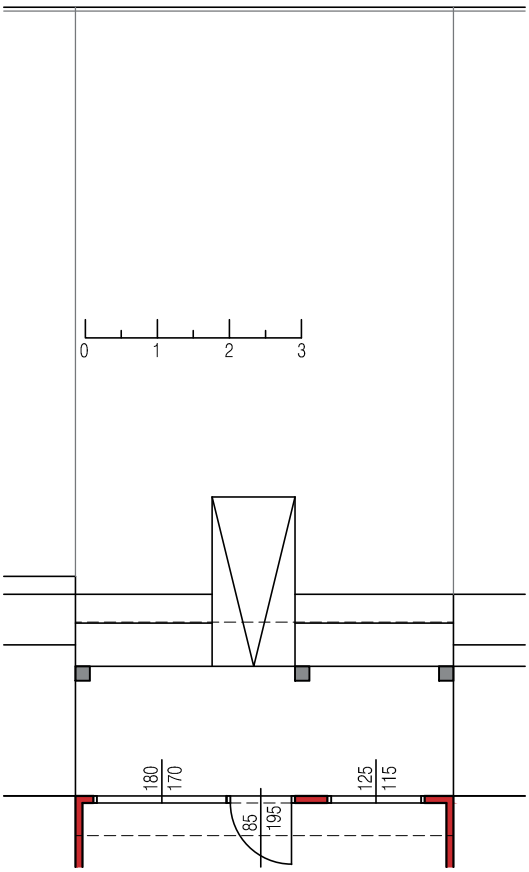
ssond 021

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 021
July 2012	Andreas Aahs

ground floor 1:100



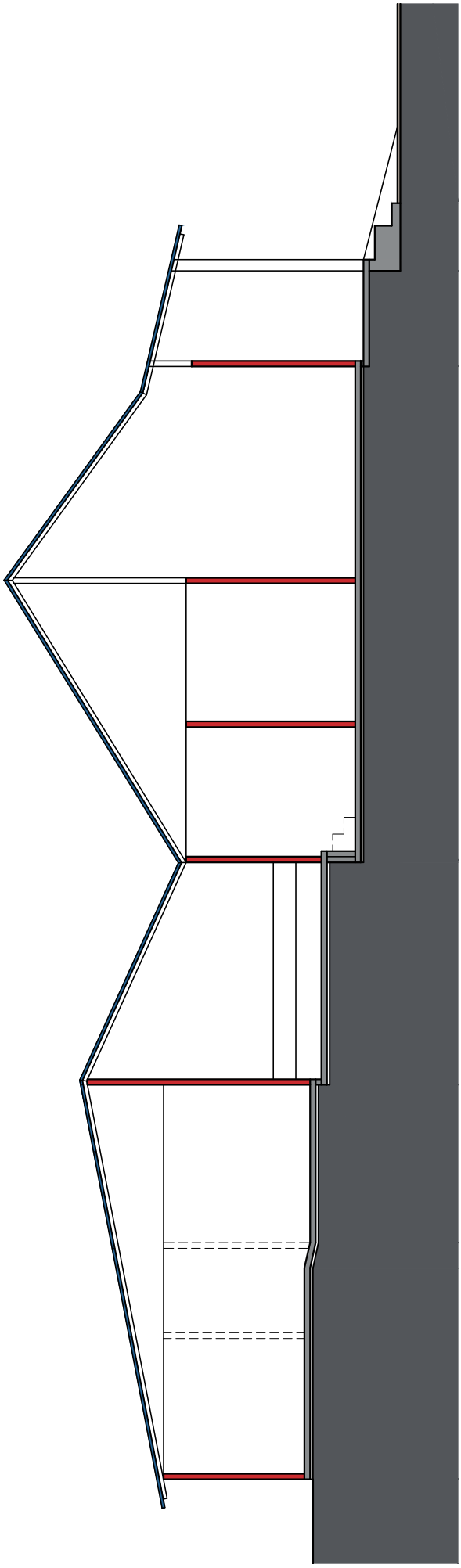


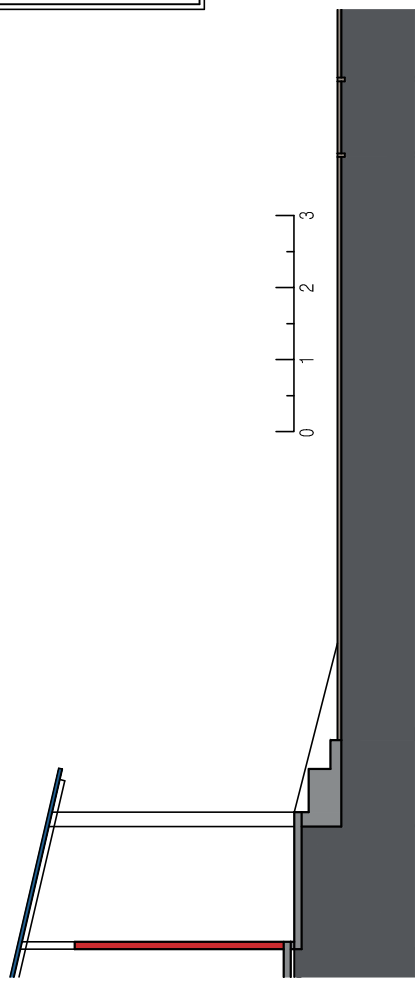
ssond 025

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 025
July 2012	Andreas Aahs

section 1:100



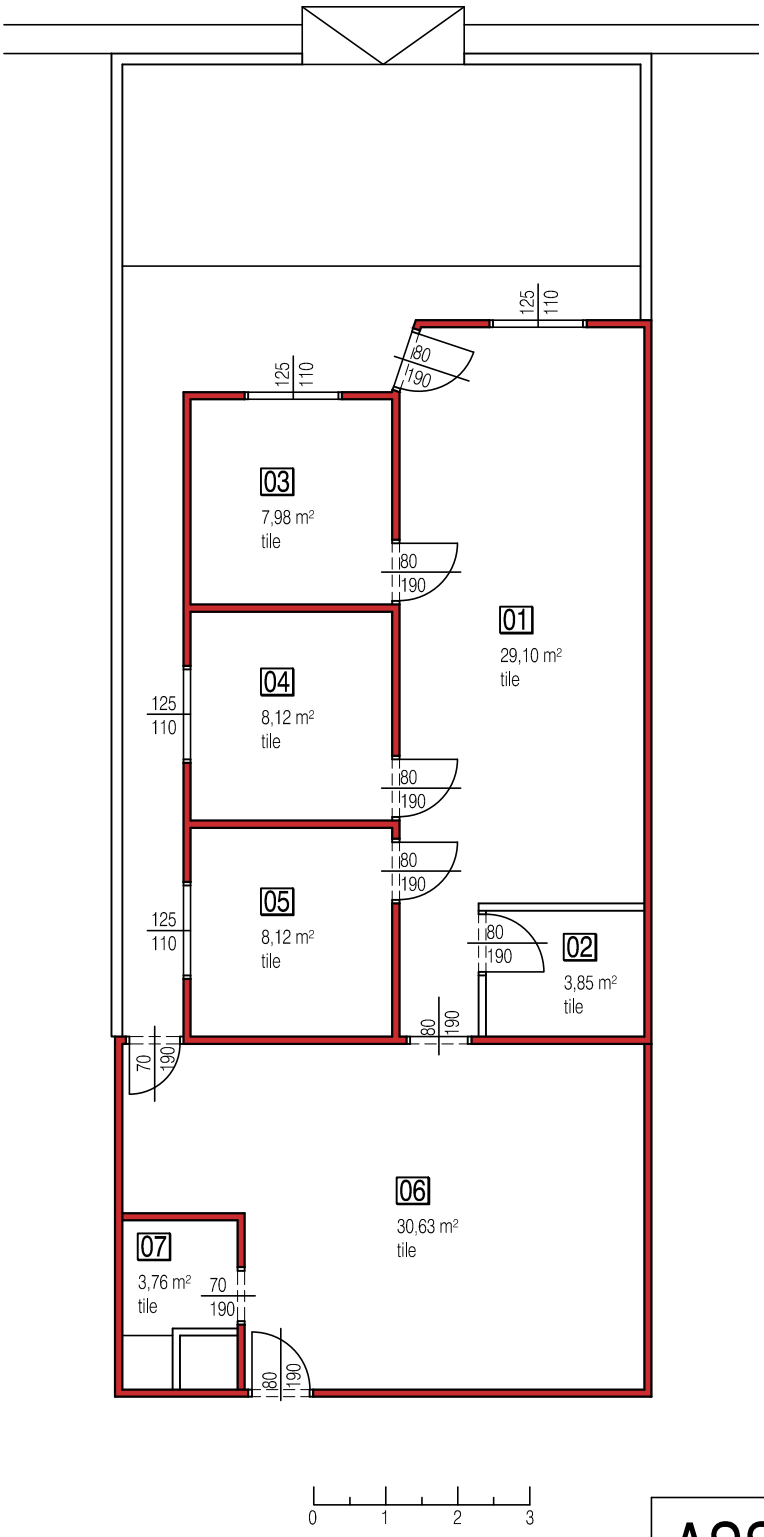


ssond 025

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 025
July 2012	Andreas Aahs

