

**CIB2007-344**

# **The Prototype of Land- Architecture in Taiwan The Case of Yami-Aboriginal Housing in Lanyu Island**

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## **ABSTRACT**

The Lanyu Island has the cultural charm of tropic aboriginal people. Located on the Pacific Ocean in the south-east direction of Taiwan, the unique and delicate Lanyu Island owns an ecologically sustainable lifestyle which results from specific geographical location and peculiar ethnic culture. The island also creates a living spatial context, which combines human activities with natural elements.

The study focuses on the climate-affected transportation network and land use method, which shows restricted living model and architectural system. Another study focus is the original land-architecture form, which results from independent geography, living environment, and unique southwest-oriented geographic viewpoint rooted, in local society and culture. The study anticipates that the appearance of the land-architecture will reflect the context of aboriginal cultural, which will further show the way of construction spatial method.

**KEYWORDS** Lanyu Island, Land-Architecture, Aboriginal Cultural

## **1.1 INTRODUCTION**

From the ecological ideological trend of land-architecture, extending to the new relation of architecture management, between building, environment, people, and the careful consideration of the delicate nature culture of the earth's surface soil, land-architecture provides the living space for human activities. The concept of land-architecture emphasizes the close relation between nature and city, and even closer relation between environment and building. But people hardly realize that first arose less than a century ago in

the natives of Lanyon Island, the ocean southeast of Taiwan, unattached to and independent of the Taiwanese mainstream society, have developed a unique architecture management of Yami building model, by adapting to the geographical position and because of their special culture features. The land-architecture on the island of Lanyu is the prototype of those in Taiwan. It follows the natural surface of the earth, conforms to the culture of Yami lives, and exists in the fuzzy zone between ground surface and space.

## **1.2 RESEARCH APPROACH**

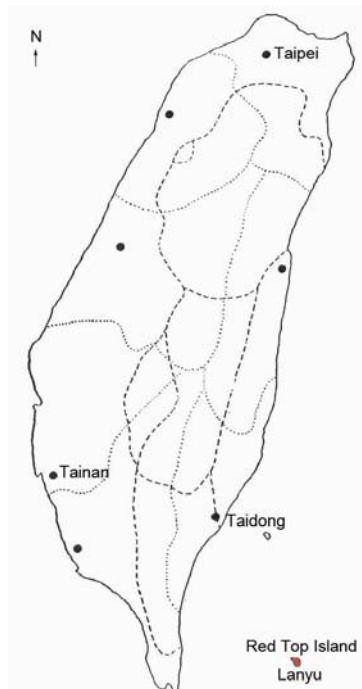
To study the architecture management of natural geographic ecology of Lanyu and culture structure as the prototype of the Land-Architecture of Taiwan, and to further study the relation between Yami-Aboriginal housing structure form and nature and culture, to analyze the direct or indirect impact of nature forms on Lanyu or Yami tribe, and to try to understand the real meaning as the Yami people manage from their experience of cultural and spatial existence, and their appreciation of environment and consideration of culture. Under this framework, there are three directions of studies:

First, the Yami housing health is under management geographical feature and physical environment of Lanyu, second, the forms of ground is under management the civilization of Yami society and their housing culture, third, the relation of the housing structure and land-architecture structure of management to Yami land-architecture. I hope the sensible adaptation of the geographical features, the structure form of the housing, the experience of housing culture and structure background of the earlier Yami tribe can be passed on and applied to the modern architecture management to Lanyu buildings.

## **1.3 THE GEOGRAPHICAL FEATURE AND PHYSICS ENVIRONMENT OF LANYU**

In Pacific Ocean, southeast of Taiwan and 49 nautical miles from the City of Taidong, Lanyu is an island of about 45.7 sq. km. area. See Figure 1.1. and 1.2. Formed in a volcano eruption in Paleocene Period, the island was called 'Red Top Island' prior to 1947. The name originated from the red color of the rocks on top of the mountain under sunshine.

Yami people, the residents of the land surrounded by the sea, have developed a sea-centered vision and managed habitable space to Yami self-expression, from an island far out in the ocean, yet looking outward to the world. Bardem Island, the home of Yami ancestors and the organ of their culture according to the legends, lies in the south. South is also where the flying fish come from in the annual trips, and return to later. "Iload" in Yami means "to the sea," "south", or "ahead". The language signifies the "facing the sea, and oriented to the south" geographical concept, influenced by their lives and culture of management as islanders.