ground floor 1:100

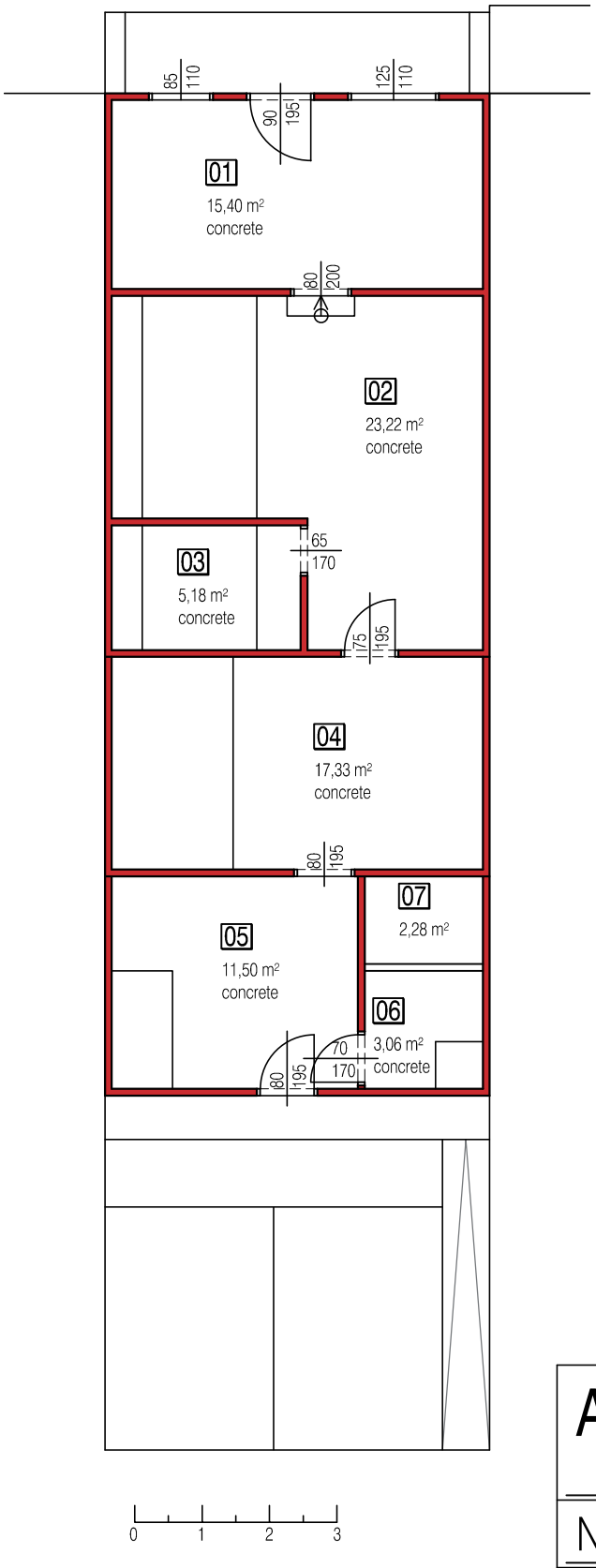


ssond 032

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 032
July 2012	Andreas Aahs

ground floor 1:100

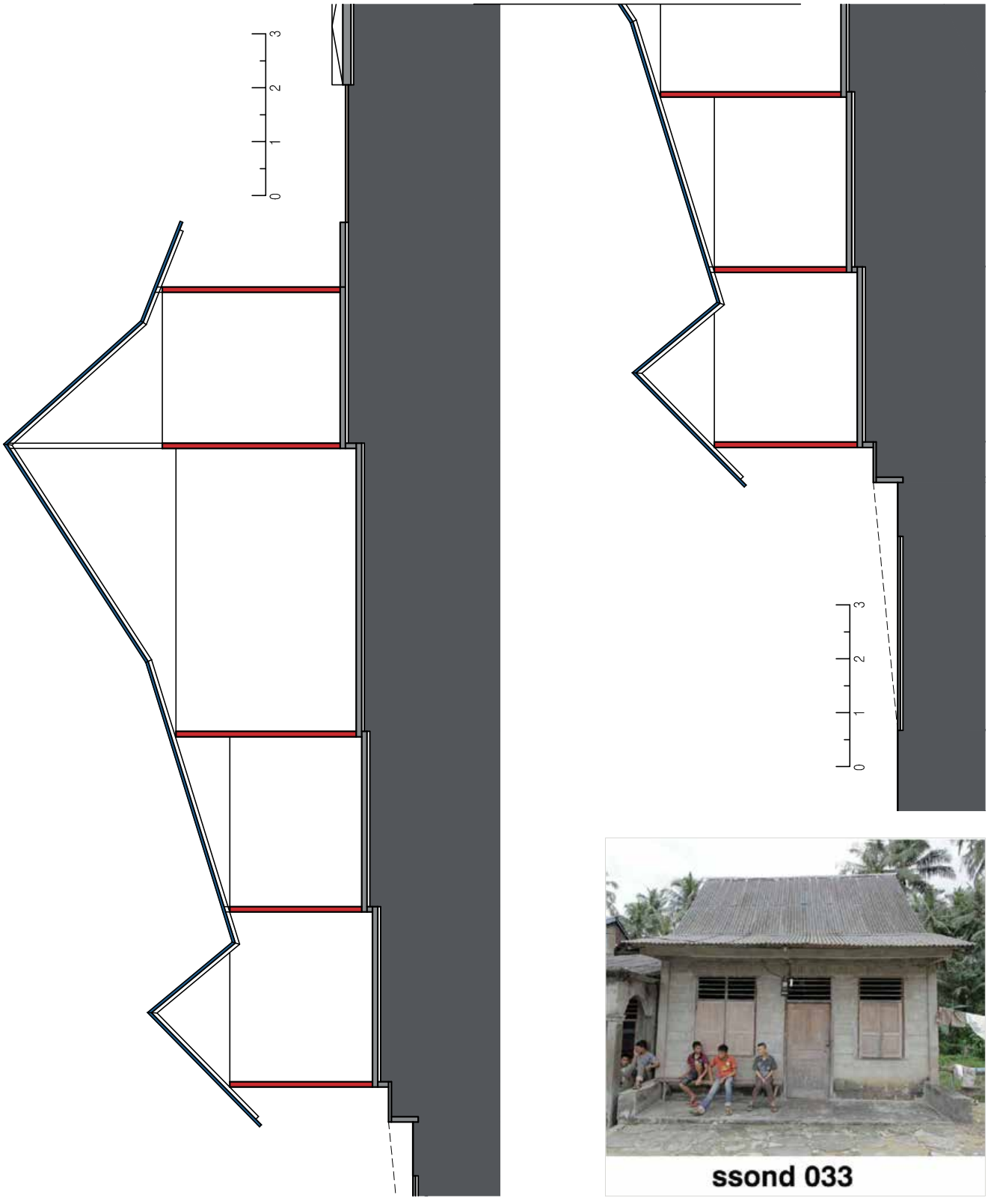


ssond 033

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 033
July 2012	Andreas Aahs

section 1:100

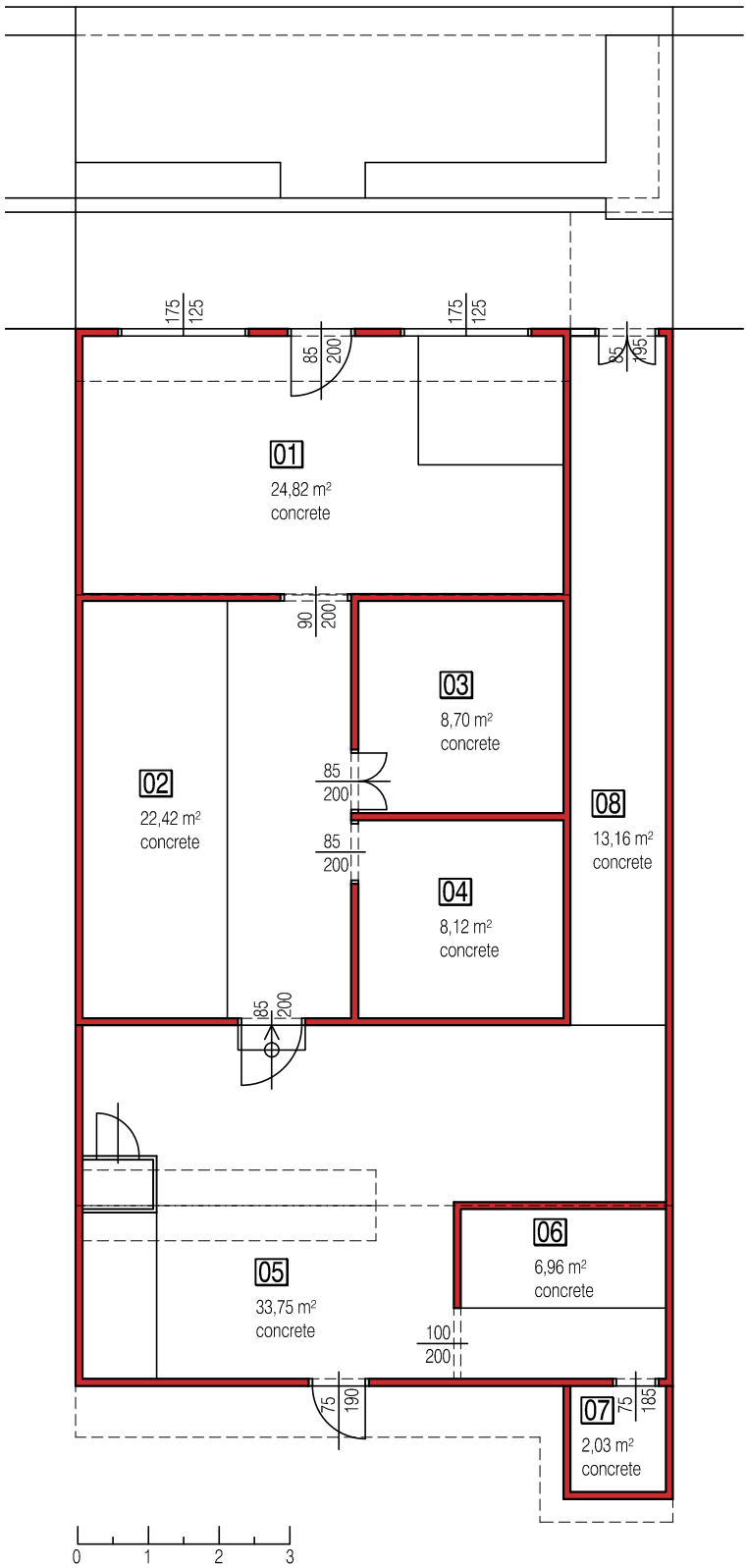


ssond 033

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 033
July 2012	Andreas Aahs