CIB2007-344 Figure 1.1 The map of Taiwan And Lanyu



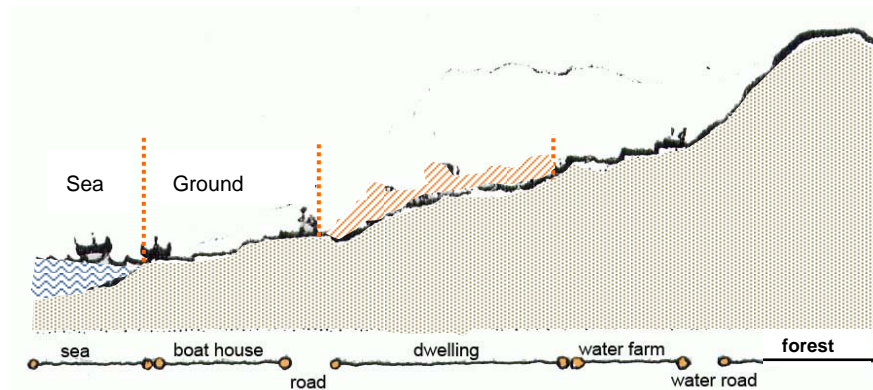
CIB2007-344 Figure 1.2 the map of Lanyu

### 1.3.1 TOPOGRAPHY AND GEOLOGY OF LANYU

Lanyu is an island surrounded by the sea. There is a central mountain range passes through the island and separates it into east and west halves, ' the whole island is formed in and site lava and set rocks. The center shows the exposed and site lava, the surrounding areas covered in fragments of volcanic lava, peripheral regions of alluvial sedimentary fans, and coastal areas of rising coral reef. ' (Ho Chun-Sun, 1975) Comparing the data of Lanyu geology with the distribution of seven Yami villages, we became aware that the main topographical areas for dwellings are the 15-27 degree gentle slopes in hillside, of alluvial fans and sedimentary deposit.

Towering hilltop of Lanyu shields the island from seasonal winds in summer and winter. Abundant forest in the central area is a rich source of construction material for Yami people. Short and swift rivers, as they flow from the mountain to the sea, provide irrigation water for farm of taro, cultivated by Yami people in the smooth hinterland of alluvial fans and areas along the coast. Coral reef and intertidal zones are best places for fishing and gathering of other sea food. Houses for fishing boats dot along the coast.

Coastal rocky areas also provide place for other Yami activities. See Figure 1.3.



CIB2007-344 Figure 1.3 Topographical areas for dwellings of Lanyu

### 1.3.2 CLIMATE IN LANYU

Lanyu has a clear tropical maritime climate, with the characteristic of the damp and hot wind, and plenty of rains. The wind blows to the land from ocean in the daytime, while to the ocean from the land at night (Lin Xi Juan, 1980). The average annual temperature in Lanyu is 26 degree C. Summer of 33 degree C high temperature lasts from April to November, and winter last from December to March. January is the coldest month when the temperature drops to 19 degree C. The strong seasonal winds in the winter, typhoons in summer, the shielding central mountain, and the surrounding sea all provide challenging conditions. Yami people have managed to develop adaptations to the climate characteristic of the island, adjusting to and overcoming the harsh natural environment. The prototype of land-architecture conforming to and making the best of topographical features has such evolved.

### 1.4 SOCIAL CULTURE AND HOUSING CULTURE OF THE YAMI PEOPLE

Regarding the origin and migration of the ancestors of Yami people, the spoken legends of seven villages do not always provide exactly same stories. Some claim that their ancestors come from Barden island (further south of Lanyu), while others believe they are descendants of stone and bamboo who proliferate in the island. Of fifty archaeological sites, most at hillside near coastal areas, there are nine ruins of abandoned villages from recent times or older legendary era. (Chen ZhongYu, 1989). One may believe these to be evidence of ancient settlers who subsequently moved and branched out. The legend that Yami people are the descendants of the stone and bamboo is extended to the concept of a universe, in which god, human, heaven, earth,

and nature all exist in harmony. This is the origin of all features of Yami culture.

#### **1.4.1 NATURAL CULTURE OF THE YAMI PEOPLE**

Yami religious beliefs are directly related to the nature. All gods, in visible forms or not, exist as parts of natural environ. These include God of Agriculture (Simurapao), God of Fishing (Siomima), God of Winds and Rains (Sipariod), God of Luck (Siliburbug), and Spirits of Famine, and provide explanations for values of lives and force of nature. In Yami legends, heaven is similar to the world on earth, where half is made of land and the other half sea.