ground floor 1:100

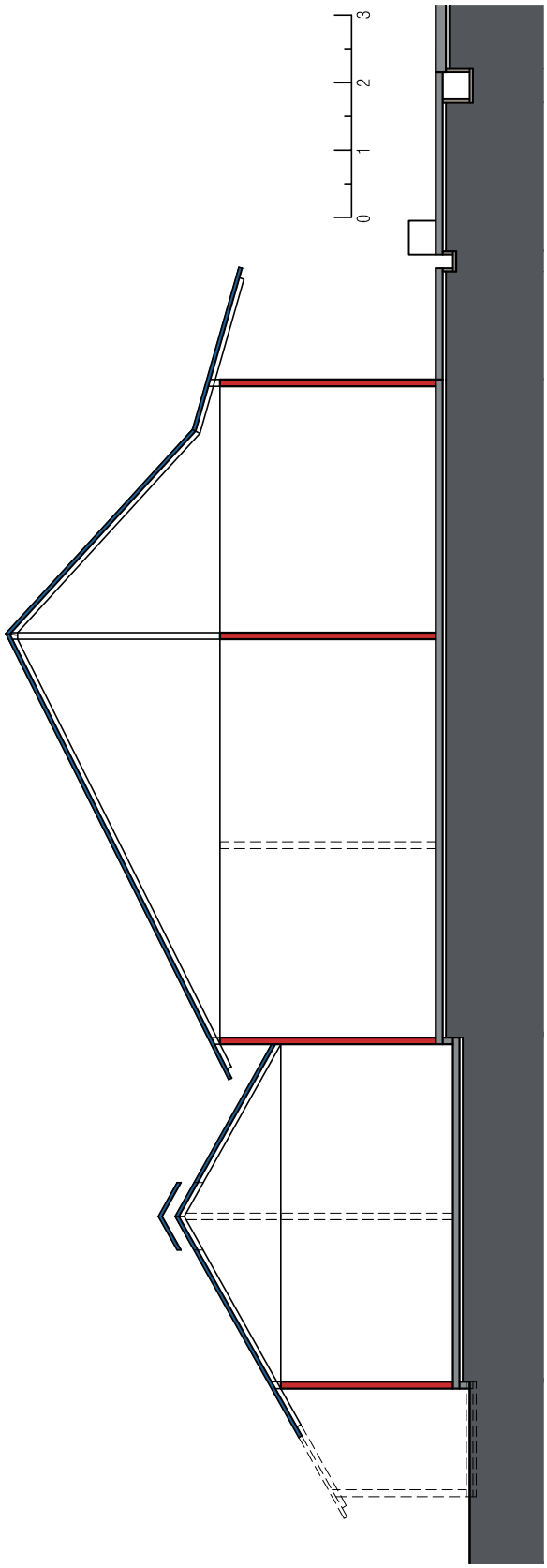


ssond 041

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 041
July 2012	Andreas Aahs

section 1:100

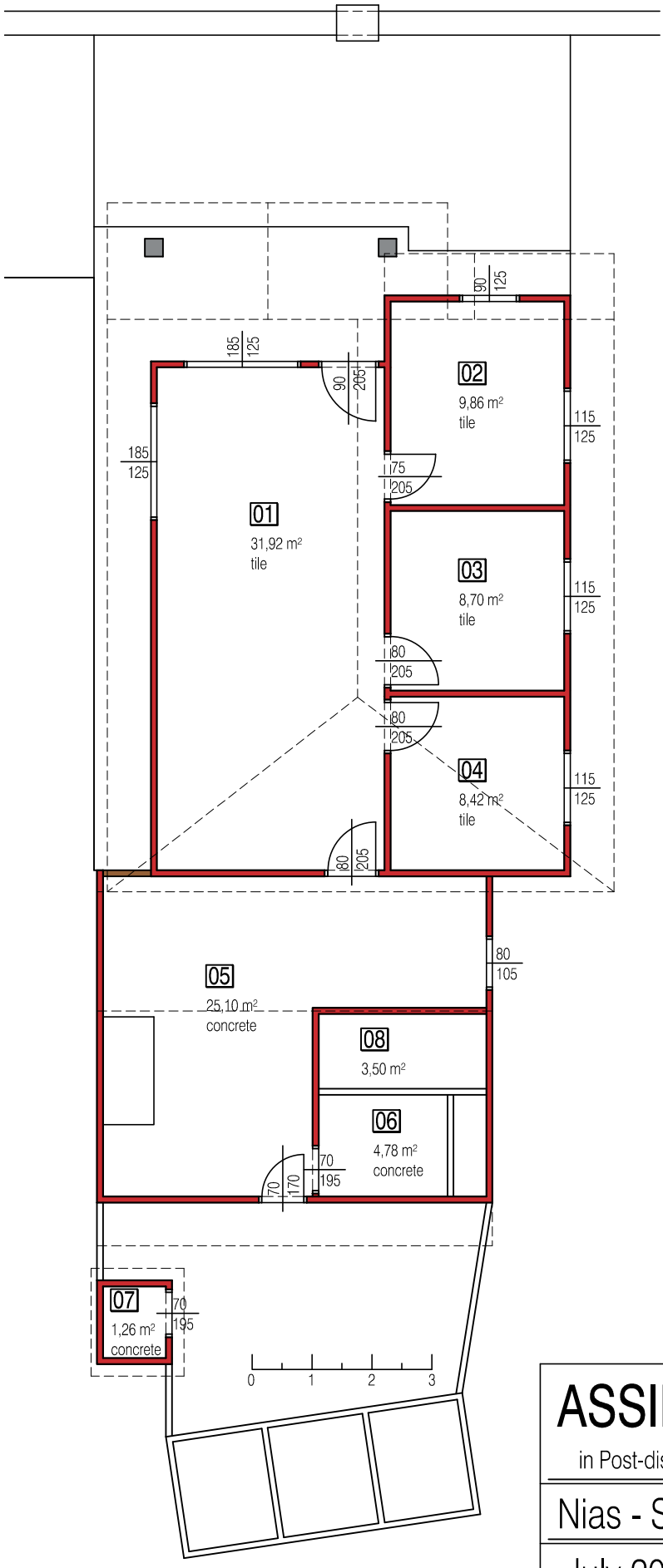


ssond 041

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 041
July 2012	Andreas Aahs

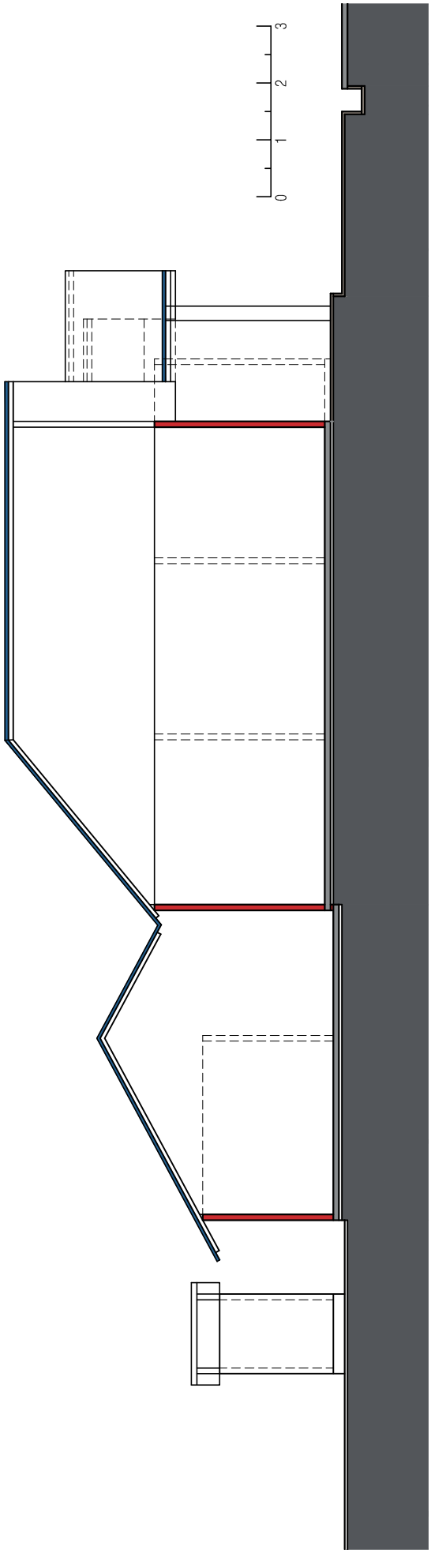
ground floor 1:100



ssond 043

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 043
July 2012	Andreas Aahs