The acknowledgement of gods in nature is a holy respect for the natural ecological environment where Yami people live. Flying fish, called 'the holy fish' by the native, has a particular high stand among Yami natural-cultural values. Flying fish return in the sea at a certain predictable time each year, leaping in large schools into the air in rhythmical splendor. They are sent from the sea in heaven, according to Yami legend (Huang Xu, 1995).

Their annual appearances re-enforce Yami people's confidence and faith in gods and nature. Yami people have a special south-oriented geographical view. They also use the 'the direction of sunrise' to imply east, and 'the direction of sunset' to imply west. 'The direction of sunrise' also implies fertility, area for women's daily activities, and ceremony of completion of house building. And 'the direction of sunset' implies death, area where men perform their works, where they store their fishing tools, or where funeral proceeding is held. Yami people pay special attention when they cut down a tree to use as the main post of a new house. The tree is considered a sign of bad luck if it falls to the direction of sunset, and is therefore discarded. (Huang Xu, 1995).

#### **1.4.2 SOCIAL CULTURE OF THE YAMI PEOPLE**

Yami social institutional framework is that of a patriarchal society. The dwellings are centered on the patriarch, and inheritances are passed along the paternal lines. The members of each clan live in a cluster of houses in one area of the village. Newer dwellings are added around and closely adjacent to the older houses of the clan. When they move, often people of three generations move together.

However, the expansion of the size of the clan is not always without limit. Dwellings and properties are passed along paternal line. People live with strict adherence to inheritance ceremonies, filial duties, obligations of sons to support their elders and to have proper funerals. Political leader is chosen from men with proven achievements and ability. He has the authorities to decide on issues of collective concerns such as production and harvesting, and presides over various ceremonial activities. The spirit of proposed prove to the management of domestic and ceremonial space.

### 1.4.3 LAND CULTURE OF THE YAMI PEOPLE

Yami people of Lanyu regard land as the root of life. In Yami agricultural society, they rely on land to provide yield to their cultivating, and reward for their good work. Seven Yami tribes live in coastal area. Each tribe owns land which is separated from those of other tribes with clear boundaries. The boundaries extend well into mountains, origins of rivers, or deep forest. They tribal members protect and cultivate the land, keep the members of other tribes from entering, and pass the township along the paternal line from generation to generation within the clan. Family builds house, or cultivate rice paddies in their land. The land rewards whoever works hard. Families that leave the land unattended go hungry and become poor. The law regulating people and land is simple and clear in the case here.

CIB2007-344 Figure 1.4 Cultivated

CIB2007-344 Figure 1.5 Dig and move the soil



Yami people lacked proper tools when they worked to clear land in earlier times. They often used their bare hands to dig and move the soil. See Figure 1.4 and 1.5 (Xia Ben Bo Ai Xiong, 1994) It is the work of men in the family. Taking up little precious left-over time they have beside fishing and other more pressing demands, they managed to clear land for paddies, sometimes over a year of time. Against the odd of harsh nature such as typhoon, land is always used to the fullest of its potential. Yami people and land exist in a mutually dependent relation which nourishes the people and nurtures the primitive land planning.

### 1.4.4 CULTURE OF DWELLING OF THE YAMI PEOPLE

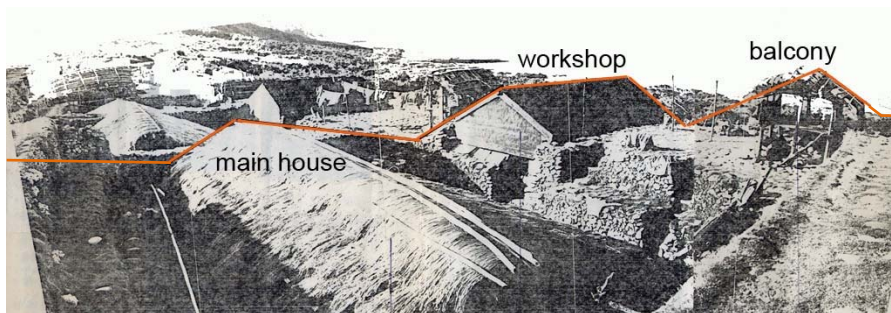
Taking the island nature and seasons into consideration, the function management of housings for Yami people are built in four different forms: delivery room, balcony, workshop, and main house.

The delivery room (Palalawan), also called nursery, is used for labor and delivery, which itself supposedly will ward off evil spirit, or is used temporarily for the newly married. It often is built independently separated from the main house. It takes only one day of time to build a delivery room.

Balcony (Tagakal) is the family space for all members to relax and cool off together in summer, important for the human physiology and the nature. A well built and decorated balcony is the symbol of the high social status of the family. The elevated structure of columns is a suitable place for people to view the vast expanse of surrounding and condition in the sea.

The workshop (Saza) is an important place in spring and autumn, where Yami people work or to pursue leisure recreational activities. It is a place to show their good material living status. Meticulous attention is paid to the building of the room, using thirty six kinds of building material. Lack of even one single item is not acceptable. It is usually built at the side of the main house.

The main house is for family members to keep warm during winter time. There are one- or two-door houses (Valag), three-door houses (Atlososesdepan), or four-door houses (Pazakowan), and difference in main post, depending on the size of the family and their social status. One- or two-door houses are for bachelors, or newly married couples. When more members arrive, a three-door house is built. A four-door house is built to promote one's social reputation, or to signify the status of an elderly.



CIB2007-344 Figure 1.6 View of Yami-aboriginal housing

### 1.5 DIALOGUE BETWEEN YAMI HOUSING STRUCTURE AND LAND-ARCHITECTURE STRUCTURE

Yami people merge the characteristics of the natural resources and life style, and pioneer a way of ground scene building form in Lanyu. The dwellings, of four above-mentioned kinds, are set up in the fuzzy contact zone between the earth's surface and the space. One can easily be amazed by the posture of an elevated balcony floating on the surface of the land, the smooth connection between the forms and spaces of rooms, the natural continuity of land surface connecting delivery room and workshop, or the delicate horizontal and vertical spatial variations of the dwellings. A main house of concave style demonstrates fluid conformity to the land surface. It produces limitless spatial potential out of a limited land surface. Through the sensible use of the regional housing construction material, construction procedure, and the organization of manpower, a combination of the nature and ground

scene structure becomes a reality.

### 1.5.1 HOUSING CONSTRUCTION MATERIAL

Yami people use many different kinds of building material. A workshop itself requires up to 36 kinds of materials. So the kind of the housing building materials is really multiple and of great variation. There are five kinds of basic building materials: timber, stone, bamboo, cogon-grass, and rattan (Lin XiJuan, 1980). Materials may also be classified into those for base, for main structure, for secondary structure, or for decorating the surface. After the clearing of land and digging, a base is laid with cobblestones to bear the weight of posts and walls. Stones are also used to build retaining wall or steps. See Figure 1.7.

Materials of the main structure are mostly timber, of which the forest has ample supply. Proper attention is paid to the falling of trees. Trees falling toward south or east are suitable. Those falling toward west are seen as signs of bad luck and therefore not to be used for building. Trees with imperfections or already earmarked by other people can not be used as main post. Timber comes from mango, Ciyai, Oring, Tehey tree, Mozngi etc. Timber of proper shapes is immersed in water for certain duration, dried in air, and then stored for use.

Materials for secondary structures include timber, bamboo, or rattan. Timber comes from Ciyai, Kolitan, Anongo, and Varok. Bamboo is used as roof frame for thatch. Rattan is used to tie around posts, roof frames, ridgepoles and beams, wallboard, and eave shelf etc.

Surface decorative materials include cogon-grass (Vocid), rattan (Vazit), reed (Sinasa), mulberry wood (Pasek), etc. Rattan is used for tying thatch, eave and wall on the door, the reed is used for holding cogon-grasses, the mulberry wood is used as the wood nails. See Figure 1.8.