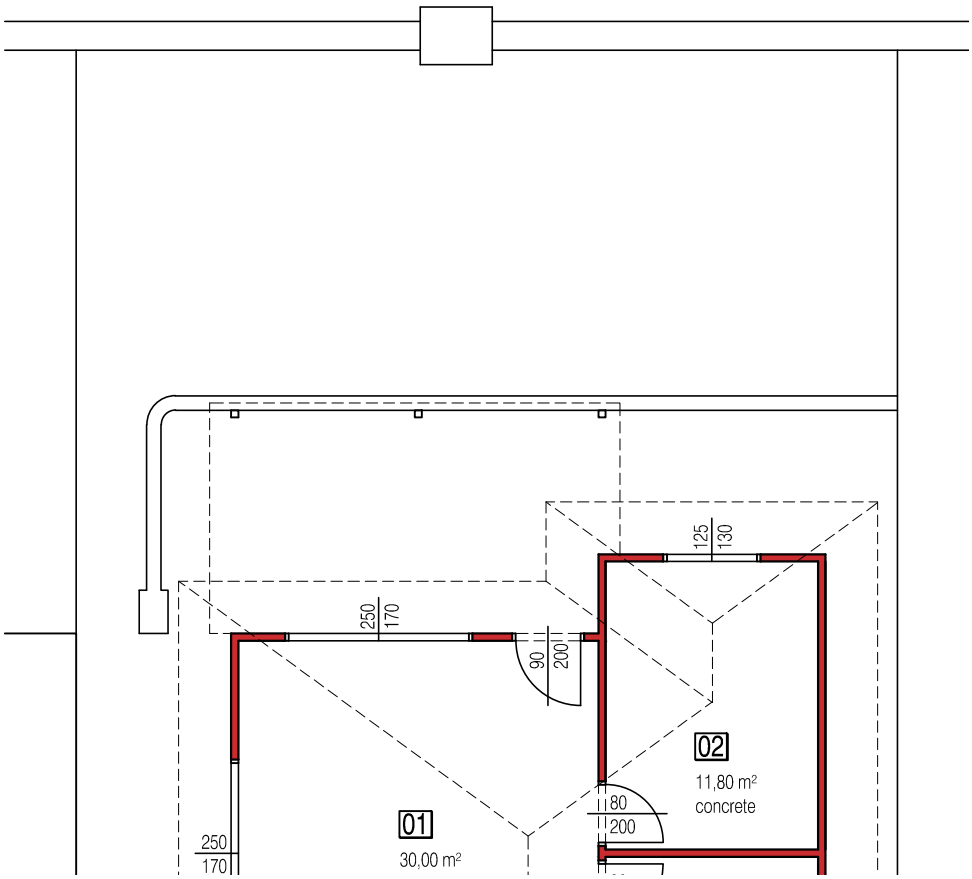
section 1:100

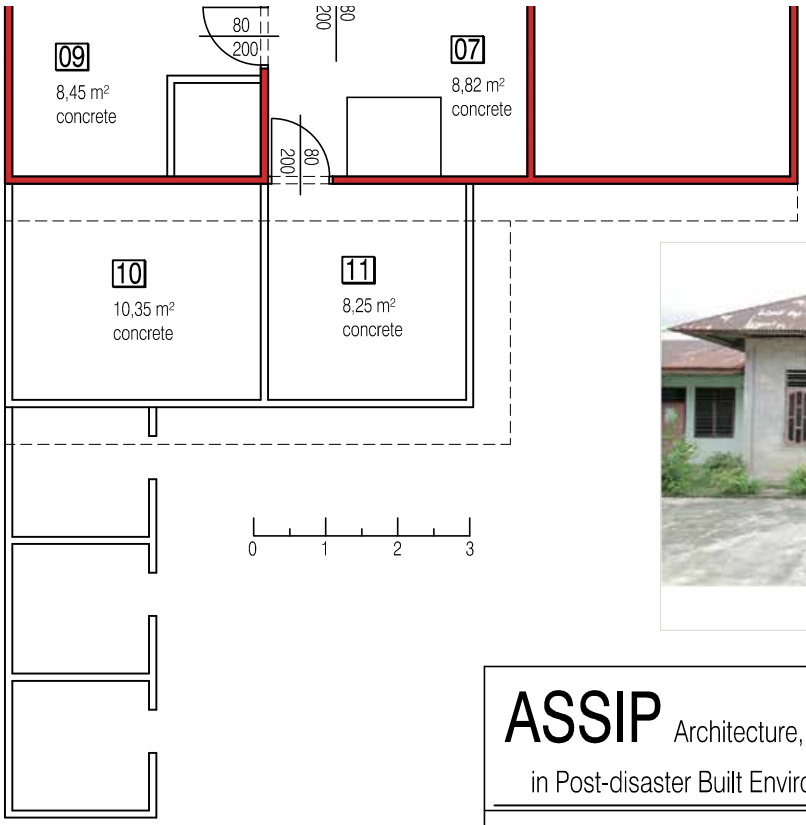
ssond 043

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 043
July 2012	Andreas Aahs

ground floor 1:100



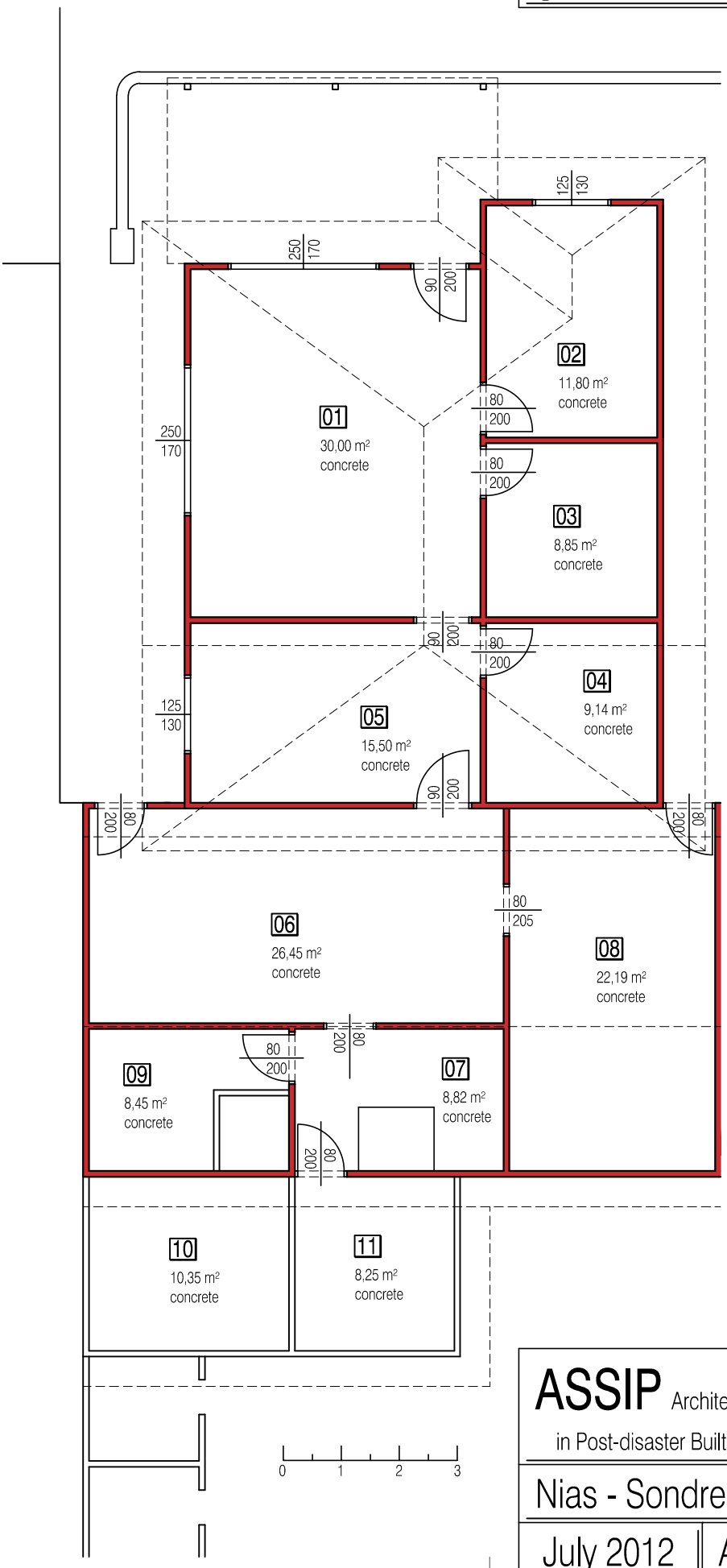


ssond 047

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 047
July 2012	Andreas Aahs

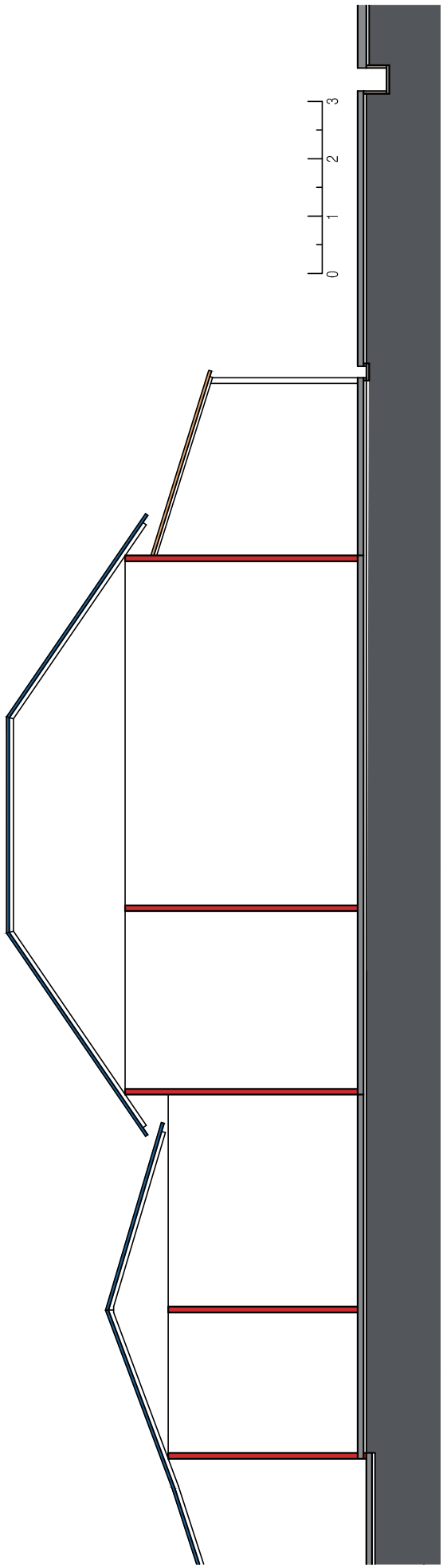
ground floor 1:100

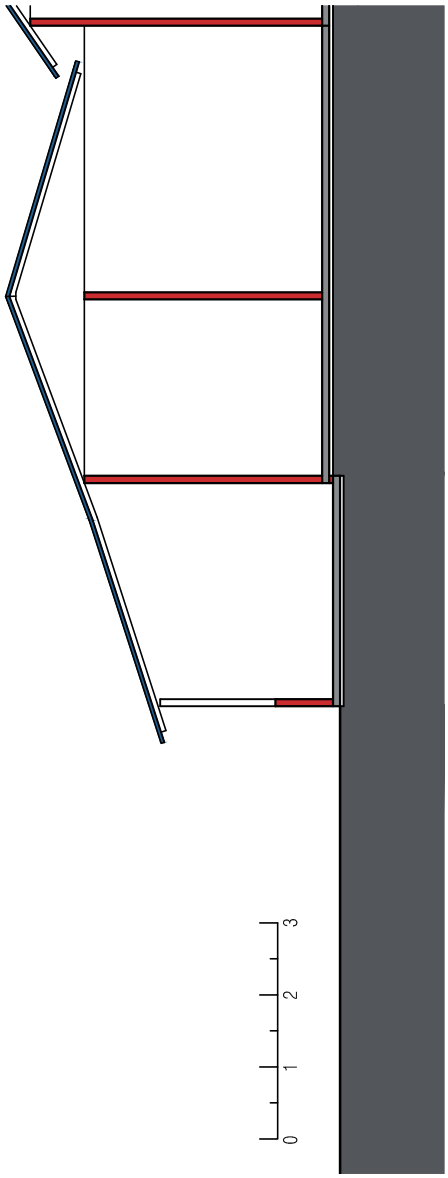


ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 047