**CIB2007-344 Figure 1.7** Stone foundation **CIB2007-344 Figure 1.8** Covered cogon-grasses



### 1.5.2 MODE AND PROCEDURE OF HOUSING

When Yami people are building a balcony, workshop or main house, the

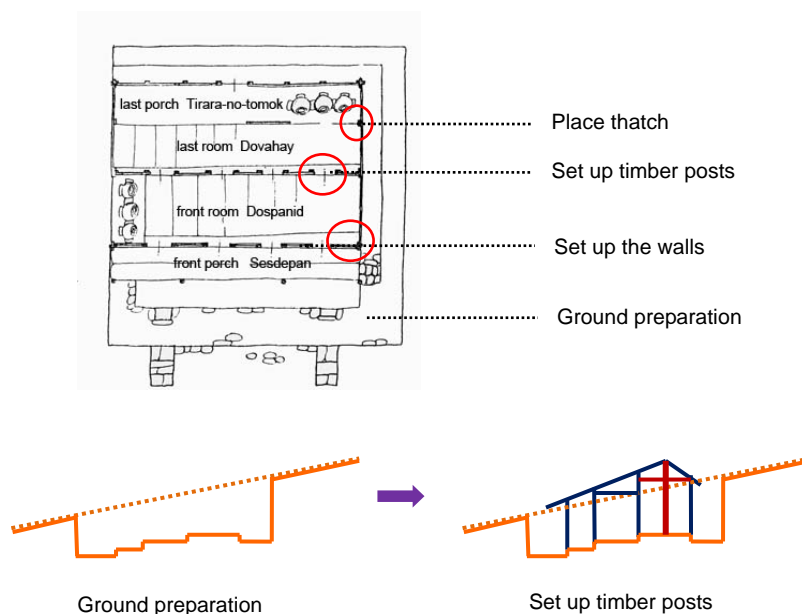
mode and procedure of construction are limited and influenced by natural conditions and culture. Basically, the procedure of constructing is from bottom to top, and from outside to inside.

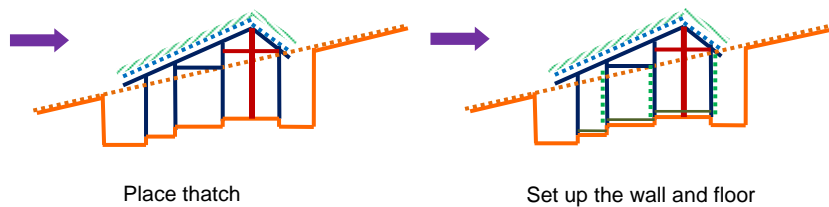
Stage one is ground preparation: Dig out the earth to place around the four boundaries, to form a stretch of elevation of 90 cm high and 60 cm wide. Walk on the elevation in barefoot until the earthwork is stable. Build a retaining wall of cobblestones, around the step. Place cobblestones to form the base of foundation. This will take up one year of time.

Stage two: Set up timber posts. The timbers have been made termite-proof under sun-baking. Measure the distance of posts with rope or bamboo. Mark the rope with ash to record the measures. Set up posts at the location according the measurements. Place poles, beams, horizontal shelves, and frames.

Stage three: Place thatch. Lay bamboo frame on roof truss, and then place a layer of cogon-grasses. The grasses have been cleanly tied in place, three-handful thick each. Repeat until five layers of bamboo-cogon grasses are laid. They are tightened with reeds and rattans so the roof can stand the winds.

Stage four: Set up the walls. Carefully measure out the locations on the floor, using ropes with ash markings. Erect wall boards, joined together with hard wood nails. Place wood floor. Place platform, horizontal board, storage room, ceiling, and carve ornament woodworks. And finally have a ceremony when the construction is completed. See Figure 1.9





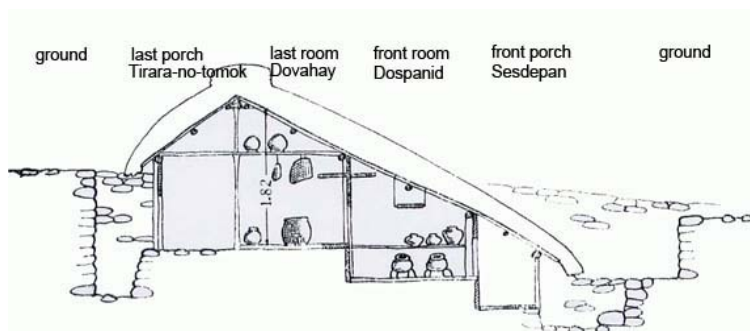
CIB2007-344 Figure 1.9 The procedure of construction of the Yami-aboriginal house

### 1.5.3 THE COMBINATION OF LAND-ARCHITECTURE STRUCTURE FORM AND NATURAL

A traditional Yami family house possesses individual special characters of spatial forms. Delivery room, balcony, workshop, and main house are linked together, conforming to the natural elements, on and above ground, and the surrounding from mountain to sea, to form a diversified complex organism space.