July 2012	Andreas Aahs

section 1:100



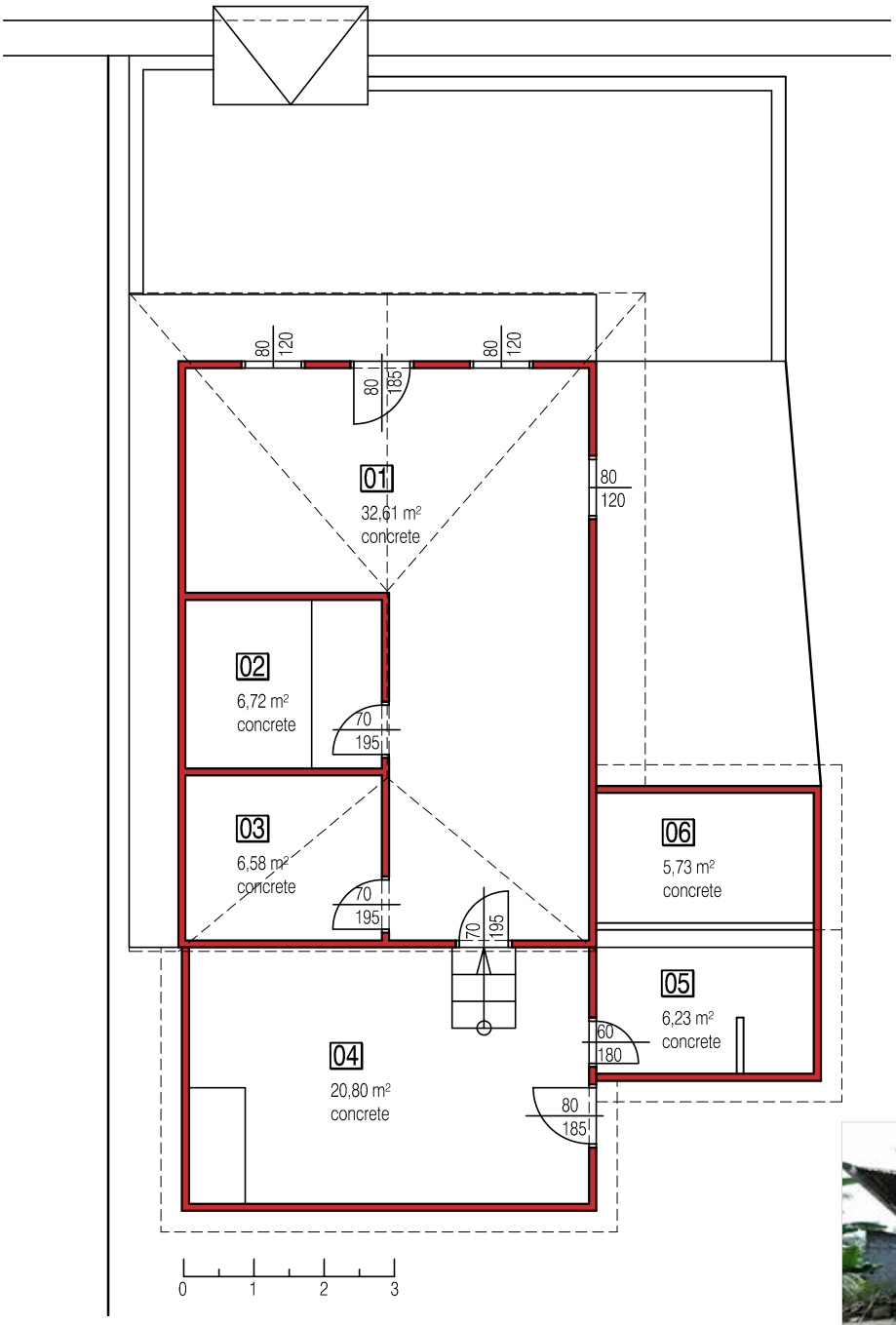


ssond 047

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 047
July 2012	Andreas Aahs

ground floor 1:100

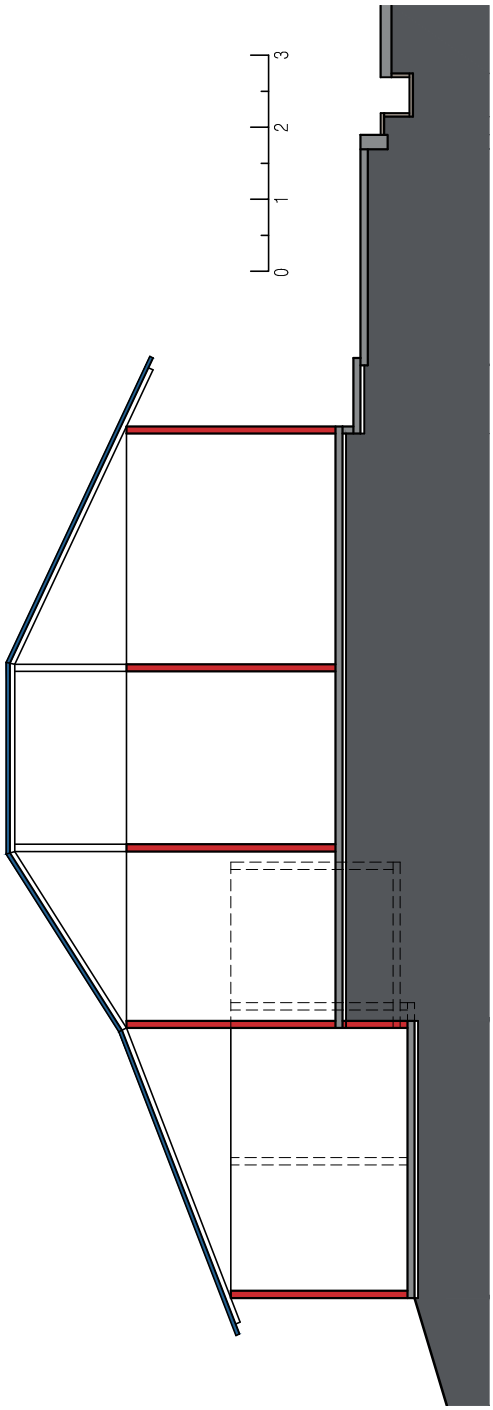


ssond 525

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 525
July 2012	Andreas Aahs

section 1:100



ssond 525

ASSIP Architecture, Space, and Society in Post-disaster Built Environment in Indonesia

Nias - Sondregeasi	ssond 525
July 2012	Andreas Aahs

room function of the houses in Sondregeasi																																										
		residential area of the modern house in Sondregeasi																					nourishment and sanitary sector																			backyard		
		tawolo	guestroom	living room	meeting room	kolukolu	bedroom	bedroom	bedroom	bedroom	storage	storage	garage	feröma	praying room	working room	warung	dining room	room for feast	practice room	play room	multifunctional r.	tawolo	feröma	kitchen	kitchen	dining room	bedroom	bedroom	storage	storage	garage	water	water	bath	bath	toilet	machine room	toilet	fireplace	sty
ssond	003	1	1	1			1	2																	3		3	3	4	3			3		5		5	6			
ssond	005	2	2		2		2	3			3	2	3											4	5		5	4		4	5		10	9	6				8		
ssond	014		1	1			2	3															4	7	7		7	4	5	7			8		8		8				
ssond	021		1	1			2	3	4		4		4												5	6	5			5	6		7		7		7				
ssond	025		1	4	1		2	3	4					1		1	4								5	6				5	6		8		7		7				
ssond	032		1		1		3	4	5					1	2			1							6		6						7		7		7			X	
ssond	033	1	1	2			2	3			1		2						3						5		4	4		4			7		6		6				
ssond	041		1	2	1	1	1	2	3				2							4					5		5			5	8	8	6		6		7				
ssond	043		1	1			1	2	3	4															5		5			5			8		6		7				X
ssond	047		1	1			2	3	4		5				1						4	5			7		6			6	8		9		9	10	9				X
ssond	525		1	1			1	2	3		1		1												4		4			4			6		5		5				
	11	3	11	9	4	1	11	11	7	1	5	1	5	2	2	1	1	1	1	1	1	1	1	2	11	2	10	4	2	10	5	1	11	1	11	1	10	1	1	1	2