First let us try to analyze the dialogue between the external structure forms of Yami houses and nature. The cluster of houses is built on the gentle slope, forming a line of continuity from hill to sea. The base of cobblestones and the peripheral three lines of earthwork are strong enough to prevent erosion by the torrential rains. The lower part of ground structure faces the sea, while the ridge is parallel to coastline, and the roof runs from the ridge downward to each side. The thatch roof can stand the beating of winds in winter or typhoons. In an island plentiful in rainfall, the gentle slope of alluvial fan can absorb rainwater nicely. Underground drainage system lets the water run out to the sea directly. See Figure 1.10.

The language of Lanyu

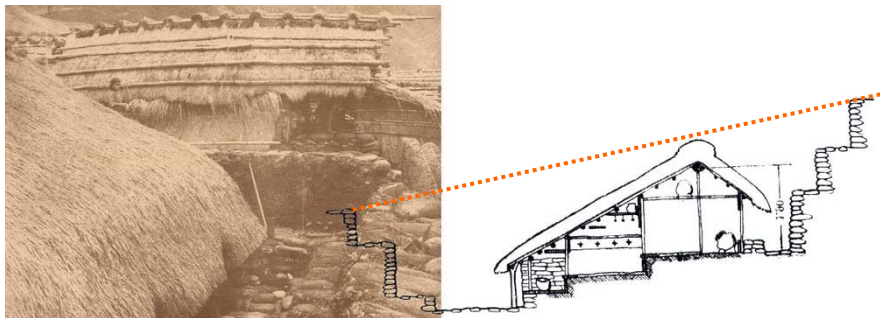


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44 Figure 1.10 The section of the Yami aboriginal house

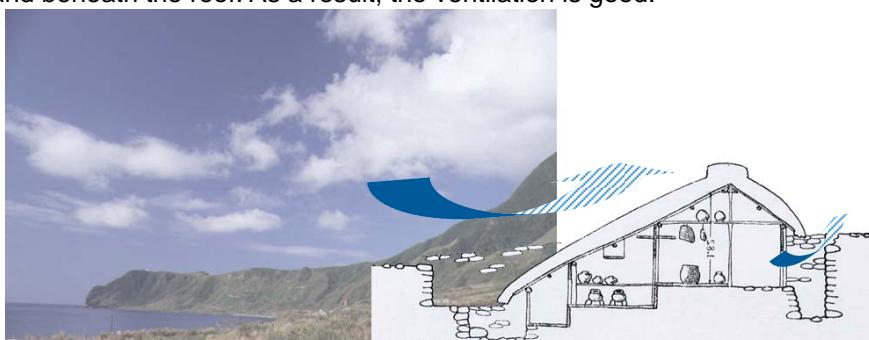
A Yami workshop is on a gentle slope, beside the main house. The lower part is half-enclosed and used for storage. Behind, it is connected to the main house through an opening. The upper part is an open space. A balcony, erected on eight columns, is meant to be merged into the mountain-to-sea axis. It is not intended to exist alone on the land, liberated from the surrounding ground scene and space... See Figure 1.11.



**CIB2007-344 Figure 1.11** The section of the ground and architecture

The structure of the houses also reflects a careful consideration of climatic elements. Lanyu is an island of high humidity, high temperature, stormy winds, and torrential rains. Yami people have, over the time, learned to overcome the harsh environmental condition. They have demonstrated the intelligence and ability to make a more comfortable living since early times. See Figure 1.12.

The basic structure of a Yami main house is one 'double-envelops' supported on a central post. It provides indoor temperature which is comfortable during summer, with proper consideration of insulation and ventilation. The roof and walls, the covering of space with wood frames, demonstrate their skills in dealing with climate at the time. Thatch roof, made of threads of peeled bamboo and cogon-grass, trapping the air between the layers, is ideal for insulation. While insulated from the heat in the outside, the indoor air flow is well kept between the space around the walls, frames, and beneath the roof. As a result, the ventilation is good.



**CIB2007-344 Figure 1.12** Between sea and mountain land architecture

## 1.6 CONCLUSION

Yami-Aboriginal land-architecture structure form is obviously well adapted to the ecology of nature. The materials managed from the abundant supplies in the forest of environment. Their interpretation of housing may be traced back to their religious believes and universe concept of heaven and gods. The house is not only a shelter from winds and rains, but also provides space for living, culture, social interconnecting and other human activities. Yami people have developed their unique management of house construction by merging labor with manpower resources and limited natural environment. The exquisite cultural Heritage will be passed to the future generations of architecture management to Lanyu.

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